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Industrial Automation Guide 2010/2011

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Industrial Automation Guide 2010/2011



50 years of innovation in industrial business

Welcome to Omron's world of advanced industrial automation. The INDUSTRIAL AUTOMATION GUIDE is your essential tool to select best-in-class devices for your automation system. It highlights our core competences in sensing, control, visualisation, motion and panel components.

Of course, Omron offers a much larger range of products that you can find in the attached CD-ROM. For more information on services and company competence, please visit our website at **www.industrial.omron.eu.**

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Machine Automation Competence

Wherever and whenever you need it



A Global Corporation

Omron Industrial Automation is a global manufacturer of technologically advanced products and a leading provider of application expertise. It is part of Omron Corporation, which has been anticipating and meeting social needs since its founding in 1933.

Omron continues to make significant contributions in a wide variety of fields, such as industrial automation, electronic components and healthcare.

Omron Industrial Automation Europe

In Europe we have maintained a leading position in machine and industrial automation for over 30 years. We use our expertise in machine automation in helping our customers to turn their dreams into reality… world class machines and solutions.

Specialization is about supporting you with competent and experienced people, quality products that work in conditions far beyond their published specifications and always maintaining our commitment to you, the customer. We provide solutions based on our customers needs, whether that solution is used in a fixed form through to a highly flexible machine.

- **50 years in industrial automation**
- **Over 27,000 employees**
- **Support in every European country**
- **Over 2,100 employees in 19 European countries**
- **800 specialised field engineers**
- **8% of turnover invested in R&D**
- **More than 200,000 products**
- **More than 6,950 patents registered to date**

Application support

As an Omron customer, you will have our support that matches your precise needs. Our dedicated automation experts will help you develop the best machine architecture ,our dedicated product specialists will help get the best functionality, and an experienced account manager will follow and coordinate the total business cycle.





"From the moment you contact Omron,
you get direct access to our application expertise."





European manufacturing

Omron has manufacturing sites in 's-Hertogenbosch, the Netherlands and Nufringen, Germany where, in addition to our standard product range, we can provide fast and flexible customised solutions using on-site R&D facilities and expertise. Both factories meet very strict quality assurance standards, and are at the forefront of meeting global environmental standards. Omron actively welcomes visitors to these facilities.

Online support

Omron's website is designed to provide fast, no-nonsense support, enabling you to quickly find the latest information on manuals, datasheets and brochures, read about our latest product releases, and check out the most frequently asked questions. You can also download our latest software versions or patch upgrades along with 2-D and 3-D CAD drawings. All the support you need is available on www.industrial.omron.eu.

European Repair Centre

Omron has set up a special repair service with DHL that enables your product to be collected, repaired and returned within 5 days. This repair service is totally free of charge for products under Omron's warranty conditions, and includes a direct collection and delivery at your site. You can get more information about this service at www.repair.europe.omron.com.

Product selection table

CHAPTER	1	Programmable Logic Controllers (PLC)	2	Remote I/O	3	Human Machine Interface (HMI)
						
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SMART PLATFORM

One software – One connection – One minute

Omron's Smart Platform is designed to make machine automation easy. It provides seamless, drag-and-drop integration of all automation components in your machine. From sensor to controller, from HMI to drive, all devices are accessible through one connection using a single software suite, CX-One.
Built-in distributed intelligence in Omron devices means less time programming and troubleshooting.

Everyone claims ease of use, a short movie explains how easy programming and configuration really can be:
www.smartplatform.info



Automation systems – Table of contents

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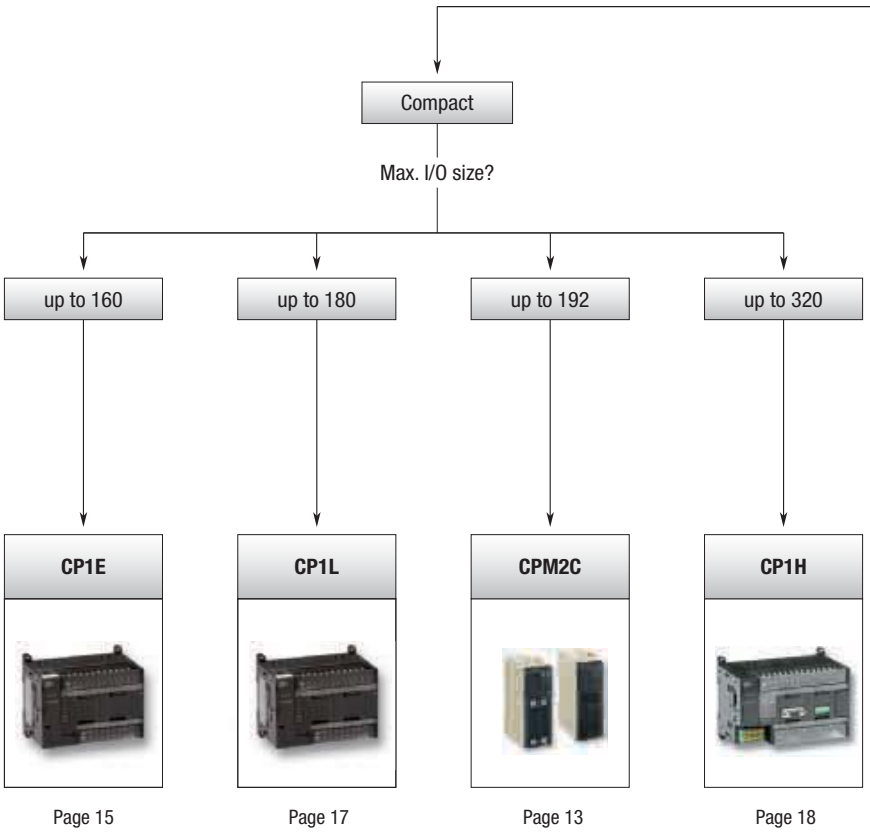
KNOW ONE... KNOW THEM ALL!

Whether your automation requires a simple and economical solution, or your target is advanced, high-speed control, you can find what you need in Omron's line-up of Programmable Controllers.

And if your systems grow, or change due to market demand, you will find that only Omron offers a full range of Compact PLCs and Modular PLCs that share the same architecture. Therefore your programs are fully upward compatible, both in memory allocation and instruction set.

- One scalable PLC family to always match exactly with your application
- Transparent communication routing through different networks
- The best size/performance ratio in the industry





Type of PLC needed?

- **Modular**
  - Max. I/O size?
    - up to 640
      - **CJ1M**
      - Page 20
    - up to 2560
      - **CJ2M**
      - Page 20
      - High-speed synchronous I/O
        - **CJ2H**
        - Page 20
- **Rack**
  - Max. I/O size?
    - up to 5120
      - **CS1G/H**
      - Page 28
      - Dual redundancy
        - **CS1D**
        - Page 28

Selection table

		Compact PLC series			
					
Model		**CPM2C**	**CP1E**	**CP1L**	**CP1H**
Max digital I/O points[*1]		192	160	180	320[*2]
Built-in	**Digital I/O**	10 to 32	10 to 60	10 to 60	20 or 40
	Interrupt inputs	2 or 4	4 or 6	2, 4, or 6	6 or 8
	Counter inputs	2 or 4	5 or 6	4	2 or 4
	Pulse outputs[*1]	2	2	2	2 or 4
CPU features[*1]		Compact size Expansion units Quick-response inputs Input interrupts High-speed counter Pulse output with PWM Built-in RS-232C port Real time clock	USB port standard Expansion I/O units Quick-response inputs Input interrupts High-speed counter Pulse output with PWM Built-in RS-232C port Serial option boards Real time clock 2 Analogue adjusters	USB port standard Expansion I/O units Quick-response inputs Input interrupts High-speed counter Pulse output with PWM Built-in RS-232C port Option board slots Real time clock 1 Analogue adjuster 1 External analogue input	USB port standard Expansion I/O units CJ-series Special I/O Units CJ-series CPU Bus Units Quick-response inputs Input interrupts High-speed counter Pulse output with PWM Built-in RS-232C port Option board slots Real time clock 1 Analogue adjuster 1 External analogue input LED display, 2 digit
Instruction Execution time (bit instruction)		0.64 µs	1.10 µs	0.61 µs	0.10 µs
Program memory		4K words	2 or 8K steps	5 or 10K steps	20K steps
Data memory		2K words	2 or 8K words	10 or 32K words	32K words
External memory		Expansion memory unit	–	Memory cassette	Memory cassette
Analogue I/O		Analogue I/O unit Temperature sensor unit	Built-in for E-NA model (2 in + 1 out) Analogue I/O Expansion Units Temperature Input Expansion Units	Analogue I/O Expansion Units Temperature Input Expansion Units	Built-in for XA model (4 in + 2 out) Analogue I/O Expansion Units Temperature Input Expansion Units CJ Analogue I/O Units CJ Temperature Units
Special function units		–			CJ-series Special I/O Units CJ-series CPU Bus Units
Fieldbus master		–			Ethernet EtherNet/IP Controller Link DeviceNet PROFIBUS-DP PROFINET ModBus CompoNet CompoBus/S CAN (freely configurable)
Fieldbus I/O		CompoBus/S DeviceNet	PROFIBUS-DP CompoBus/S DeviceNet	PROFIBUS-DP CompoBus/S DeviceNet	PROFIBUS-DP CompoBus/S DeviceNet
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[*1] Some features listed are not available for all CPU types within each series. Please review specifications for more information on CPU features and performance.
[*2] Represents local I/O capacity. If a fieldbus master is used more I/O is possible.

		Modular PLC series			Rack PLC series	
						
Model		**CJ1M/G/H**	**CJ2M**	**CJ2H**	**CS1G/H**	**CS1D**
Max. digital I/O points[*1]		2560	2560	2560	5120	5120
Built-in[*1]	**Digital I/O**	16	–			
	Interrupt inputs	4	–			
	Counter inputs	2	–			
	Pulse outputs	2	–			
CPU features[*1]		Compact size No backplane required Large program capacity Easy backups Built-in pulse I/O Loop control CPU type Real time clock	USB port standard Built-in Ethernet/IP port High-speed I/O units Option board plug-in Structures and arrays Tag data links Compact size No backplane required Large program capacity Function Block memory Easy backups Real time clock	USB port standard Built-in Ethernet/IP port High-speed I/O units Structures and arrays Tag data links Synchronous I/O Compact size No backplane required Extra Large program capacity Easy backups Real time clock	High I/O capacity Inner board support Large program capacity Backwards compatible Easy backups Real time clock	Redundant CPU Redundant power supply Hot swapping High I/O capacity Inner board support Large program capacity Backwards compatible Easy backups Real time clock
Instruction Execution time (bit instruction)		0.10/0.04/0.02 µs	0.04 µs	0.016 µs	0.04/0.02 µs	0.04/0.02 µs
Program memory		5 to 120K steps	5 to 60K steps	50 to 400K steps	10 to 250K steps	10 to 250K steps
Data memory		32 to 256K words	64 to 160K words	160 to 832K words	64 to 448K words	64 to 448K words
CompactFlash memory		Up to 512 MB				
Analogue I/O		Analogue I/O unit Temperature sensor unit Temperature control unit				
Special function units		Temperature control High-speed counters (500 kHz) SSI encoder input Position control Protocol macro RFID sensor unit		Temperature control High-speed counters (500 kHz) SSI encoder input Position control Protocol macro RFID sensor unit High-speed I/O Synchronised Position	Temperature control SSI encoder input High-speed counters (500 kHz) Position control Motion control Process control Protocol macro RFID sensor unit	
Fieldbus master		Ethernet EtherNet/IP Controller Link DeviceNet PROFIBUS-DP PROFINET ModBus CompoNet CompoBus/S CAN (freely configurable)				
Fieldbus I/O		DeviceNet PROFIBUS-DP CAN (freely configurable)				
Page		20			28	

[*1] Some features listed are not available for all CPU types within each series. Please review specifications for more information on CPU features and performance.

CPM2C CPU units



The versatile slim-line controller

An extensive range of models ensures efficient machine control in an ultra-compact package. CPU units are available with relay or transistor output, terminal block or various connector options, and an optional real-time clock function. Select the output type, number of I/O points and other specifications to meet your needs. Expansion I/O units with 8 to 32 I/O points make it possible to configure a control system with a maximum of 192 I/O points.

- Space-saving slim outline, high-density I/O
- 10-32 I/O points per CPU, transistor or relay outputs
- 20 kHz counter input, two 10 kHz pulse outputs integrated
- Two communication ports built-in, freely accessible
- Digital, analogue, and fieldbus expansion units

Ordering information

Input points	Output points	Program capacity	Data memory capacity	Logic execution speed	Size in mm (HxWxD)	I/O Connectors	Output method	Built-in functions	Real time clock	Order code
6 points	4 points	4K words	2K words	0.64 µs	90x33x65	2 Terminal blocks	Relay	1 Encoder input (20 kHz)	–	CPM2C-10CDR-D
									Yes	CPM2C-10C1DR-D
						2 Fujitsu (24 pt)	Transistor (source type)	1 Encoder input (20 kHz) 2 Pulse output (10 kHz)	–	CPM2C-10CDT1C-D
									Yes	CPM2C-10C1DT1C-D
						2 MIL (20 pt)	Transistor (source type)	1 Encoder input (20 kHz) 2 Pulse output (10 kHz)	–	CPM2C-10CDT1M-D
									Yes	CPM2C-10C1DT1M-D
12 points	8 points	4K words	2K words	0.64 µs	90x33x65	2 Terminal blocks	Relay	1 Encoder input (20 kHz)	–	CPM2C-20CDR-D
									Yes	CPM2C-20C1DR-D
						2 Fujitsu (24 pt)	Transistor (source type)	1 Encoder input (20 kHz) 2 Pulse output (10 kHz)	–	CPM2C-20CDT1C-D
									Yes	CPM2C-20C1DT1C-D
						2 MIL (20 pt)	Transistor (source type)	1 Encoder input (20 kHz) 2 Pulse output (10 kHz)	–	CPM2C-20CDT1M-D
									Yes	CPM2C-20C1DT1M-D
16 points	16 points	4K words	2K words	0.64 µs	90x33x65	2 Fujitsu (24 pt)	Transistor (source type)	1 Encoder input (20 kHz) 2 Pulse output (10 kHz)	–	CPM2C-32CDT1C-D
						2 MIL (20 pt)	Transistor (source type)	1 Encoder input (20 kHz) 2 Pulse output (10 kHz)	–	CPM2C-32CDT1M-D
6 points	4 points	4K words	2K words	0.64 µs	90x40x65	1 Fujitsu (24 pt)	Transistor (source type)	1 Encoder input (20 kHz) 2 Pulse output (10 kHz) Programmable Slave with DeviceNet slave and CompoBus/S Master	Yes	CPM2C-S110C-DRT
6 points	4 points	4K words	2K words	0.64 µs	90x40x65	1 Fujitsu (24 pt)	Transistor (source type)	1 Encoder input (20 kHz) 2 Pulse output (10 kHz) CompoBus/S Master	Yes	CPM2C-S110C

Note: All CPU's are available only with DC supply voltage (CPM2C-PA201 can be used as power supply).
CPU's with sourcing transistor outputs are also available with sinking transistor outputs.
MIL = connector according to MIL-C-83503 (compatible with DIN 41651/IEC 60603-1).

CPM2C expansion units



Expand the capacity of your CPM2C PLC

Expansion I/O units with 8 to 32 I/O points make it possible to configure a control system with a maximum of 192 I/O points

Ordering information

Unit	Output type	I/O Connectors	Inputs	Outputs	Order code
Expansion I/O units	–	1 Fujitsu (24 pt)	8	–	CPM2C-8EDC
		1 MIL (20 pt)			CPM2C-8EDM
	–	1 Fujitsu (24 pt)	16	–	CPM2C-16EDC
		1 MIL (20 pt)			CPM2C-16EDM
	Relay	1 Terminal block	–	8	CPM2C-8ER
	Transistor output (source type)	1 Fujitsu (24 pt)			CPM2C-8ET1C
		1 MIL (20 pt)			CPM2C-8ET1M
	Transistor output (source type)	1 Fujitsu (24 pt)	–	16	CPM2C-16ET1C
		1 MIL (20 pt)			CPM2C-16ET1M
	Relay	2 Terminal blocks	6	4	CPM2C-10EDR
	Relay	2 Terminal blocks	12	8	CPM2C-20EDR
	Transistor output (source type)	2 Fujitsu (24 pt)	16	8	CPM2C-24EDT1C
		2 MIL (20 pt)			CPM2C-24EDT1M
	Transistor output (source type)	2 Fujitsu (24 pt)	16	16	CPM2C-32EDT1C
		2 MIL (20 pt)			CPM2C-32EDT1M
Analogue I/O units	Analogue (resolution 1/6000)	2 Terminal blocks	2	1	CPM2C-MAD11
Temperature sensor units	Thermocouple input	1 Terminal block	2	–	CPM2C-TS001
	Platinum resistance input	1 Terminal block	2	–	CPM2C-TS101
CompoBus/S I/O link unit	–	1 Terminal block	I/O link of 8 input bits and 8 output bits		CPM2C-SRT21
RS-232C and RS422 adapter units	–	1 D-sub 9-pin	RS-232C		CPM2C-CIF01-V1
		1 Terminal block and 1 D-sub 9-pin	RS-232C and RS422		CPM2C-CIF11

Note: Expansion I/O units with sourcing transistor outputs are also available with sinking transistor outputs.
MIL = connector according to MIL-C-83503 (compatible with DIN 41651/IEC 60603-1).

CP1E CPU units



Easy, efficient & economic

Omron's CP1E series targets a 'lean' automation solution, but still offers all functionality you need to control relatively simple applications, including outstanding positioning capability. The CP1E comes with 10, 14, 20, 30, 40 or 60 I/O built-in and can be expanded with a wide range of CP1W or CPM1A expansion units up to 160 I/O points. It uses a standard USB port for programming and monitoring. The E-N type includes a serial communication port and offers an additional plug-in serial communication port. As the CP1E series shares the same architecture as the CP1L, CP1H, CJ1, and CS1 series, programs are compatible for memory allocations and instructions.

Ordering information

Input points	Output points	Expandable up to (digital I/O)*1	Program capacity	Data memory capacity	Logic execution speed	Expandability	Power supply	Output method	Built-in functions	Order code
6 points	4 points	10	2K steps	2K words	1.19 µs	–	100 to 240 VAC	Relay	4 high speed inputs	CP1E-E10DR-A
								Transistor (sinking)		CP1E-E10DT-A
								Transistor (sourcing)		CP1E-E10DT1-A
							24 VDC	Relay		CP1E-E10DR-D
								Transistor (sinking)		CP1E-E10DT-D
								Transistor (sourcing)		CP1E-E10DT1-D
8 points	6 points	14					100 to 240 VAC	Relay	6 high speed inputs	CP1E-E14DR-A
12 points	8 points	20						Relay		CP1E-E20DR-A
18 points	12 points	150				Up to 3 expansions		Relay		CP1E-E30DR-A
24 points	16 points	160						Relay		CP1E-E40DR-A
8 points	6 points	14	8K steps	8K words		–		Relay	6 high speed inputs	CP1E-N14DR-A
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N14DT-A
								Transistor (sourcing)		CP1E-N14DT1-A
							24 VDC	Relay	6 high speed inputs	CP1E-N14DR-D
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N14DT-D
								Transistor (sourcing)		CP1E-N14DT1-D
12 points	8 points	20					100 to 240 VAC	Relay	6 high speed inputs	CP1E-N20DR-A
12 digital + 2 analogue points	8 digital + 1 analogue point	140				Up to 3 expansions		Relay + analogue		CP1E-NA20DR-A
12 points	8 points	20				–		Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N20DT-A
								Transistor (sourcing)		CP1E-N20DT1-A
							24 VDC	Relay	6 high speed inputs	CP1E-N20DR-D
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N20DT-D
								Transistor (sourcing)		CP1E-N20DT1-D
12 digital + 2 analogue points	8 digital + 1 analogue point	140				Up to 3 expansions		Transistor (sinking) + analogue		CP1E-NA20DT-D
								Transistor (sourcing) + analogue		CP1E-NA20DT1-D
18 points	12 points	150					100 to 240 VAC	Relay	6 high speed inputs	CP1E-N30DR-A
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N30DT-A
								Transistor (sourcing)		CP1E-N30DT1-A
							24 VDC	Relay	6 high speed inputs	CP1E-N30DR-D
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N30DT-D
								Transistor (sourcing)		CP1E-N30DT1D
24 points	16 points	160					100 to 240 VAC	Relay	6 high speed inputs	CP1E-N40DR-A
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N40DT-A
								Transistor (sourcing)		CP1E-N40DT1-A
							24 VDC	Relay	6 high speed inputs	CP1E-N40DR-D
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N40DT-D
								Transistor (sourcing)		CP1E-N40DT1-D
36 points	24 points	180					100 to 240 VAC	Relay	6 high speed inputs	CP1E-N60DR-A
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N60DT-A
								Transistor (sourcing)		CP1E-N60DT1-A
							24 VDC	Relay	6 high speed inputs	CP1E-N60DR-D
								Transistor (sinking)	6 high speed inputs 2 pulse outputs	CP1E-N60DT-D
								Transistor (sourcing)		CP1E-N60DT1-D

*1 Some CPU units can be expanded with CP1W or CPM1A expansion units.

Accessories

Type	Remarks	Order code
RS-232C Option Board	Plug-in board (D-Sub, 9 pins, female)	CP1W-CIF01
RS-422A/485 Option board	Plug-in board	CP1W-CIF11
RS-422A/485 Option board (isolated type)	Plug-in board	CP1W-CIF12
USB Programming cable	A-type male to B-type male (length: 1.8 m)	CP1W-CN221



The compact machine controller

When it comes to controllers for compact machines, Omron's CP1L series offers the compactness of a micro-PLC with the capability of a modular PLC. It provides all the functionality you need to control your machine, including outstanding positioning capability. The CP1L comes with 14, 20, 30, 40, or 60 I/O built-in and can be expanded with a wide range of CP1W or CPM1A expansion units up to 180 I/O points. It uses a standard USB port for programming and monitoring and offers two optional plug-in serial communication ports, of which one can be used for a display or Ethernet option as well. As the CP1L series shares the same architecture as the CP1E, CP1H, CJ1, and CS1 series, programs are compatible for memory allocations and instructions.

Ordering information

Input points	Output points	Expandable up to*1	Program Capacity	Data Memory capacity	Logic execution speed	Power supply	Output type	Built-in functions	Order code
6 points	4 points	10 points	5K steps	10K words	0.55 µs	84 to 264 VAC	Relay output	4 Encoder inputs (100 kHz) 2 Interrupts/counters	CP1L-L10DR-A
						20.4 to 26.4 VDC	Relay output	4 Encoder inputs (100 kHz) 2 Interrupts/counters	CP1L-L10DR-D
							Transistor output (sink type)	4 Encoder inputs (100 kHz) 2 Pulse outputs (100 kHz) 2 Interrupts/Counters	CP1L-L10DT-D
							Transistor output (source type)		CP1L-L10DT1-D
8 points	6 points	54 points	5K steps	10K words	0.55 µs	85 to 264 VAC	Relay output	4 Encoder inputs (100 kHz) 4 Interrupts/counters	CP1L-L14DR-A
						20.4 to 26.4 VDC	Relay output	4 Encoder inputs (100 kHz) 4 Interrupts/counters	CP1L-L14DR-D
							Transistor output (sink type)	4 Encoder inputs (100 kHz) 2 Pulse outputs (100kHz) 4 Interrupts/Counters	CP1L-L14DT-D
							Transistor output (source type)		CP1L-L14DT1-D
12 points	8 points	60 points	5K steps	10K words	0.55 µs	85 to 264 VAC	Relay output	4 Encoder inputs (100 kHz) 6 Interrupts/counters	CP1L-L20DR-A
						20.4 to 26.4 VDC	Relay output	4 Encoder inputs (100 kHz) 6 Interrupts/counters	CP1L-L20DR-D
							Transistor output (sink type)	4 Encoder inputs (100 kHz) 2 Pulse outputs (100kHz) 6 Interrupts/Counters	CP1L-L20DT-D
							Transistor output (source type)		CP1L-L20DT1-D
18 points	12 points	150 points	10K steps	32K words	0.55 µs	85 to 264 VAC	Relay output	4 Encoder inputs (100 kHz) 6 Interrupts/counters	CP1L-M30DR-A
						20.4 to 26.4 VDC	Relay output	4 Encoder inputs (100 kHz) 6 Interrupts/counters	CP1L-M30DR-D
							Transistor output (sink type)	4 Encoder inputs (100 kHz) 2 Pulse outputs (100kHz) 6 Interrupts/Counters	CP1L-M30DT-D
							Transistor output (source type)		CP1L-M30DT1-D
24 points	16 points	160 points	10K steps	32K words	0.55 µs	85 to 264 VAC	Relay output	4 Encoder inputs (100 kHz) 6 Interrupts/counters	CP1L-M40DR-A
						20.4 to 26.4 VDC	Relay output	4 Encoder inputs (100 kHz) 6 Interrupts/counters	CP1L-M40DR-D
							Transistor output (sink type)	4 Encoder inputs (100 kHz) 2 Pulse outputs (100kHz) 6 Interrupts/Counters	CP1L-M40DT-D
							Transistor output (source type)		CP1L-M40DT1-D
36 points	24 points	180 points	10K steps	32K words	0.55 µs	85 to 264 VAC	Relay output	4 Encoder inputs (100 kHz) 6 Interrupts/counters	CP1L-M60DR-A
						20.4 to 26.4 VDC	Relay output	4 Encoder inputs (100 kHz) 6 Interrupts/counters	CP1L-M60DR-D
							Transistor output (sink type)	4 Encoder inputs (100 kHz) 2 Pulse outputs (100 kHz) 6 Interrupts/Counters	CP1L-M60DT-D
							Transistor output (source type)		CP1L-M60DT1-D

*1 CP1L CPU series can be expanded with CP1W-, or CPM1A expansion units

Accessories

Type	Remarks	Order code
RS-232C Option Board	Plug-in board (D-Sub, 9 pins, female)	CP1W-CIF01
RS-422A/485 Option board	Plug-in board (Terminal block)	CP1W-CIF11
RS422A/485 (isolated) option board	Plug-in board (D-Sub, 9 pins, female)	CP1W-CIF12
Ethernet option board	Plug-in board (not for 10 points CPU)	CP1W-CIF41
Memory cassette	512K words (upload/download program)	CP1W-ME05M
USB Programming cable	A-type male to B-type male (length: 1.8m)	CP1W-CN221
LCD display	4 rows x 12 characters	CP1W-DAM01



The All-in-One PLC

Designed for compact machines, it combines the compactness of a micro PLC and the power of a modular PLC. Four built-in high-speed counters and four pulse outputs are ideal for multi-axis positioning control. The CP1H-XA comes with 4 analogue inputs and 2 analogue outputs built-in. This makes it suitable for simple loop control, using the PLC's advanced PID control function with auto-tuning. The CP1H can be expanded with CPM1 I/Os and supports up to 2 CJ1 special I/O units. This means that it is open to popular fieldbuses and supports all communication units of the CJ1 series.

- Up to 1 MHz for inputs/outputs
- CJ1M compatible instruction set and execution speed
- 4 analogue inputs and 2 analogue outputs for the XA model
- USB port for easy communication, programming and configuration
- Supports PROFIBUS, DeviceNet, CAN and Ethernet

Ordering information

Input points	Output points	Expandable up to (digital I/O)*1	Program capacity	Data memory capacity	Logic execution speed	Power supply	Output method	Built-in functions		Order code
24 points	16 points	320 points	20K steps	32K words	100 ns	85 to 264 VAC	Relay output	4 Encoder inputs (100 kHz) 8 Interrupts/Counters	–	CP1H-X40DR-A
						20.4 to 26.4 VDC	Transistor output (sink type)	4 Encoder inputs (100 kHz) 4 Pulse outputs (100 kHz) 8 Interrupts/counters		CP1H-X40DT-D
							Transistor (source type)			CP1H-X40DT1-D
24 points	16 points	320 points	20K steps	32K words	100 ns	85 to 264 VAC	Relay output	4 Encoder inputs (100 kHz) 8 Interrupts/Counters	4 Analogue in 2 Analogue out (res: 1/12000)	CP1H-XA40DR-A
						20.4 to 26.4 VDC	Transistor output (sink type)	4 Encoder inputs (100 kHz) 4 Pulse outputs (100 kHz) 8 Interrupts/Counters		CP1H-XA40DT-D
							Transistor (source type)			CP1H-XA40DT1-D
12 points	8 points	300 points	20K steps	32K words	100 ns	20.4 to 26.4 VDC	Transistor (sink type)	4 Encoder inputs (2×1 MHz + 2×100 kHz) 4 Pulse outputs (2×1 MHz + 2×100 kHz) 6 Interrupts/Counters	–	CP1H-Y20DT-D

*1 CP1H CPU series can be expanded with CPM1A expansion units and CJ1 Special I/O units.

Accessories

Type	Remarks	Order code
RS-232C option board	Plug-in board (D-Sub, 9 pins, female)	CP1W-CIF01
RS-422A/485 option board	Plug-in board (Terminal block)	CP1W-CIF11
RS422A/485 (isolated) option board	Plug-in board (D-Sub, 9 pins, female)	CP1W-CIF12
Ethernet option board	Plug-in board (not for 10 points CPU)	CP1W-CIF41
Memory cassette	512K words (upload/download program)	CP1W-ME05M
Expansion I/O connecting cable	80 cm cable to connect CPM1A I/O	CP1W-CN811
CJ1 expansion unit adapter	Unit to connect CJ1 Special I/O units	CP1W-EXT01
LCD display	4 rows x 12 characters	CP1W-DAM01



Expand the capacity of your compact PLC

A wide variety of expansion units such as Digital I/O, Analogue I/O and Remote I/O are available to create the application you need. These CP1W / CPM1A expansion units can be used for CPM1A-, CPM2A-, CP1L-, and CP1H series PLC.

Ordering information

Unit	Size in mm (HxWxD)	Output type	Inputs	Outputs	Order code	
					CP1W model	CPM1A model
Expansion I/O units	90x66x50	–	8	–	CP1W-8ED	CPM1A-8ED
		Relay	–	8	CP1W-8ER	CPM1A-8ER
		Transistor (sinking)			CP1W-8ET	CPM1A-8ET
		Transistor (sourcing)			CP1W-8ET1	CPM1A-8ET1
	90x86x50	Relay	–	16	CP1W-16ER	–
	90x86x50	Relay	12	8	CP1W-20EDR1	CPM1A-20EDR1
		Transistor (sinking)			CP1W-20EDT	CPM1A-20EDT
		Transistor (sourcing)			CP1W-20EDT1	CPM1A-20EDT1
	90x150x50	Relay	24	16	CP1W-40EDR	CPM1A-40EDR
		Transistor (sinking)			CP1W-40EDT	CPM1A-40EDT
		Transistor (sourcing)			CP1W-40EDT1	CPM1A-40EDT1
Analogue I/O units	90x66x50	Analogue (resolution 1/256)	2	1	–	CPM1A-MAD01
	90x86x50	Analogue (resolution 1/6000)	2	1	CP1W-MAD11	CPM1A-MAD11
	90x86x50	Analogue (resolution 1/6000)	4	–	CP1W-AD041	CPM1A-AD041
	90x86x50	Analogue (resolution 1/6000)	–	4	CP1W-DA041	CPM1A-DA041
Temperature sensor units	90x86x50	Thermocouple input	2	–	CP1W-TS001	CPM1A-TS001
		Thermocouple input	4	–	CP1W-TS002	CPM1A-TS002
		Platinum resistance input	2	–	CP1W-TS101	CPM1A-TS101
		Platinum resistance input	4	–	CP1W-TS102	CPM1A-TS102
		Platinum resistance input and voltage/current output	2	1	–	CPM1A-TS101-DA
DeviceNet I/O link unit	90x66x50	–	I/O link of 32 input bits and 32 output bits		–	CPM1A-DRT21
PROFIBUS-DP I/O link unit	90x66x50	–	I/O link of 16 input bits and 16 output bits		–	CPM1A-PRT21
CompoBus/S I/O link unit	90x66x50	–	I/O link of 8 input bits and 8 output bits		CP1W-SRT21	CPM1A-SRT21

CJ-Series CPU units



Fast and powerful CPUs for any task

The family of CJ1 and CJ2 CPUs range from basic CPUs for simple sequence control to powerful and fast models that offer total machine control which can handle up to 2560 I/O points. This enables you to modularize or 'slice' your machine into logical sections without changing PLC series.

All CPU units support IEC61131-3 Structured text, Sequential Function Charts and ladder language. Omron's extensive function block library helps to reduce your programming effort, while you can create your own function blocks to suit your specific needs.

The new CJ2 CPU units offer increased capacity, higher performance plus built-in USB- and Ethernet ports, yet are fully compatible with the extensive range of CJ1 I/O units.

Ordering information

Max. digital I/O points	Program capacity	Data memory capacity	Logic execution speed	Max. I/O units	Width	5 V current consumption	Built-in functions	Order code
2,560	400 K	832 K	16 ns	40	80 mm	820 mA	USB + EtherNet/IP + RS-232C	CJ2H-CPU68-EIP
2,560	250 K	512 K	16 ns	40	80 mm	820 mA	USB + EtherNet/IP + RS-232C	CJ2H-CPU67-EIP
2,560	150 K	352 K	16 ns	40	80 mm	820 mA	USB + EtherNet/IP + RS-232C	CJ2H-CPU66-EIP
2,560	100 K	160 K	16 ns	40	80 mm	820 mA	USB + EtherNet/IP + RS-232C	CJ2H-CPU65-EIP
2,560	50 K	160 K	16 ns	40	80 mm	820 mA	USB + EtherNet/IP + RS-232C	CJ2H-CPU64-EIP
2,560	60 K	160 K	40 ns	40	62 mm	700 mA	USB + EtherNet/IP, serial comm. option slot	CJ2M-CPU35
2,560	30 K	160 K	40 ns	40	62 mm	700 mA	USB + EtherNet/IP, serial comm. option slot	CJ2M-CPU34
2,560	20 K	64 K	40 ns	40	62 mm	700 mA	USB + EtherNet/IP, serial comm. option slot	CJ2M-CPU33
2,560	10 K	64 K	40 ns	40	62 mm	700 mA	USB + EtherNet/IP, serial comm. option slot	CJ2M-CPU32
2,560	5 K	64 K	40 ns	40	62 mm	700 mA	USB + EtherNet/IP, serial comm. option slot	CJ2M-CPU31
2,560	400 K	832 K	16 ns	40	49 mm	420 mA	USB + RS-232C	CJ2H-CPU68
2,560	250 K	512 K	16 ns	40	49 mm	420 mA	USB + RS-232C	CJ2H-CPU67
2,560	150 K	352 K	16 ns	40	49 mm	420 mA	USB + RS-232C	CJ2H-CPU66
2,560	100 K	160 K	16 ns	40	49 mm	420 mA	USB + RS-232C	CJ2H-CPU65
2,560	50 K	160 K	16 ns	40	49 mm	420 mA	USB + RS-232C	CJ2H-CPU64
2,560	60 K	160 K	40 ns	40	31 mm	500 mA	USB + RS-232C	CJ2M-CPU15
2,560	30 K	160 K	40 ns	40	31 mm	500 mA	USB + RS-232C	CJ2M-CPU14
2,560	20 K	64 K	40 ns	40	31 mm	500 mA	USB + RS-232C	CJ2M-CPU13
2,560	10 K	64 K	40 ns	40	31 mm	500 mA	USB + RS-232C	CJ2M-CPU12
2,560	5 K	64 K	40 ns	40	31 mm	500 mA	USB + RS-232C	CJ2M-CPU11
1,280	60 k	128 k	40 ns	40	69 mm	1,060 mA	Loop control engine (300 blocks)	CJ1G-CPU45P
1,280	30 k	64 k	40 ns	40	69 mm	1,060 mA	Loop control engine (300 blocks)	CJ1G-CPU44P
960	20 k	64 k	40 ns	30	69 mm	1,060 mA	Loop control engine (300 blocks)	CJ1G-CPU43P
960	10 k	64 k	40 ns	30	69 mm	1,060 mA	Loop control engine (50 blocks)	CJ1G-CPU42P
640	20 k	32 k	100 ns	20	49 mm	640 mA	2 Encoder inputs (100 kHz) 2 Pulse outputs (100 kHz) 4 interrupt/counter inputs	CJ1M-CPU23
320	10 k	32 k	100 ns	10	49 mm	640 mA	2 Encoder inputs (100 kHz) 2 Pulse outputs (100 kHz) 4 interrupt/counter inputs	CJ1M-CPU22
160	5 k	32 k	100 ns	10	49 mm	640 mA	2 Encoder inputs (100 kHz) 2 Pulse outputs (100 kHz) 4 interrupt/counter inputs	CJ1M-CPU21
640	20 k	32 k	100 ns	19	62 mm	950 mA	100 base-Tx Ethernet port	CJ1M-CPU13-ETN
				20	31 mm	580 mA	–	CJ1M-CPU13
320	10 k	32 k	100 ns	9	62 mm	950 mA	100 base-Tx Ethernet port	CJ1M-CPU12-ETN
				10	31 mm	580 mA	–	CJ1M-CPU12
160	5 k	32 k	100 ns	9	62 mm	950 mA	100 base-Tx Ethernet port	CJ1M-CPU11-ETN
				10	31 mm	580 mA	–	CJ1M-CPU11

Accessories

Description	Remarks	Order code
CompactFlash memory card, 128 MB, for all models (not required for operation)	Industrial grade	HMC-EF183
CompactFlash memory card, 256 MB, for all models (not required for operation)	Industrial grade	HMC-EF283
CompactFlash memory card, 512 MB, for all models (not required for operation)	Industrial grade	HMC-EF583
CompactFlash PC-Card adapter	–	HMC-AP001
I/O terminal block (40×M3 screw) for CJ1M-CPU2x	MIL (40 pt)	XW2D-40G6
Servo unit terminal block for 1 axis	–	XW2B-20J6-8A
Servo unit terminal block for 2 axes	–	XW2B-40J6-9A
Connection cable between I/O terminal block and CJ1M-CPU2x (___ = length in cm)	MIL (40 pt)	XW2Z-___K
SMARTSTEP cable for CJ1M CPU2x, cable length: 1 m	–	XW2Z-100J-A26
W-series servo cable for CJ1M CPU2x, cable length: 1 m	–	XW2Z-100J-A27
CX-One, integrated software for programming and configuration of all Omron control system components	–	CX-ONE-AL__C-E
Connection cable, D-Sub 9-pin PC serial port to PLC peripheral port (length: 2.0 m)	–	CS1W-CN226
Connection cable, D-Sub 9-pin PC serial port to PLC peripheral port (length: 6.0 m)	–	CS1W-CN626
USB to serial conversion cable	–	CS1W-CIF31
RS-232C Option Board*1	–	CP1W-CIF01
RS-422A/485 Option board*1	–	CP1W-CIF11
RS422A/485 (isolated) Option board*1	–	CP1W-CIF12
Battery Set*2	–	CJ1W-BAT01
USB Programming cable	–	CP1W-CN221

*1 Only used with CJ2M-CPU3_
*2 Included with the CPU unit

Note: MIL = connector according to MIL-C-83503 (compatible with DIN 41651/IEC 60603-1).



Power and flexibility

CJ systems can operate on 24 VDC power supply, or on 100 to 240 VAC mains. For small-scale systems with mainly digital I/O a low cost, small capacity power supply can be used. For systems with many analogue I/Os and control/communication units, it may be necessary to use a larger power supply unit.

Depending on the CPU type, up to 3 expansions can be connected to the CPU 'rack', giving a total capacity of 40 I/O units. The total length of the expansion cables of one system may be up to 12 m.

Ordering information

Power supply

Input range	Power consumption	Output capacity at 5 VDC	Output capacity at 24 VDC	Max. output power	Features	Width	Order code
21.6 to 26.4 VDC	35 W max.	2.0 A	0.4 A	16.6 W	–	27 mm	CJ1W-PD022
19.2 to 28.8 VDC	50 W max.	5.0 A	0.8 A	25 W	–	60 mm	CJ1W-PD025
85 to 264 VAC 47 to 63 Hz	50 VA max.	2.8 A	0.4 A	14 W	–	45 mm	CJ1W-PA202
	100 VA max.	5.0 A	0.8 A	25 W	Run output (SPST relay)	80 mm	CJ1W-PA205R
					Maintenance status display	80 mm	CJ1W-PA205C

Note: The CJ1W-PD022 has no galvanic isolation

I/O expansion

Type	Description	Width, Length	Order code
I/O control unit	Required unit on CPU 'rack' to connect I/O expansions	20 mm	CJ1W-IC101
I/O interface unit	Start unit for each I/O expansion 'rack'. Requires a power supply unit.	31 mm	CJ1W-II101
I/O expansion cable	Connects CJ1W-IC101 or -II101 to the next expansion rack's -II101	0.3 m	CS1W-CN313
		0.7 m	CS1W-CN713
		2.0 m	CS1W-CN223
		3.0 m	CS1W-CN323
		5.0 m	CS1W-CN523
		10 m	CS1W-CN133
		12 m	CS1W-CN133-B2

CJ-Series digital I/O units



8 to 64 points per unit – input, output or mixed

Digital I/O units serve as the PLC's interface to achieve fast, reliable sequence control. A full range of units, from high-speed DC inputs to relay outputs, let you adapt CJ1 to your needs.

CJ1 units are available with various I/O densities and connection technologies. Up to 16 I/O points can be wired to units with detachable M3 screw terminals or screwless clamp terminals. High-density 32- and 64- point I/O units are equipped with standard 40-pin flat cable-connectors. Prefabricated cables and wiring terminals are available for easy interfacing to high-density I/O units.

Ordering information

Points	Type	Rated voltage	Rated current	Width	Remarks	Connection type*1	Order code
16	AC input	120 VAC	7 mA	31 mm	–	M3	CJ1W-IA111
8	AC input	240 VAC	10 mA	31 mm	–	M3	CJ1W-IA201
8	DC input	24 VDC	10 mA	31 mm	–	M3	CJ1W-ID201
16	DC input	24 VDC	7 mA	31 mm	–	M3 Screwless	CJ1W-ID211 CJ1W-ID211(SL)
16	DC input	24 VDC	7 mA	31 mm	Fast-response (15 µs ON, 90 µs OFF)	M3	CJ1W-ID212
16	DC input	24 VDC	7 mA	31 mm	Inputs start interrupt tasks in PLC program	M3	CJ1W-INT01
16	DC input	24 VDC	7 mA	31 mm	Latches pulses down to 50 µs pulse width	M3	CJ1W-IDP01
32	DC input	24 VDC	4.1 mA	20 mm	–	1 x Fujitsu	CJ1W-ID231
32	DC input	24 VDC	4.1 mA	20 mm	–	1 x MIL*1 (40 pt)	CJ1W-ID232
32	DC input	24 VDC	4.1 mA	20 mm	Fast-response (15 µs ON, 90 µs OFF)	1 x MIL*1 (40 pt)	CJ1W-ID233
64	DC input	24 VDC	4.1 mA	31 mm	–	2 x Fujitsu	CJ1W-ID261
64	DC input	24 VDC	4.1 mA	31 mm	–	2 x MIL*1 (40 pt)	CJ1W-ID262
8	Triac output	250 VAC	0.6 mA	31 mm	–	M3	CJ1W-OA201
8	Relay output	250 VAC	2 A	31 mm	–	M3 Screwless	CJ1W-OC201 CJ1W-OC201(SL)
16	Relay output	250 VAC	2 A	31 mm	–	M3 Screwless	CJ1W-OC211 CJ1W-OC211(SL)
8	DC output (sink)	12 to 24 VDC	2 A	31 mm	–	M3	CJ1W-OD201
8	DC output (source)	24 VDC	2 A	31 mm	With short-circuit protection, alarm	M3	CJ1W-OD202
8	DC output (source)	24 VDC	0.5 A	31 mm	With short-circuit protection, alarm	M3	CJ1W-OD204
16	DC output (sink)	12 to 24 VDC	0.5 A	31 mm	–	M3 Screwless	CJ1W-OD211 CJ1W-OD211 (SL)
16	DC output (source)	24 VDC	0.5 A	31 mm	With short-circuit protection, alarm	M3 Screwless	CJ1W-OD212 CJ1W-OD212 (SL)
16	DC output (sink)	24 VDC	0.5 A	31 mm	Fast-response (15 µs ON, 80 µs OFF)	M3	CJ1W-OD213
32	DC output (sink)	12 to 24 VDC	0.5 A	20 mm	–	1 x Fujitsu	CJ1W-OD231
32	DC output (source)	24 VDC	0.3 A	20 mm	With short-circuit protection, alarm	1 x MIL*1 (40 pt)	CJ1W-OD232
32	DC output (sink)	24 VDC	0.5 A	20 mm	Fast-response (15 µs ON, 80 µs OFF)	1 x MIL*1 (40 pt)	CJ1W-OD234
64	DC output (sink)	12 to 24 VDC	0.3 A	31 mm	–	2 x Fujitsu	CJ1W-OD261
64	DC output (source)	24 VDC	0.3 A	31 mm	–	2 x MIL*1 (40 pt)	CJ1W-OD262
16 +16	DC in+out (source)	24 VDC	0.5 A	31 mm	–	2 x MIL*1 (20 pt)	CJ1W-MD232
32 +32	DC in+out (sink)	24 VDC	0.3 A	31 mm	–	2 x MIL*1 (40 pt)	CJ1W-MD263
32 +32	DC in+out (TLL)	5 VDC	35 mA	31 mm	–	2 x MIL*1 (40 pt)	CJ1W-MD563

*1 MIL = connector according to MIL-C-83503 (compatible with DIN 41651/IEC 60603-1).

Note: All digital I/O unit are designated as basic I/O units.

Accessories

Description	Connection type	Order code
Replacement 18-point screwless terminal blocks for I/O units, pack of 5 pcs.	Screwless	CJ-WM01-18P-5
Replacement 18-point screw terminal blocks for I/O units, pack of 5 pcs.	M3	CJ-OD507-18P-5
I/O terminal block (40×M3 screw) for XW2Z-___K	MIL (40pt)	XW2D-40G6
Connection cable between I/O terminal block and I/O unit (___ = length in cm)	MIL (40pt)	XW2Z-___K

CJ-Series analogue I/O and control units



From basic analogue I/O to advanced temperature control

The CJ-series offers a wide choice of analogue input units, fit for any application, from low-speed, multi-channel temperature measurement to high-speed, high-accuracy data acquisition. Analogue outputs can be used for accurate control or external indication.

Advanced units with built-in scaling, filtering and alarm functions reduce the need for complex PLC programming. High-accuracy process I/O units support an extensive range of sensors, for fast and accurate data acquisition. Temperature control units relieve the PLC CPU of PID calculations and alarm monitoring. These functions are handled autonomously by the unit, offering control performance and auto-tuning functions similar to stand-alone temperature controllers.

Ordering information

Points	Type	Ranges	Resolution	Accuracy *1	Conversion time	Width	Remarks	Connection type	Order code
4	Universal analogue input	0 to 5 V 1 to 5 V 0 to 10 V 0 to 20 mA 4 to 20 mA K, J, T, L, R, S, B Pt100, Pt1000, JPt100	V / I: 1/12000 T/C: 0.1 °C RTD: 0.1 °C	V: 0.3% I: 0.3% T/C: 0.3% RTD: 0.3%	250 ms/4 point	31 mm	Universal inputs, with zero/span adjustment, configurable alarms, scaling, sensor error detection	M3	CJ1W-AD04U
								Screwless	CJ1W-AD04U(SL)
4	Analogue input	0 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V, 4 to 20 mA	1/8,000	V: 0.2% I: 0.4%	250 µs/point	31 mm	Offset/gain adjustment, peak hold, moving average, alarms	M3	CJ1W-AD041-V1
								Screwless	CJ1W-AD041-V1 (SL)
4	High-speed analogue input	1 to 5 V, 0 to 10 V, -5 to 5 V, -10 to 10 V, 4 to 20 mA	1/40,000	V: 0.2% I: 0.4%	35 µs/4 points	31 mm	Direct conversion (CJ2H special instruction)	M3	CJ1W-AD042
8	Analogue input	1 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V, 4 to 20 mA	1/8,000	V: 0.2% I: 0.4%	250 µs/point	31 mm	Offset/gain adjustment, peak hold, moving average, alarms	M3	CJ1W-AD081-V1
								Screwless	CJ1W-AD081-V1 (SL)
2	Analogue output	0 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V, 4 to 20 mA	1/4,000	V: 0.3% I: 0.5%	1 ms/point	31 mm	Offset/gain adjustment, output hold	M3	CJ1W-DA021
								Screwless	CJ1W-DA021 (SL)
4	Analogue output	1 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V, 4 to 20 mA	1/4,000	V: 0.3% I: 0.5%	1 ms/point	31 mm	Offset/gain adjustment, output hold	M3	CJ1W-DA041
								Screwless	CJ1W-DA041 (SL)
4	High-speed analogue output	1 to 5 V, 0 to 10 V, -10 to 10 V	1/40,000	0.3%	35 µs/4 points	31 mm	Direct conversion (CJ2H special instruction)	M3	CJ1W-DA042V
8	Voltage output	0 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V	1/8,000	0.3%	250 µs/point	31 mm	Offset/gain adjustment, output hold	M3	CJ1W-DA08V
								Screwless	CJ1W-DA08V (SL)
8	Current output	4 to 20 mA	1/8,000	0.5%	250 µs/point	31 mm	Offset/gain adjustment, output hold	M3	CJ1W-DA08C
								Screwless	CJ1W-DA08C (SL)
4 + 2	Analogue in + output	1 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V, 4 to 20 mA	1/8,000	in: 0.2% out: 0.3%	1 ms/point	31 mm	Offset/gain adjustment, scaling, peak hold, moving average, alarms, output hold	M3	CJ1W-MAD42
								Screwless	CJ1W-MAD42 (SL)
4	Universal analogue input	DC voltage, DC current, Thermocouple, Pt100/Pt1000, potentiometer	1/256000	0.05%	60 ms/4 points	31 mm	All inputs individually isolated, configurable alarms, maintenance functions, user-defined scaling, zero/span adjustment	M3	CJ1W-PH41U
2	Process input	4 to 20 mA 0 to 20 mA 0 to 10 V, -10 to 10 V, 0 to 5 V, -5 to 5 V, 1 to 5 V, 0 to 1.25 V, 1.25 to 1.25 V	1/64,000	0.05%	5 ms/point	31 mm	Configurable alarms, maintenance functions, user-defined scaling, zero/span adjustment, square root, totaliser	M3	CJ1W-PDC15

CJ-Series analogue I/O and control units

Points	Type	Ranges	Resolution	Accuracy *1	Conversion time	Width	Remarks	Connection type	Order code
2	Thermocouple input	B, E, J, K, L, N, R, S, T, U, WRe5-26, PLII, -100 to 100 mV	1/64,000	0.05%	5 ms/point	31 mm	Configurable alarms, maintenance functions	M3	CJ1W-PTS15
2	Resistance thermometer input	Pt50, Pt100, JPt100, Ni508.4	1/64,000	0.05%	5 ms/point	31 mm	Configurable alarms, maintenance functions	M3	CJ1W-PTS16
4	Thermocouple Input	B, J, K, L, R, S, T	0.1°C	0.3%	62.5 ms/point	31 mm	4 configurable alarm outputs	M3	CJ1W-PTS51
4	Resistance thermometer input	Pt100, JPt100	0.1°C	0.3%	62.5 ms/point	31 mm	4 configurable alarm outputs	M3	CJ1W-PTS52
6	Thermocouple input	K-type (-200 to 1,300°C) J-Type (-100 to 850°C)	0.1°C	0.5%	40 ms/point	31 mm	Basic I/O unit, setup by DIP switches, adjustable filtering 10/50/60 Hz	M3	CJ1W-TS561
								Screwless	CJ1W-TS561 (SL)
6	Resistance thermometer input	Pt100 (-200 to 650°C) Pt1000 (-200 to 650°C)	0.1°C	0.5%	40 ms/point	31 mm	Basic I/O unit, setup by DIP switches, adjustable filtering 10/50/60 Hz	M3	CJ1W-TS562
								Screwless	CJ1W-TS562 (SL)
4	Temperature control loops, Thermocouple	B, J, K, L, R, S, T	0.1°C	0.3%	500 ms total	31 mm	4 control outputs: PNP open collector, 100 mA max.	M3	CJ1W-TC002
2	Temperature control loops, Thermocouple	B, J, K, L, R, S, T	0.1°C	0.3%	500 ms total	31 mm	2 control outputs: PNP open collector, 100 mA max., 2 current transformer inputs for heater burnout detection.	M3	CJ1W-TC004
4	Temperature control loops, RTD	Pt100, JPt100	0.1°C	0.3%	500 ms total	31 mm	4 control outputs: PNP open collector, 100 mA max.	M3	CJ1W-TC102
2	Temperature control loops, RTD	Pt100, JPt100	0.1°C	0.3%	500 ms total	31 mm	2 control outputs: PNP open collector, 100 mA max., 2 current transformer inputs for heater burnout detection.	M3	CJ1W-TC104

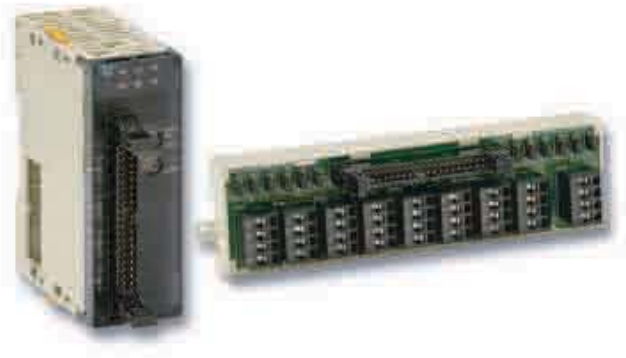
*1 Accuracy for Voltage and Current Inputs/Outputs as percentage of full scale and typical value at 25°C ambient temperature (Consult the operation manual for details)
Accuracy for Temperature Inputs/Outputs as percentage of process value and typical value at 25°C ambient temperature (Consult the operation manual for details)

Note: All Analogue I/O units are designated as Special I/O units, except TS561/TS562, which are Basic I/O units (cannot be used with CP1H).

Accessories

Description	Connection type	Order code
Replacement 18-point screwless terminal blocks for I/O units, pack of 5 pcs.	Screwless	CJ-WM01-18P-5
Replacement 18-point screw terminal blocks for I/O units, pack of 5 pcs.	M3	CJ-OD507-18P-5

CJ-Series motion/position control units



Add motion control to any CJ-Series PLC

From simple position measurement to multi-axis synchronised motion control, the CJ-Series offers a full range of units:

- Counter units gather position information from SSI- or incremental encoders. Actual positions are compared with internally stored target values.
- Position Control units are used for point-to-point positioning with servo drives or stepper motors. Target data and acceleration/deceleration curves can be adjusted on-the-fly.
- Position- and Motion Control units equipped with MECHATROLINK-II interface can control multiple drives through a single high-speed link. Message routing through multiple communication layers allows the attached drives to be configured from any point in the control network.

Ordering information

Channels/ Axes	Type	Signal type	Unit class	Width	Remarks	Connection type	Order code
2	SSI inputs (absolute position data)	Synchronous serial protocol	Special I/O unit	31 mm	Baud rate, encoding type, data length, etc. can be set per channel	M3 screw	CJ1W-CTS21-E
2	500 kHz Counter	24 V, line driver	Special I/O unit	31 mm	2 configurable digital inputs + outputs	1 x Fujitsu (40 pt)	CJ1W-CT021
4	100 kHz Counter	Line driver, 24 V via terminal block	Special I/O unit	31 mm	Target values trigger interrupt to CPU	1 x MIL (40 pt)	CJ1W-CTL41-E
1	DC Motor Control unit	PWM (24 V/4 A)	Special I/O unit	31 mm	4 configurable digital inputs + 50 kHz counter input	3 x Screwless	CJ1W-DCM11-E
1	Position Control unit	24 V open collector	Special I/O unit	31 mm	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	1 x Fujitsu (40 pt)	CJ1W-NC113
2	Position Control unit	24 V open collector	Special I/O unit	31 mm	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	1 x Fujitsu (40 pt)	CJ1W-NC213
4	Position Control unit	24 V open collector	Special I/O unit	31 mm	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	2 x Fujitsu (40 pt)	CJ1W-NC413
2	Position Control Unit High speed type	24 V open collector	Special I/O Unit	51 mm	500 kpps pulse outputs, built-in feedback pulse counters, synchronous multi-axis control	MIL	CJ1W-NC214
4	Position Control Unit High speed type	24 V open collector	Special I/O Unit	62 mm	500 kpps pulse outputs, built-in feedback pulse counters, synchronous multi-axis control	MIL	CJ1W-NC414
2	Position Control Unit	MECHATROLINK-II	CPU bus unit	31 mm	Position, speed and torque control, access to all drive parameters	ML-II	CJ1W-NC271
4	Position Control Unit	MECHATROLINK-II	CPU bus unit	31 mm	Position, speed and torque control, access to all drive parameters	ML-II	CJ1W-NC471
16	Position Control unit	MECHATROLINK-II	CPU bus unit	31 mm	Position, speed and torque control, access to all drive parameters	ML-II	CJ1W-NCF71
30	Advanced Motion Control unit	MECHATROLINK-II, Encoder I/O, digital I/O	CPU bus unit	49 mm	Trajexia Motion Controller on the CJ-series, see page 75	ML-II, 9-pin D-Sub, screwless push-in	CJ1W-MCH72

Note: Line driver signal type units also available.

Accessories

Description	Connection type	Order code
General purpose I/O terminal block (40×M3 screw)	MIL (40 pt)	XW2D-40G6
Screwless terminal block for connecting 24 V or Line driver encoders to CJ1W-CTL41-E	MIL (40 pt.) to 32 pt. screwless clamp	XW2G-40G7-E
General purpose I/O connection cable for I/O units with 40-pt. Fujitsu connector (___ = length in cm)	Fujitsu (40 pt.) to MIL (40 pt.)	XW2Z-___B
General purpose I/O connection cable for I/O units with 40-pt. MIL connector (___ = length in cm)	2 x MIL (40 pt)	XW2Z-___K
Servo relay unit 1-Axis position control unit	–	XW2B-20J6-1B
Servo relay unit 2-Axes position control unit	–	XW2B-40J6-2B
Cable connecting servo relay unit to Position control unit CJ1W-NC113, cable length 1 m. For Sigma-5 and Sigma-II servo drives.	–	XW2Z-100J-A14
Cable connecting servo relay unit to Position control unit CJ1W-NC213/413, cable length 1 m. For Sigma-5 and Sigma-II servo drives.	–	XW2Z-100J-A15
Cable connecting servo relay unit to Position control unit CJ1W-NC113, cable length 1 m. For SmartStep servo drives.	–	XW2Z-100J-A16
Cable connecting servo relay unit to Position control unit CJ1W-NC213/413, cable length 1 m. For SmartStep servo drives.	–	XW2Z-100J-A17
Cable connecting servo relay unit to Position control unit CJ1W-NC133, cable length 1 m. For Sigma-5 and Sigma-II servo drives.	–	XW2Z-100J-A18
Cable connecting servo relay unit to Position control unit CJ1W-NC233/433, cable length 1 m. For Sigma-5 and Sigma-II servo drives.	–	XW2Z-100J-A19
Cable connecting servo relay unit to Position control unit CJ1W-NC133, cable length 1 m. For SmartStep servo drives.	–	XW2Z-100J-A20
Cable connecting servo relay unit to Position control unit CJ1W-NC233/433, cable length 1 m. For SmartStep servo drives.	–	XW2Z-100J-A21
Cable connecting servo relay unit to Sigma-5 and Sigma-II servo drives, cable length 1 m.	–	XW2Z-100J-B4
Cable connecting servo relay unit to SmartStep servo drive, cable length 1 m.	–	XW2Z-100J-B5

CJ-Series communication units



Open to any communication

The CJ-Series offers both standardised open networks interfaces, and cost-efficient high-speed proprietary network links. Datalinks between PLCs, or to higher-level information systems can be made using serial or Ethernet links, or the easy-to-use controller link network.

Omron supports the 2 major field networks, DeviceNet and PROFIBUS-DP.
For high-speed field I/O, Omron's own CompoBus/S offers an unsurpassed ease of installation. Fully user-configurable serial and CAN-based communication can be used to emulate a variety of application-specific protocols. EtherNet/IP units provide data link functions to share large amounts of data between PLCs. The new PROFINET-IO controller together with the SmartSlice modular I/O system offers Ethernet based I/O with controller- and network redundancy.

Ordering information

Type	Ports	Data transfer	Protocols	Unit class	Width	Connection type	Order code
Serial	2 x RS-232C		CompoWay/F, Host link, NT link, Modbus, User-defined	CPU bus unit	31 mm	9-pin D-Sub	CJ1W-SCU21-V1
Serial	2 x RS-232C	High-speed	CompoWay/F, Host link, NT link, Modbus, User-defined	CPU bus unit	31 mm	9-pin D-Sub	CJ1W-SCU22
Serial	2 x RS-422A/RS-485		CompoWay/F, Host link, NT link, Modbus, User-defined	CPU bus unit	31 mm	9-pin D-Sub	CJ1W-SCU31-V1
Serial	2 x RS-422A/RS-485	High-speed	CompoWay/F, Host link, NT link, Modbus, User-defined	CPU bus unit	31 mm	9-pin D-Sub	CJ1W-SCU32
Serial	1 x RS-232C + 1 x RS-422/RS-485		CompoWay/F, Host link, NT link, Modbus, User-defined	CPU bus unit	31 mm	9-pin D-Sub	CJ1W-SCU41-V1
Serial	1 x RS-232C + 1 x RS-422/RS-485	High-speed	CompoWay/F, Host link, NT link, Modbus, User-defined	CPU bus unit	31 mm	9-pin D-Sub	CJ1W-SCU42
Ethernet	1 x 100 Base-Tx		UDP, TCP/IP, FTP server,SMTP (e-mail), SNTP (time adjust), FINS routing, socket service	CPU bus unit	31 mm	RJ45	CJ1W-ETN21
EtherNet/IP	1 x 100 Base-Tx		EtherNet/IP, UDP, TCP/IP, FTP server, SNTP, SNMP	CPU Bus unit	31 mm	RJ45	CJ1W-EIP21
Controller link	2-wire twisted pair		Omron proprietary	CPU bus unit	31 mm	2-wire screw + GND	CJ1W-CLK21-V1
DeviceNet	1 x CAN		DeviceNet	CPU bus unit	31 mm	5-p detachable	CJ1W-DRM21
PROFIBUS-DP	1 x RS-485 (Master)		DP, DPV1	CPU bus unit	31 mm	9-pin D-Sub	CJ1W-PRM21
PROFIBUS-DP	1 x RS-485 (Slave)		DP	Special I/O unit	31 mm	9-pin D-Sub	CJ1W-PRT21
PROFINET-IO	1 x 100 Base-Tx		PROFINET-IO Controller, FINS/UDP	CPU Bus unit	31 mm	RJ45	CJ1W-PNT21
CAN	1 x CAN		User-defined, supports 11-bit and 29-bit identifiers	CPU bus unit	31 mm	5-p detachable	CJ1W-CORT21
CompoNet	4-wire, data + power to slaves (Master)		CompoNet (CIP-based)	Special I/O unit	31 mm	4-p detachable IDC or screw	CJ1W-CRM21
CompoBus/S	2-wire (Master)		Omron proprietary	Special I/O unit	20 mm	2-wire screw + 2-wire power	CJ1W-SRM21

Accessories

Description	Connection type	Order code
RS-232C to RS-422/RS-485 signal converter. Mounts directly on serial port.	9-pin D-sub to screw clamp terminals	CJ1W-CIF11
Controller link PCI board with support software	PCI, wired CLK	3G8F7-CLK21-EV1
Controller link repeater unit (wire to wire)	Screw - Screw	CS1W-RPT01
Controller link repeater unit (wire to HPCF fiber)	Screw - HPCF connector	CS1W-RPT02
Controller link repeater unit (wire to graded-index glass fiber)	Screw - ST connector	CS1W-RPT03

CS-Series CPU units



Fast and powerful CPUs for any task

Omron's CS1-series CPUs are available in two processor speeds, each in various memory capacities. Besides the basic CPU models, versions are available for dual redundant operation, supporting I/O hot-swapping. All CPUs have one dedicated board slot with a direct CPU-bus connection, in which a serial communication board or a loop control board can be mounted. All CPU units support IEC61131-3 structured text and ladder language.

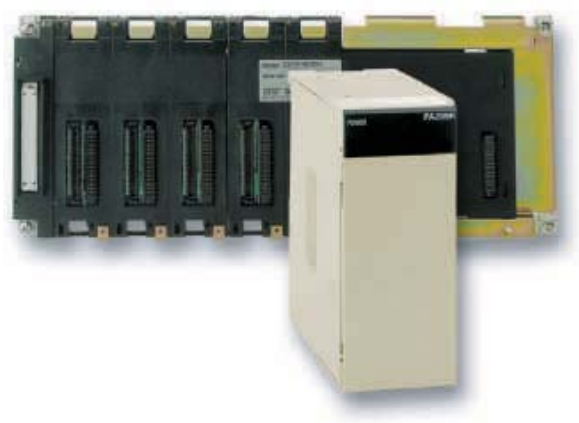
Omron's extensive function block library helps to reduce your programming effort, while you can create your own function blocks to suit your specific needs.

Ordering information

Max. Digital I/O points	Program capacity	Data memory capacity	Logic execution speed	Max. I/O units	Additional functions	Order code
5120	250K steps	448K words	20 ns	80	–	CS1H-CPU67H
				71	Supports duplex power supply and I/O hot-swapping	CS1D-CPU67S
				68	CPU for full dual-redundancy	CS1D-CPU67H
					CPU for full dual-redundancy, with loop control board	CS1D-CPU67P
	120K steps	256K words		80	–	CS1H-CPU66H
	60K steps	128K words		80	–	CS1H-CPU65H
				71	Supports duplex power supply and I/O hot-swapping	CS1D-CPU65S
				68	CPU for full dual-redundancy	CS1D-CPU65H
					CPU for full dual-redundancy, with loop control board	CS1D-CPU65P
	30K steps	64K words		80	–	CS1H-CPU64H
	20K steps				–	CS1H-CPU63H
	60K steps		40 ns		–	CS1G-CPU45H
1280	30K steps			40	–	CS1G-CPU44H
				35	Supports duplex power supply and I/O hot-swapping	CS1D-CPU44S
960	20K steps			30	–	CS1G-CPU43H
	10K steps				–	CS1G-CPU42H
				26	Supports duplex power supply and I/O hot-swapping	CS1D-CPU42S

Accessories

Description	Remarks	Order code
Duplex unit, required for CS1D-CPU6_H systems	–	CS1D-DPL01
Serial communication option board, 2 x RS-232C	–	CS1W-SCB21-V1
Serial communication option board, 1 x RS-232C + 1 x RS422/RS-485	–	CS1W-SCB41-V1
Loop control option board	50 control blocks max.	CS1W-LCB01
Loop control option board	300 control blocks max.	CS1W-LCB05
Replacement battery set, for all CS1 CPUs	–	CS1W-BAT01
Compact Flash memory card, 128 MB, for all models (not required for operation)	Industrial grade	HMC-EF183
Compact Flash memory card, 256 MB, for all models (not required for operation)	Industrial grade	HMC-EF283
Compact Flash memory card, 512 MB, for all models (not required for operation)	Industrial grade	HMC-EF583
Compact Flash PC-Card adapter	–	HMC-AP001
CX-One, integrated software for programming and configuration of all Omron control system components	–	CX-ONE-AL__C-E
Connection cable, D-Sub 9-pin PC serial port to PLC peripheral port	length: 2.0 m	CS1W-CN226
Connection cable, D-Sub 9-pin PC serial port to PLC peripheral port	length: 6.0 m	CS1W-CN626
USB to serial conversion cable	–	CS1W-CIF31



Expand with up to 7 racks

CS1 systems can operate on 24 VDC power supply, or on 100-240 VAC mains. For small-scale systems with mainly digital I/O a low cost, small capacity power supply can be used. For systems with many analogue I/Os and control/communication units, it may be necessary to use a larger power supply unit.

PLC racks are available in several sizes, from 2 to 10 slots wide. Special backplanes are required for duplex systems. Depending on the CPU type, up to 7 expansions can be connected to the CPU rack, giving a total capacity of 80 I/O units. The total length of the expansion cables of one system may be up to 12 m.

Ordering information

Power supplies

Input range	Power consumption	Output capacity 5 VDC	Output capacity 26 VDC	Max. output power	Extra functions	Order code
19.2 to 28.8 VDC	40 W max.	6.6 A	0.62 A	30 W	–	C200HW-PD024
		4.3 A	0.56 A	28 W	Power supply for dual-redundant system	CS1D-PD024
	55 VA max.	5.3 A	1.3 A	40 W	–	C200HW-PD025
					Power supply for dual-redundant system	CS1D-PD025
85 to 264 VAC 50/60 Hz	120 VA max.	4.6 A	0.62 A	30 W	Maintenance status display	C200HW-PA204C
85 to 132 VAC, 170 to 264 VAC, 50/60 Hz					–	C200HW-PA204
					Service output 24 VDC, 0.8 A	C200HW-PA204S
					Run status output (SPST relay)	C200HW-PA204R
	180 VA max.	9.0 A	1.3 A	45 W	Run status output (SPST relay)	C200HW-PA209R
	150 VA max.	7.0 A	1.3 A	35 W	Power supply for dual-redundant system	CS1D-PA207R

Specifications

Type	Slots	Expansion connector	Width	Special functions	Order code
CPU backplane	2	No	200 mm	–	CS1W-BC023
CPU backplane	3	Yes	260 mm	–	CS1W-BC033
CPU backplane	5	Yes	330 mm	–	CS1W-BC053
CPU backplane	8	Yes	435 mm	–	CS1W-BC083
CPU backplane	10	Yes	505 mm	–	CS1W-BC103
Expansion backplane	3	Yes	260 mm	–	CS1W-BI033
Expansion backplane	5	Yes	330 mm	–	CS1W-BI053
Expansion backplane	8	Yes	435 mm	–	CS1W-BI083
Expansion backplane	10	Yes	505 mm	–	CS1W-BI103
CPU backplane	5	Yes	505 mm	For Duplex CPU + Power supplies	CS1D-BC052
CPU backplane	8	Yes	505 mm	For Duplex Power supplies	CS1D-BC082S
Expansion backplane	9	Yes	505 mm	For Duplex Power supplies	CS1D-BI092

Type	Remarks	Order code
I/O Expansion cable to connect CS1 CPU backplane or Expansion backplane to next Expansion backplane.	0.3 m	CS1W-CN313
	0.7 m	CS1W-CN713
	2.0 m	CS1W-CN223
	3.0 m	CS1W-CN323
	5.0 m	CS1W-CN523
	10.0 m	CS1W-CN133
	12.0 m	CS1W-CN133-B2

CS-Series digital I/O units



Up to 96 I/O points per unit – input, output or mixed

Digital I/O units serve as the PLC's interface to achieve fast, reliable sequence control. A full range of units, from high-speed DC inputs to relay outputs, let you adapt CS1 to your needs.

CS1 units are available with various I/O densities and connection technologies. Up to 16 I/O points can be wired to units with detachable M3 screw terminals directly. High-density 32- and 64- point I/O units are equipped with standard 40-pin connectors. Prefabricated cables and wiring terminals are available for easy interfacing to high-density I/O units.

Ordering information

Points	Type	Rated voltage	Rated current	Remarks	Connection type	Order code *1
16	AC or DC input	120 VAC or VDC	10 mA	–	M3	CS1W-IA111
16	AC input	240 VAC	10 mA	–	M3	CS1W-IA211
16	DC input	24 VDC	7 mA	–	M3	CS1W-ID211
16	DC input	24 VDC	7 mA	Inputs start interrupt tasks in PLC program	M3	CS1W-INT01
16	DC input	24 VDC	7 mA	Latches pulses down to 50 µs pulse width	M3	CS1W-IDP01
32	DC input	24 VDC	6 mA	–	1×40 pt Fujitsu	CS1W-ID231
64	DC input	24 VDC	6 mA	–	2×40 pt Fujitsu	CS1W-ID261
96	DC input	24 VDC	5 mA	–	2×56 pt Fujitsu	CS1W-ID291
8	Triac output	250 VAC	1.2 A	–	M3	CS1W-OA201
16	Triac output	250 VAC	0.5 A	–	M3	CS1W-OA211
8	Relay output	250 VAC	2.0 A	–	M3	CS1W-OC201
16	Relay output	250 VAC	2.0 A	–	M3	CS1W-OC211
16	DC output (sink)	12 to 24 VDC	0.5 A	–	M3	CS1W-OD211
16	DC output (source)	24 VDC	0.5 A	With short-circuit protection, alarm	M3	CS1W-OD212
32	DC output (sink)	12 to 24 VDC	0.5 A	–	1×40 pt Fujitsu	CS1W-OD231
32	DC output (source)	24 VDC	0.5 A	With short-circuit protection, alarm	1×40 pt Fujitsu	CS1W-OD232
64	DC output (sink)	12 to 24 VDC	0.3 A	–	2×40 pt Fujitsu	CS1W-OD261
64	DC output (source)	24 VDC	0.3 A	With short-circuit protection, alarm	2×40 pt Fujitsu	CS1W-OD262
96	DC output (sink)	12 to 24 VDC	0.1 A	–	2×56 pt Fujitsu	CS1W-OD291
96	DC output (source)	24 VDC	0.1 A	–	2×56 pt Fujitsu	CS1W-OD292
32+32	DC output (sink)	12 to 24 VDC	0.3 A	–	2×40 pt Fujitsu	CS1W-MD261
32+32	DC in+out (source)	24 VDC	0.3 A	With short-circuit protection, alarm	2×40 pt Fujitsu	CS1W-MD262
48+48	DC output (sink)	12 to 24 VDC	0.1 A	–	2×56 pt Fujitsu	CS1W-MD291
48+48	DC in+out (source)	12 to 24 VDC	0.1 A	–	2×56 pt Fujitsu	CS1W-MD292

*1 C200H I/O units can also be mounted, except on CS1D systems.

Note: All Digital I/O units are designated as Basic I/O units.

CS-Series analogue and process I/O units



From basic analogue I/O to process control

CS1 offers a wide choice of analogue input units, fit for any application, from low-speed, multi-channel temperature measurement to high-speed, high-accuracy data acquisition. Analogue outputs can be used for accurate control or external indication.

Advanced units with built-in scaling, filtering and alarm functions reduce the need for complex PLC programming. High-accuracy process I/O units support an extensive range of sensors, for fast and accurate data acquisition. All process and temperature I/O units provide isolation between all individual channels.

Ordering information

Points	Type	Ranges	Resolution	Accuracy*1	Conversion time	Remarks	Connection type	Order code
4	Analogue input	0 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V, 4 to 20 mA	1/8,000	V: 0.2% of PV I: 0.4% of PV	250 µs/point	Offset/gain adjustment, peak hold, moving average, alarms	M3	CS1W-AD041-V1
8	Analogue input						M3	CS1W-AD081-V1
18	Analogue input			0.2% of PV			2 x MIL (34p.)	CS1W-AD161
4	Analogue output	0 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V, 4 to 20 mA	1/4,000	V: 0.3% of PV I: 0.5% of PV	1 ms/point	Offset/gain adjustment	M3	CS1W-DA041
8	Voltage output	0 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V		0.3% of PV		Offset/gain adjustment, output hold	M3	CS1W-DA08V
8	Current output	4 to 20 mA		0.5% of PV			M3	CS1W-DA08C
4 + 4	Analogue in + output	0 to 5 V, 0 to 10 V, -10 to 10 V, 1 to 5 V (4 to 20 mA input)	1/8,000	V in: 0.2% of PV I in: 0.4% of PV out: 0.3% of PV	1 ms/point	Offset/gain adjustment, scaling, peak hold, moving average, alarms, output hold	M3	CS1W-MAD44
4	Process input	4 to 20 mA, 0 to 20 mA, 0 to 10 V, -10 to 10 V, 0 to 5 V, -5 to 5 V, 1 to 5 V, 1 to 1.25 V, -1.25 to 1.25 V	1/64,000	0.05% of PV	5 ms/point	Configurable alarms, maintenance functions, user-defined scaling, zero/span adjustment, square root, totaliser.	M3	CS1W-PDC11
8	Process input	-10 to 10 V, 0 to 5 V, 1 to 5 V, 4 to 20 mA	1/16,000	0.3% of PV	62.5 ms/point	Configurable alarms, zero/span adjustment, square root	M3	CS1W-PDC55
4	Thermocouple input	B, E, J, K, L, N, R, S, T, U, WRe5-26, PLII, -100 to 100 mV	1/64,000	0.05% of PV	5 ms/point	Configurable alarms (absolute + rate-of-change), peak hold, maintenance functions	M3	CS1W-PTS11
4	Resistance thermometer input	Pt50, Pt100 JPt100, Ni508.4	1/64,000	0.05% of PV	5 ms/point	Configurable alarms (absolute + rate-of-change), peak hold, maintenance functions	M3	CS1W-PTS12
4	Thermocouple input	B, J, K, L, R, S, T	0.1°C	0.3% of PV	62.5 ms/point	4 configurable alarm outputs	M3	CS1W-PTS51
4	Resistance thermometer input	Pt100, JPt100	0.1°C	0.3% of PV	62.5 ms/point	4 configurable alarm outputs	M3	CS1W-PTS52
8	Thermocouple input	B, J, K, L, R,S, T	0.1°C	0.3% of PV	31.2 ms/point	Configurable alarms per channel	M3	CS1W-PTS55
8	Resistance thermometer input	Pt100, JPt100	0.1°C	0.3% of PV	31.2 ms/point	Configurable alarms per channel	M3	CS1W-PTS56
4	2-Wire transmitter input	1 to 5 V, 4 to 20 mA	1/4,096	0.2% of FS	25 ms/point	Built-in power supply for transmitter, configurable alarms, square root, rate-of-change, etc.	M3	CS1W-PTW01
8	Power transducer input	-1 to 1 mA, 0 to 1 mA	1/4,096	0.2% of FS	25 ms/point	Inrush current limiter, configurable alarms, averaging, etc.	M3	CS1W-PTR01
8	Power transducer input	-100 to 100 mV, 0 to 100 mV	1/4,096	0.2% of FS	25 ms/point	Inrush current limiter, configurable alarms, averaging, etc.	M3	CS1W-PTR02
4	Pulse rate input	20000 pps, voltage, open collector, contact	up to 1/32,000	–	25 ms/point	Averaging, totaliser	M3	CS1W-PPS01

CS-Series analogue and process I/O units

Points	Type	Ranges	Resolution	Accuracy*1	Conversion time	Remarks	Connection type	Order code
4	Isolated control output	1 to 5 V, 4 to 20 mA	1/4,000	I: 0.1% of FS V: 0.2% of FS	25 ms/point	Output readback, high/low/rate limiting, disconnection alarm, zero/span adjustment	M3	CS1W-PMV01
4	Isolated control output	-10 to 10 V, 0 to 10 V, -5 to 5 V, 0 to 5 V, -1 to 1 V, 0 to 1 V	1/4,000	0.1% of FS	10 ms/point	High/low/rate limiting, output hold, zero/span adjustment	M3	CS1W-PMV02

*1 Accuracy for Voltage and Current Inputs/Outputs as percentage of full scale and typical value at 25°C ambient temperature (Consult the operation manual for details)
Accuracy for Temperature Inputs/Outputs as percentage of process value and typical value at 25°C ambient temperature (Consult the operation manual for details)

Note: All analogue I/O units are designated as special I/O units



Add motion control to any CS1 PLC

From simple position measurement to multi-axis synchronised motion control, CS1 offers a full range of units:

- Counter units gather position information from SSI- or incremental encoders. Actual positions are compared with internally stored target values.
- Position control units are used for point-to-point positioning with servo drives or stepper motors. Target data and acceleration/deceleration curves can be adjusted on-the-fly.
- Position- and motion control units equipped with MECHATROLINK-II interface can control multiple drives through a single high-speed link. Message routing through multiple communication layers allows the attached drives to be configured from any point in the control network.

Ordering information

Channels/ Axes	Type	Signal type	Unit class	Remarks	Connection type	Order code
2	SSI inputs (absolute position data)	Synchronous serial protocol	Special I/O unit	Baud rate, encoding type, data length, etc. can be set per channel 2 digital outputs, NPN/PNP selectable.	M3 screw	CS1W-CTS21
2	500 kHz Counter	24 V, 12V, line driver	Special I/O unit	4 configurable digital inputs + 4 configurable digital outputs Target values trigger interrupt to CPU	1 x Fujitsu (40 pt)	CS1W-CT021
4					2 x Fujitsu (40 pt)	CS1W-CT041
1	Position control unit	24V open collector	Special I/O unit	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	1 x Fujitsu (40 pt)	CS1W-NC113
2	Position control unit	24V open collector	Special I/O unit	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	1 x Fujitsu (40 pt)	CS1W-NC213
4	Position control unit	24V open collector	Special I/O unit	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	2 x Fujitsu (40 pt)	CS1W-NC413
1	Position control unit	Line driver	Special I/O unit	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	1 x Fujitsu (40 pt)	CS1W-NC133
2	Position control unit	Line driver	Special I/O unit	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	1 x Fujitsu (40 pt)	CS1W-NC233
4	Position control unit	Line driver	Special I/O unit	500 kpps pulse outputs, inputs for origin, limit switches, stop, interrupt	2 x Fujitsu (40 pt)	CS1W-NC433
2	Motion control unit	Analogue	Special I/O unit	Closed loop with automatic trapezoid or S-curve acceleration/deceleration	Snap-on connectors (3M)	CS1W-MC221-V1
4	Motion control unit	Analogue	Special I/O unit	Closed loop with automatic trapezoid or S-curve acceleration/deceleration	Snap-on connectors (3M)	CS1W-MC421-V1

Accessories

Description	Connection type	Order code
General purpose I/O terminal block (40×M3 screw)	MIL (40 pt)	XW2D-40G6
General purpose I/O connection cable for I/O units with 40-pt. Fujitsu connector (___ = length in cm)	Fujitsu (40 pt.) to MIL (40 pt.)	XW2Z-___B
Servo relay unit 1-Axis position control unit	–	XW2B-20J6-1B
Servo relay unit 2-Axes position control unit	–	XW2B-40J6-2B
Cable connecting servo relay unit to Position control unit CS1W-NC113, cable length 1 m. For Sigma-II servo drives.	–	XW2Z-100J-A6
Cable connecting servo relay unit to Position control unit CS1W-NC213/413, cable length 1 m. For Sigma-II servo drives.	–	XW2Z-100J-A7
Cable connecting servo relay unit to Position control unit CS1W-NC113, cable length 1 m. For SmartStep servo drives.	–	XW2Z-100J-A8
Cable connecting servo relay unit to Position control unit CS1W-NC213/413, cable length 1 m. For SmartStep servo drives.	–	XW2Z-100J-A9
Cable connecting servo relay unit to Position control unit CS1W-NC133, cable length 1 m. For Sigma-II servo drives.	–	XW2Z-100J-A10
Cable connecting servo relay unit to Position control unit CS1W-NC233/433, cable length 1 m. For Sigma-II servo drives.	–	XW2Z-100J-A11
Cable connecting servo relay unit to Position control unit CS1W-NC133, cable length 1 m. For SmartStep servo drives.	–	XW2Z-100J-A12
Cable connecting servo relay unit to Position control unit CS1W-NC233/433, cable length 1 m. For SmartStep servo drives.	–	XW2Z-100J-A13
Cable connecting servo relay unit to Sigma-II servo drives, cable length 1 m.	–	XW2Z-100J-B4
Cable connecting servo relay unit to SmartStep servo drive, cable length 1 m.	–	XW2Z-100J-B5



Open to any communication, standard or user-defined

CS1 provides both standardised open networks interfaces, and cost efficient, high-speed proprietary network links. Datalinks between PLCs, or to higher-level information systems can be made using Serial or Ethernet links, or the easy-to-use Controller Link network.

Omron supports the 2 major field networks, DeviceNet and PROFIBUS-DP.
For high-speed field I/O, Omron's own CompoBus/S offers an unsurpassed ease of installation. Fully user-configurable serial and CAN-based communication can be used to emulate a variety of application-specific protocols.

Ordering information

Type	Ports	Protocols	Unit class	Remarks	Connection type	Order code
Serial	2 x RS-232C	CompoWay/F, Host Link, NT link, Modbus, User-defined	CPU bus unit	–	9-pin D-Sub	CS1W-SCU21-V1
Serial	2 x RS-232C/RS-485	CompoWay/F, Host Link, NT link, Modbus, User-defined	CPU bus unit	–	9-pin D-Sub	CS1W-SCU31-V1
Serial	2 x RS-232C	CompoWay/F, Host Link, NT link, Modbus, User-defined	CPU option board	–	9-pin D-Sub	CS1W-SCB21-V1
Serial	1 x RS-232C + 1 x RS-422/RS-485	CompoWay/F, Host Link, NT link, Modbus, User-defined	CPU option board	–	9-pin D-Sub	CS1W-SCB41-V1
GP-IB	Master/Slave selectable	GP-IB instrument communication	Special I/O unit	–	GP-IB	CS1W-GPI01
Ethernet	1 x 100 Base-Tx	UDP, TCP/IP, FTP server, SMTP (e-mail), SNTP (time adjust), FINS routing, socket service	CPU bus unit	–	RJ45	CS1W-ETN21
Controller link	2-wire twisted pair	Omron proprietary	CPU bus unit	–	2-wire screw + GND	CS1W-CLK21-V1
	Optical HPCF			–	2 x HPCF connector	CS1W-CLK12-V1
	Optical graded-index fiber			–	4 x ST connector	CS1W-CLK52-V1
EtherNet/IP	1 x 100 Base-Tx	EtherNet/IP, UDP, TCP/IP, FTP server, SNTP, SNMP	CPU Bus unit	31 mm	RJ45	CS1W-EIP21
DeviceNet	1 x CAN	DeviceNet	CPU bus unit	–	5-p detachable	CS1W-DRM21-V1
CompoNet	4-wire, data + power to slaves (Master)	CompoNet (CIP-based)	Special I/O unit	–	4-p detachable IDC or screw	CS1W-CRM21
PROFIBUS-DP	1 x RS-485 (Master)	DP, DPV1	CPU bus unit	–	9-pin D-Sub	CS1W-PRM21
CAN	1 x CAN	CANopen, User-defined	CPU bus unit	–	5-p detachable	CS1W-CORT21
PROFIBUS-DP	1 x RS-485 (Slave)	DP	C200H special I/O unit	C200H units cannot be used on CS1D systems	9-pin D-Sub	C200HW-PRT21
CompoBus/S	2-wire (Master)	Omron proprietary	C200H special I/O unit		2-wire screw + 2-wire power	C200HW-SRM21-V1

Accessories

Description	Connection type	Order code
RS-232C to RS-422/RS-485 signal converter. Mounts directly on serial port.	9-pin D-sub to screw clamp terminals	CJ1W-CIF11
Controller link PCI board with support software	PCI, wired CLK	3G8F7-CLK21-EV1
Controller link PCI board with support software	PCI, HPCF connectors	3G8F7-CLK12-EV1
Controller link PCI board with support software	PCI, ST connectors	3G8F7-CLK52-EV1
Controller link repeater unit (wire to wire)	Screw - Screw	CS1W-RPT01
Controller link repeater unit (wire to HPCF fiber)	Screw - HPCF connector	CS1W-RPT02
Controller link repeater unit (wire to graded-index glass fiber)	Screw - ST connector	CS1W-RPT03



FA Wireless LAN unit

WE70 utilises spread-spectrum modulation technology based on radio waves to enable communication between devices in a limited area. This gives users the mobility to move around within a broad coverage area and still be connected to the network. The smart roaming function enables high speed roaming therefore moving equipment and mobile object can communicate at high speed.

- Conforms to IEEE 802.11a/b/g.
- Same noise and environment resistance level as a PLC.
- Features Omron's original security system.
- Signals can be observed with LED indicators.
- Conforms to radio wave standards for the USA, Europe, and China.

Ordering information

Area	Type	Model
Europe	Access Point (Master)	WE70-AP-EU
	Client (Slave)	WE70-CL-EU
USA	Access Point (Master)	WE70-AP-US
	Client (Slave)	WE70-CL-US
China	Access Point (Master)	WE70-AP-CN
	Client (Slave)	WE70-CL-CN

Accessories

Type	Specifications	Model
Directional Magnetic-base Antenna	1 set with two Antennas, 2.4 GHz/5 GHz Dual-band compatible	WE70-AT001H

Type	Model
DIN Rail Mounting Bracket (for TH35 7.5)	WT30-FT001
DIN Rail Mounting Bracket (for TH35 15)	WT30-FT002
Antenna Extension Cable (5 m)	WE70-CA5M

THE SMARTEST MODULAR I/O SYSTEM

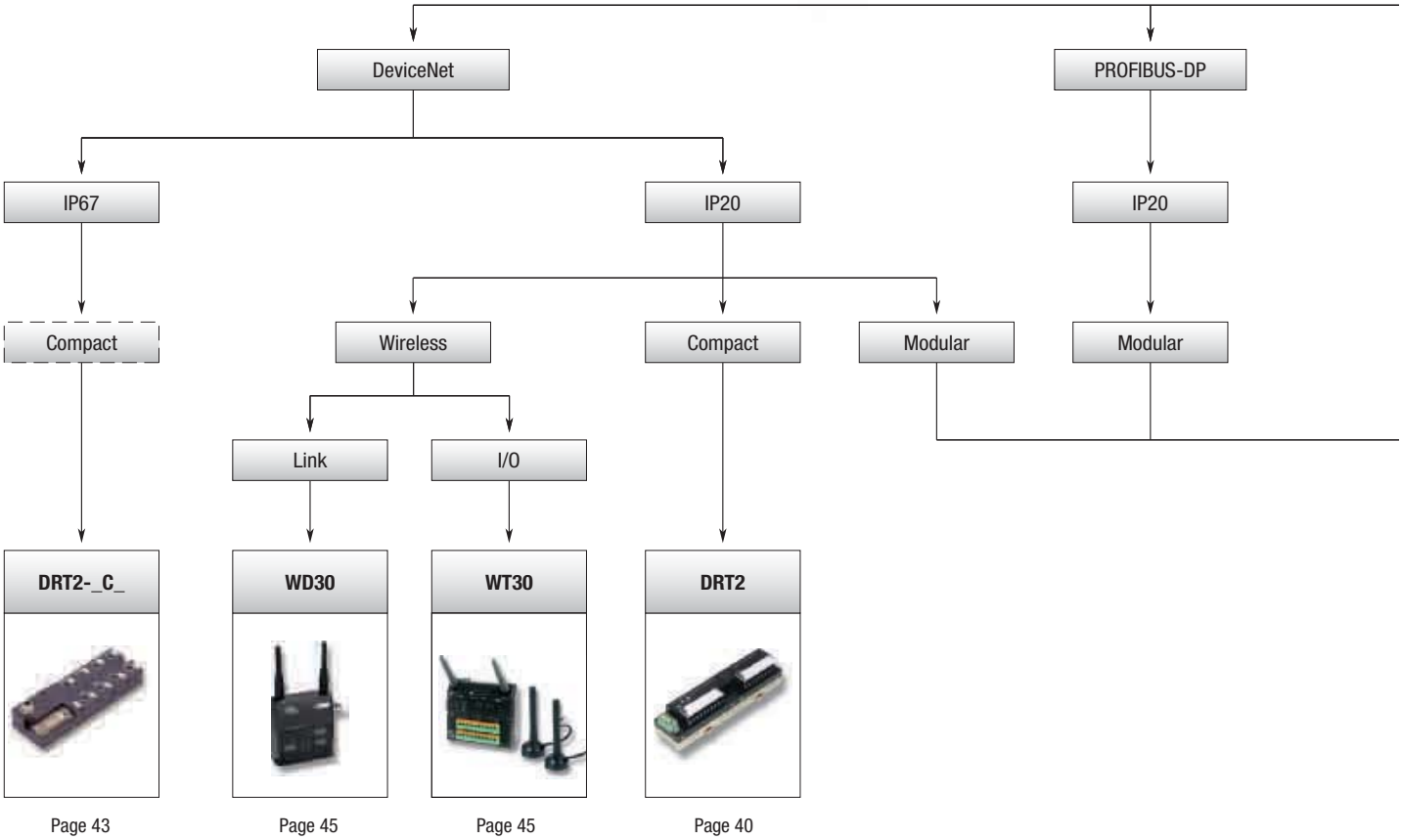
SmartSlice – Intelligence point by point

SmartSlice is the most advanced, yet easy-to-use remote I/O system currently available.
Its built-in intelligence will help to reduce the effort you spend on engineering, troubleshooting and maintenance in your machine, line or plant. By keeping track of control performance and logging all operations, each module can provide timely warnings, preventing costly machine downtime.

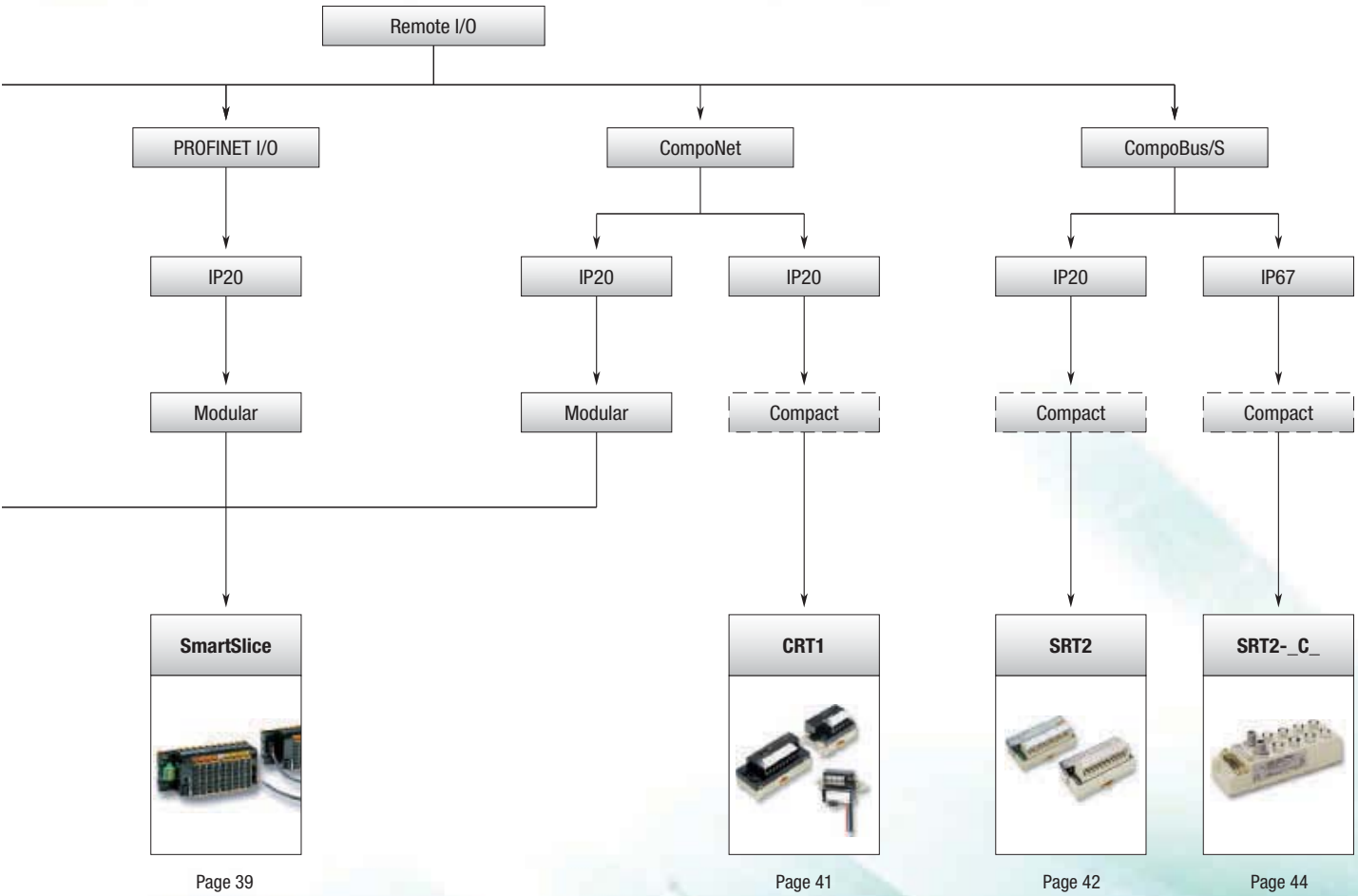
SmartSlice supports the open communication standards PROFINET-IO, PROFIBUS-DP, DeviceNet, CompoNet and MECHATROLINK-II. This provides you the flexibility to adapt to local requirements, anywhere in the world, without changing your I/O.

- Reduce engineering time
- Reduce machine downtime
- Increase your efficiency

The five most used smart features are demonstrated at:
www.smartslice.info






Remote I/O
PROFINET I/O
CompoNet
CompoBus/S
IP20
IP20
IP20
IP20
IP67
Modular
Modular
Compact
Compact
Compact
SmartSlice
CRT1
SRT2
SRT2-_C_
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	Modular I/O	Compact I/O		
				
Model	**GRT**	**DRT2**	**CRT1**	**SRT2**
Network connection	DeviceNet open-style terminal block PROFIBUS-DP 9-pin D-sub CompoNet: 4-pin system connector PROFINET-IO: 2 x RJ45 MECHATROLINK-II: 2 x ML-II	DeviceNet with open-style push-in terminal block	Unshielded 4-wire flat cable and IDC connectors, or general-purpose 2-wire cable by screw terminals.	CompoBus/S, (2-wire + power) by M3 screw terminals
I/O types	2/4/8-point digital I/O 2-point analogue I/O 2-point temperature input Counter units Power feed units Expansion units	8/16 DI+extension, 8/16 DO+extenstion, 16 relay out, 4 AI (V/I, TC, Pt100), 2 AO (V/I),	16 DI+extension, 16 DO+extenstion, 4 AI, 2 AO, 2 DI, 2 DO.	4/8/16 DI, 4/8/16 DO, 8/16 relay out, 4 AI (V/I) 2 AO (V/I)
I/O Connection technology	Push-in screwless clamp	M3 screw terminals (1 or 3-wire DI)	M3 screw terminals, eCON/RITS sensor connectors	M3 screw terminals (1 or 3-wire DI)
Smart features	I/O and power supply diagnostics. Operation timers and counters per I/O point. Analogue value calculations and alarms.	I/O and power supply diagnostics. Operation timers and counters per I/O point. Analogue value calculations and alarms.	I/O and power supply diagnostics. Operation timers and counters for each I/O point. Analogue value calculations and alarms.	I/O isolation, status indication
Ingress Protection class	IP20 (DIN rail mounting in cabinets)	IP20 (DIN rail mounting in cabinets)	IP20 (DIN rail mounting in cabinets)	IP20 (DIN rail mounting in cabinets)
Size in mm (H×W×D)	Bus coupler: 84×58×70 I/O units: 84×15×74	main units: 50×115/125×50; 8/16 pt. expansion: 50×66/94×50	main units: 50×115×50; 8/16 pt. expansion: 50×66/94×50; 2-point slaves: 50×50×30	DI/DO units : 50×80/105/180×48; Relay units: 50×100/155×50; analogue units : 50×105×48
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	Field I/O		Wireless I/O
			
Model	**DRT2-_C_**	**SRT2-_C_**	**WD30/WT30**
Network connection	DeviceNet with M12 micro connector	CompoBus/S, by 4-wire M12 connector, unshielded	DeviceNet M12 connection RS-232C by 9-pin D-sub
I/O types	8/16 DI, 8/16 DO, 8DI + 8 DO	4/8 DI, 4/8 DO	Wireless link, 16 DI, 8DI + 8DO
I/O Connection technology	M12, 1 or 2 I/O signals per connector. 7/8" I/O Power connector.	M12 connectors, one I/O point per connector	Push-in screwless clamp
Smart features	I/O and power supply diagnostics. Operation timers and counters per I/O point.	I/O isolation, status indication	Wireless link diagnostics Explicit message communication
Ingress Protection class	IP67, flat mounting by two M5 screws	IP67, flat mounting by three M5 screws	IP20 (cabinet mounting). Separate antennas (IP67) can be mounted outside the cabinet
Size in mm (H×W×D)	175×60×27.3	114/160×54×29.5	WD30: 80x95x35 WT30: 105x90x40
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The smartest modular I/O system

Omron's SmartSlice I/O system is compact, intelligent and easy. When used with Omron's CS1/CJ1 DeviceNet master units it is plug-and-work, no configuration tool is required. By using built-in functions such as pre-scaling, totalising, differentiation and alarming in analogue I/O units, PLC programming can be minimised. Preventive maintenance data can be accessed using CX-Integrator software, standard PLC function blocks or NS-series Smart Active Parts.

- Most compact in the market (84 mm high)
- Easy set-up, backup and restore functions
- Diagnostics and preventive maintenance data at I/O level
- Detachable terminal blocks allow hot-swapping without re-wiring
- 3-wire connection with 'push-in' technology, no screwdriver required for installation

Ordering information

Model	Function	Specifications	Size in mm (HxWxD)	Order code
Interface units	DeviceNet interface unit	For up to 64 I/O units	84x58x70	GRT1-DRT
	CompoNet interface unit	For up to 64 I/O units (limited to 32 byte in + 32 byte out)	84x58x70	GRT1-CRT
	PROFIBUS-DP interface unit	For up to 64 I/O units	84x58x70	GRT1-PRT
	PROFINET-IO interface unit	For up to 64 I/O units	84x58x70	GRT1-PNT
	MECHATROLINK-II interface unit	For up to 64 I/O units (slave to Trajexia motion controller)	84x58x70	GRT1-ML2
	End plate	One unit required per bus interface	84x20x58	GRT1-END
	End plate with memory function	Supports toolless replacement of PROFINET-IO interface unit	84x20x58	GRT1-END-M
I/O units	4 NPN inputs	24 VDC, 6 mA, 3-wire connection	84x15x74	GRT1-ID4
	4 PNP inputs	24 VDC, 6 mA, 3-wire connection	84x15x74	GRT1-ID4-1
	8 NPN inputs	24 VDC, 4 mA, 1-wire connection + 4xG	84x15x74	GRT1-ID8
	8 PNP inputs	24 VDC, 4 mA, 1-wire connection + 4xV	84x15x74	GRT1-ID8-1
	4 AC inputs	110 VAC, 2-wire connection	84x15x74	GRT1-IA4-1
	4 AC inputs	230 VAC, 2-wire connection	84x15x74	GRT1-IA4-2
	4 NPN outputs	24 VDC, 500 mA, 2-wire connection	84x15x74	GRT1-OD4
	4 PNP outputs	24 VDC, 500 mA, 2-wire connection	84x15x74	GRT1-OD4-1
	4 PNP outputs with short-circuit protection	24 VDC, 500 mA, 3-wire connection	84x15x74	GRT1-OD4G-1
	4 PNP outputs with short-circuit protection	24 VDC, 2 A, 2-wire connection	84x15x74	GRT1-OD4G-3
	8 NPN outputs	24 VDC, 500 mA, 1-wire connection + 4xV	84x15x74	GRT1-OD8
	8 PNP outputs	24 VDC, 500 mA, 1-wire connection + 4xG	84x15x74	GRT1-OD8-1
	8 PNP outputs with short-circuit protection	24 VDC, 500 mA, 1-wire connection + 4xG	84x15x74	GRT1-OD8G-1
	2 relay outputs	240 VAC, 2A, normally-open contacts	84x15x74	GRT1-ROS2
	60 kHz Counter unit, NPN	A+B encoder inputs + 1 Z/control input + 1 output (NPN-type)	84x15x74	GRT1-CT1
	60 kHz Counter unit, PNP	A+B encoder inputs + 1 Z/control input + 1 output (PNP-type)	84x15x74	GRT1-CT1-1
	100 kHz Counter / Positioner unit	A+B+Z encoder inputs (line driver or 24 V selectable) + 1 control input + 2 outputs (PNP-type)	84x15x74	GRT1-CP1-L
	2 analogue inputs, current/voltage	±10 V, 0-10 V, 0-5 V, 1-5 V, 0-20 mA, 4-20 mA	84x15x74	GRT1-AD2
	2 analogue outputs, voltage	±10 V, 0-10 V, 0-5 V, 1-5 V	84x15x74	GRT1-DA2V
	2 analogue outputs, current	0-20 mA, 4-20 mA	84x15x74	GRT1-DA2C
	2 Pt100 inputs	Pt100, 2-wire or 3-wire connection	84x15x74	GRT1-TS2P
	2 Pt1000 inputs	Pt1000, 2-wire or 3-wire connection	84x15x74	GRT1-TS2PK
	2 Thermocouple inputs	Types B, E, J, K, N, R, S, T, U, W, PL2, with cold junction compensation	84x15x74	GRT1-TS2T

Model	Description	Size in mm (HxWxD)	Order code
Other units	I/O power feed unit, separates power supply between groups of I/O units	84x15x74	GRT1-PD2
	I/O power feed unit with electronic overload protection, separates power supply between groups of I/O units	84x15x74	GRT1-PD2G
	I/O power feed and distribution unit, separates power supply between groups of I/O units, 8xV + 4xG	84x15x74	GRT1-PD8
	I/O power feed and distribution unit, separates power supply between groups of I/O units, 4xV + 8xG	84x15x74	GRT1-PD8-1
	I/O power connection unit, 8xV + 4xG	84x15x74	GRT1-PC8
	I/O power connection unit, 4xV + 8xG	84x15x74	GRT1-PC8-1
	Turnback unit, right-hand side	84x20x58	GRT1-TBR
	Turnback unit, left-hand side	84x58x70	GRT1-TBL
	Turnback cable, one meter	1 m	GCN2-100

Accessories

Description	Order code
Replacement front connectors, pack of 5 pcs.	GRT1-BT1-5
PROFIBUS-DP connector, 9-pin D-sub	PROFIBUS Connector 839550
PROFIBUS-DP connector, 9-pin D-sub, with bus termination	PROFIBUS Term. Conn. 846086
PROFINET RJ45 connector	IE-PS-RJ45-FH-BK
CompoNet connectors	See page 41



Smart DeviceNet I/O

Compact DeviceNet I/O units with extensive diagnostic functions. Data regarding power supply status, I/O response times, operation counters and on-time are continuously recorded and checked against user-defined limits. Any deviation is reported to the control system, as indication to perform machine maintenance and prevent unplanned downtime. Smart DeviceNet I/Os are supported by PLC Function Blocks and HMI Smart Active Parts, allowing program-less visualisation and monitoring from the CJ1 PLCs and NS operator terminals.

- Compact size IP20 housing
- Expandable digital I/Os
- Built-in diagnostics and preventive maintenance functions
- Detachable I/O terminal blocks
- Analogue I/O with data pre-processing and alarm functions

Ordering information

Unit type	Specifications	Size in mm (HxWxD)	Remarks	Order code
8-point PNP input unit	24 VDC, 6 mA per point	50x115x50	–	DRT2-ID08-1
16-point PNP input unit	24 VDC, 6 mA per point	50x115x50	Expandable with one XWT unit	DRT2-ID16-1
16-point PNP input unit	24 VDC, 6 mA per point	50x180x58	3-tier connection for direct sensor wiring	DRT2-ID16TA-1
8-point PNP output unit	24 VDC, 0.5 A per point	50x115x50	–	DRT2-OD08-1
16-point PNP output unit	24 VDC, 0.5 A per point	50x115x50	Expandable with one XWT unit	DRT2-OD16-1
16-point PNP output unit	24 VDC, 0.5 A per point	50x180x58	3-tier connection for direct actuator wiring	DRT2-OD16TA-1
16-point relay output unit	2 A per point, max. 8 A per common	50x125x52	with easy-to-replace relays, expandable with one XWT unit	DRT2-ROS16
8-point input + 8-point output unit (PNP)	24 VDC, input 6 mA, output 0.5 A per point	50x115x50	–	DRT2-MD16-1
8-point input + 8-point output unit (PNP)	24 VDC, input 6 mA, output 0.5 A per point	50x180x58	3-tier connection for direct sensor/actuator wiring	DRT2-MD16TA-1
4-Channel analogue input unit	0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA	50x115x50	Resolution 1/6000, conversion time 4 ms (4 inputs)	DRT2-AD04
4-Channel analogue input unit	1 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA	50x115x50	Resolution 1/30000, conversion time 250 ms (4 inputs)	DRT2-AD04H
2-Channel analogue output unit	0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA	50x115x50	Resolution 1/6000, conversion time 2 ms (2 outputs)	DRT2-DA02
4-Channel temperature input unit	Platinum Resistance Thermometer types Pt100, JPt100	50x115x50	0.3% accuracy, conversion time 250 ms (4 inputs)	DRT2-TS04P
4-Channel temperature input unit	Thermocouple types R, S, K, J, T, B, L, E, U, N, W, and PL2	50x115x50	0.3% accuracy, conversion time 250 ms (4 inputs)	DRT2-TS04T
8-point PNP input expansion unit	24 VDC, 6 mA per point	50x66x50	Expansion unit for DRT2 and CRT1 series	XWT-ID08-1
16-point PNP input expansion unit	24 VDC, 6 mA per point	50x94x50	Expansion unit for DRT2 and CRT1 series	XWT-ID16-1
8-point PNP output expansion unit	24 VDC, 0.5 A per point	50x66x50	Expansion unit for DRT2 and CRT1 series	XWT-OD08-1
16-point PNP output expansion unit	24 VDC, 0.5 A per point	50x94x50	Expansion unit for DRT2 and CRT1 series	XWT-OD16-1

Note: To order models with NPN (sinking) outputs and corresponding inputs (+V common), omit the "-1" from the model code.

Accessories

Type	Order code
Power supply tap with 2 fuses, 2 bus connectors and termination resistor	DCN1-1P
T-branch tap with 3 bus connectors (screw clamp) and terminating resistor	DCN1-1C
T-branch tap with 3 bus connectors (screwless)	DCN1-1NC
T-branch tap with 5 bus connectors (screw clamp) and terminating resistor	DCN1-3C
T-branch tap with 5 bus connectors (screwless)	DCN1-3NC
Terminating resistor with screw terminals	DRS1-T



Smart CompoNet I/O

Combining the smart features of DRT2 DeviceNet I/O and the speed and ease of use of CompoBus/S, CompoNet is ideal for high-speed machine control with a flexible and expandable architecture. The special flat cable and IDC connectors make installation quick and easy. The use of repeaters allows wide-area networks with free topology, ideal for conveyor- and warehouse automation.

- Compact size IP20 housing
- Expandable digital I/Os with detachable terminal blocks
- Easy network wiring with IDC connections
- Built-in diagnostics and preventive maintenance functions
- Analogue I/O with data pre-processing and alarm functions

Ordering information

Main units

Unit type	Specifications	Size in mm (HxWxD)	Remarks	Order code
2-point PNP input unit	24 VDC, 6 mA per point	48x48x32	e-CON sensor connectors, power supply via CompoNet cable (50 cm attached)	CRT1B-ID02S-1
8-point PNP input unit	24 VDC, 6 mA per point	50x115x57.6	Screw terminals, common power terminals per 8 points	CRT1-ID08-1
8-point PNP input unit	24 VDC, 6 mA per point	50x96x60	3 push-in terminals per I/O point (signal + power)	CRT1-ID08SL-1
16-point PNP input unit	24 VDC, 6 mA per point	50x115x50	Expandable with one XWT unit.	CRT1-ID16-1
16-point PNP input unit	24 VDC, 6 mA per point	52x180x69	3 terminals per I/O point (for power distribution)	CRT1-ID16TA-1
2-point PNP output unit	24 VDC, 0.2 A per point	48x48x32	e-CON sensor connectors, power supply via CompoNet cable (50 cm attached)	CRT1B-OD02S-1
8-point PNP output unit	24 VDC, 0.5 A per point	50x115x57.6	Screw terminals, common power terminals per 8 points	CRT1-OD08-1
8-point PNP output unit	24 VDC, 0.5 A per point	50x96x60	3 push-in terminals per I/O point (signal + power)	CRT1-OD08SL-1
16-point PNP output unit	24 VDC, 0.5 A per point	50x115x50	Expandable with one XWT unit.	CRT1-OD16-1
16-point PNP output unit	24 VDC, 0.5 A per point	52x180x69	3 terminals per I/O point (for power distribution)	CRT1-OD16TA-1
8-point SSR output unit	265 V AC, 0.3 A per point	50x95x57.6	Screw terminals, common power terminals per 8 points	CRT1-ROF08
8-point relay output unit	250 VAC, 2 A per point, 8 A per common	50x95x57.6	Screw terminals, common power terminals per 8 points	CRT1-ROS08
16-point relay output unit	250 VAC, 2 A per point, 8 A per common	50x140x57.6	8 outputs per common	CRT1-ROS16
8-point input + 8-point output unit, PNP	24 VDC, 0.5 A per point	50x115x57.6	Screw terminals, common power terminals	CRT1-MD16-1
8-point input + 8-point output unit, PNP	24 VDC, 0.5 A per point	50x170x60	3 push-in terminals per I/O point (signal + power)	CRT1-MD16SL-1
8-point input + 8-point output unit PNP	24 VDC, 0.5 A per point	52x180x69	3 terminals per I/O point (for power distribution)	CRT1-MD16TA-1
4-Channel analogue input unit	0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA	50x115x50	Resolution 1/6000, conversion time 4 ms (4 inputs)	CRT1-AD04
2-Channel analogue output unit	0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA	50x115x50	Resolution 1/6000, conversion time 2 ms (2 outputs)	CRT1-DA02
4-Channel Temperature input unit	Platinum Resistance Thermometer type Pt100	50x115x50	0.3% accuracy, conversion time 250 ms (4 inputs)	CRT1-TS04P
4-Channel Temperature input unit	Thermocouple types R, S, K, J, T, B, L, E, U, N, W and PL2	50x115x50	0.3% accuracy, conversion time 250 ms (4 inputs)	CRT1-TS04T

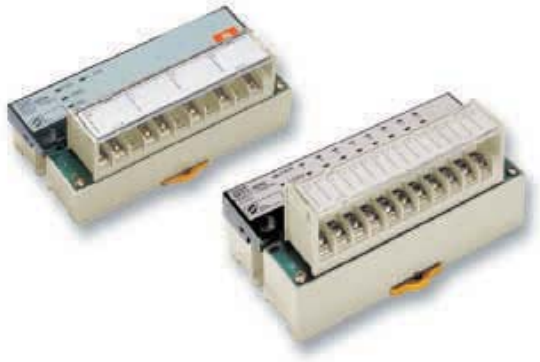
Expansion units

Unit type	Specifications	Size in mm (HxWxD)	Remarks	Order code
8-point PNP input expansion unit	24 VDC, 6 mA per point	50x66x50	Expansion unit for DRT2 and CRT1 series	XWT-ID08-1
16-point PNP input expansion unit	24 VDC, 6 mA per point	50x94x50	Expansion unit for DRT2 and CRT1 series	XWT-ID16-1
8-point PNP output expansion unit	24 VDC, 0.5 A per point	50x66x50	Expansion unit for DRT2 and CRT1 series	XWT-OD08-1
16-point PNP output expansion unit	24 VDC, 0.5 A per point	50x94x50	Expansion unit for DRT2 and CRT1 series	XWT-OD16-1

Note: To order models with NPN (sinking) outputs and corresponding inputs (+V common), omit the "-1" from the model code.

Accessories

Unit type	Specifications	Size in mm (HxWxD)	Remarks	Order code
CompoNet Repeater unit	1 upstream port + 1 downstream port	50x95x43	For extending CompoNet trunk lines, or creating branch lines	CRS1-RPT01
CompoNet 4-wire flat cable	For IP20 use	100 m	For power supply + communication, use with DCN4-connectors	DCA4-4F10
CompoNet Branch connector for trunk line	For IP20 use	–	To create a branching point on a trunk line	DCN4-TR4
CompoNet Branch line end connector	For IP20 use	–	To connect a branch line to a trunk line	DCN4-BR4
CompoNet Y-connector	For IP20 use	–	To connect two line connectors to one slave unit	DCN4-MD4
CompoNet Screw terminal connector	For IP20 use	–	To provide conventional screw terminals for masters or slaves	DCN4-TB4
CompoNet Terminator	For IP20 use	–	Plugs in to DCN4-MD4 or DCN4-TR4	DCN4-TM4
CompoNet connector tool	For DCN4-connectors	–	To attach DCN4-connectors to DCA4-4F10 flat cable	DWT-A01



Fast and easy over CompoBus/S

Omron's unique CompoBus/S is the original I/O bus for machine automation. With free topology and up to 500 m bus length in long-distance mode, it can be used as a remote I/O system. In high-speed mode (100 m max.) the guaranteed sub-millisecond cycle time makes it ideal for efficient machine control. Used with the compact CPM2C-S PLC as master, your machine control system will fit in the smallest spaces.

- Compact size in IP20 housing
- Fast cycle time; less than 1 ms per 256 I/O points
- Easy set-up; no software required
- Choice of 4- 8- and 16-point Digital I/O; transistor-, and relay models
- Analogue In/Outputs and customisable modules available

Ordering information

Unit type	Specifications	Size in mm (HxWxD)	Remarks	Order code
4-point PNP input unit	24 VDC, 6 mA per point	48x80x50	Compact IP20 I/O	SRT2-ID04-1
8-point PNP input unit	24 VDC, 6 mA per point	48x80x50	Compact IP20 I/O	SRT2-ID08-1
16-point PNP input unit	24 VDC, 6 mA per point	48x105x50	Compact IP20 I/O	SRT2-ID16-1
16-point PNP input unit	24 VDC, 6 mA per point	50x180x59	3-tier connection for direct sensor wiring	SRT2-ID16T-1
4-point PNP output unit	24 VDC, 0.3 A per point	48x80x50	Compact IP20 I/O	SRT2-OD04-1
8-point PNP output unit	24 VDC, 0.3 A per point	48x80x50	Compact IP20 I/O	SRT2-OD08-1
16-point PNP output unit	24 VDC, 0.3 A per point	48x105x50	Compact IP20 I/O	SRT2-OD16-1
16-point PNP output unit	24 VDC, 0.5 A per point	50x180x59	3-tier connection for direct sensor/actuator wiring	SRT2-OD16T-1
8-point input + 8-point output unit (PNP)	24 VDC, input 6 mA, output 0.3 A per point	50x180x59	3-tier connection for direct actuator wiring	SRT2-MD16T-1
8-point relay output unit	Max. 3 A per point	50x100x50	with easy-to-replace relays	SRT2-ROC08
16-point relay output unit	Max. 3 A per point	50x155x50	with easy-to-replace relays	SRT2-ROC16
4-Channel analogue input unit	0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA	48x105x50	Resolution 1/6000, conversion time 4 ms (4 inputs)	SRT2-AD04
2-Channel analogue output unit	0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA	48x105x50	Resolution 1/6000, conversion time 2 ms (2 outputs)	SRT2-DA02

Note: To order models with NPN (sinking) outputs and corresponding inputs (+V common), omit the "-1" from the model code.

Accessories

Type	Order code
CompoBus/S 4-wire flatcable for power and communication (100 m)	SCA1-4F10
CompoBus/S branch connector (IDC) for flatcable	SCN1-TH4
CompoBus/S termination connector (IDC) for flatcable	SCN1-TH4T
CompoBus/S termination block (screw connection)	SRS1-T



DeviceNet I/O for harsh environments

Rugged I/O units for field mounting. The DRT2 slave units feature internal diagnostic and maintenance data collection, which can be accessed over the network. Power supply status, I/O response times, operation counters and on-time monitor data is available at all times, and is internally checked against user-defined limits. Maintenance warnings will be generated when limits are exceeded. Using CX-One or NS-series HMI with Smart Active Parts for visualisation, this allows more efficient system setup, commissioning and troubleshooting without any additional programming.

- IP67 protection, DRT2 versions are also oil- and welding-spatter proof
- Internal circuits powered by DeviceNet; fewer connections means less installation errors
- Smart Slave functions for diagnostics and preventive maintenance
- Indication of broken wire and short-circuit in I/O signals
- M12 connectors for fast installation

Ordering information

Unit type	Specifications	Size in mm (HxWxD)	Remarks	Order code
4-point PNP input unit	24 V, 6 mA	123x60x44	Separate I/O power supply connection	DRT2-ID04CL-1
8-point PNP input unit	24 V, 6 mA	175x60x44	Separate I/O power supply connection	DRT2-ID08CL-1
8-point PNP input unit	24 V, 11 mA, with power short-circuit and sensor disconnection detection	175x60x38	Unit power supply via DeviceNet cable	DRT2-ID08C-1
16-point PNP input unit	24 V, 6 mA, 2 inputs per M12 connector	175x60x44	Separate I/O power supply connection	DRT2-HD16CL-1
16-point PNP input unit	24 V, 11 mA, 2 inputs per M12 connector, with power short-circuit and sensor disconnection detection	175x60x38	Unit power supply via DeviceNet cable	DRT2-HD16C-1
4-point PNP output unit	24 V, 0.5 A per point	123x60x44	Separate I/O power supply connection	DRT2-OD04CL-1
8-point PNP output unit	24 V, 0.5 A per point	175x60x44	Separate I/O power supply connection	DRT2-OD08CL-1
8-point PNP output unit	24 V, 1.5 A per point (8 A total), with short-circuit protection + indication	175x60x44	Separate I/O power supply connection	DRT2-OD08C-1
16-point PNP output unit	24 V, 0.5 A per point, 2 points per M12 connector	175x60x44	Separate I/O power supply connection	DRT2-WD16CL-1
8-point input + 8-point PNP output unit	24 V, 6 mA input, 0.5 A output per point, 2 points per M12 connector	175x60x44	Separate I/O power supply connection	DRT2-MD16CL-1

Note: To order models with NPN (sinking) outputs and corresponding inputs (+V common), omit the "-1" from the model code.

Accessories

Unit type	Specifications	Order code
DeviceNet thin cable	with one M12 socket connector (female), 1 m	DCA1-5CN01F1
DeviceNet thin cable	with one M12 socket connector (female), 2 m	DCA1-5CN02F1
DeviceNet thin cable	with one M12 socket connector (female), 5 m	DCA1-5CN05F1
DeviceNet thin cable	with one M12 socket connector (female) and one M12 plug connector (male), 1 m	DCA1-5CN01W1
DeviceNet thin cable	with one M12 socket connector (female) and one M12 plug connector (male), 2 m	DCA1-5CN02W1
DeviceNet thin cable	with one M12 socket connector (female) and one M12 plug connector (male), 5 m	DCA1-5CN05W1
DeviceNet T-connector for thin cable	with two M12 socket connectors (female) + one M12 plug connector (male)	DCN2-1
DeviceNet terminator	with M12 plug connector	DRS2-1
Power supply cable	with one 7/8 inches socket connector (female), 2 m	XS4F-D421-102-A
Power supply cable	with one 7/8 inches socket connector (female), 5 m	XS4F-D421-105-A
Power supply cable	with one 7/8 inches socket connector (female) and one 7/8 inches plug connector (male), 2 m	XS4W-D421-102-A
Power supply cable	with one 7/8 inches socket connector (female) and one 7/8 inches plug connector (male), 5 m	XS4W-D421-105-A
Power supply T-connector	with two 7/8 inches socket connectors (female) + one 7/8 inches plug connector (male)	XS4R-D424-5
4-wire I/O connection cable	with one M12 plug connector (male), 1 m	XS2H-D421-C80-A
4-wire I/O connection cable	with one M12 plug connector (male), 2 m	XS2H-D421-D80-A
4-wire I/O connection cable	with one M12 plug connector (male), 5 m	XS2H-D421-G80-A
4-wire I/O connection cable	with one M12 socket connector (female) and one M12 plug connector (male), 1 m	XS2W-D421-C81-A
4-wire I/O connection cable	with one M12 socket connector (female) and one M12 plug connector (male), 2 m	XS2W-D421-D81-A
4-wire I/O connection cable	with one M12 socket connector (female) and one M12 plug connector (male), 5 m	XS2W-D421-G81-A
Y-connector for 16-point I/O units	Splits the 2 I/O points per M12 connector to two M12 connectors	XS2R-D426-1
Y-connector cable for 16-point I/O units	Splits the 2 I/O points per M12 connector to two M12 connectors, 1 m	XS2R-D426-C11-F
M12 connector	M12 plug connector (male), solder type	XS2G-D421
M12 connector	M12 socket connector (female), solder type	XS2C-D421
IP67 cap for M12 sockets	Metal cap for unused I/O connections	XS2Z-12



Dust- and waterproof CompoBus I/O

Rugged I/O units for field mounting. Omron's unique CompoBus/S is the most efficient I/O bus for machine automation. With free topology and up to 500 m bus length in long-distance mode, it can be used as a remote I/O system. In high-speed mode (100 m max.) the guaranteed sub-millisecond cycle time makes it ideal for efficient machine control. With IP67 slave modules distributed throughout the machine, the need for protective enclosures is minimised.

- IP67 protection against dust and water
- Fast cycle time; less than 1 ms for 256 I/O points
- Easy setup; no software required
- Choice of 4- and 8-point Digital I/O
- M12 connectors for easy field wiring

Ordering information

Unit type	Specifications	Size in mm (HxWxD)	Order code
4-point PNP input unit	24 V, 6 mA	114x54x45	SRT2-ID04CL-1
8-point PNP input unit	24 V, 6 mA	114x54x45	SRT2-ID08CL-1
4-point PNP output unit	24 V, 0.5 A per point	114x54x45	SRT2-OD04CL-1
8-point PNP output unit	24 V, 0.5 A per point	114x54x45	SRT2-OD08CL-1

Note: To order models with NPN (sinking) outputs and corresponding inputs (+V common), omit the "-1" from the model code.

Accessories

Unit type	Specifications	Remarks	Order code
CompoBus/S terminator	with M12 plug connector	–	SRS2-1
M12 connector	M12 plug connector (male), screw type	For CompoBus/S 4-wire round cable	XS2G-D4S7
M12 connector	M12 socket connector (female), screw type	For CompoBus/S 4-wire round cable	XS2C-D4S7
M12 T-connector (4-wire)	with two M12 socket connectors (female) + one M12 plug connector (male)	–	XS2R-D427-5
4-wire I/O connection cable	with one M12 plug connector (male), 1 m	–	XS2H-D421-C80-A
4-wire I/O connection cable	with one M12 plug connector (male), 2 m	–	XS2H-D421-D80-A
4-wire I/O connection cable	with one M12 plug connector (male), 5 m	–	XS2H-D421-G80-A
4-wire I/O connection cable	with one M12 socket connector (female) and one M12 plug connector (male), 1 m	–	XS2W-D421-C81-A
4-wire I/O connection cable	with one M12 socket connector (female) and one M12 plug connector (male), 2 m	–	XS2W-D421-D81-A
4-wire I/O connection cable	with one M12 socket connector (female) and one M12 plug connector (male), 5 m	–	XS2W-D421-G81-A
Y-connector for 16-point I/O units	Splits the 2 I/O points per M12 connector to two M12 connectors	–	XS2R-D426-1
Y-connector cable for 16-point I/O units	Splits the 2 I/O points per M12 connector to two M12 connectors, 1 m	–	XS2R-D426-C11-F
M12 connector	M12 plug connector (male), solder type	–	XS2G-D421
M12 connector	M12 socket connector (female), solder type	–	XS2C-D421
IP67 cap for M12 sockets	Metal cap for unused I/O connections	–	XS2Z-12



Wireless DeviceNet communication

There are applications where a normal wired connection is not practical, impossible to maintain or prone to disturbance. WD30 provides a wireless master/slave data link for up to 63 DeviceNet sub-networks. Alternatively, a WD30 master unit can directly control WT30 wireless I/O slave units. For direct access to wireless remote I/O without passing through DeviceNet, the WT30 master is equipped with a serial Compo-Way/F interface.

- Easy to set-up: Extensive diagnostic features such as signal strength measurement and channel usage
- Each Wireless Master handles up to 100/100 words, input/output data. Up to 63 Wireless Slaves per Wireless Master
- Uses spread spectrum technology for superior noise resistance in manufacturing environments
- Relay function for extension of communication range (3 repeaters max.)
- Explicit message communication

Ordering information

Unit type	Size in mm (HxWxD)	Order code
Wireless Master unit; slave on DeviceNet network; with 2 pencil antennas	80x159x35	WD30-ME
Wireless Master unit; slave on DeviceNet network; with 2 magnetic base antennas	80x95x35	WD30-ME01
Wireless Slave unit; Master on DeviceNet network; with 2 pencil antennas	80x159x35	WD30-SE
Wireless Slave unit; Master on DeviceNet network; with 2 magnetic base antennas	80x95x35	WD30-SE01
Wireless Master unit; controlled by serial RS232-C link (antenna not included)	105x90x40	WT30-M01-FLK
Wireless Slave unit; 16 digital inputs (NPN/PNP)	105x90x40	WT30-SID16
Wireless slave unit; 8 digital inputs + 8 digital outputs (PNP)	105x90x40	WT30-SMD16-1

Accessories

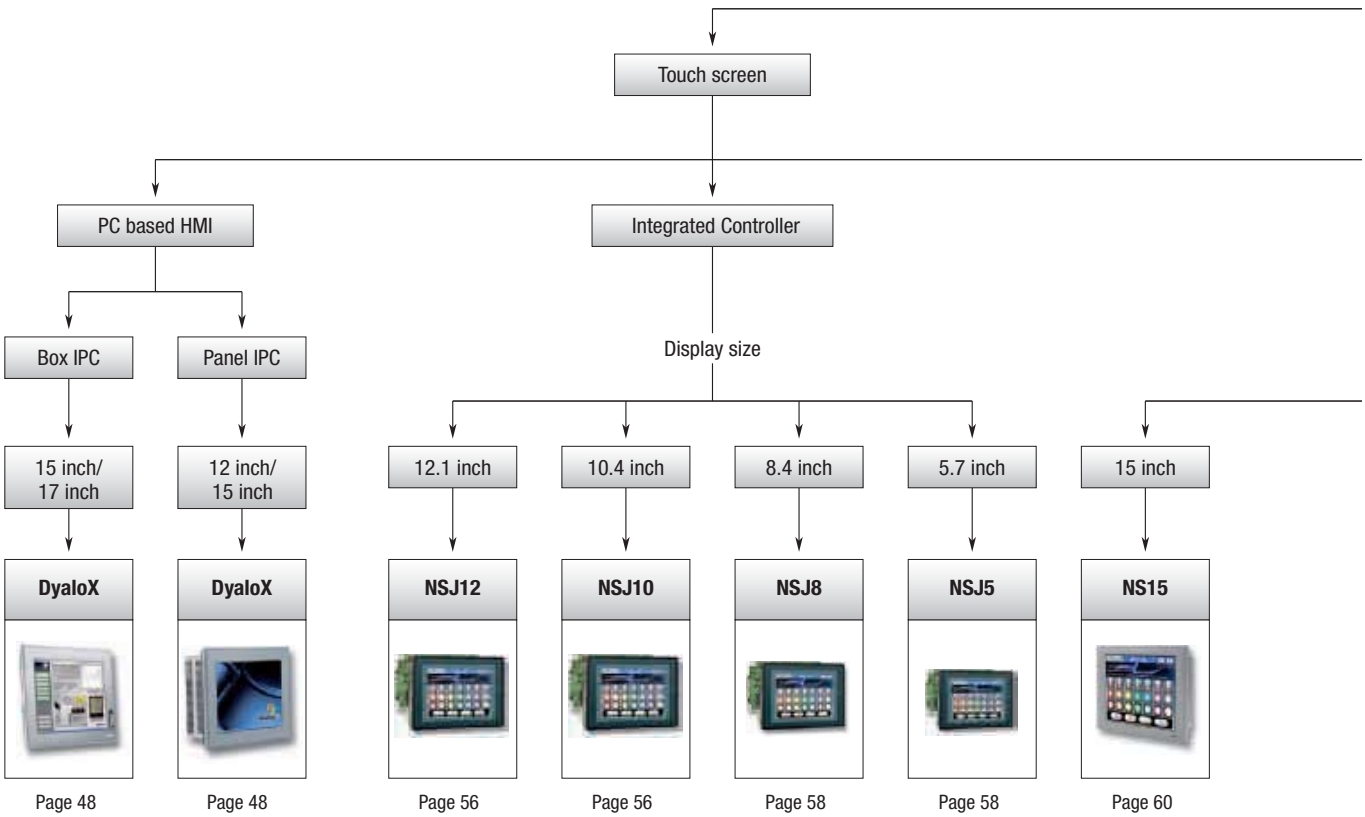
Unit type	Remarks	Size	Order code
Magnet base antennas (set of 2), with 2 m cable	–	115x∅36	WT30-AT001
Pencil antennas (set of 2)	–	75	WT30-AT003
DIN-rail mounting bracket for WT30	–	–	WT30-FT001
DeviceNet thin cable	with one M12 socket connector (female)	1 m	DCA1-5CN01F1
DeviceNet thin cable	with one M12 socket connector (female)	2 m	DCA1-5CN02F1
DeviceNet thin cable	with one M12 socket connector (female)	5 m	DCA1-5CN05F1
DeviceNet thin cable	with one M12 socket connector (female) and one M12 plug connector (male)	1 m	DCA1-5CN01W1
DeviceNet thin cable	with one M12 socket connector (female) and one M12 plug connector (male)	2 m	DCA1-5CN02W1
DeviceNet thin cable	with one M12 socket connector (female) and one M12 plug connector (male)	5 m	DCA1-5CN05W1
DeviceNet T-connector for thin cable	with two M12 socket connectors (female) + one M12 plug connector (male)	–	DCN2-1
DeviceNet terminator	with M12 plug connector	–	DRS2-1

NQ HMI SERIES - Create and Operate

Powerful, colour HMI in a compact format

The NQ series, Omron's family of easy to use and economic HMI terminals, offers you many useful features, with the best quality graphical display in even the smallest touch screen. This makes the NQ family ideal for many different applications, for example from a simple semi-automatic packaging machine up to a bigger in-line packaging or filling machine.

- High quality display - Sharp contrast and colors, long backlight life
- Create applications quickly - Easy, full featured, intuitive software
- Powerful HMI features - Function keys, Trending, Data logging, etc.





Interaction type

- Function keys
  - 4 lines
    - NT11 — Page 66
  - 2 lines
    - NT2S — Page 67
- Scalable HMI
  - Display size
    - 12.1 inch/ 10.4 inch
      - NS12/NS10 — Page 60
    - 8.4 inch
      - NS8 — Page 60
    - 5.7 inch
      - NS5 — Page 61
    - 5.7 inch
      - NS5 Handheld — Page 62
- Compact HMI
  - 5.7 inch
    - NQ5 — Page 65
  - 3.5 inch/ 3.8 inch
    - NQ3 — Page 65



Industrial PC created for 24/7 operation in the most demanding industrial environments

The DyaloX Industrial PC is designed to provide exceptional performance operating around-the-clock throughout its lifetime. Drawing on our many years of experience in industrial-class standalone PC-based equipment, we have created unique self-diagnostic hardware and software, such as the Omron RAS solution, to ensure that DyaloX IPCs will keep on running long after other IPCs have given up.

- Omron RAS solution
- Industrial-grade 600 MHz or 1.3 GHz Intel Celeron CPU
- Reliable silicon storage up to 8GB
- Fan-less heat sink cooling for enhanced reliability
- 3 year warranty, 5 year minimum availability, 7 year courier repair service

Ordering information

DyaloX IPC

Type		Order Code
Industrial PC panel, 600 MHz CPU	12 inches, 600 MHz, 512 MB internal, black	NSA12-TX12B
	12 inches, 600 MHz, 512 MB internal, silver	NSA12-TX12S
	15 inches, 600 MHz, 512 MB internal, black	NSA15-TX12B
	15 inches, 600 MHz, 512 MB internal, silver	NSA15-TX12S
Industrial PC panel, 1.3 GHz CPU	12 inches, 1.3 GHz, 512 MB internal, 2 GB storage, black	NSA12-TX01B-E
	12 inches, 1.3 GHz, 512 MB internal, 2 GB storage, silver	NSA12-TX01S-E
	15 inches, 1.3 GHz, 512 MB internal, 2 GB storage, black	NSA15-TX01B-E
	15 inches, 1.3 GHz, 512 MB internal, 2 GB storage, silver	NSA15-TX01S-E
Industrial PC box, 1.3 GHz CPU	1.3 GHz, RAM: 512 MB, storage: 2 GB	NSA-CPU01-E
	1.3 GHz, RAM: 512 MB, storage: 4 GB	NSA-CPU02-E
	1.3 GHz, RAM: 1 GB, storage: 2 GB	NSA-CPU03-E
	1.3 GHz, RAM: 1 GB, storage: 4 GB	NSA-CPU04-E

Touch panel

Type		Order Code
Touchscreen panel	15 inches, black	NSA-TX151B
	15 inches, silver	NSA-TX151S
	17 inches, black	NSA-TY171B
	17 inches, silver	NSA-TY171S

Accessories

Type	Order Code
2 GB CF with XP Embedded English	NSA-CEX02-E
4 GB CF with XP Embedded English	NSA-CEX04-E
8 GB CF with XP Embedded English	NSA-CEX08-E
512 MB DDR-SD RAM (non-ECC)	NSA-MR581
1 GB DDR-SD RAM (non-ECC)	NSA-MR191
DVI & USB cable 0.1 m	NSA-DU02
DVI & USB cable 2 m	NSA-DU22
DVI & USB cable 5 m	NSA-DU52
DVI cable 10 m	NSA-DV101
Set of 5 Anti-reflection sheets for 12 inches	NS12-KBA04
Set of 5 Anti-reflection sheets for 15 inches	NS15-KBA04
Battery for NSA12/15-TX01, NSA-CPU	NSA-BAT01
Battery for NSA12/15-TX12	NSA-BAT03

DyaloX IPC specifications

Main specifications

Item		NSA1_-TX12	NSA1_-TX01_-E	NSA-CPU01-E	NSA-CPU02-E	NSA-CPU03-E	NSA-CPU04-E
OS		CF with Windows XP embedded*1	Preinstalled Windows XP embedded				
Processor		600 MHz Intel Celeron-M Processor	1.3 GHz Intel Celeron-M Processor				
Storage device	Type	Industrial CF memory or HDD*1	DiskOnModule (Flash memory)				
	Capacity	CF: 2/4/8 GB (with OS) IDE I/F*1	2 GB	2 GB	4 GB	2 GB	4 GB
	Service life (write cycles)	CF: 100,000 write cycle/block HDD: 2 years at 24 hours/day operation, 3 years at 8 hours/day operation	NAND flash memory: 100,000 write cycles (to the same block)*2				
Memory	Main memory	512 MB DDR-SDRAM (non-ECC)	512 MB DDR-SDRAM (non-ECC)			1GB DDR-SDRAM (non-ECC)	
	Cache memory	512 KB Level 2 cache memory (built into the CPU)					
Interface	Keyboard	-	PS/2 keyboard with 6-pin MINI DIN connector				
	Mouse	-	PS/2 mouse with MINI DIN connector				
	Serial ports	2 ports conforming to EIA RS-232C for 9-pin D-SUB male connectors					
	Ethernet	2 x 10 BASE-T/ 100 BASE-TX RJ45 connector	One 10 BASE-T/100 BASE-TX port for an RJ45 connector				
	USB ports	4 x USB 2.0/1.1 for type-A connectors. (2 on front panel, cable 3 m max.)	2 USB 2.0/1.1 ports for USB type-A connectors	2 USB 2.0/1.1 ports for USB type-A connectors 2 USB 1.1 for USB type-A connectors			
	Memory Card	1 CF Card slot					
	Video output	-		1 DVI port for DVI-I connector			
	Audio	-		Line-In/Line-Out/Mic-In for mini jack			
Expansion slots		PCI expansion bus, 1 slot	PCI expansion bus, 2 slots				
Special RAS board	External input port	3-pin connector port for the UPS power interruption signal					
	Status LEDindicators	4 (RUN/BATLOW/ERR/DIAG)					
RAS functions	Special RAS board functions	Alive connection monitoring, device restart, timer start, startup and shutdown monitoring, backlight lit time measurement, UPS power interrupt signal output, and logging functions					
	Motherboard RAS functions	Standard PC RAS info, post error logging, post error retry, CMOS data recovery					
POWER LED indicator		Yes (green)					
Service life*3		50,000 hours at 40°C		50,000 hours at 30°C			
Battery life	Main board	5 years at 25°C (NSA-BAT03)	5 years at 25°C (NSA-BAT01)				
	RAS board	5 years at 25°C (NSA-BAT03)	5 years at 25°C (NSA-BAT01)				

*1 Sold separately

*2 Calculate condition

Free area: 500 MB (*excluding OS & Application)
Overwrite data size/time: 0.5 MB/time
Overwrite times/day: 10,000 times/day
MTBF: (500 MB *100,000 times) / (0.5 MB *10,000 times/day) = 10,000 days = 27 years

*3 The service life is a guideline that is provided strictly for reference. It varies with factors such as the installation location and operating conditions.

Touch Panel specifications

Item		NSA12-TX12_-E	NSA15-TX12_-E	NSA12-TX01_-E	NSA15-TX01_-E
Display panel	Type	TFT colour LCD			
	Size	12.1 inches	15 inches	12.1 inches	15 inches
	Resolution	1024×768 dots			
	Brightness	300 cd/m^2 (typical)			
	Viewing angle	130° left to right, 90° up and down			
	Colours displayed	262,144			
Backlight	Type	2 CCFL	4 CCFL	2 CCFL	4 CCFL
	Brightness adjustment	Three-level software adjustment*1			
	Backlight not lit detection	The software reads the lamp burnout detection signal from the inverter*2			
	Service life	50,000 hours min.*3			
Touch panel	Type	Analogue resistive type			
	Effective input area Size in mm (H×W)	185.5×247	229×305	185.5×247	229×305
	Operating service life	10,000,000 operations (with non-stop key stroking using fingers to input) 100,000 characters (with non-stop character entry using a stylus to input)			
Interface	USB ports	4 x USB2.0/1.1 for type-A connectors (2 on front side)		2 x USB2.0/1.1 for type-A connectors	
	Video Input	-			
POWER LED indicator		Yes (green)			
Service life*4		50,000 hours at 25°C		50,000 hours at 40°C	

*1 The contrast cannot be adjusted significantly.
*2 It is not the service life, but rather lamp failure due to hardware problems such as a broken wire that is detected. Backlight not lit detection means both backlight lamps have burnt out.
*3 The service life is a guideline for maximum contrast at room temperature with normal humidity and is provided strictly for reference. It varies significantly with the ambient temperature. The service life will be shorter under extreme (high or low) temperature conditions and falls off sharply particularly under low-temperature conditions.
*4 The service life is a guideline that is provided strictly for reference. It varies with factors such as the installation location and operating conditions.

General specifications

Item	NSA1_-TX12_-E	NSA1_-TX01_-E	NSA-CPU0_-E
Rated supply voltage	24 VDC		
Allowable supply voltage range	20.4 VDC to 27.6 VDC (24 VDC ±15%)	20.0 VDC to 27.6 VDC (24 VDC ±15%)	
Power consumption	12 inches: 65 W max. 15 inches: 75 W max.	12 inches: 80 W max. 15 inches: 100 W max.	60 W max.
Ambient operating temperature	0 to 50°C*1		
Ambient storage temperature	-10 to 60°C*1		
Ambient operating humidity	10% to 80% with no condensation*1		
Ambient storage humidity	10% to 85% with no condensation*1		
Operating atmosphere	Must be free of corrosive gases. Must be fairly dust free.		
Noise resistance	Conforms to IEC6100-4-4, power supply line: 2 kV		
Vibration resistance (in operation)	Conforms to JIS C0041, 0.05 mm amplitude at 10 to 55 Hz for 50 min. Each in the X, Y, and Z directions		
Shock resistance (in operation)	Conforms to JIS C0041, 196 m/s^2 three times each in the X, Y, and Z directions		
Degree of protection	Front panel: IP65 or the equivalent*1		–
Weight	12 inches: 5 kg max. 15 inches: 7 kg max.	12 inches: 5 kg max. 15 inches: 7 kg max.	4 kg max.
Dimensions in mm (HxWxD)	12 inches: 281×342×98 15 inches: 296.5×397.5×103	12 inches: 264×322×100 15 inches: 312×384×108	233x308x76.5

*1 For more information, please check the user manual.

CF & HDD

Item	NSA-CEX02	NSA-CEX04	NSA-CEX08
Storage capacity	2 GB	4 GB	8 GB

Touch panel specifications (box model)

Item		NSA-TX151	NSA-TY171
Display panel	Type	TFT colour LCD	
	Size	15.0 inches	17.0 inches
	Resolution	1024×768 dots	1280×1024 dots
	Brightness	270 cd/m^2 (typical)	200 cd/m^2 (typical)
	Viewing angle	130° left to right, 90° up and down	
	Colours displayed	262,144	
Backlight	Type	2 CCFL	4 CCFL
	Brightness adjustment	10 level adjustment by rotary switch	
	Service life	50,000 hours min.*1	
Touch panel	Type	Analogue resistive type	
	Effective input area Size in mm (H×W)	229×305	272×340
	Operating service life	10,000,000 operations (with non-stop key stroking using fingers to input) 100,000 characters (with non-stop character entry using a stylus to input)	
Interface	USB ports	3 x USB 1.1 for type-A connectors (2 on front side) 1 x USB 1.1 (used for touch) for type-B connector	
	Video Input	1 x DVI-D port	
POWER LED indicator		Yes (green)	
Service life*2		50,000 hours at 30°C	

*1 The service life is a guideline for maximum contrast at room temperature with normal humidity and is provided strictly for reference. It varies significantly with the ambient temperature. The service life will be shorter under extreme (high or low) temperature conditions and falls off sharply particularly under low-temperature conditions.
*2 The service life is a guideline that is provided strictly for reference. It varies with factors such as the installation location and operating conditions.

General specifications (box model)

Item	NSA-TX151	NSA-TY171
Rated supply voltage	24 VDC	
Allowable supply voltage range	20.0 VDC to 27.6 VDC (24 VDC ±15%)	
Power consumption	40 W max.	55 W max.
Ambient operating temperature	0 to 50°C*1	
Ambient storage temperature	-10 to 60°C*1	
Ambient operating humidity	10% to 80% with no condensation*1	
Ambient storage humidity	10% to 85% with no condensation*1	
Operating atmosphere	Must be free of corrosive gases. Must be fairly dust free.	
Noise resistance	Conforms to IEC6100-4-4, power supply line: 2 kV	
Vibration resistance (in operation)	Conforms to JIS C0041, 0.05 mm amplitude at 10 to 55 Hz for 50 min. Each in the X, Y, and Z directions	
Shock resistance (in operation)	Conforms to JIS C0041, 196 m/s^2 three times each in the X, Y, and Z directions	
Degree of protection	IP65F (front panel oil protection)*1	
Weight	6 kg max.	7 kg max.
Dimensions in mm (HxWxD)	328x404x57	371x436x57

*1 For more information, please check the user manual.

Selection table

	HMI & Control with SYSMAC One			
				
Model	**NSJ12**	**NSJ10**	**NSJ8**	**NSJ5**
Type of Display	12.1 inch colour TFT	10.4 inch colour TFT	8.4 inch colour TFT	5.7 inch colour TFT or STN
Display Size / Resolution	246×184.5 mm (800×600 pixels)	215.5×162.4 mm (640×480 pixels)	170.9×128.2 mm (640×480 pixels)	117.2×88.4 mm (320×240 pixels)
Control	CJ1G-CPU45H; 60k-steps program memory, 128k-words data memory, logic instruction time 0.04 µs	CJ1G-CPU45H; 60k-steps program memory, 128k-words data memory, logic instruction time 0.04 µs	CJ1G-CPU45H; 60k-steps program memory, 128k-words data memory, logic instruction time 0.04 µs CJ1M-CPU13; 20k-steps program memory, 32k-words data memory, logic instruction time 0.04 µs	CJ1G-CPU45H; 60k-steps program memory, 128k-words data memory, logic instruction time 0.04 µs CJ1M-CPU13; 20k-steps program memory, 32k-words data memory, logic instruction time 0.04 µs
Communication	DeviceNet Master/Slave or PROFIBUS Master and optional Ethernet interface	DeviceNet Master/Slave or PROFIBUS Master and optional Ethernet interface	DeviceNet Master/Slave or PROFIBUS Master and optional Ethernet interface	DeviceNet Master/Slave or PROFIBUS Master and optional Ethernet interface
Expansion (1 board max.)	Ethernet, Controller Link, I/O extension	Ethernet, Controller Link, I/O extension	Ethernet, Controller Link, I/O extension	Ethernet, Controller Link, I/O extension
Dimensions in mm (HxWxD)	Without expansion unit 241×315×73.3 With expansion unit 241×315×89.3	Without expansion unit 241×315×73.3 With expansion unit 241×315×89.3	Without expansion unit 177×232×73.3 With expansion unit 177×232×89.3	Without expansion unit 195×142×79 With expansion unit 195×142×95
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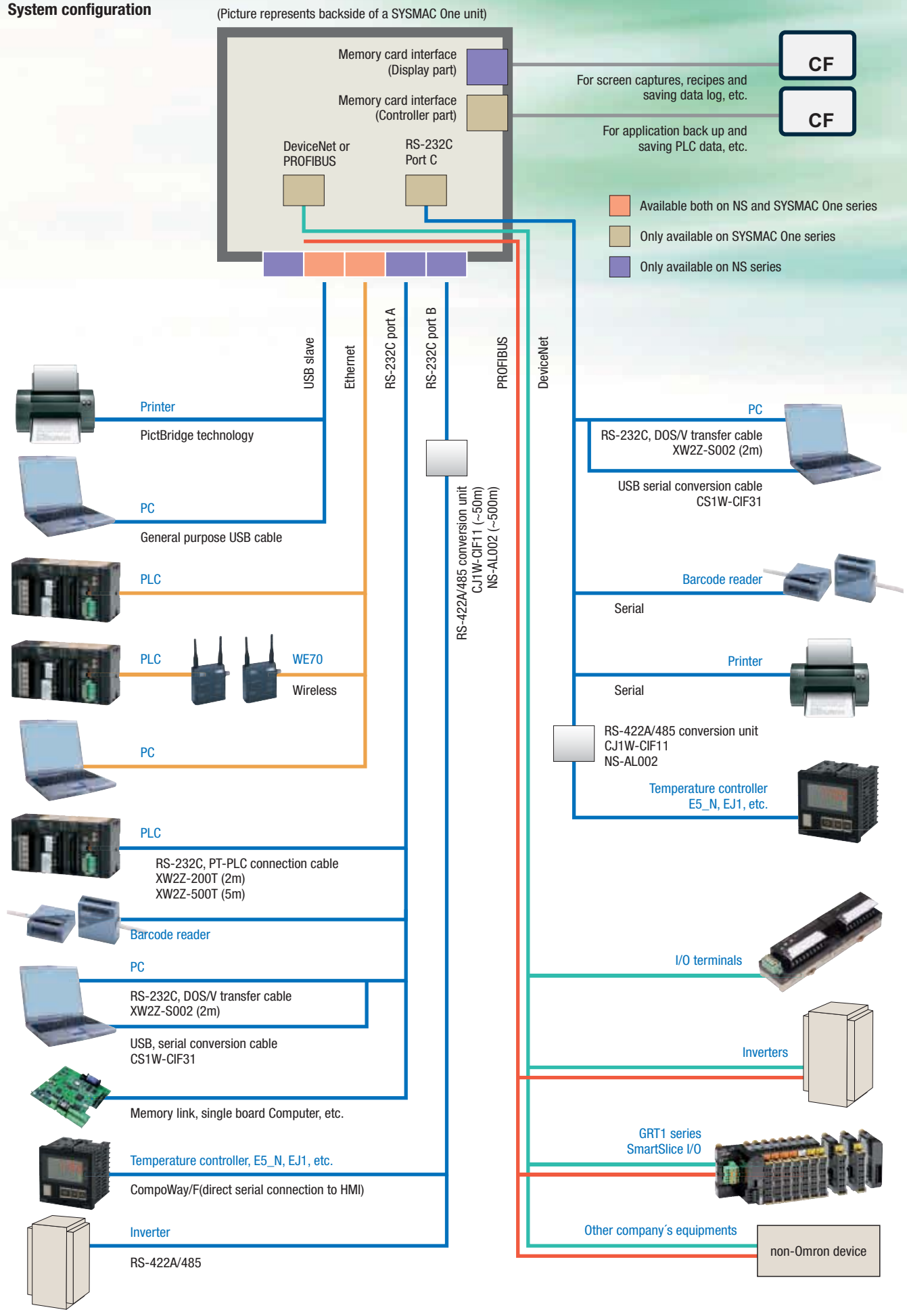
	Scalable HMI – NS					
						
Model	**NS15**	**NS12**	**NS10**	**NS8**	**NS5**	**NS5 Handheld**
Display	15 inch TFT colour	12.1 inch TFT colour	10.4 inch TFT colour	8.4 inch TFT colour	5.7 inch Monochrome or STN/TFT colour	5.7 inch STN colour
Resolution	1024×768 pixels (XGA)	800x600 pixels (SVGA)	640x480 pixels (VGA)	640x480 pixels (VGA)	320x240 pixels (QVGA)	320x240 pixels (QVGA)
Nr. of colours	256 (32,768 for image data)	256 (32,768 for image data)	256 (32,768 for image data)	256 (32,768 for image data)	Monochrome 16 greyscales, STN/TFT 256 colours (STN 4096, TFT 32,768 for image data)	256 colours (4096 colours for image data)
Memory Size	60MB screen memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory
Options	Controller Link, Video input board (NS-CA002)	Ethernet, Controller Link, Video input board (RGB/Composite)	Ethernet, Controller Link, Video input board (RGB/Composite)	Ethernet, Video input board (RGB/Composite)	Ethernet	RS-232 or RS-422 communication depending on cable
Dimensions in mm (HxWxD)	300×400×80	241×315×48.5	241×315×48.5	177×195×48.5	142×195×54	176×223×70.5 (excl. emergency button)
Page	60	60	60	60	61	62

System configuration





HMI with integrated PLC and Network interface

The NSJ12 and NSJ10 are combined with a CJ1G-CPU 45H and a DeviceNet or PROFIBUS interface fitted into a compact housing occupying less panel space than the separate products. Programming can be done via the standard high-speed USB port. The SYSMAC One is completely transparent, so the PLC, network (including field devices) and HMI can be accessed via a single port. A great advantage when servicing your machine remotely.

- HMI + PLC with 2 separate CPUs for greater performance and reliability
- Transparent architecture for easy remote maintenance
- Compact design occupying less panel space
- Flexible and cost-effective solution with multiple screen sizes, CPUs & networks
- Smart Active Parts for graphical interaction to field devices

Ordering Information

Type					Order Code
SYSMAC One 12.1" TFT	CJ1G-CPU45H	PROFIBUS	with Ethernet	Black	NSJ12-TS01B-G5P
				Ivory	NSJ12-TS01-G5P
SYSMAC One 12.1" TFT	CJ1G-CPU45H	PROFIBUS	no Ethernet	Black	NSJ12-TS00B-G5P
				Ivory	NSJ12-TS00-G5P
SYSMAC One 10" TFT	CJ1G-CPU45H	PROFIBUS	with Ethernet	Black	NSJ10-TV01B-G5P
				Ivory	NSJ10-TV01-G5P
SYSMAC One 10" TFT	CJ1G-CPU45H	PROFIBUS	no Ethernet	Black	NSJ10-TV00B-G5P
				Ivory	NSJ10-TV00-G5P

Type					Order Code
SYSMAC One 12.1" TFT	CJ1G-CPU45H	DeviceNet	with Ethernet	Black	NSJ12-TS01B-G5D
				Ivory	NSJ12-TS01-G5D
SYSMAC One 12.1" TFT	CJ1G-CPU45H	DeviceNet	no Ethernet	Black	NSJ12-TS00B-G5D
				Ivory	NSJ12-TS00-G5D
SYSMAC One 10" TFT	CJ1G-CPU45H	DeviceNet	with Ethernet	Black	NSJ10-TV01B-G5D
				Ivory	NSJ10-TV01-G5D
SYSMAC One 10" TFT	CJ1G-CPU45H	DeviceNet	no Ethernet	Black	NSJ10-TV00B-G5D
				Ivory	NSJ10-TV00-G5D

Note: For the accessories, please refer to page 63

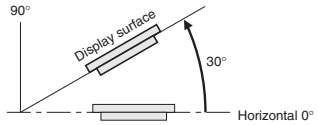
Specifications

Item		NSJ12-TS0_-G5D	NSJ10-TV0_-G5D
Supply voltage		24 VDC	
Allowable supply voltage range		20.4 to 27.6 VDC (24 VDC ±15%)	
Power consumption		30 W max.	
Current consumption		Controller Section Internal 5 V: 500 mA max. DeviceNet Section Internal 5 V: 200 mA max., External 24 V: 18 mA max.	
Inrush current *1		At 24 VDC: 10 A/20 ms max. for cold start at room temperature	
Ambient operating temperature (depending on angle of display surface off horizontal) *2		90° to 60°: 0 to 50°C 60° to 30°: 0 to 45°C 30° to 0°: Use prohibited	
Ambient storage temperature		-20 to 60°C	
Ambient operating humidity		0 to 40°C: 35% to 85% (with no condensation) 40 to 50°C: 35% to 60% (with no condensation)	
Ambient operating environment		No corrosive gases	
Insulation resistance		20 MΩ min. (at 100 VDC) between DC external and GR terminals	
Dielectric strength		800 VDC for 1 min between DC external and GR terminals, leakage current: 10 mA max.	
Noise immunity		2 kV on power supply line (conforming to IEC 61000-4-4)	
Vibration resistance (during operation)		10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s^2 in X, Y and Z directions for 80 minutes	
Shock resistance (during operation)		147 m/s^2, 3 times each in X, Y and Z directions	
External dimensions in mm (W×H×D)	Without Expansion unit	315x241x73.3	
	With Expansion unit	315x241x89.3	
Panel output dimensions		302^{+1}_{0}×228^{+1}_{0} mm (W×H) Panel thickness: 1.6 to 4.8	
Grounding		100 Ω or less	
Weight		2.7 kg max.	2.5 kg max.
Degree of protection		Front operating panel: Equivalent to IP65F and NEMA4 *3	

Item	NSJ12-TS0_-G5D	NSJ10-TV0_-G5D
Battery life	5 years (at 25°C) The SRAM and RTC will be backed up for 5 days after the battery runs low (i.e., after the indicator lights orange). The SRAM and RTC will be backed up by a super capacitor for 5 minutes after removing the old battery (i.e., after turning ON power after 5 minutes).	
International standards	Conforms to cULus and EC Directives.	

*1 A delay circuit that charges a capacitor is used to limit the inrush current. If a hot start is performed when the power supply has been OFF only a short period of time, the capacitor will still be charged and the inrush current specified above will be exceeded by up to approximately five times the specified value. When selecting fuses or breakers for external circuits, allow sufficient margin in the melting temperatures, detection characteristics, and inrush current.

*2 Display angles off horizontal are as follows:



*3 May not be applicable in locations with long-term exposure to oil.



HMI with integrated PLC and Network interface

The NSJ8 and NSJ5 are combined either with a CJ1G-CPU 45H or with a low-cost CJ1M-CPU13 PLC and a DeviceNet or PROFIBUS interface. It is fitted into a compact housing occupying less panel space than the separate products. Programming can be done via the standard high-speed USB port. The SYSMAC One is completely transparent, so the PLC, network (including field devices) and HMI can be accessed via a single port. A great advantage when servicing your machine remotely.

- HMI + PLC with 2 separate CPUs for greater performance and reliability
- Transparent architecture for easy remote maintenance
- Compact design taking up less panel space
- Flexible and cost effective solution with multiple screen sizes, CPUs & networks
- Smart Active Parts for graphical interaction to field devices

Ordering Information

Type					Order Code
SYSMAC One 8.4" TFT	CJ1G-CPU45H	PROFIBUS	with Ethernet	Black	NSJ8-TV01B-G5P
				Ivory	NSJ8-TV01-G5P
SYSMAC One 8.4" TFT	CJ1G-CPU45H	PROFIBUS	no Ethernet	Black	NSJ8-TV00B-G5P
				Ivory	NSJ8-TV00-G5P
SYSMAC One 5.7" TFT	CJ1G-CPU45H	PROFIBUS	with Ethernet	Black	NSJ5-TQ11B-G5P
				Ivory	NSJ5-TQ11-G5P
SYSMAC One 5.7" TFT	CJ1G-CPU45H	PROFIBUS	no Ethernet	Black	NSJ5-TQ10B-G5P
				Ivory	NSJ5-TQ10-G5P
SYSMAC One 5.7" STN	CJ1G-CPU45H	PROFIBUS	with Ethernet	Black	NSJ5-SQ11B-G5P
				Ivory	NSJ5-SQ11-G5P
SYSMAC One 5.7" STN	CJ1G-CPU45H	PROFIBUS	no Ethernet	Black	NSJ5-SQ10B-G5P
				Ivory	NSJ5-SQ10-G5P
SYSMAC One 8.4" TFT	CJ1M-CPU13	PROFIBUS	with Ethernet	Black	NSJ8-TV01B-M3P
				Ivory	NSJ8-TV01-M3P
SYSMAC One 8.4" TFT	CJ1M-CPU13	PROFIBUS	no Ethernet	Black	NSJ8-TV00B-M3P
				Ivory	NSJ8-TV00-M3P
SYSMAC One 5.7" TFT	CJ1M-CPU13	PROFIBUS	with Ethernet	Black	NSJ5-TQ11B-M3P
				Ivory	NSJ5-TQ11-M3P
SYSMAC One 5.7" TFT	CJ1M-CPU13	PROFIBUS	no Ethernet	Black	NSJ5-TQ10B-M3P
				Ivory	NSJ5-TQ10-M3P
SYSMAC One 5.7" STN	CJ1M-CPU13	PROFIBUS	with Ethernet	Black	NSJ5-SQ11B-M3P
				Ivory	NSJ5-SQ11-M3P
SYSMAC One 5.7" STN	CJ1M-CPU13	PROFIBUS	no Ethernet	Black	NSJ5-SQ10B-M3P
				Ivory	NSJ5-SQ10-M3P

Type					Order Code
SYSMAC One 8.4" TFT	CJ1G-CPU45H	DeviceNet	with Ethernet	Black	NSJ8-TV01B-G5D
				Ivory	NSJ8-TV01-G5D
SYSMAC One 8.4" TFT	CJ1G-CPU45H	DeviceNet	no Ethernet	Black	NSJ8-TV00B-G5D
				Ivory	NSJ8-TV00-G5D
SYSMAC One 5.7" TFT	CJ1G-CPU45H	DeviceNet	with Ethernet	Black	NSJ5-TQ11B-G5D
				Ivory	NSJ5-TQ11-G5D
SYSMAC One 5.7" TFT	CJ1G-CPU45H	DeviceNet	no Ethernet	Black	NSJ5-TQ10B-G5D
				Ivory	NSJ5-TQ10-G5D
SYSMAC One 5.7" STN	CJ1G-CPU45H	DeviceNet	with Ethernet	Black	NSJ5-SQ11B-G5D
				Ivory	NSJ5-SQ11-G5D
SYSMAC One 5.7" STN	CJ1G-CPU45H	DeviceNet	no Ethernet	Black	NSJ5-SQ10B-G5D
				Ivory	NSJ5-SQ10-G5D

Type					Order Code
SYSMAC One, 8.4" TFT	CJ1M-CPU13	DeviceNet	with Ethernet	Black	NSJ8-TV01B-M3D
				Ivory	NSJ8-TV01-M3D
SYSMAC One, 8.4" TFT	CJ1M-CPU13	DeviceNet	no Ethernet	Black	NSJ8-TV00B-M3D
				Ivory	NSJ8-TV00-M3D
SYSMAC One, 5.7" TFT	CJ1M-CPU13	DeviceNet	with Ethernet	Black	NSJ5-TQ11B-M3D
				Ivory	NSJ5-TQ11-M3D
SYSMAC One, 5.7" TFT	CJ1M-CPU13	DeviceNet	no Ethernet	Black	NSJ5-TQ10B-M3D
				Ivory	NSJ5-TQ10-M3D
SYSMAC One, 5.7" STN	CJ1M-CPU13	DeviceNet	with Ethernet	Black	NSJ5-SQ11B-M3D
				Ivory	NSJ5-SQ11-M3D
SYSMAC One, 5.7" STN	CJ1M-CPU13	DeviceNet	no Ethernet	Black	NSJ5-SQ10B-M3D
				Ivory	NSJ5-SQ10-M3D

Function	CJ1G-CPU45H	CJ1M-CPU13
UM capacity	60K steps	20K steps
I/O	1,280 points	640 points
Extended data memory	32K words × 3 banks	–
EM file memory	Yes	–
Maximum number of Expansion Racks	3	1
FB program memory capacity	1024 KB	256 KB
Maximum number of FB definitions	1,024	128
Maximum number of FB instances	2,048	256
Variable table sizes	128 KB	64 KB

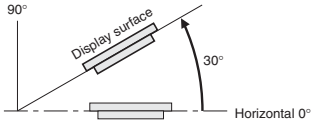
Note: For the accessories, please refer to page 63

Specifications

Item		NSJ8-TV0_-G5D NSJ8-TV0_-M3D	NSJ5-TQ1_-G5D NSJ5-SQ1_-G5D NSJ5-TQ1_-M3D NSJ5-SQ1_-M3D
Supply voltage		24 VDC	
Allowable supply voltage range		20.4 to 27.6 VDC (24 VDC ±15%)	
Power consumption		30 W max.	SQ0_: 21 W max. TQ0_: 22 W max.
Current consumption		Controller Section Internal 5 V: 500 mA max. DeviceNet Section Internal 5 V: 200 mA max., External 24 V: 18 mA max.	
Inrush current *1		At 24 VAC: 10 A/20 ms max. for cold start at room temperature	
Ambient operating temperature (depending on angle of display surface off horizontal) *2		90° to 60°: 0 to 50°C 60° to 30°: 0 to 45°C 30° to 0°: Use prohibited	90° to 30°: 0 to 50°C 30° to 0°: 0 to 40°C
Ambient storage temperature		-20 to 60°C	
Ambient operating humidity		0 to 40°C: 35% to 85% (with no condensation) 40 to 50°C: 35% to 60% (with no condensation)	
Ambient operating environment		No corrosive gases	
Insulation resistance		20 MΩ min. (at 100 VDC) between DC external and GR terminals	
Dielectric strength		800 VDC for 1 min between DC external and GR terminals, leakage current: 10 mA max.	
Noise immunity		2 kV on power supply line (conforming to IEC 61000-4-4)	
Vibration resistance (during operation)		10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s^2 in X, Y and Z directions for 80 minutes	
Shock resistance (during operation)		147 m/s^2, 3 times each in X, Y and Z directions	
External dimensions in mm (W×H×D)	Without Expansion unit	232×177×73.3	195×142×79
	With Expansion unit	232×177×89.3	195×142×95
Panel output dimensions		$220.5^{+0.50}_{0}$×$165.5^{+0.50}_{0}$ mm (W×H) Panel thickness: 1.6 to 4.8	$184^{+0.50}_{0}$×$131^{+0.50}_{0}$ mm (W×H) Panel thickness: 1.6 to 4.8
Grounding		100 Ω or less	
Weight		2.0 kg max.	1.1 kg max.
Degree of protection		Front operating panel: Equivalent to IP65F and NEMA4 *3	
Battery life		5 years (at 25°C) The SRAM and RTC will be backed up for 5 days after the battery runs low (i.e., after the indicator lights orange). The SRAM and RTC will be backed up by a super capacitor for 5 minutes after removing the old battery (i.e., after turning ON power after 5 minutes).	
International standards		Conforms to cULus and EC Directives.	

*1 A delay circuit that charges a capacitor is used to limit the inrush current. If a hot start is performed when the power supply has been OFF only a short period of time, the capacitor will still be charged and the inrush current specified above will be exceeded by up to approximately five times the specified value. When selecting fuses or breakers for external circuits, allow sufficient margin in the melting temperatures, detection characteristics, and inrush current.

*2 Display angles off horizontal are as follows:



*3 May not be applicable in locations with long-term exposure to oil.



One-touch machine management

The NS-series is our advanced HMI series that covers a large range from 5.7" Monochrome STN to 15" TFT. Easily programmed it offers advanced features like, many communication possibilities, very good synergy with our PLC's and other devices with Ladder monitor, Smart Active Parts and proven reliability.

- Perfect clarity and fast switching screens
- Extremely long backlight life (up to 50,000 hours)
- Support all European languages, Asian and Cyrillic
- Easy data logging on compact flash
- Large Memory size (60 MB)
- Support for several non-Omron PLC's

Ordering information

Type			Order Code
TFT, 15'', 1024 x 768 pixels	with Ethernet	Black	NS15-TX01B-V2
		Silver	NS15-TX01S-V2
TFT, 12'', 800 x 600 pixels	no Ethernet	Black	NS12-TS00B-V2
		Ivory	NS12-TS00-V2
	with Ethernet	Black	NS12-TS01B-V2
		Ivory	NS12-TS01-V2
TFT, 10'', 640 x 480 pixels	no Ethernet	Black	NS10-TV00B-V2
		Ivory	NS10-TV00-V2
	with Ethernet	Black	NS10-TV01B-V2
		Ivory	NS10-TV01-V2
TFT, 8.4'', 640 x 480 pixels	no Ethernet	Black	NS8-TV00B-V2
		Ivory	NS8-TV00-V2
	with Ethernet	Black	NS8-TV01B-V2
		Ivory	NS8-TV01-V2

Note: For the accessories, please refer to page 63

Specifications

Item	NS15	NS12	NS10	NS8
Display type	15 inch colour TFT	12 inch colour TFT	10 inch colour TFT	8 inch colour TFT
Display resolution	1024×768 (XGA)	800×600 (SVGA)	640×480 (VGA)	
Number of colours	256 (32.768 for image data)			
Backlight	2×CCFL	1×CCFL		
Backlight lifetime	Min. 50000 hours			
View angle	Left/right ±85°, Top 70°, Bottom 80°	Left/right ±60°, Top 45°, Bottom 75°	Left/right ±60°, Top 35°, Bottom 65°	Left/right ±65°, Top 50°, Bottom 60°
Touch panel	Analogue resistive touch	Matrix resistive touch		
Number of functional keys	3	–		
Dimensions in mm (H×W×D)	304×405×75.8	241×315×48.5		
Weight	4.2 kg max.	2.5 kg max.		2.0 kg max.
Screen data capacity	60 MB			
Internal memory	Bit memory: 32,767 bits, Word memory: 32,767 words, Retentative memory: 8,192 bits and 8,192 words.			
Memory card interface	1 slot ATA Compact Flash card			
Printer connection	PictBridge support			
Serial (COM1)	1×RS-232			
Serial (COM2)	1×RS-232/422/485	1×RS-232		
USB Slave	For programming & printing			
Ethernet	IEEE 802.3u 10Base-T/100Base-TX			
Expansion module	Optional network/video unit			Optional video unit
Line voltage	24 VDC ±15%			
Power consumption	45 W max.	25 W max.		
Battery	CJ1W-BAT01			
Battery lifetime	5 years (at 25°C)			
Enclosure rating (front side)	IP65F (equivalent to NEMA4)			
Obtained standards	UL 1604 Class 1 Diff. 2, cUL, CE, Lloyds, DNV			
Operating environment	No corrosive gases			
Noise immunity	Conforms to IEC61000-4-4, 2 KV (power lines)			
Ambient operating temperature	0 to 50°C*1			
Ambient operating humidity	35% to 85% (0 to 40°C) with no condensation, 35% to 60% (40 to 50°C) with no condensation			

*1 see manual for details.



More power, smaller size

This series consists of Monochrome models with 16 grey scales and STN/TFT models with up to 32,768 colours. It is equipped with a USB connection for project download/ upload and the possibility to communicate over Ethernet. One great advantage with the NS is that you can make use of Omron unique Smart Active Parts (SAP) that save you time when configuring, commissioning and maintaining your machine. SAP are pre-programmed, pre-tested visualisation objects with embedded communication code, bringing 'drag and drop' simplicity to HMI design.

- Perfect clarity and fast switching screens
- Extremely long backlight life (up to 75,000 hours)
- Support all European languages, Asian and Cyrillic
- Easy data logging on compact flash
- Large Memory size (60 MB)
- Support for several non-Omron PLC's

Ordering information

Type				Order Code
NS5-TQ	TFT, 5.7'', 320×240 pixels	no Ethernet	Black	NS5-TQ10B-V2
			Ivory	NS5-TQ10-V2
		with Ethernet	Black	NS5-TQ11B-V2
			Ivory	NS5-TQ11-V2
NS5-SQ	STN, 5.7'', 320×240 pixels	no Ethernet	Black	NS5-SQ10B-V2
			Ivory	NS5-SQ10-V2
		with Ethernet	Black	NS5-SQ11B-V2
			Ivory	NS5-SQ11-V2
NS5-MQ	STN, Monochrome 5.7'', 320×240 pixels	no Ethernet	Black	NS5-MQ10B-V2
			Ivory	NS5-MQ10-V2
		with Ethernet	Black	NS5-MQ11B-V2
			Ivory	NS5-MQ11-V2

Note: For the accessories, please refer to page 63

Specifications

Item	NS5-TQ	NS5-SQ	NS5-MQ
Display type	5.7 inch colour TFT	5.7 inch colour STN	5.7 inch monochrome
Display resolution	340×240 (QVGA)		
Number of colours	256 (32.768 for image data)	256 (4.096 for image data)	16 grey scales
Backlight	1×CCFL		
Backlight lifetime	Min. 75000 hours		Min. 50000 hours
View angle	Left/right ±70°, Top 70°, Bottom 50°	Left/right ±50°, Top 45°, Bottom 50°	Left/right ±45°, Top 20°, Bottom 40°
Touch panel	Matrix resistive touch		
Number of functional keys	–		
Dimensions in mm (H×W×D)	142×195×54		
Weight	1.0 kg max.		
Screen data capacity	60 MB		
Internal memory	Bit memory: 32,767 bits, Word memory: 32,767 words, Retentative memory: 8,192 bits and 8,192 words.		
Memory card interface	1 slot ATA Compact Flash card		
Printer connection	PictBridge support		
Serial (COM1)	1×RS-232		
Serial (COM2)	1×RS-232		
USB Slave	For programming & printing		
Ethernet	IEEE 802.3u 10Base-T/100Base-TX		
Expansion module	–		
Line voltage	24 VDC ±15%		
Power consumption	15 W max.		
Battery	CJ1W-BAT01		
Battery lifetime	5 years (at 25°C)		
Enclosure rating (front side)	IP65F (equivalent to NEMA4)		
Obtained standards	UL 1604 Class 1 Diff. 2, cUL, CE, Lloyds, DNV		
Operating environment	No corrosive gases		
Noise immunity	Conforms to IEC61000-4-4, 2 KV (power lines)		
Ambient operating temperature	0 to 50°C*1		
Ambient operating humidity	35% to 85% (0 to 40°C) with no condensation, 35% to 60% (40 to 50°C) with no condensation		

*1 See manual for details.



NS5 Handheld, suitable for use in harsh conditions

The NS series has evolved into a mobile format. Based on the standard 5.7" STN colour version, we can offer a handheld version of the NS series. Offering 10 Function keys for most used functions and with a protection degree of IP65 it is the product to use in harsh environment where freedom of movement is needed.

- 10 Function keys, 4 hardwired for inching
- Emergency switch on front plus enable switch on back of unit
- Well protected against water, IP65
- Compact Flash, Serial and USB interface

Ordering information

Type			Order code
NSH5	STN, 5.7", 320×240 pixels	Black	NSH5-SQR10B-V2

Accessories

Type	Order code
Bracket NS handheld protecting emergency button from accidental activation	NSH5-ATT01
Bracket NS handheld for wall mounting	NSH5-ATT02
Cable NS handheld, RS-422, 10m UL	NSH5-422UL-10M
Cable NS handheld, RS-232, 10m UL	NSH5-232UL-10M
Cable NS handheld, RS-232, 3m UL	NSH5-232UL-3M

Specifications

Memory card interface	1 slot ATA Compact Flash card
Serial (COM1)	1×RS-232/RS-422A
USB Slave	For programming
Line voltage	24 VDC ±15%
Power consumption	10 W max.
Battery	CJ1W-BAT01
Battery lifetime	5 years (at 25°C)
Enclosure rating	IP65*1
Obtained standards	UL 1604 Class 1 Diff. 2, cUL, CE, NEMA equivalent
Operating environment	No corrosive gases
Noise immunity	Conforming to IEC 61000-4-4: 2 kV (power supply line)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	35% to 85% max. (with no condensation)
Vibration resistance (during operation)	10 to 57 Hz with amplitude of 0.075 mm, 57 to 150 Hz with acceleration of 9.8 m/s^2 three minutes each in X, Y, and Z directions
Shock resistance (during operation)	147 m/s^2 three times each in X, Y, and Z directions
Drop test*1	Dropped from 1 m. Conforming to JIS B 3502/IEC61131-2

*1 see manual for details.

Ordering information

Type	Description		Order code
Cable	Serial programming cable		XW2Z-S002
PT-to-PLC Connecting Cable	PT connection: 9 pins PLC connection: 9 pins	Length: 2 m	XW2Z-200T
		Length: 5 m	XW2Z-500T
Accessories	Video input	Inputs: 4 channels NTSC / PAL	NS-CA001
		Inputs: 2 channels NTSC / PAL, 1 channel RGB	NS-CA002
	Cable to connect NS-CA00_ to Video console unit		F150-VKP (2 m)
			F150-VKP (5 m)
	Controller link interface unit		NS-CLK21
	RS-422A/485 adapter (50 m)		CJ1W-CIF11
	RS-422A adapter (500 m)		NS-AL002
	Anti-reflection sheets (5 sheets)	NS15	NS15-KBA04
		NS12/10	NS12-KBA04
		NS8	NS7-KBA04
		NS5	NT30-KBA04
	Anti-reflection protective covers (5 pack)	NS12/10	NS12-KBA05
		NS8	NS7-KBA05
		NS5	NT31C-KBA05
	Transparent protective covers (5 pack)	NS15 (1 cover)	NS15-KBA05N
		NS12/10	NS12-KBA05N
		NS8	NS7-KBA05N
		NS5	NT31C-KBA05N
	Chemical-resistant cover (1 cover)	NS5	NT30-KBA01
	Attachment adapter	(NT625C/631/631C series to NS12 series)	NS12-ATT01
		(NT625C/631/631C series to NS12 series) Black	NS12-ATT01B
		(NT620S/620C/600S series to NS8 series)	NS8-ATT01
		(NT600M/600G/610G/612G series to NS8 series)	NS8-ATT02
	Memory card	128 MB	HMC-EF183
		256 MB	HMC-EF283
		512 MB	HMC-EF583
	Memory card adapter for PC		HMC-AP001
	Battery		CJ1W-BAT01
	Barcode reader (refer to the catalogue for details)		V520-RH21-6

Category	Compact HMI				
					
Model	**NQ5-TQ**	**NQ5-SQ**	**NQ5-MQ**	**NQ3-TQ**	**NQ3-MQ**
Display	5.7 inch TFT Colour LED backlight	5.7 inch STN Colour CCFL backlight	5.7 inch STN Monochrome CCFL backlight	3.5 inch TFT Colour LED backlight	3.8 inch FSTN Monochrome LED backlight
Resolution	320×240 pixels	320×240 pixels	320×240 pixels	320×240 pixels	320×240 pixels
Number of colours	256 (32.000 for image data)	256 (4096 for image data)	Monochrome blue mode, 16 gradations	256 (32.000 for image data)	Monochrome black/white, 4 gradations
Memory	8 MB	8 MB	8 MB	8 MB	4 MB
Communication ports	2×RS-232/RS-422A/RS-485 1×USB Host, 1 x USB Slave 1xEthernet	2×RS-232/RS-422A/RS-485 1×USB Host, 1 x USB Slave	2×RS-232/RS-422A/RS-485 1×USB Host, 1 x USB Slave	1×RS-232/RS-422A/RS-485 1×USB Host, 1 x USB Slave 1xEthernet	1×RS-232/RS-422A/RS-485 1×USB Host, 1×USB Slave
Dimensions in mm (HxWxD)	142×195×50	142×195×50	142×195×50	102×128×44.5	102×128×44.5
Page	65	65	65	65	65

Category	Function-key HMI			
				
Model	**NT11**	**NT2S**		
Type of Display	LED backlight LCD	LED backlight LCD		
Number of F-keys	22	6 or 20 depending on model		
Number of characters	20×4 lines	16×2 lines		
Printer connection	Yes	Depending on model		
Number of screens	250	65,000 (limited by memory)		
Size in mm (HxWxD)	113×218×38.2	6 F-keys 60×109×43 20 F-keys 107×107×43		
Page	66	67		



Power behind a clear display

The NQ Series comes in different display sizes and each in a colour and monochrome version. All of them display clear and sharp pictures, buttons, text and graphs on a modern touch screen.

- Clear and bright display
- Portrait/Landscape display (NQ5)
- USB Host and Slave connections
- Easy to use software
- Trending, Logging, Alarm handling, etc.

Ordering information

Type			Order Code
Colour TFT	5.7 inch, 320x240 pixels	Ethernet (available Q4 2010)	NQ5-TQ010-B
Colour STN	5.7 inch, 320x240 pixels	No Ethernet	NQ5-SQ000-B
		No Ethernet, Portrait model	NQ5-SQ001-B
Monochrome STN	5.7 inch, 320x240 pixels	No Ethernet	NQ5-MQ000-B
		No Ethernet, Portrait model	NQ5-MQ001-B
Colour TFT	3.5 inch, 320x240 pixels	No Ethernet	NQ3-TQ000-B
		Ethernet (available Q4 2010)	NQ3-TQ010-B
Monochrome FSTN	3.8 inch, 320x240 pixels	No Ethernet	NQ3-MQ000-B

Accessories

Type		Order code
Cables	Mini-peripheral port CJ1/CS1/CQM1H/CPM2C PLC, 2 m	NQ-CN221
	Serial port RS-232 CJ1/CS1/CP1/CQM1H PLC, 2 m	NQ-CN222
	Serial port RS-232 CJ1/CS1/CP1/CQM1H PLC, 5 m	NQ-CN521
	USB programming cable, 2 m	CP1W-CN221
	Serial programming cable, 2 m	NT2S-CN002
Software	NQ-Designer can be downloaded for free from Omron website.	–

Specifications

Item	NQ5-TQ	NQ5-SQ	NQ5-MQ	NQ3-TQ	NQ3-MQ
Display type	5.7 inch Colour TFT	5.7 inch Colour STN	5.7 inch Monochrome STN blue mode	3.5 inch Colour TFT	3.8 inch Monochrome FSTN black/white
Display resolution	320×240 (QVGA)				
Number of colours	256 (32.000 for image data)	256 (4096 for image data)	16 gradations	256 (32.000 for image data)	4 gradations
Backlight	LED	1×CCFL		LED	
Backlight lifetime	Min. 50,000 hours at 25°C				
Touch panel	Analogue resistive touch				
Number of functional keys	6			5	
Dimensions in mm (H×W×D)	142×195×50			102×128×44.5	
Weight	0.4 kg max.				
Screen data capacity	8 MB			8 MB	4 MB
Internal memory	Bit, Word and Retentive memory				
Serial (COM1)	1×RS-232/422/485				
Serial (COM2)	1×RS-232			–	–
USB Slave	For programming				
USB Host	For USB stick file transfer				
Ethernet	IEEE 802.3u 10Base-T/100Base-TX				
Line voltage	24 VDC ±15%				
Power consumption	10 W max.			10 W max.	
Battery	NQ-BAT01 (3 V coin battery)				
Battery lifetime	5 years (at 25°C)				
Enclosure rating (front side)	IP65				
Obtained standards	CE, cUL				
Operating environment	No corrosive gases				
Ambient operating temperature	0 to 50°C*1				
Ambient operating humidity	10-85% RH, no condensation				

*1 see manual for details.



HMI with four text lines and 22 F-keys

The NT11 is a Function key HMI with four text lines that can each hold up to 20 characters. It has a parallel printer connection next to a serial port for connection to a PLC. It has a LED backlight that has a life expectancy of at least 50,000 hours.

- Easy programming software.
- Small size and installation depth.
- Customisable F-Keys
- Printer connection.
- Cost effective solution.

Ordering information

Type			Order code
STN monochrome	Ten-key type	Ivory	NT11-SF121-EV1
		Black	NT11-SF121B-EV1

Accessories

Type	Description			Order code
Cables	For screen transfer			XW2Z-S002
	For PLC connection	PT: 9-pin PLC: 9-pin	Cable length: 2 m	XW2Z-200T
			Cable length: 5 m	XW2Z-500T
		PT: 9-pin PLC: Mini-peripheral	Cable length: 2 m	NT-CN221
Options	Reflection Protective Sheets	Replacement for ivory type (10 sheets)		NT11-SF121-EV1
		Replacement for black type (10 sheets)		NT11-SF121B-EV1

Software

Type	Order code
NTST Version 4.8	NTZJCAT1EV4
Upgrade NTST Version 4.8	NTZJCAT1EV4S

Specifications

Size in mm (HxWxD)	113×218×38.2
Effective display area	100×40mm (160×64 pixels)
Line voltage	24 VDC ±15%
Function keys	22 keys
Touch panel	–
Obtained standards	CE, cULus
No. of display characters (standard characters)	20 characters × 4 lines
No. of registered screens	250
Screen data capacity (standard)	32 KB
Expansion memory	–
Memory card interface	–
Printer connection	Supported
Backlight life	50,000 hours average



HMI with two text lines, 6 or 20 F-keys and up to two serial ports

The NT2S is the smallest HMI that we can offer you. It is based on a 16 × 2 lines LCD display with 6 or 20 Function keys. It offers IP65 protection, an optional RTC and printer connection.

- Easy and free programming software.
- Small size and installation depth.
- Real Time Clock (depending on model).
- Printer connection (depending on model).
- Cost effective solution.

Ordering information

Type			Order code
STN monochrome	Programmable	6-key type, Black	NT2S-SF121B-EV2
			NT2S-SF122B-EV2
	PLC controlled		NT2S-SF123B-EV2
	Programmable	20-key type, Black	NT2S-SF125B-E
			NT2S-SF126B-E
	PLC controlled		NT2S-SF127B-E

Accessories

Type	Description	Order code
NT2S-SF121/125 and NT3S	peripheral port CPM series except CPM2C, 2 m	NT2S-CN212-V1
NT2S-SF121/125 and NT3S	peripheral port CPM series except CPM2C, 5 m	NT2S-CN215-V1
NT2S-SF122/SF123/SF126/SF127	peripheral port CPM series except CPM2C, 2 m	NT2S-CN222-V1
NT2S-SF122/SF123/SF126/SF127	peripheral port CPM series except CPM2C, 5 m	NT2S-CN225-V2
NT2S-SF121/125 and NT3S	mini-peripheral port CJ1/CS1 and CPM2C series, 2 m	NT2S-CN223-V2
NT2S-SF122/SF123/SF126/SF127	mini-peripheral port CJ1/CS1 and CPM2C series, 2 m	NT2S-CN224-V1
NT2S-SF121/125 and NT3S	serial port CJ1/CS1/CP1/CPM2/CQM1(H), 2 m	NT2S-CN232-V1
NT2S-SF121/125 and NT3S	serial port CJ1/CS1/CP1/CPM2/CQM1(H), 5 m	NT2S-CN235-V1
NT2S-SF122/SF123/SF126/SF127	serial port CJ1/CS1/CP1/CPM2/CQM1(H), 2 m	NT2S-CN242-V1
All NT2S and NT3S models	serial programming cable, 2 m	NT2S-CN002

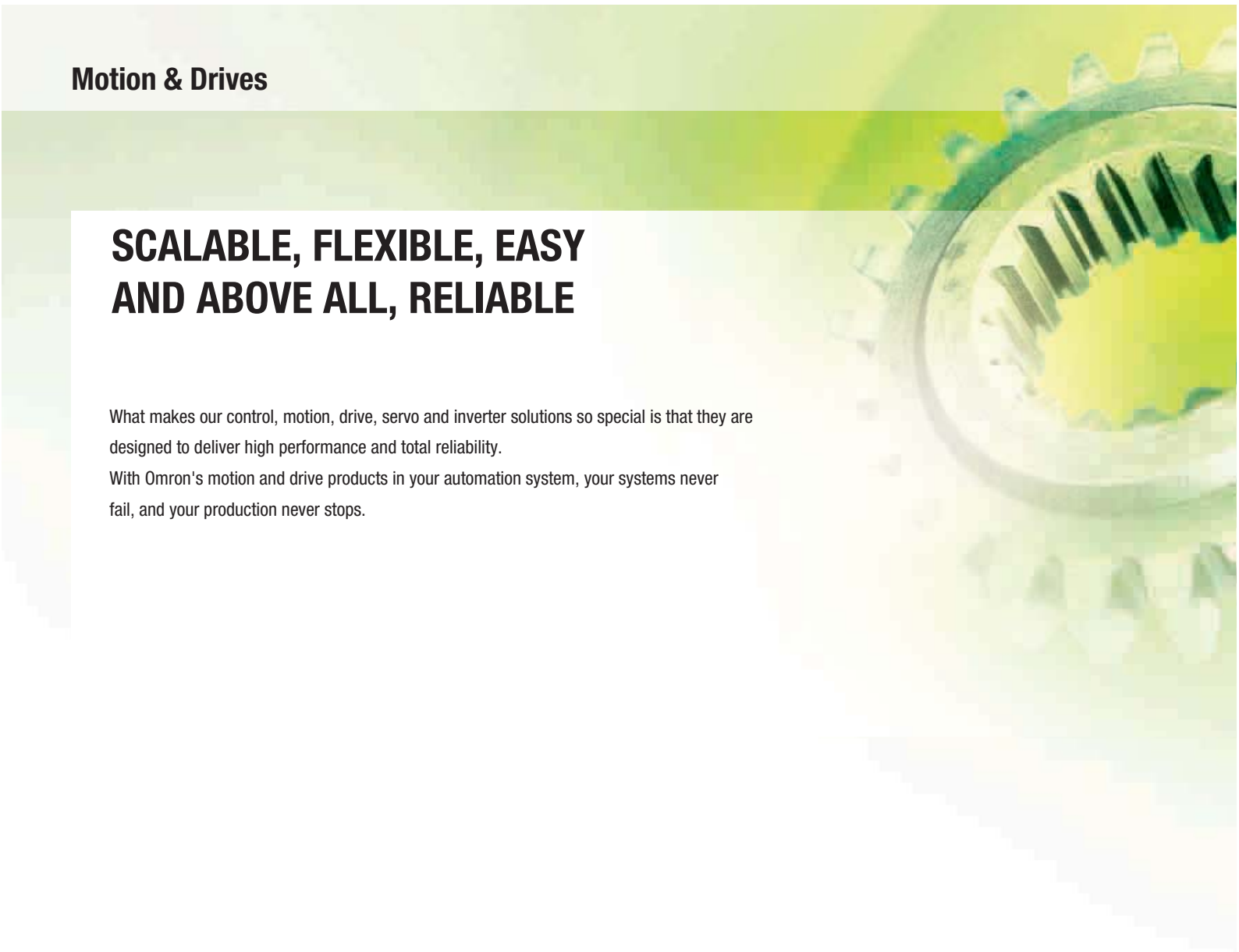
Software

Type	Order code
This software is provided free of charge and features Windows fonts, a Multi language import/export utility, a character map to design your own characters and can be used to place bitmaps in your application.	NTXS

Specifications

Size in mm (H×W×D)	60×109×43 (6 F-keys), 107×107×43 (20 F-keys)
Effective display area	56×11 mm
Line voltage	24 VDC ±10%
Touch panel	–
Obtained standards	CE, cULus
No. of display characters (standard characters)	16 characters x 2 lines
No. of registered screens	65,000 max.
Screen data capacity (standard)	24 KB in Programmable models
Expansion memory	–
Memory card interface	–
Internal memory	1K words data, 1K words retentative memory
Printer connection	Supported
Multi-Vendor support	Supported for several non-Omron PLCs. *1
Backlight life	LED, min. 50,000 hours

*1 Please contact Omron for a list of available drivers.



SCALABLE, FLEXIBLE, EASY AND ABOVE ALL, RELIABLE

What makes our control, motion, drive, servo and inverter solutions so special is that they are designed to deliver high performance and total reliability.
With Omron's motion and drive products in your automation system, your systems never fail, and your production never stops.



Motion & Drives – Table of contents

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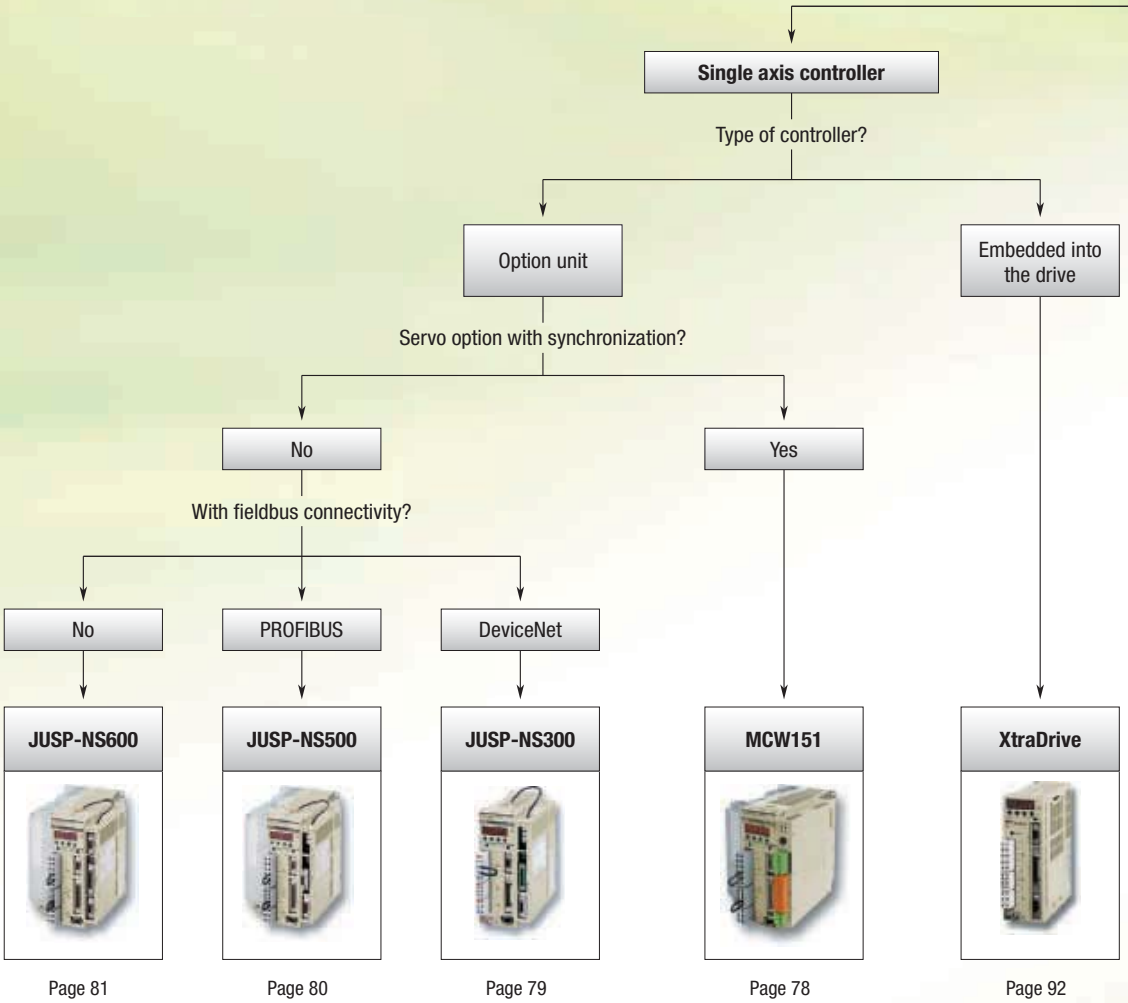
TOTAL FREEDOM IN MOTION CONTROL

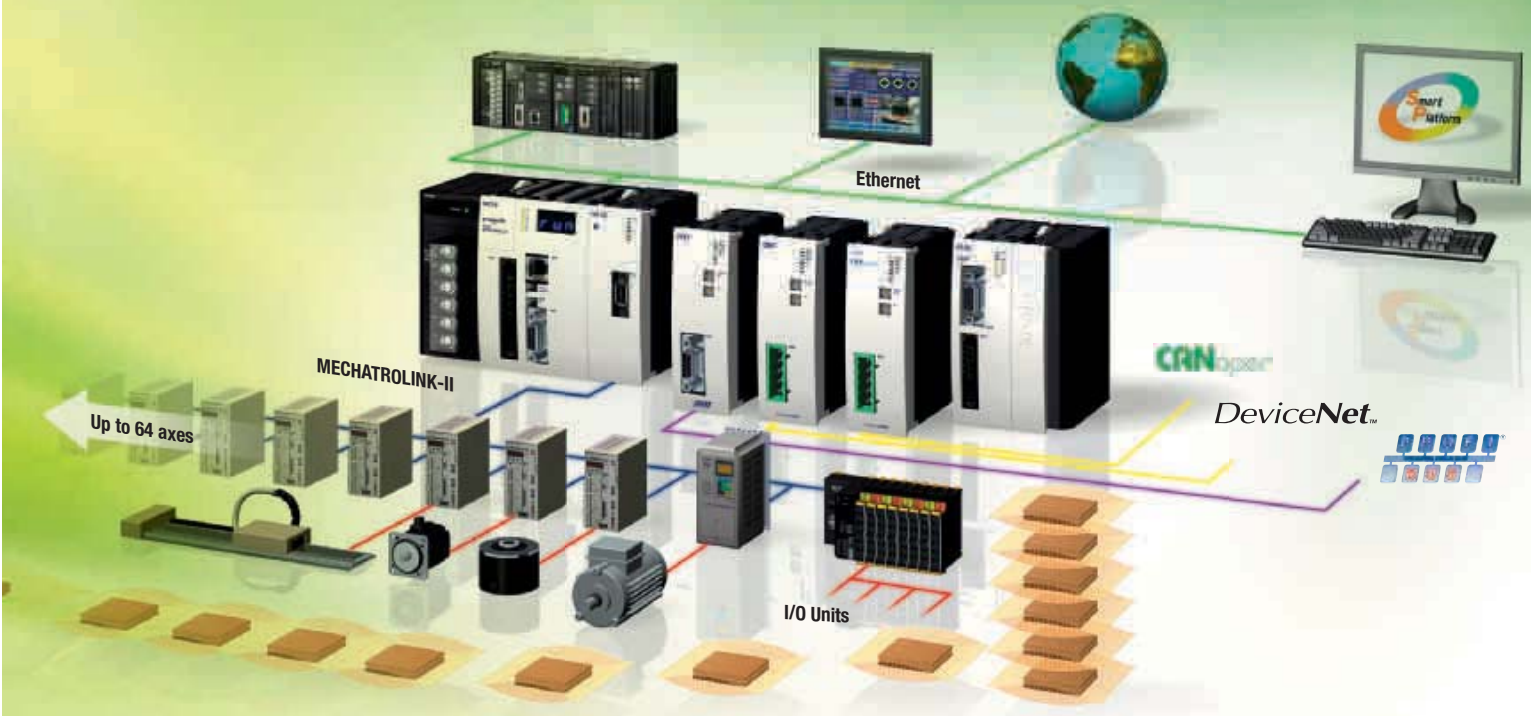
Trajexia – the advanced motion controller that puts you in control

Trajexia is the motion platform that offers you the performance of a dedicated motion system, the ease of use you get from an automation specialist and the peace of mind you have from a global player.

- 64 axes advanced motion coordination over a robust and fast motion link
- Each axis can run complex interpolation moves, e-cams and e-gearboxes
- Advanced debugging tools including trace and oscilloscope functions

Check how Trajexia can give you total freedom in motion control at:
www.trajexia.com





Which motion architecture do you need?

Multi-axis controller

Controller inside the Omron PLC?

Stand-alone controller

Yes

Control over MECHATROLINK?

No

Yes

Control method?

Pulse train output

Analog output

Single to multi-axes PTP applications

Advanced motion, e-cam, multi-axis synchronization

Trajexia stand-alone



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NCs



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MCs



Please contact your Omron representative

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Trajexia MCH72



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Multi-axes motion controllers				
				
Model	**Trajexia stand-alone**	**Trajexia-PLC CJ1W-MCH72**	**CJ1W-NC_71**	**CJ1W-NC_**
	Flexible concept of advanced motion control over MECHATROLINK-II motion bus and traditional interfaces	Flexible concept of advanced motion control over MECHATROLINK-II motion bus in PLC format	Point-to-point positioning controller over MECHATROLINK-II motion bus	Point-to-point positioning controller
Axes control method	MECHATROLINK-II motion bus, analogue output and pulse-train output	MECHATROLINK-II motion bus	MECHATROLINK-II motion bus	Pulse train output
Number of axes	4, 16, 64	30 axes	2, 4, 16	1, 2, 4
Applicable servo drive	Junma ML-II, Sigma-II, Sigma-5 ML-II, G-Series, Accurax G5	Junma ML-II, Sigma-II, Sigma-5 ML-II, G-Series, Accurax G5	Junma ML-II, Sigma-II, G-Series, Accurax G5	SmartStep, Junma Pulse, Sigma-II, Sigma-5 A/P, SmartStep2, Accurax G5
Application	Advanced motion, e-cam, e-gearbox, phase shift, registration	Advanced motion, e-cam, e-gearbox, phase shift, registration	From simple PTP to multi axis PTP coordinated systems.	Point to point applications
Servo control mode	Position, speed and torque	Position, speed and torque	Position, speed and torque	Open loop position with linear interpolation
PLC series	Stand-alone motion solution. Serial, Ethernet, PROFIBUS-DP, DeviceNet and CANopen connectivity	CJ1 PLC	CJ1 and CS1 PLCs	CJ1 and CS1 PLCs
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Servo based motion controllers					
					
Model	**R88A-MCW151**	**XtraDrive**	**JUSP-NS300**	**JUSP-NS500**	**JUSP-NS600**
	Advanced motion in a compact package	All in one! Servo drive and motion controller integrated	Position controller over DeviceNet	Position controller over PROFIBUS-DP	Position controller over serial link
Axes control method	Direct connection to servo drive	Integrated into the servo drive	Direct connection to servo drive	Direct connection to servo drive	Direct connection to servo drive
Connectivity	DeviceNet, PROFIBUS, Hostlink	PROFIBUS	DeviceNet	PROFIBUS	RS-485/RS-422
Digital I/O	8 DI, 6 DO, 2 registration inputs, 1 encoder in 1 pulse out + servo I/Os	Servo inputs + expansion available	Uses the servo I/O and adds 2 additional DO and 1 DI	Uses the servo I/O and adds 2 additional DO and 1 DI	Uses the servo I/O and adds 8 additional DI and 6 DO
Application	Advanced motion, e-cam, ELS, phase shift, registration	Advanced motion	Point to point with registration capability	Point to point with registration capability	Point to point with registration capability
Servo control mode	Position, speed and torque. Open loop for additional axis	Position, speed and torque	Position and speed		
Applicable servo drive	Sigma-II	XtraDrive	Sigma-II		
Page	78	92	79	80	81

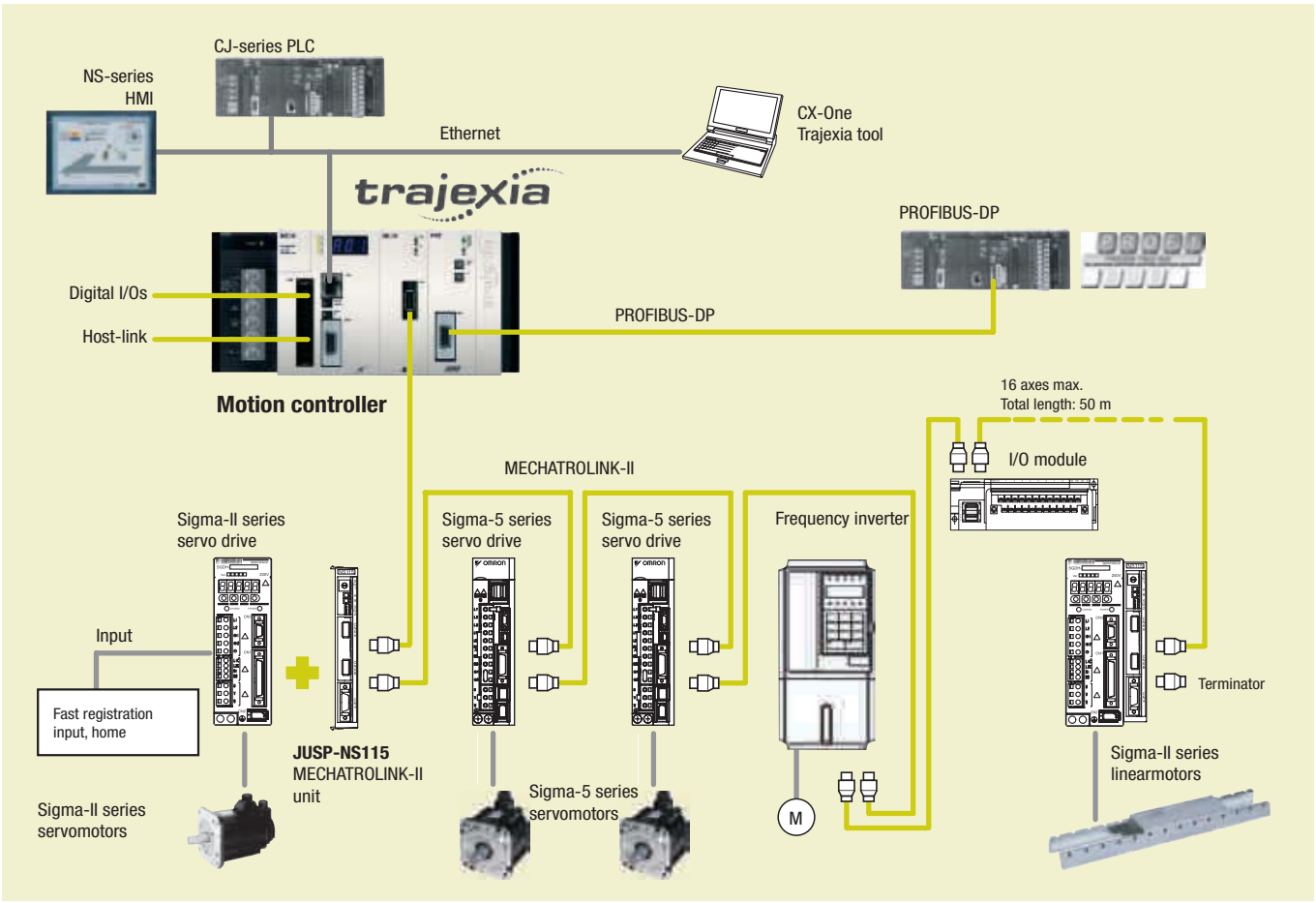


The advanced motion controller that puts you in control

Trajexia is Omron's new motion platform that offers you the performance of a dedicated motion system, the ease of use you get from an automation specialist and the peace of mind you have from a global player. Trajexia puts you in full control to create the best machines today and… tomorrow.

- Control of up to 64 axes over a robust and fast motion bus
- Advanced motion control such as CAM control, registration control, interpolation and axes synchronization via simple motion commands
- Control of servos, inverters and I/Os over a single motion network
- Multi-tasking controller capable of running up to 22 tasks simultaneously
- Open communication: serial, Ethernet built-in, PROFIBUS-DP, DeviceNet and CANopen

System configuration



Ordering information

Trajexia motion controller

Name	Order code
Trajexia motion controller unit. Controls up to16 servos and 8 inverters, Ethernet port built-in.	TJ1-MC16
Trajexia motion controller unit. Controls up to 4 axes, Ethernet port built-in.	TJ1-MC04
Trajexia motion controller unit. Controls up to 64 axes, Ethernet port built-in.	TJ2-MC64
Power supply for Trajexia controller 100-240 VAC	CJ1W-PA202
Power supply for Trajexia controller 24 VDC	CJ1W-PD022

Trajexia – axes control modules

Name	Order code
Trajexia MECHATROLINK-II master unit (up to 16 axes)	TJ1-ML16
Trajexia MECHATROLINK-II master unit (up to 4 axes)	TJ1-ML04
Trajexia flexible axes unit (for 2 axes)	TJ1-FL02

Note: The TJ1-ML04 and TJ1-ML16 supported by the TJ2-MC64 motion controller are V2 (Version 2) and lot number equal or above Lot No.091019 (YYMMDD).

Trajexia – communication modules

Name	Order code
Trajexia PROFIBUS-DP slave unit	TJ1-PRT
Trajexia DeviceNet slave unit	TJ1-DRT

MECHATROLINK-II - related devices

Name	Remarks	Order code
Distributed I/O modules	64-point input and 64-point output	JEPMC-IO2310
	Analogue input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analogue output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (For inverter's version supported contact your Omron sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (For inverter's version supported contact your Omron sales office)	SI-T

I/O Cables

	Remarks	Length m	Order code
I/O cable for JEPMC-IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Servo system

Note: Refer to servo systems section for detailed information.

Frequency inverters

Note: Refer to frequency inverters section for detailed information.

Computer software

Specifications	Order code
CX-Motion Pro V1.22 or higher	CX-One
Trajexia Studio[*1] V1.22 or higher	TJ1-Studio

[*1] When the Trajexia Studio software is included in CX-One, then it is called CX-Motion Pro.

For full specifications please refer to chapter software on page 582.

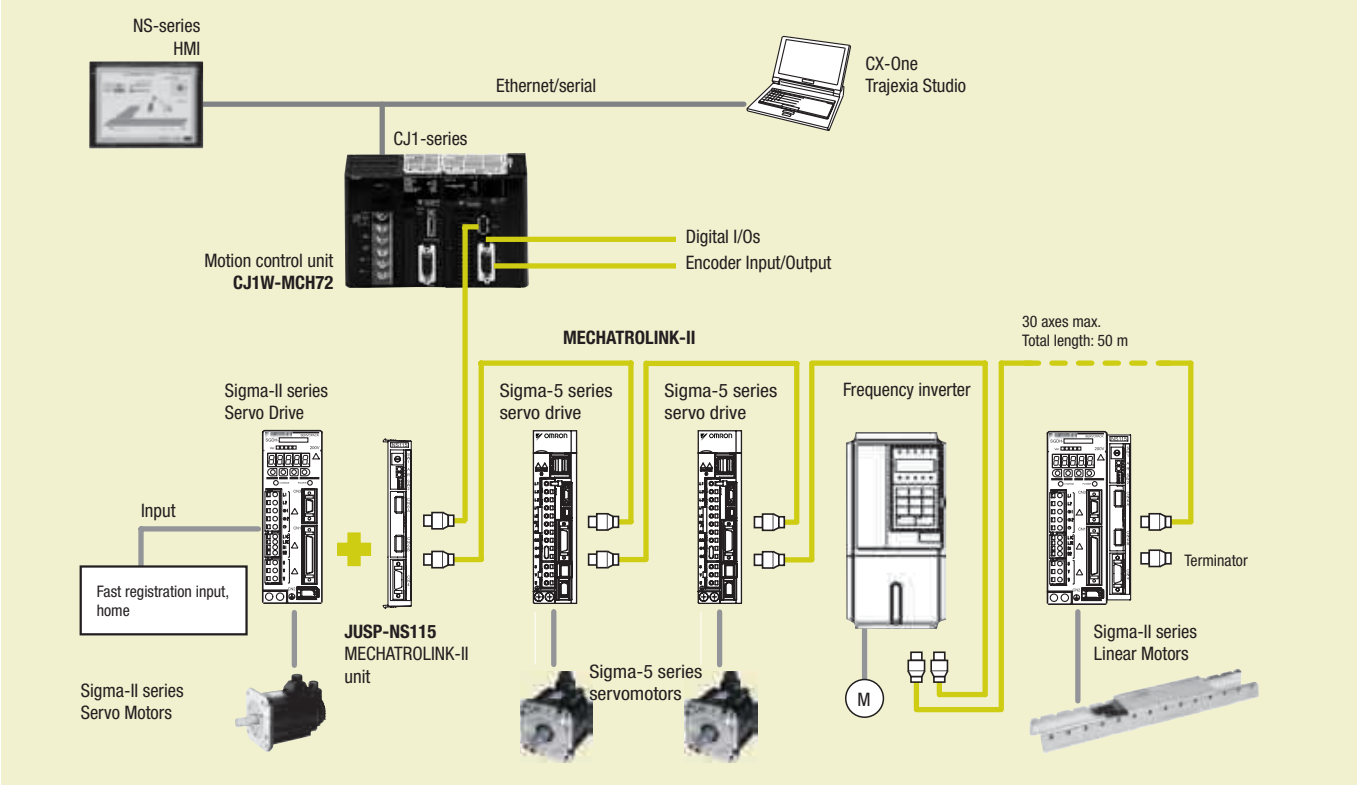


Trajexia motion controller integrated with your PLC

Trajexia, the family of advanced motion controllers that put you in control, now has a compact and integrated version. Meet Trajexia-PLC, the motion controller that has all the flexibility and modularity of Omron PLCs, plus the outstanding motion-control features of the Trajexia platform.

- Control of up to 30 physical axes
- Control of servos and inverters over a single motion network
- Advanced motion control such as CAM control, registration control, interpolation and axes synchronization via simple motion commands
- Serial port for external encoder
- Embedded digital I/Os
- I/O data exchange with the PLC CPU

Ordering information



Motion controller

Name	Order code
MECHATROLINK-II Trajexia motion control unit	CJ1W-MCH72

MECHATROLINK-II - Related devices

Name	Remarks	Order code
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface units	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed F7, G7 inverter (For inverter version support contact your Omron sales office)	SI-T
MECHATROLINK-II repeater	When 17 or more axes are connected to the MECHATROLINK-II the repeater is required	JEPMC-REP2000

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

Computer software

Specifications	Order code
CX-Motion Pro V1.22 or higher	CX-One
Trajexia Studio*1 V1.22 or higher	TJ1-Studio

*1 When the Trajexia Studio software is included in CX-One, then it is called CX-Motion Pro.

For full specifications please refer to chapter software on page 582.

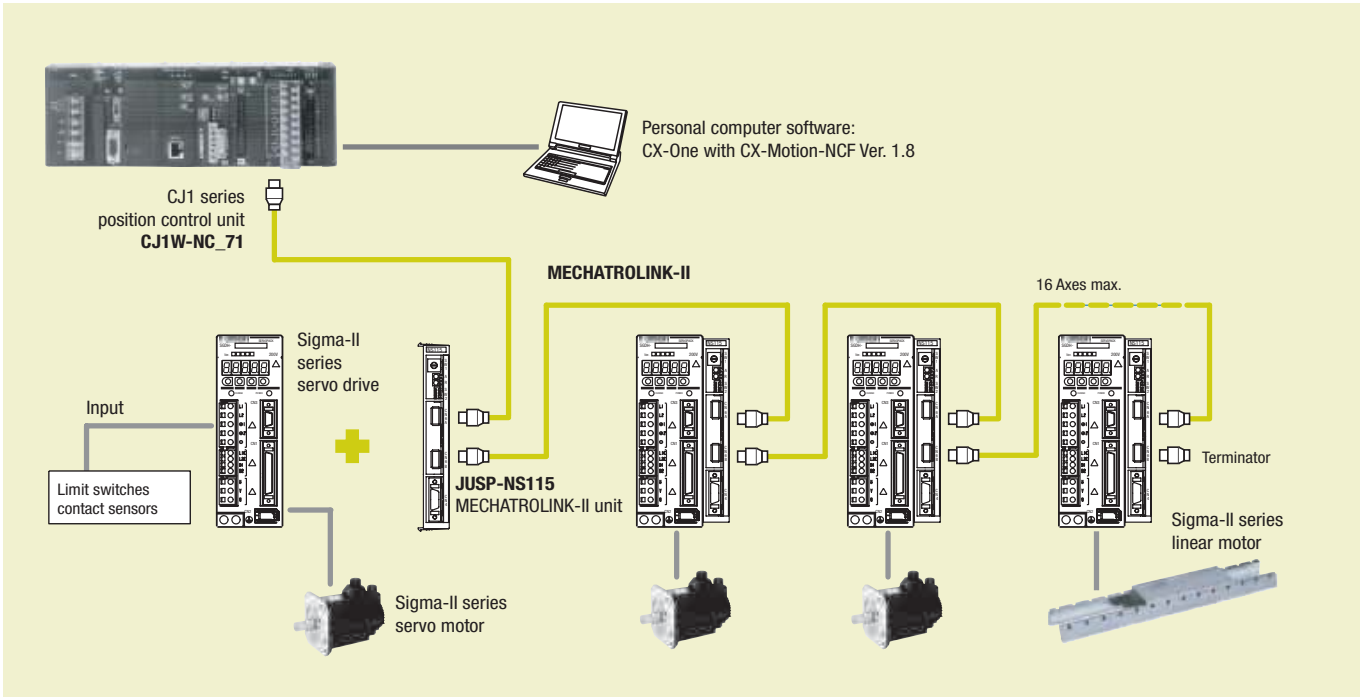


2, 4 and 16-axis point-to-point positioning controller over MECHATROLINK-II

NC_71 is a powerful controller for point-to-point applications. It is based on MECHATROLINK-II motion bus, which reduces programming, development and maintenance costs. Supports PLC open function blocks.

- Simplified wiring. Data routing to all servo drives (MECHATROLINK)
- Integration into Omron Smart Platform: FBs, SAPs, CX-One
- Servo drives full control and parameter access via MECHATROLINK
- Easy, fast, reliable, optimised for positioning applications
- Advanced PTP: 8-axis (4 dim.+ 4 dim.) interpolator (16 axis version)

Ordering information



Position controller unit

Name	Order code
MECHATROLINK-II position controller unit 2-axis	CJ1W-NC271
MECHATROLINK-II position controller unit 4-axis	CJ1W-NC471
MECHATROLINK-II position controller unit 16-axis	CJ1W-NCF71

MECHATROLINK-II related devices

Name	Remarks	Order code
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30

Servo system

Note: Refer to servo systems section for more information

Computer software

Specifications	Order code
CX-One version 3 or higher	CX-ONE

For full specifications please refer to chapter software on page 582.

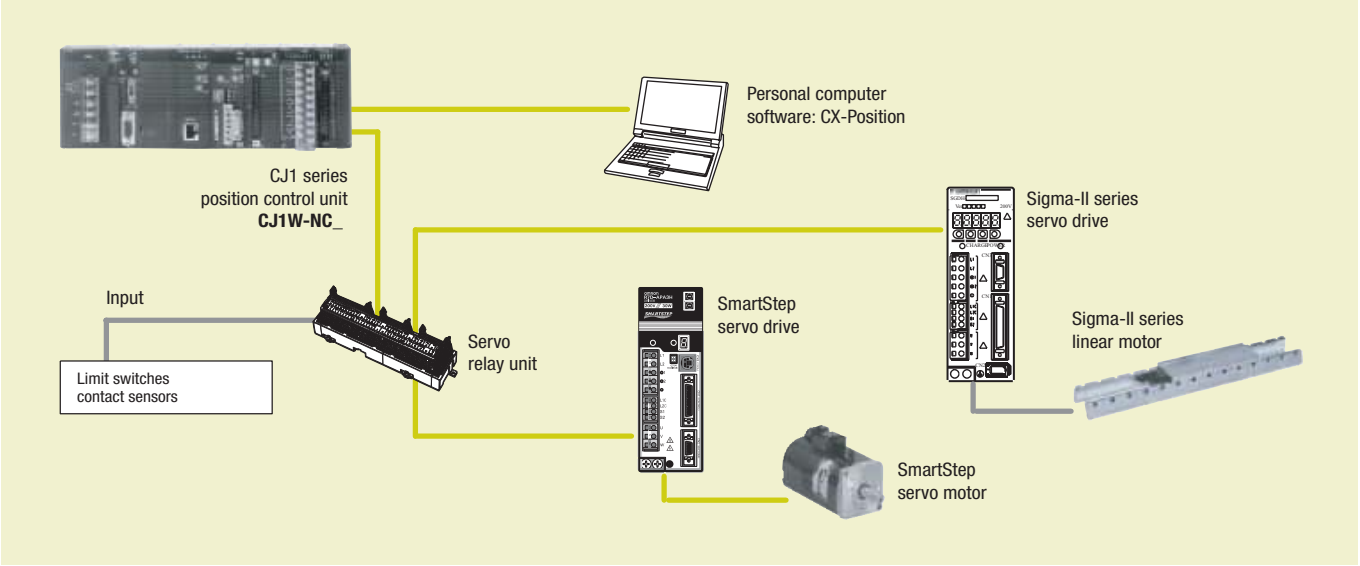


4-axis point-to-point positioning controller with pulse train output

The NC motion controllers support positioning control via pulse-train outputs. Positioning is performed using trapezoidal or S-curve acceleration and deceleration. Ideal for controlling simple positioning in stepper motors and servos with pulse-train input.

- Positioning can be done by direct ladder commands
- Positioning using trapezoidal and S curve
- Interrupt feeding function
- Positioning points are saved in internal flash memory
- Origin search and backlash compensation functions

Ordering information



Position control unit

Name	Order code
1 axis position control unit. Open-collector output	CJ1W-NC113
2 axes position control unit. Open-collector output	CJ1W-NC213
4 axes position control unit. Open-collector output	CJ1W-NC413
1 axis position control unit. Line-driver output	CJ1W-NC133
2 axes position control unit. Line-driver output	CJ1W-NC233
4 axes position control unit. Line-driver output	CJ1W-NC433

Servo drive cables

Note: Refer the selected servo systems section for cable and servo relay units information.

Computer software

Specifications	Order code
CX-One version 1.1 or higher	CX-ONE

For full specifications please refer to chapter software on page 582.

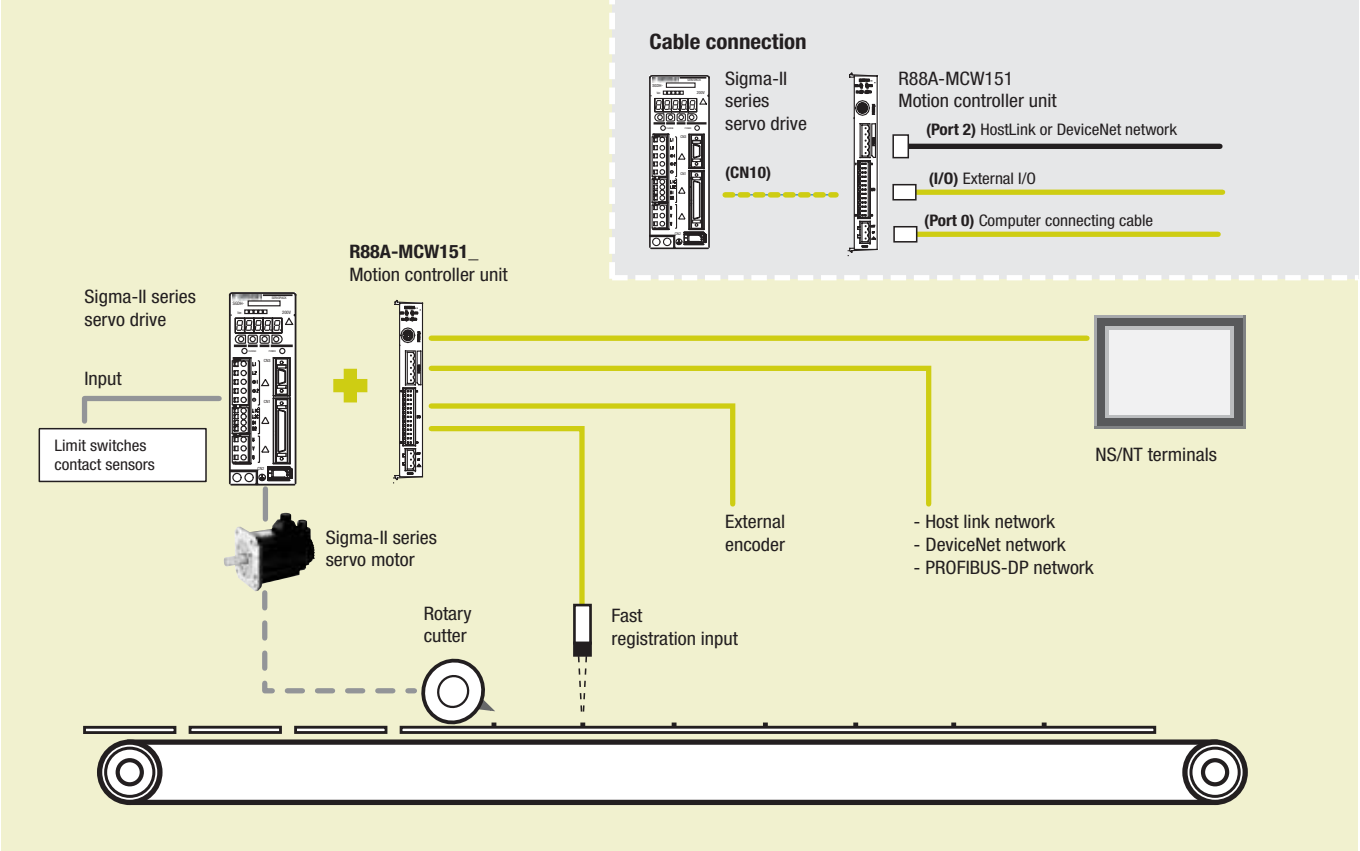


Motion in a compact package

The MCW151 is a powerful servo-based controller. Complex motions such as cams, gears, linked axes and interpolation are made easy with a comprehensive BASIC command set.

- Controls 1 real axis, 1 virtual axis and a configurable third axis
- One pulse-train output to control an additional axis
- User-friendly and intuitive BASIC motion programming
- Multi-tasking programming
- 2 fast-registration inputs

Ordering information



Motion controller unit

Name	Order code
1.5 axis advanced motion controller with host link interface	R88A-MCW151-E
1.5 axis advanced motion controller with DeviceNet interface	R88A-MCW151-DRT-E

PROFIBUS connectivity

Name	Order code
PROFIBUS-DP module interface for R88A-MCW151-E motion controllers	PRT1-SCU11

Serial cables (for Port 0, 1)

Name	Order code
Programming cable, 2 m. (Port 0)	R88A-CCM002P4-E
Splitter cable, 1 m (Port 0 & 1). Combined with R88A-CCM002P4-E cable allows using motion perfect and a general purpose application.(e.g. terminal)	R88A-CCM001P5-E

Connectors

Specification	Order code
I/O connector (Included in package)	B2L 3.5/26 SN SW (Weidmüler)
Power connector (Included in package)	MSTB 2.5/3-ST-5.08 (Phoenix)
Port 2 connector (Included in package)	MSTB 2.5/5-ST-5.08 (Phoenix)

Note: For a complete view of DeviceNet network accessories, refer to Automation systems catalogue or contact your Omron representative.

Computer software

Specifications	Order code
Motion perfect	MOTION TOOLS CD
EDS file	

Servo System

Note: Refer to the servo systems section for more information

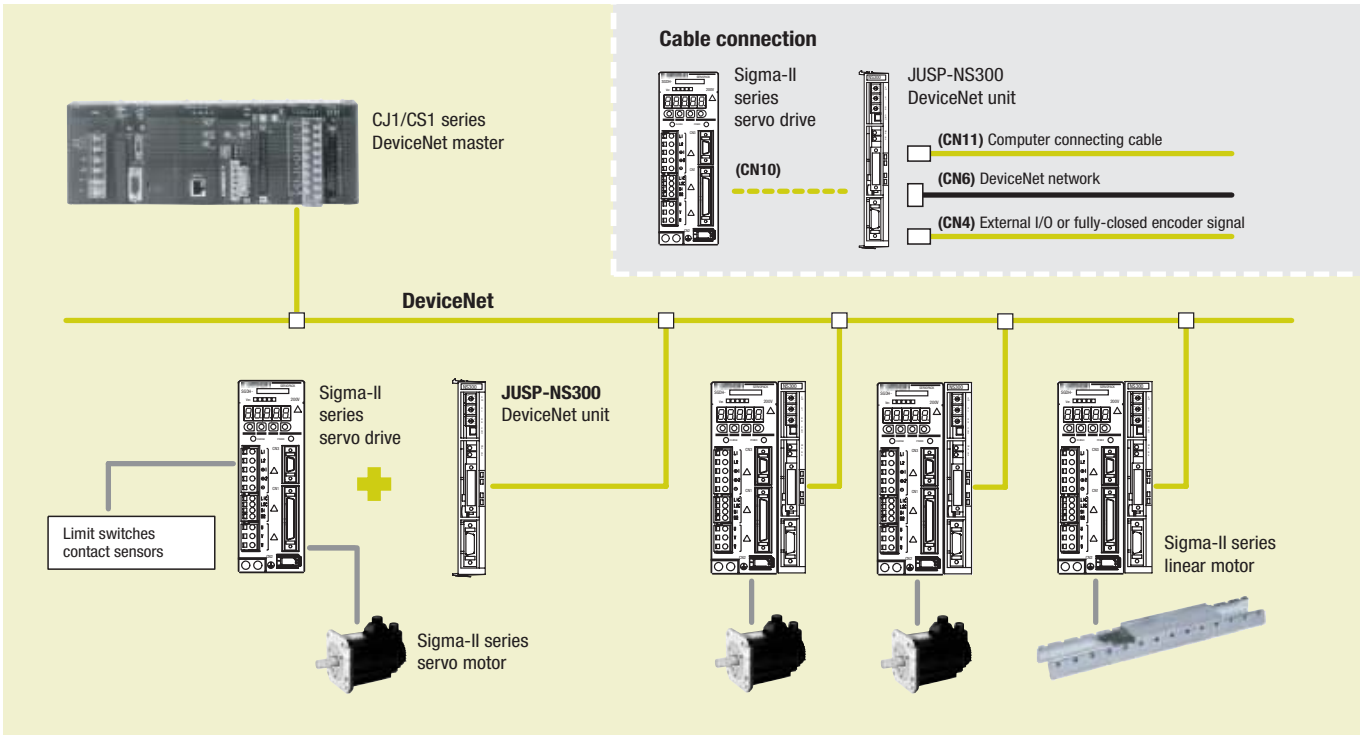


Position controller over DeviceNet

The NS300 is the drive-based solution for simple and reliable positioning using DeviceNet.

- No programming language is necessary
- Up to 63 drives can be connected in a network
- Supports polling I/O and explicit messages
- Parameters are maintained by the PLC
- Various positioning modes (homing, multistep and speed positioning)

Ordering information



DeviceNet interface unit

Name	Order code
DeviceNet Interface unit with point to point positioning functionality	JUSP-NS300

Serial cable (for CN11)

Name		Order code
Computer connecting cable	2 m	R88A-CCW002P4

Connectors

Name	Order code
Connector for CN4. For connecting external I/O signals or fully-closed encoder signals	R88A-CNU01R or DE9406973
Connector for CN6. DeviceNet connector with retaining screws	XW4B-05C1-H1-D
Connector for CN6. DeviceNet multi-branching connector with retaining screws	XW4B-05C4-TF-D
Connector for CN6. DeviceNet multi-branching connector (without retaining screws)	XW4B-05C4-T-D

Note: For a complete view of DeviceNet network accessories, refer to networks section or contact your Omron representative.

Computer software

Name	Order code
NS tool	MOTION TOOLS CD
ESD file	

Servo system

Note: Refer to the Servo systems section for more information.

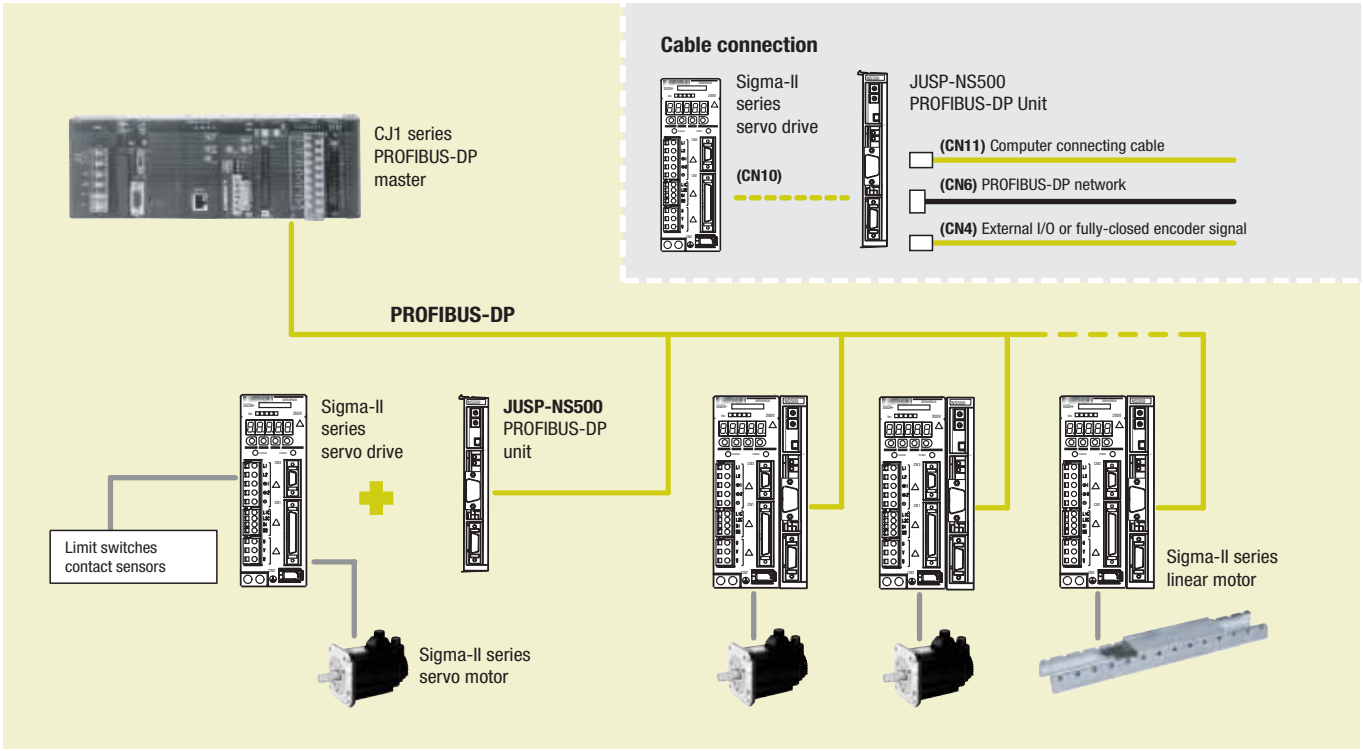


Position controller over PROFIBUS-DP

The NS500 is a flexible and simple distributed control over PROFIBUS-DP.
It connects directly to the Sigma-II and has several positioning modes, making it simple to configure.

- No programming language is necessary
- Various positioning modes (homing, multistep and speed positioning)
- Connects directly to Sigma-II drives
- Up to 125 servos can be connected
- Fully closed control loop

Ordering information



PROFIBUS-DP interface unit

Name	Order code
PROFIBUS-DP interface unit with point to point positioning functionality	JUSP-NS500

Serial cable (for CN11)

Name		Order code
Computer connecting cable	2 m	R88A-CCW002P4

Connectors

Name	Order code
Connector for CN4. For connecting external I/O signals or fully-closed encoder signals	R88A-CNU01R or DE9406973

Computer software

Name	Order code
NS tool	MOTION TOOLS CD
GSD file	

Servo system

Note: Refer to the Servo systems section for more information.

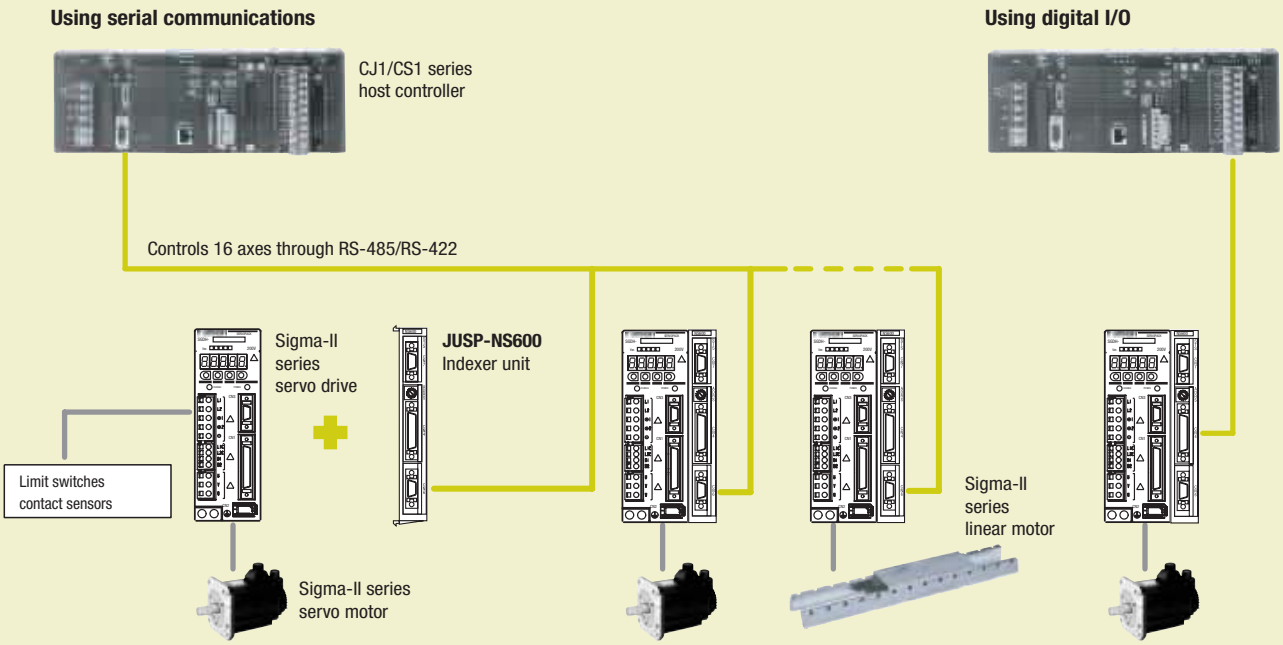


Position controller over serial link

The NS600 provides flexible and simple distributed control. It connects directly to the Sigma-II and has several positioning modes, making it simple to configure. It supports a standard RS-485/-422 and discrete I/O control

- Direct connection to servo drive
- No programming language is necessary
- Discrete I/O positioning control
- Up to 16 servos can be connected via network
- Parameters are maintained by the PLC

Ordering information



Indexer option unit

Name	Order code
Indexer unit. Versatile point to point positioning	JUSP-NS600

Serial options (for CN7)

Name		Order code
Computer connecting cable	2 m	R88A-CCW002P2 or JZSP-CMS02
Parameter unit with 1m cable	2 m	JUSP-OP02A-2 or R88A-PR02W

Control cables (for CN4)

Name		Order code
Relay terminal block		XW2B-40F5-P
Relay terminal block cables	1 m	R88A-CTU001N
	2 m	R88A-CTU002N
General purpose I/O cable (with open end)	1 m	FND-CCX001S
	2 m	FND-CCX002S

Serial cables (for CN6)

Name		Order code
Computer connecting cable	2 m	R88A-CCW002P2 or JZSP-CMS02

Connectors

Specification	Order code
Connector for CN4	R88A-CNU01C
Connector for CN6 and CN7	R7A-CNA01R

Computer software

Specifications	Order code
SigmaWin+	MOTION TOOLS CD

Servo system

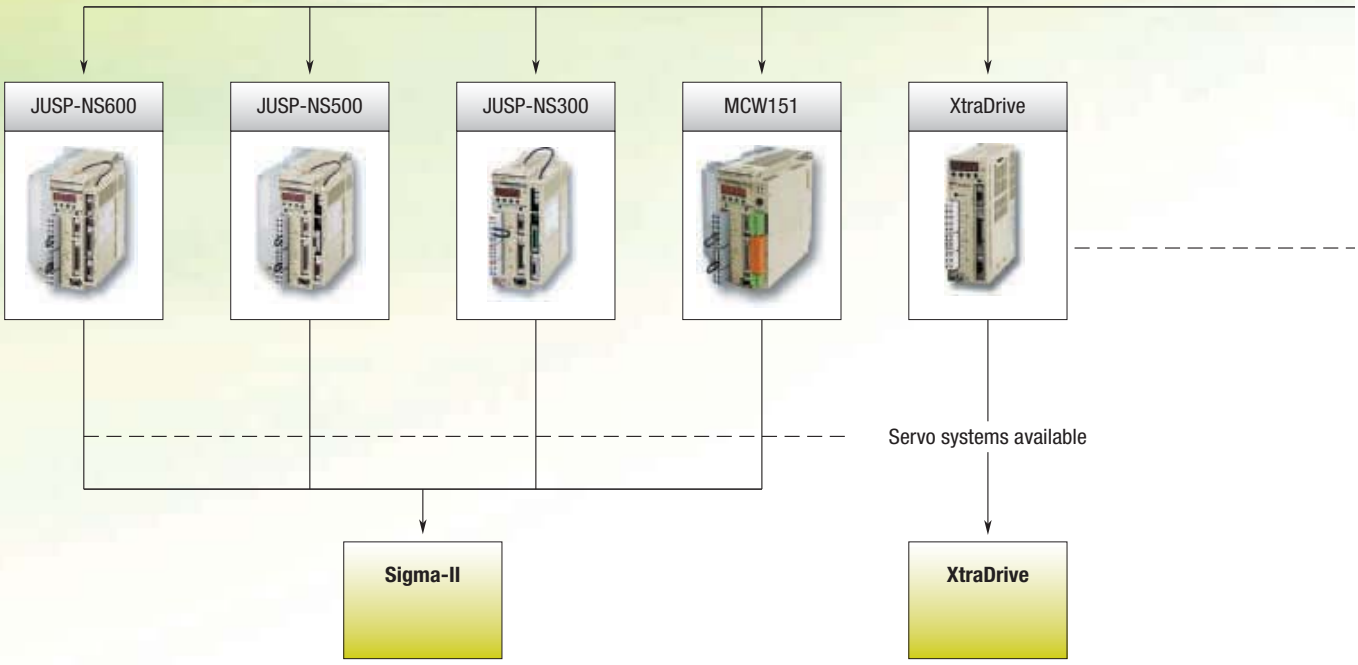
Note: Refer to the Servo systems section for more information.

SAVE SPACE, SAVE WIRING, SAVE TIME

A new concept in drive simplicity

The Junma ML-2 ultra-compact servo series draws on our world-leading servo-drive technology to open up new dimensions in drive simplicity. The Junma is probably the first servo drive that is fully tune-less and programless.

- Pocket-size servo with smallest footprint 15x4.5 cm
- Tuning-less technology built-in for immediate start-up
- Built-in MECHATROLINK-II motion bus reduces cabling and allows remote servo configuration and diagnosis



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Which motion controller is used?

Trajexia stand-alone	NCs or other controller with pulse train output	MCs or other controller with analog output	NC_71	Trajexia-PLC CJ1W-MCH72
Sigma-5 ML-II, Sigma-II, Junma ML-II	**Sigma-5 A/P, Sigma-II, Junma Pulse, SmartStep**	**Sigma-5 A/P, Sigma-II, XtraDrive**	**Sigma-II, Junma ML-II**	**Sigma-5 ML-II, Sigma-II, Junma ML-II**
Inverters*				
F7 		F7 		F7 
Page 171		Page 171		Page 171

*See inverter chapter

Selection table

Servo drives						
						
	Sigma-5	**XtraDrive**	**Sigma-II**	**SmartStep**	**Junma ML-II**	**Junma Pulse**
	The 5-star servo drive	All in one! Servo drive and motion	Designed with ZERO compromise	Servo capability with stepper simplicity	No more parameter set up Save space, save time	No more parameter set up Save space, save time
Ratings 230 V single-phase	50 W to 1,500 W	30 W to 1,500 W	30 W to 1,500 W	30 W to 800 W	100 W to 750 W	100 W to 750 W
Ratings 400 V single-phase	500 W to 15 kW	0.5 kW to 5 kW	0.5 kW to 55 kW	–	–	–
Motors applicable	Sigma-5, Sigma-II, Sigma linear motors, Sigma Direct drives motors	Sigma linear motors, rotary Sigma-II and SmartStep motors	Rotary Sigma-II and Sigma linear motors	SmartStep motors	Junma motors	Junma motors
Positioning control	Pulse train input or MECHATROLINK-II	Internal program, pulse train input or via PROFIBUS-DP	Pulse train input or via option unit	Pulse train input	MECHATROLINK-II	Pulse train input
Speed control	Analog ±10 V or MECHATROLINK-II	Internal program, analogue ±10 V or via PROFIBUS-DP	Analogue ±10 V or via option unit	–	–	–
Torque control	Analog ±10 V or MECHATROLINK-II	Internal program, analogue ±10 V or via PROFIBUS-DP	Analogue ±10 V or via option unit	–	–	–
Page	86	92	96	101	104	106

Rotary servo motors			
			
	SGMAH	**SGMPH**	**SGMGH**
	Sigma-II rotary motors (6 different motor families to cover all application needs)		
	Low-inertia design for high dynamics	Medium inertia design with flat profile	High torque servo motors
Rated speed	3,000 rpm	3,000 rpm	1,500 rpm
Max speed	5,000 rpm	5,000 rpm	3,000 rpm
Rated torque	0.095 Nm to 2.39 Nm	0.318 Nm to 4.77 Nm	2.84 Nm to 95.4 Nm
Sizes	30 to 800 W	100 to 1500 W	0.45 to 15 kW
Drives applicable	Sigma-II, Sigma-5 and XtraDrive	Sigma-II, Sigma-5 and XtraDrive	Sigma-II, Sigma-5 and XtraDrive
Encoder resolution	13 bits-incremental/ 16 bits-absolute	13 bits-incremental/ 16 bits-absolute	17 bits-incremental and absolute
IP rating	IP55	IP55 (optional IP67)	IP67
Page	127		

Rotary servo motors				
					
	SGMJV	**SGMAV**	**SGMEV**	**SGMGV**	**SGMSV**
	Sigma-5 rotary motors				
	Medium inertia for high dynamics	Low inertia for high dynamics	Medium inertia with flat profile	High torque servomotors	Low inertia for high dynamics
Rated speed	3,000 rpm	3,000 rpm	3,000 rpm	1,500 rpm	3,000 rpm
Max speed	6,000 rpm	6,000 rpm	5,000 rpm	2,000/3,000 rpm	5,000 rpm
Rated torque	0.159 Nm to 2.39 Nm	0.159 Nm to 3.18 Nm	0.318 Nm to 4.77 Nm	1.96 Nm to 95.4 Nm	3.18 Nm to 15.8 Nm
Sizes	50 to 750 W	50 to 1,000 W	100 to 1,500 W	0.3 to 15 kW	1 to 5 kW
Drives applicable	Sigma-5	Sigma-5	Sigma-5	Sigma-5	Sigma-5
Encoder resolution	20 bits - incremental and absolute	20 bits - incremental and absolute	20 bits - incremental and absolute	20 bits - incremental and absolute	20 bits - incremental and absolute
IP rating	IP65	IP65	IP55	IP67	IP67
Page	109				

Sigma linear servo motors			
			
	SGLGW	**SGLFW**	**SGLTW**
	Coreless GW linear motor construction results in zero attraction force	Iron-core Sigma linear motor, making the difference	Iron-core TW linear motor with magnetic attraction cancellation
Rated force range	13.5 N to 325 N	25 N to 2250 N	300 N to 2,000 N
Peak force range	40 N to 1300 N	86 N to 5400N	600 N to 7500 N
Maximum speed	5 m/sec	5 m/sec	5 m/sec
Design type	Coreless coil	Iron-core coil	Iron-core coil
Magnetic attraction	zero	314 N to 14600 N	zero
Drives applicable	Sigma-II and XtraDrive	Sigma-II and XtraDrive	Sigma-II and XtraDrive
Page	145		

Rotary servo motors					
					
	SGMSH	**SGMUH**	**SGMBH**	**SmartStep motors**	**Junma Motors**
	Sigma-II rotary motors (6 different motor families to cover all application needs)			**SmartStep**	**Junma (SJDE)**
	Low-inertia motors for high dynamics	High speed servo motors	High power applications	Ultra compact motor	Medium inertia compact motor
Rated speed	3,000 rpm	6,000 rpm	1,500 rpm	3,000 rpm	3000 rpm
Max speed	5,000 rpm	6,000 rpm	2,000 rpm	4,500 rpm	4500 rpm
Rated torque	3.18 Nm to 15.8 Nm	1.59 Nm to 6.3 Nm	140 Nm to 350 Nm	0.095 Nm to 2.39 Nm	0.318 to 2.39 Nm
Sizes	1 to 5 kW	1 to 5 kW	22 kW to 55 kW	30 to 800 W	100 to 750 W
Drives applicable	Sigma-II, Sigma-5 and XtraDrive	Sigma-II, Sigma-5 and XtraDrive	Sigma-II	SmartStep and XtraDrive	Junma (MLII and Pulse)
Encoder resolution	17 bits-incremental and absolute	17 bits-incremental	17 bits-incremental and absolute	2000 pulses/revolution	13 bits - Analogue incremental
IP rating	IP67	IP67	IP44	IP55	IP55
Page	127			138	142

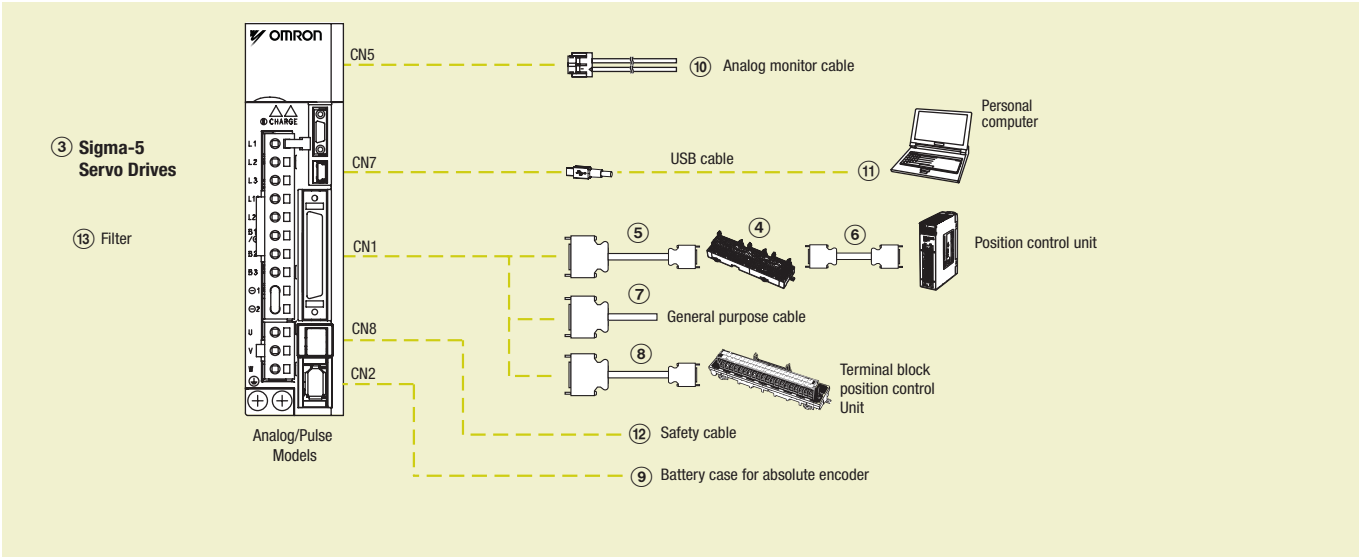


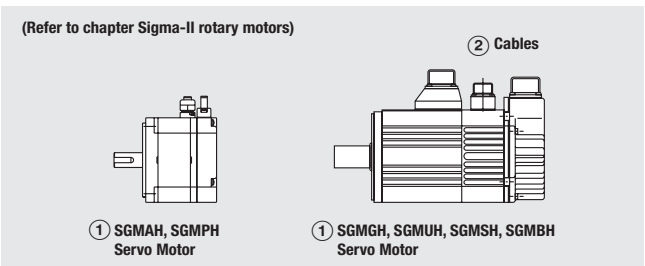
The 5-star servo drive. High performance and compact servo family with integrated ML-II.

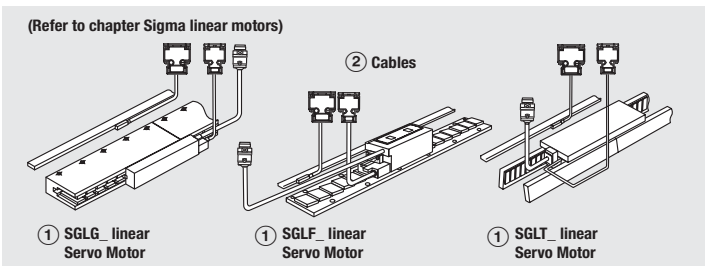
- Advance autotuning function
- Enhanced vibration supression function
- Standard support for analog voltage/pulse train reference series or MECHATROLINK-II communications reference series.
- Support for direct drive servomotors, linear servomotors and linear sliders
- Integrated safety stop function
- Frequency response of 1.6 kHz

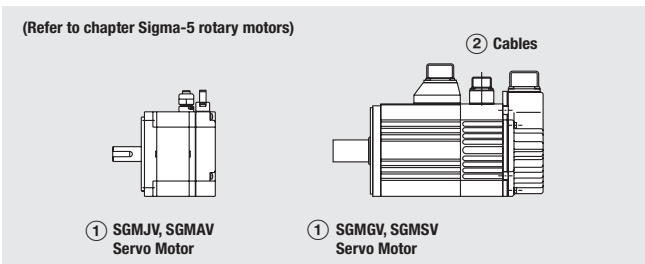
Ordering information

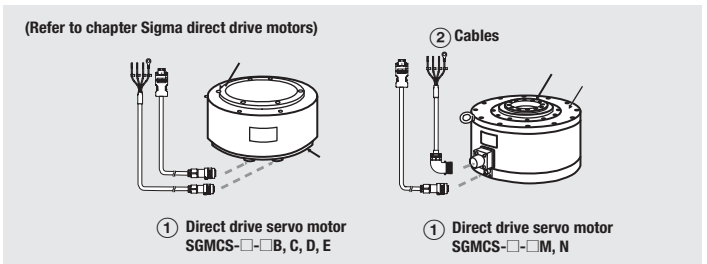
Sigma-5 Analog/Pulse reference configuration











Note: The symbols ①②③④⑤... show the recommended sequence to select the components in a Sigma-5 servo system

Servo motors, power & encoder cables

Note: ①② Refer to the servo motors chapter for detailed motor specifications and selection

Servo drives

Symbol	Specifications		Compatible rotary servo motors ①	Compatible direct drive motors ①	Compatible linear motors ①	Order code
③	1 phase 230 VAC	50 W	SGMAH-A5D_, SGMJV-A5A_, SGMAV-A5A_	-	-	SGDV-R70A01A
			-	-	SGLGW-30A050_	SGDV-R70A05A
		100 W	SGMAH-01A_, SGMPH-01A_, SGMJV-01A_, SGMAV-01A_, SGMEV-01A_	-	-	SGDV-R90A01A
			-	-	SGLGW-30A080_, SGLGW-40A140_	SGDV-R90A05A
		200 W	SGMAH-02A_, SGMPH-02A_, SGMJV-02A_, SGMAV-02A_, SGMEV-02A_	SGMCS-07B_	-	SGDV-1R6A01A
			-	-	SGLGW-60A140_, SGLGW-40A253_, SGLFW-20A_, SGLFW-35A120_	SGDV-1R6A05A
		400 W	SGMAH-04A_, SGMPH-04A_, SGMJV-04A_, SGMAV-04A_, SGMEV-04A_	SGMCS-02B_, SGMCS-05B_, SGMCS-04C_, SGMCS-10C_, SGMCS-14C_, SGMCS-08D_, SGMCS-17D_, SGMCS-25D_	-	SGDV-2R8A01A
			-	-	SGLGW-40A365_, SGLGW-60A253A_	SGDV-2R8A05A
		750 W	SGMAH-08A_, SGMPH-08A_, SGMJV-08A_, SGMAV-08A_, SGMEV-08A_	SGMCS-16E_, SGMCS-35E_	-	SGDV-5R5A01A
			-	-	SGLGW-60A365A_, SGLFW-35A230_, SGLFW-50A200_	SGDV-5R5A05A
		1.5 kW	SGMPH-15A_, SGMAV-10A_, SGMEV-15A_	SGMCS-45M_, SGMCS-80M_, SGMCS-80N_	-	SGDV-120A01A008000
			-	-	SGLGW-90A200A_, SGLFW-50A380_, SGLFW-1ZA200_	SGDV-120A05A008000
	3 phase 400 VAC	0.5 kW	SGMAH-03D_, SGMPH-04D_, SGMGH-05D_, SGMEV-04D_, SGMGV-05D_	-	-	SGDV-1R9D01A
			-	-	SGLFW-35D_	SGDV-1R9D05A
		1.0 kW	SGMAH-07D_, SGMPH-08D_, SGMGH-09D_, SGMSH-10D_, SGMUH-10D_, SGMEV-08D_, SGMGV-09D_, SGMSV-10D_	-	-	SGDV-3R5D01A
			-	-	SGLFW-50D200_, SGLTW-35D170_, SGLTW-50D170_	SGDV-3R5D05A
		1.5 kW	SGMPH-15D_, SGMGH-13D_, SGMSH-15D_, SGMUH-15D_, SGMEV-15D_, SGMGV-13D_, SGMSV-15D_	-	-	SGDV-5R4D01A
			-	-	SGLFW-50D380_, SGLFW-1ZD200_	SGDV-5R4D05A
		2 kW	SGMGH-20D_, SGMSH-20D_, SGMGV-20D_, SGMSV-20D_	-	-	SGDV-8R4D01A
			-	-	SGLFW-1ED380_, SGLTW-35D320_, SGLTW-50D320_	SGDV-8R4D05A
		3 kW	SGMGH-30D_, SGMSH-30D_, SGMUH-30D_, SGMGV-30D_, SGMGV-30D_	-	-	SGDV-120D01A
			-	-	SGLFW-1ZD380_, SGLFW-1ED560_, SGLTW-40D400_	SGDV-120D05A
		5 kW	SGMGH-44D_, SGMSH-50D_, SGMUH-40D_, SGMGV-44D_, SGMSV-50D_	-	-	SGDV-170D01A
			-	-	SGLTW-40D60_, SGLTW-80D400_	SGDV-170D05A
		6 kW	SGMGH-55D_, SGMGV-55D_	-	-	SGDV-210D01A
		7.5 kW	SGMGH-75D_, SGMGV-75D_	-	-	SGDV-260D01A
		11 kW	SGMGH-1AD_, SGMGV-1AD_	-	-	SGDV-280D01A
		15 kW	SGMGH-1ED_, SGMGV-1ED_	-	-	SGDV-370D01A

Control cables (for CN1)

Symbol	Description	Connect to	Length	Order code
④	Servo relay unit	CJ1W-NC1_3		XW2B-20J6-1B (1 axis)
		CJ1W-NC2_3/4_3		XW2B-40J6-2B (2 axis)
		CJ1M-CPU22/23		XW2B-20J6-8A (1 axis)
				XW2B-40J6-9A (2 axis)
⑤	Cable to servo drive	Servo relay units XW2B-_0J6-_B	1 m	XW2Z-100J-B4
			2 m	XW2Z-200J-B4

Symbol	Description	Connect to	Length	Order code
⑥	Position control unit connecting cable	CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU22/23	0.5 m	XW2Z-050J-A27
			1 m	XW2Z-100J-A27
⑦	Control cable	For general purpose controllers	1 m	R88A-CPW001S
			2 m	R88A-CPW002S
⑧	Relay terminal block cable	General purpose controller	1 m	R88A-CTW001N
			2 m	R88A-CTW002N
	Relay terminal block		-	XW2B-50G5

Battery backup for absolute encoder (for CN2 encoder cable)

Symbol	Name	Order code
⑨	Battery	JZSP-BA01

Note: When the encoder cables with a battery case are used, no battery is required for CN1 (between pin 21 and 22). Battery for CN1 is ER6VCN3.

Cable (for CN5)

Symbol	Name	Order code
⑩	Analog monitor cable	R88A-CMW001S
		DE9404559

USB personal computer cable (for CN7)

Symbol	Name	Order code
⑪	USB Mini Connector cable	JZSP-CVS06-02-E

Note: Double shield USB cable recommended

Cable for Safety Functions (for CN8)

Symbol	Name	Order code
⑫	Safety connector with 3 m cable (with Loose Wires at one End)	JZSP-CVH03-03-E

Note: When using the safety function, connect this cable to the safety devices. Even when not using the safety function, use servo drive with the Safe Jumper Connector (JZSP-CVH05-E) connected.

Filters

Symbol	Applicable servo drive	Rated current	Rated voltage	Order code
⑬	SGDV-R70A__A, SGDV-R90A__A, SGDV-1R6A__A, SGDV-2R8A__A	5 A	250 VAC single-phase	R88A-FI5-1005-RE
	SGDV-5R5A__A	9 A		R88A-FI5-1009-RE
	SGDV-120A01A008000	16 A		R88A-FI5-1016-RE
	SGDV-1R9D__A, SGDV-3R5D__A, SGDV-5R4D__A	4.3 A	400 VAC three-phase	R88A-FI5-3004-RE
	SGDV-8R4D__A, SGDV-120D__A	8.6 A		R88A-FI5-3008-RE
	SGDV-170D__A	14.5 A		R88A-FI5-3012-RE

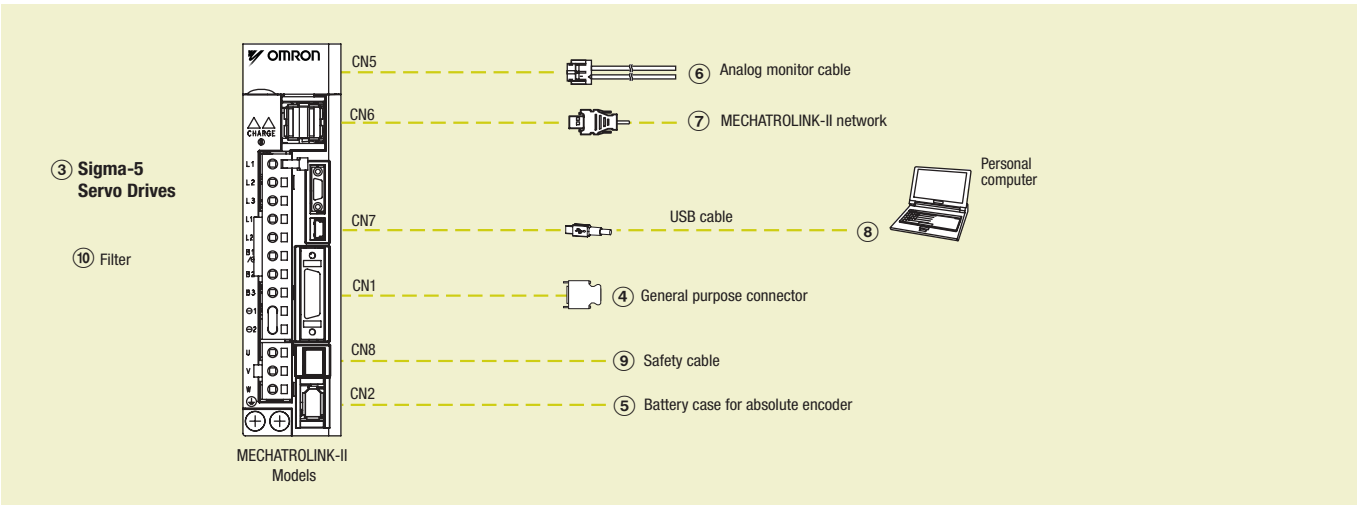
Connectors

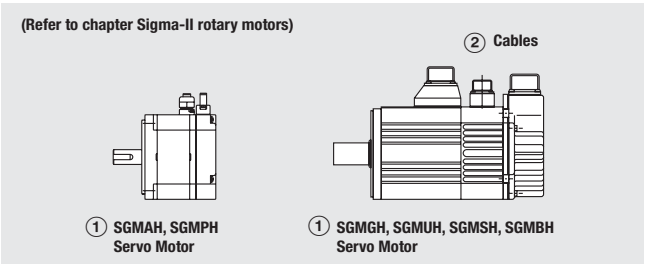
Specifications	Order code
I/O connector kit (for CN1)	R88A-CNU11C
Sigma-5 drive encoder connector (for CN2)	JZSP-CMP9-1
Safe Jumper Connector	JZSP-CVH05-E

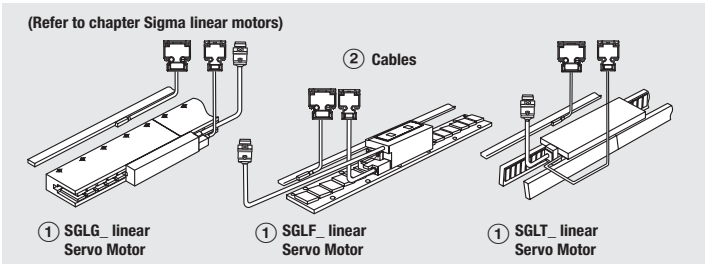
Computer software

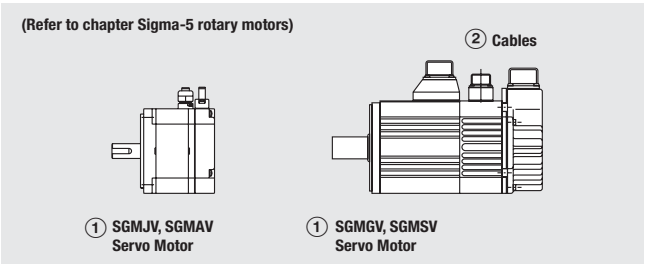
Specifications	Order code
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.50 or higher)	CX-drive
Complete OMRON software package including CX-drive. (CX-One version 3.0.2 or higher)	CX-One

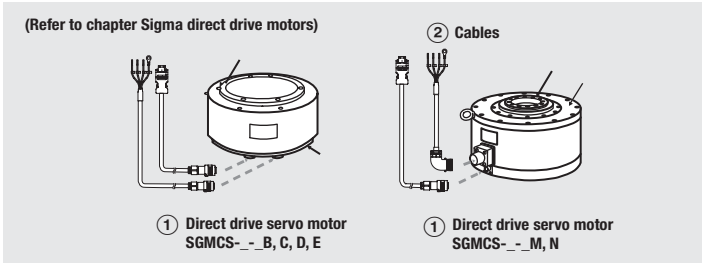
Sigma-5 MECHATROLINK servo drive configuration











Note: The symbols ①②③④⑤... show the recommended sequence to select the components in a Sigma-5 servo system

Servo motors, power & encoder cables

Note: ①② Refer to the servo motors chapter for detailed motor specifications and selection

Servo drives

Symbol	Specifications		Compatible rotary servo motors ①	Compatible direct drive motors ①	Compatible linear motors ①	Order code
③	1 phase 230 VAC	50 W	SGMAH-A5D_, SGMJV-A5A_, SGMAV-A5A_	-	-	SGDV-R70A11A
			-	-	SGLGW-30A050_	SGDV-R70A15A
		100 W	SGMAH-01A_, SGMPH-01A_, SGMJV-01A_, SGMAV-01A_, SGMEV-01A_	-	-	SGDV-R90A11A
			-	-	SGLGW-30A080_, SGLGW-40A140_	SGDV-R90A15A
		200 W	SGMAH-02A_, SGMPH-02A_, SGMJV-02A_, SGMAV-02A_, SGMEV-02A_	SGMCS-07B_	-	SGDV-1R6A11A
			-	-	SGLGW-60A140_, SGLGW-40A253_, SGLFW-20A_, SGLFW-35A120_	SGDV-1R6A15A
		400 W	SGMAH-04A_, SGMPH-04A_, SGMJV-04A_, SGMAV-04A_, SGMEV-04A_	SGMCS-02B_, SGMCS-05B_, SGMCS-04C_, SGMCS-10C_, SGMCS-14C_, SGMCS-08D_, SGMCS-17D_, SGMCS-25D_	-	SGDV-2R8A11A
			-	-	SGLGW-40A365_, SGLGW-60A253A_	SGDV-2R8A15A
		750 W	SGMAH-08A_, SGMPH-08A_, SGMJV-08A_, SGMAV-08A_, SGMEV-08A_	SGMCS-16E_, SGMCS-35E_	-	SGDV-5R5A11A
			-	-	SGLGW-60A365A_, SGLFW-35A230_, SGLFW-50A200_	SGDV-5R5A15A
		1.5 kW	SGMPH-15A_, SGMAV-10A_, SGMEV-15A_	SGMCS-45M_, SGMCS-80M_, SGMCS-80N_	-	SGDV-120A11A008000
			-	-	SGLGW-90A200A_, SGLFW-50A380_, SGLFW-1ZA200_	SGDV-120A15A008000

Symbol	Specifications		Compatible rotary servo motors ①	Compatible direct drive motors ①	Compatible linear motors ①	Order code
③	3 phase 400 VAC	0.5 kW	SGMAH-03D_, SGMPH-04D_, SGMGH-05D_, SGMEV-04D_, SGMGV-05D_	-	-	SGDV-1R9D11A
			-	-	SGLFW-35D_	SGDV-1R9D15A
		1.0 kW	SGMAH-07D_, SGMPH-08D_, SGMGH-09D_, SGMSH-10D_, SGMUH-10D_, SGMEV-08D_, SGMGV-09D_, SGMSV-10D_	-	-	SGDV-3R5D11A
			-	-	SGLFW-50D200_, SGLTW-35D170_, SGLTW-50D170_	SGDV-3R5D15A
		1.5 kW	SGMPH-15D_, SGMGH-13D_, SGMSH-15D_, SGMUH-15D_, SGMEV-15D_, SGMGV-13D_, SGMSV-15D_	-	-	SGDV-5R4D11A
			-	-	SGLFW-50D380_, SGLFW-1ZD200_	SGDV-5R4D15A
		2 kW	SGMGH-20D_, SGMSH-20D_, SGMGV-20D_, SGMSV-20D_	-	-	SGDV-8R4D11A
			-	-	SGLFW-1ED380_, SGLTW-35D320_, SGLTW-50D320_	SGDV-8R4D15A
		3 kW	SGMGH-30D_, SGMSH-30D_, SGMUH-30D_, SGMGV-30D_, SGMGV-30D_	-	-	SGDV-120D11A
			-	-	SGLFW-1ZD380_, SGLFW-1ED560_, SGLTW-40D400_	SGDV-120D15A
		5 kW	SGMGH-44D_, SGMSH-50D_, SGMUH-40D_, SGMGV-44D_, SGMSV-50D_	-	-	SGDV-170D11A
			-	-	SGLTW-40D60_, SGLTW-80D400_	SGDV-170D15A
		6 kW	SGMGH-55D_, SGMGV-55D_	-	-	SGDV-210D11A
		7.5 kW	SGMGH-75D_, SGMGV-75D_	-	-	SGDV-260D11A
		11 kW	SGMGH-1AD_, SGMGV-1AD_	-	-	SGDV-280D11A
		15 kW	SGMGH-1ED_, SGMGV-1ED_	-	-	SGDV-370D11A

Battery backup for absolute encoder (for CN2 encoder cable)

Symbol	Name	Order code
⑤	Battery	JZSP-BA01

Note: When the encoder cables with a battery case JUSP-BA01 are used, no battery is required for CN1 (between pin 21 and 22). Battery for CN1 is ER6VCN3.

Cable (for CN5)

Symbol	Name	Order code
⑥	Analog monitor cable	R88A-CMW001S
		DE9404559

USB personal computer cable (for CN7)

Symbol	Name	Order code
⑧	USB Mini Connector cable	JZSP-CVS06-02-E

Note: Double shield USB cable recommended

Cable for Safety Functions (for CN8)

Symbol	Name	Order code
⑨	Safety connector with 3 m cable (with Loose Wires at one End)	JZSP-CVH03-03-E

Note: When using the safety function, connect this cable to the safety devices. Even when not using the safety function, use servo drive with the Safe Jumper Connector (JZSP-CVH05-E) connected.

Mechatrolink-II cables (for CN6)

Symbol	Specifications	Length	Order code
⑦	Mechatrolink-II Terminator resistor		JEPMC-W6022
	Mechatrolink-II Cables	0.5 m	JEPMC-W6003-A5
		1 m	JEPMC-W6003-01
		3 m	JEPMC-W6003-03
		5 m	JEPMC-W6003-05
		10 m	JEPMC-W6003-10
		20 m	JEPMC-W6003-20
		30 m	JEPMC-W6003-30

Filters

Symbol	Applicable servo drive	Rated current	Rated voltage	Order code
⑩	SGDV-R70A__A, SGDV-R90A__A, SGDV-1R6A__A, SGDV-2R8A__A	5 A	250 VAC single-phase	R88A-FI5-1005-RE
	SGDV-5R5A__A	9 A		R88A-FI5-1009-RE
	SGDV-120A__A008000	16 A		R88A-FI5-1016-RE
	SGDV-1R9D__A, SGDV-3R5D__A, SGDV-5R4D__A	4.3 A	400 VAC three-phase	R88A-FI5-3004-RE
	SGDV-8R4D__A, SGDV-120D__A	8.6 A		R88A-FI5-3008-RE
	SGDV-170D__A	14.5 A		R88A-FI5-3012-RE

Connectors

Specification	Order code
I/O connector kit (for CN1)	R88A-CNW01C
Sigma-5 drive encoder connector (for CN2)	JZSP-CMP9-1
Safe Jumper Connector	JZSP-CVH05-E

Computer software

Specifications	Order code
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.50 or higher)	CX-drive
Complete OMRON software package including CX-drive. (CX-One version 3.0.2 or higher)	CX-One

Specifications

Single-phase, 230 V

Servo drive type			SGDV- _	R70A__A	R90A__A	1R6A__A	2R8A__A	5R5A__A	120A__A008000
Applicable servo motor			SGMAH-_	A3A_/A5A_	01A_	02A_	04A_	08A_	-
			SGMPH-_	-	01A_	02A_	04A_	08A_	15A_
			SGMJV-_	A5A_	01A_	02A_	04A_	08A_	-
			SGMAV-_	A5A_	01A_	C2A_/02A_	04A_	06A_/08A_	10A_
			SGMEV-_	-	01A_	02A_	04A_	08A_	15A_
Basic specifications	Max. applicable motor capacity (W)			50	100	200	400	750	1500
	Continuous output current (Arms)			0.66	0.91	1.6	2.8	5.5	11.6
	Max. output current (Arms)			2.1	2.9	6.5	9.3	16.9	28
	Input power supply		Main circuit	Single-phase, 200 to 230 VAC + 10 to -15% (50/60 Hz)					
			Control circuit	Single-phase, 200 to 230 VAC + 10 to -15% (50/60 Hz)					
	Control method			Single phase full-wave rectification / IGBT / PWM / sine-wave current drive method					
	Feedback			Serial encoder (incremental/absolute)					
	Conditions	Usage/storage temperature		0 to +55 °C / -20 to 85 °C					
		Usage/storage humidity		90%RH or less (non-condensing)					
		Altitude		1000m or less above sea level					
		Vibration/shock resistance		4.9 m/s^2 / 19.6 m/s^2					
	Configuration			Base mounted					
	Approx. weight (kg)			0.9			1.0	1.5	2.8

Three-phase, 400 V

Servo drive type			SGDV- _	1R9D__A	3R5D__A	5R4D__A	8R4D__A	120D__A	170D__A	210D__A	260D__A	280D__A	370D__A
Applicable servo motor			SGMAH-_	03D_	07D_	-	-	-	-	-	-	-	-
			SGMPH-_	02D_/04D_	08D_	15D_	-	-	-	-	-	-	-
			SGMGH-_	05D_	09D_	13D_	20D_	30D_	44D_	55D_	75D_	1AD_	1ED_
			SGMSH-_	-	10D_	15D_	20D_	30D_	40D_/50D_	-	-	-	-
			SGMUH-_	-	10D_	15D_	-	30D_	40D_	-	-	-	-
			SGMEV-_	02/03/04D_	07D_/08D_	15D_	-	-	-	-	-	-	-
			SGMGV-_	03D_/05D_	09D_	13D_	20D_	30D_	44D_	55D_	75D_	1AD_	1ED_
			SGMSV-_	-	10D_	15D_	20D_	25D_	40D_/50D_	-	-	-	-
Basic specifications	Max. applicable motor capacity (W)			0.5	1.0	1.5	2.0	3.0	5.0	6.0	7.5	11	15
	Continuous output current (Arms)			1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.4	28.1	37.2
	Max. output current (Arms)			5.5	8.5	14	20	28	42	55	65	70	85
	Input power supply		Main circuit	Three-phase, 380 to 480 VAC + 10 to -15% (50/60Hz)									
			Control circuit	24 VDC +/-15%									
	Control method			Three phase full-wave rectification / IGBT / PWM / sine-wave current drive method									
	Feedback			Serial encoder (incremental/absolute)									
	Conditions	Usage/storage temperature		0 to +55 °C / -20 to +85 °C									
		Usage/storage humidity		90%RH or less (non-condensing)									
		Altitude		1000 m or less above sea level									
		Vibration/shock resistance		4.9 m/s^2 / 19.6 m/s^2									
	Configuration			Base mounted									
	Approx. weight (kg)			2.7			3.7		5.6	11.3		16.2	



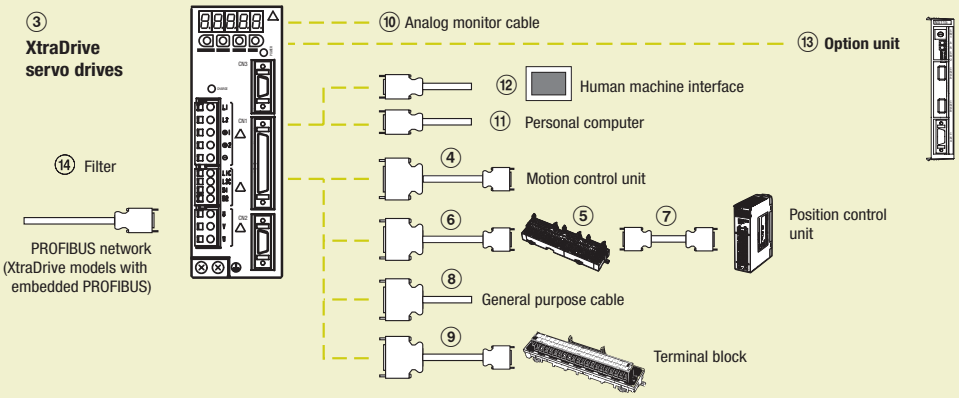
All-in-one servo drive and motion controller integrated

If your application demands the highest accuracy, the shortest cycle time in the most compact size and the ability to connect to PROFIBUS-DP or CAN, then look no further than XtraDrive. Complex motions such as cams, gears and linked axes are also available.

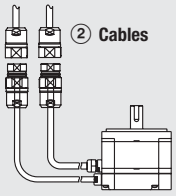
- Patented non-linear technique for tight control
- Very low tracking error with no overshoot and zero settling time
- The ideal drive for linear-motor control
- Supports various servo-motor encoder types
- PROFIBUS-DP embedded

Ordering information

System configuration

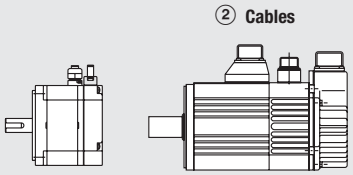


(Refer to chapter SmartStep servo motors)



① R7M servo motor

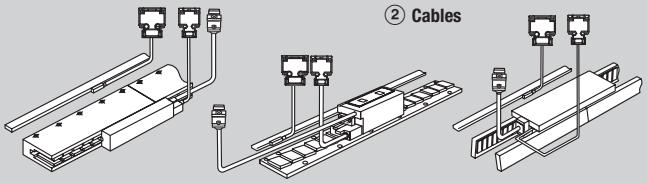
(Refer to chapter Sigma-II rotary motors)



① SGMAH, SGMPH servo motor

① SGMGH, SGMUH, SGMSH, SGMBH servo motor

(Refer to chapter Sigma-II linear motors)



① SGLG_ linear servo motor

① SGLF_ linear servo motor

① SGLT_ linear servo motor

Note: The symbols ①②③④⑤... show the recommended sequence to select the components for a servo system.

Servo motors, power & encoder cables

Note: ①② Refer to the Servo motors chapter for detailed motor specifications and selection.

Servo drives

Symbol	Specifications		Compatible servo motors ①			Order code			
			Sigma-II rotary	SmartStep	Sigma linear motors	XtraDrive	XtraDrive-E with electronic CAM	XtraDrive-DP with PROFIBUS	XtraDrive-DP-E with PROFIBUS and electronic CAM
③	1 phase 200 VAC	30 W	SGMAH-A3A_	R7M-A03030-_	–	XD-P3-MN01	XD-P3-MN01-E	–	–
		50 W	SGMAH-A5D_	R7M-A05030-_	SGLGW-30A050_	XD-P5-MN01	XD-P5-MN01-E	–	–
		100 W	SGMAH-01A_, SGMPH-01A_	R7M-A10030-_, R7M-AP10030-_	SGLGW-30A080_, SGLGW-40A140_	XD-01-MN01	XD-01-MN01-E	XD-01-MSD0	XD-01-MSD0-E
		200 W	SGMAH-02A_, SGMPH-02A_	R7M-A20030-_, R7M-AP20030-_	SGLFW-20A_, SGLFW-35A120_, SGLGW-40A253A_, SGLGW-60A140_	XD-02-MN01	XD-02-MN01-E	XD-02-MSD0	XD-02-MSD0-E
		400 W	SGMAH-04A_, SGMPH-04A_	R7M-A40030-_, R7M-AP40030-_	SGLGW-40A365A_, SGLGW-60A253A_	XD-04-MN01	XD-04-MN01-E	XD-04-MSD0	XD-04-MSD0-E
		750 W	SGMAH-08A_, SGMPH-08A_	R7M-A75030-_, R7M-AP75030-_	SGLFW-35A230_, SGLFW-50A200_, SGLGW-60A365A_	XD-08-MN	XD-08-MN01-E	XD-08-MSD0	XD-08-MSD0-E

Symbol	Specifications		Compatible servo motors ①			Order code			
			Sigma-II rotary	SmartStep	Sigma linear motors	XtraDrive	XtraDrive-E with electronic CAM	XtraDrive-DP with PROFIBUS	XtraDrive-DP-E with PROFIBUS and electronic CAM
③	1 phase 200 VAC	1.5 kW	SGMPH-15A_	–	SGLFW-50A380_, SGLFW-1ZA200_, SGLGW-90A200A_	XD-15-MN	XD-15-MN00-E	–	–
	3 phase 400 VAC	0.5 kW	SGMGH-05D_, SGMAH-03D_, SGMPH-02D_/04D_	–	SGLFW-35D_	XD-05-TN	XD-05-TN00-E	XD-05-TSD0	XD-05-TSD0-E
		1.0 kW	SGMGH-09D_, SGMSH/UH-10D_, SGMAH-07D_, SGMPH-08D_	–	SGLFW-50D200_, SGLTW-35D170_, SGLTW-50D170_	XD-10-TN	XD-10-TN00-E	XD-10-TSD0	XD-10-TSD0-E
		1.5 kW	SGMGH-13D_, SGMSH/UH-15D_, SGMPH-15D_	–	SGLFW-50D380_, SGLFW-1ZD200_	XD-15-TN	XD-15-TN00-E	XD-15-TSD0	XD-15-TSD0-E
		2.0 kW	SGMGH-20D_, SGMSH-20D_	–	SGLTW-35D320_, SGLTW-50D320_	XD-20-TN	XD-20-TN00-E	XD-20-TSD0	XD-20-TSD0-E
		3.0 kW	SGMGH-30D_, SGMSH/UH-30D_	–	SGLFW-1ZD380_, SGLTW-40D400_	XD-30-TN	XD-30-TN00-E	XD-30-TSD0	XD-30-TSD0-E
		5.0 kW	SGMGH-44D_, SGMSH/UH-40D_, SGMSH-50D_	–	SGLTW-40D600_, SGLTW-80D400_	XD-50-TN	XD-50-TN00-E	–	–

Note: SGLGW-_ linear motor combination is made considering the use of standard magnets. Refer to the linear motors chapter for details.

Control cables (for CN1)

Symbol	Description	Connect to	Length	Order code
④	Control cable (1 axis)	Motion control units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M1
			2 m	R88A-CPW002M1
			3 m	R88A-CPW003M1
			5 m	R88A-CPW005M1
	Control cable (2 axis)	Motion control units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M2
			2 m	R88A-CPW002M2
			3 m	R88A-CPW003M2
			5 m	R88A-CPW005M2
	Terminal block (4 axes)	Motion control unit C200HW-MC402-E	–	R88A-TC04-E
	Servo drive connecting cable (1 axis)		1 m	R88A-CMUK001J3-E2
	PLC unit control cables (4 axes)		1 m	R88A-CMX001S-E
			1 m	R88A-CMX001J1-E
⑤	Servo relay unit	CS1W-NC1_3, CJ1W-NC1_3, or C200HW-NC113 Position control unit	–	XW2B-20J6-1B (1 axis)
		CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3, or C200HW-NC213/413 Position control unit	–	XW2B-40J6-2B (2 axes)
		CQM1H-PLB21 CQM1-CPU43	–	XW2B-20J6-3B (1 axis)
		CJ1M-CPU22/23	–	XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes)
⑥	Cable to servo drive	Servo relay units XW2B-_ 0J6-_ B	1 m	XW2Z-100J-B4
			2 m	XW2Z-200J-B4
⑦	Position control unit connecting cable	C200H-NC112	0.5 m	XW2Z-050J-A1
			1 m	XW2Z-100J-A1
		C200H-NC211	0.5 m	XW2Z-050J-A2
			1 m	XW2Z-100J-A2
		CQM1-CPU43-V1 and CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 and C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 and C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11

Symbol	Description	Connect to	Length	Order code
⑦	Position control unit connecting cable	CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU22/23	0.5 m	XW2Z-050J-A27
			1 m	XW2Z-100J-A27
⑧	Control cable	For general purpose controllers	1 m	R88A-CPW001S or JZSP-CKI01-1
			2 m	R88A-CPW002S or JZSP-CKI01-2
⑨	Relay terminal block cable	General-purpose controller	1 m	R88A-CTW001N
			2 m	R88A-CTW002N
	Relay terminal block		–	XW2B-50G5

Cable (for CN5)

Symbol	Name	Order code
⑩	Analogue monitor cable	R88A-CMW001S or DE9404559

Options (for CN3)

Symbol	Name	Order code
⑪	Computer connecting cable	R88A-CCW002P2 or JZSP-CMS02

Human machine interface

Symbol	Name	Order code
⑫	4.1“ HMI monochrome	NT3S-ST126B-E

Option units (for CN10)

Symbol	Name	Order code
⑬	IO card, 8 inputs/8 outputs	XDIO-08

Filters

Symbol	Applicable servo drive	Rated current	Rated voltage	Order code
⑭	XD-P3-M_, XD-P5-M_, XD-01-M_, XD-02-M_	4 A	250 VAC single-phase	R88A-FIW104-SE
	XD-04-M_	7A		R88A-FIW107-SE
	XD-08-M_	15 A		R88A-FIW115-SE
	XD-15-M_	25 A		R88A-FIW125-SE
	XD-05-T_, XD-10-T_, XD-15-T_	6 A	400 VAC three-phase	R88A-FIW4006-SE
	XD-20-T_, XD-30-T_	10 A		R88A-FIW4010-SE
	XD-50-T_	20 A		R88A-FIW4020-SE

Battery backup for absolute encoder

Name	Order code
Battery (required for servo motors with absolute encoder)	JZSP-BA01 ER6VC3 (3.6V)

Connectors

Specification		Order code
Control I/O connector (For CN1)		R88A-CNU11C or JZSP-CKI9
XtraDrive 200V connector kit. (For 200V motors SGMAH/PH-__A___D-0Y and R7M-A_ -D)	Connectors included DE9406973 SPOC-17H-FRON169 SPOC-06K-FSDN169	XD-CN200K-DE
XtraDrive 400V connector kit. (For 400V motors SGMAH/PH-__D___D-0Y)	Connectors included DE9406973 SPOC-17H-FRON169 LPRA-06B-FRBN170	XD-CN400K-DE
Sigma-II Drive encoder connector (For CN2)		DE9406973 or R88A-CNU01R
Hypertac encoder connector IP67 (For motors SGMAH/PH-_____D-0Y and R7M-A_ -D)		SPOC-17H-FRON169
Hypertac power connector IP67, 200V. (For 200V motors SGMAH/PH-__A____D-0Y and R7M-A_ -D)		SPOC-06K-FSDN169

Specification	Order code
Hypertac power connector IP67, 400V. (For 400V motors SGMAH/PH-__D____D-0Y)	LPRA-06B-FRBN170
Military encoder connector IP67 (For motors SGMGH-_, SGMSH-_, SGMUH-_)	MS3108E20-29S
Military power connector IP67 (For 400V motors SGMGH-(05/10/13)D_, SGMSH-(10/15/20)D_, SGMUH-(10/15)D_)	MS3108E18-10S
Military power connector IP67 (For 400V motors SGMGH-(20/30/44)D_, SGMSH-(30/40/50)D_, SGMUH-(30/40)D_)	MS3108E22-22S
Military brake connector IP67 (For 400V servo motors SGMGH-_, SGMSH-_, SGMUH-_)	MS3108E10SL-3S

Computer software

Specifications	Order code
XtraWare	MOTION TOOLS

Specifications

Single-phase, 230 V

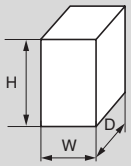
Servo drive type			XD-P3-M_	XD-P5-M_	XD-01-M_	XD-02-M_	XD-04-M_	XD-08-M_	XD-15-M_
Applicable servo motor		SGMAH-_	A3A_	A5A_	01A_	02A_	04A_	08A_	15A_
		SGMPH-_	–	–	01A_	02A_	04A_	08A_	–
		R7M-_	A03030-_	A05030-_	A10030-_	A20030-_	A40030-_	A75030-_	–
		R7M-_	–	–	AP10030-_	AP20030-_	AP40030-_	AP75030-_	–
Basic specifications	Max. applicable motor capacityW		30	50	100	200	400	750	1500
	Continuous output currentA(rms)		0.44	0.64	0.91	2.1	2.8	5.7	11.6
	Max. output currentA(rms)		1.3	2.0	2.8	6.5	8.5	13.9	28
	Input power	Main circuit	For single-phase, 200 to 230 VAC +10 to -15%						
	Supply	Control circuit	For single-phase, 200 to 230 VAC +10 to -15%						
	Control method		Single phase full-wave rectification/IGBT/PWM/sine-wave current drive method						
	Feedback		Serial encoder (incremental/absolute value)						
	Conditions: Usage/storage temperature		0 to +55°C/-20 to 85°C						
	Conditions: Usage/storage humidity		90% RH or less (non-condensing)						
	Conditions: Altitude		1000 m or less above sea level						
	Conditions: Vibration/shock resistance		4.9 m/s^2/19.6 m/s^2						
	Configuration		Base mounted						
	Approx. weight (kg)		0.8				1.1	1.7	3.8

Three-phase, 400 V

Servo drive type			XD-05-T_	XD-10-T_	XD-15-T_	XD-20-T_	XD-30-T_	XD-50-T_
Applicable servo motor		SGMAH-_	03D_	07D_	–	–	–	–
		SGMPH-_	02D_, 04D_	08D_	15D_	–	–	–
		SGMGH-_	05D_	09D_	13D_	20D_	30D_	44D_
		SGMSH-_	–	10D_	15D_	20D_	30D_	40D_/50D_
		SGMUH-_	–	10D_	15D_	–	30D_	40D_
Basic specifications	Max. applicable motor capacitykW		0.45	1.0	1.5	2.0	3.0	5.0
	Continuous output current A(rms)		1.9	3.5	5.4	8.4	11.9	16.5
	Max. output currentA(rms)		5.5	8.5	14	20	28	40.5
	Input power	Main circuit	For three-phase, 380 to 480 VAC + 10 to -15% (50/60Hz)					
	Supply	Control circuit	24VDC+ 15%					
	Control method		Three phase full-wave rectification/IGBT/PWM/sine-wave current drive method					
	Feedback		Serial encoder (incremental/absolute value)					
	Conditions: Usage/storage temperature		0 to +55°C/-20 to +85°C					
	Conditions: Usage/storage humidity		90% RH or less (non-condensing)					
	Conditions: Altitude		1000 m or less above sea level					
	Conditions: Vibration/shock resistance		4.9 m/s^2/19.6 m/s^2					
	Configuration		Base mounted					
	Approx. weight (kg)		2.8			3.8		5.5

Dimensions

Servo drives

Specifications		Drive model	H	W	D	
1-phase 200 VAC	30 W	XD-P3-M_	160	55	130	
	50 W	XD-P5-M_				
	100 W	XD-01-M_				
	200 W	XD-02-M_				
	400 W	XD-04-M_	160	75	130	
	750 W	XD-08-M_	160	90	180	
	1.5 kW	XD-15-M_	250	110	180	
3-phase 400 VAC	0.5 kW	XD-05-T_	160	110	180	
	1.0 kW	XD-10-T_				
	1.5 kW	XD-15-T_				
	2.0 kW	XD-20-T_	250	110	180	
	3.0 kW	XD-30-T_				
	5.0 kW	XD-50-T_	250	125	230	

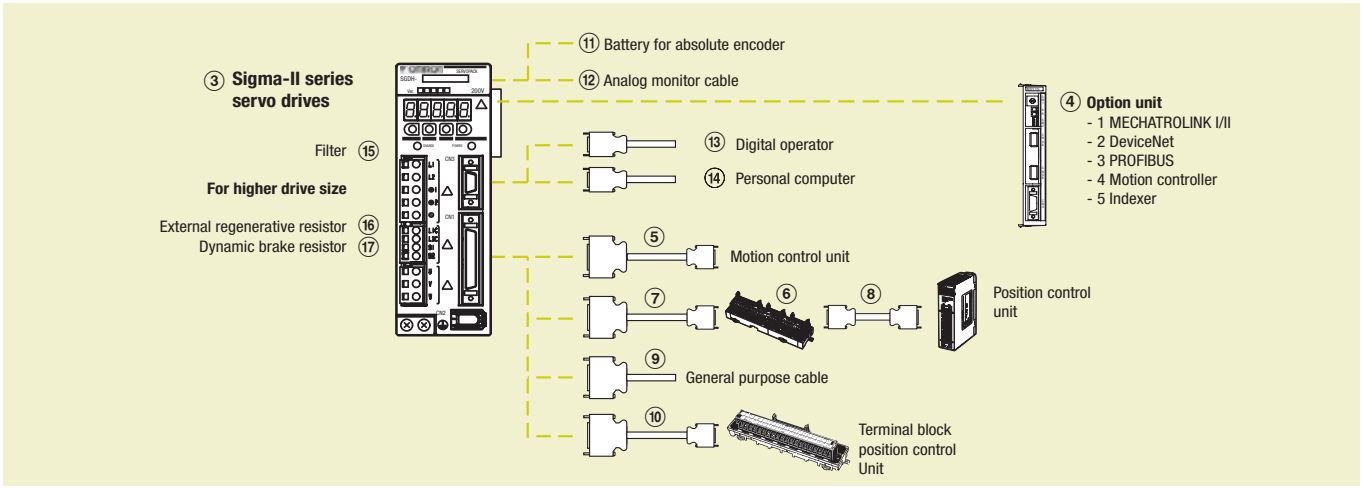


Designed with ZERO compromise

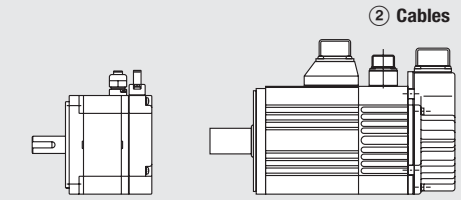
The Sigma-II servo series was designed with ZERO compromise on quality, reliability or performance. The servo amplifiers are ultra-compact with pulse and analogue inputs as standard, plus an auto-tuning function. Plug-in option cards offer enhanced functionality such as indexing and complex motion such as cams, gears and linked axes.

- 300% peak current for 3 seconds
- Automatic motor recognition with auto-tuning function
- Analogue and pulse inputs for speed, torque and position control
- Option units for Fieldbuses, MECHATROLINK-II, servos and motion controller and indexers
- Trace function allowing oscilloscope function

Ordering information



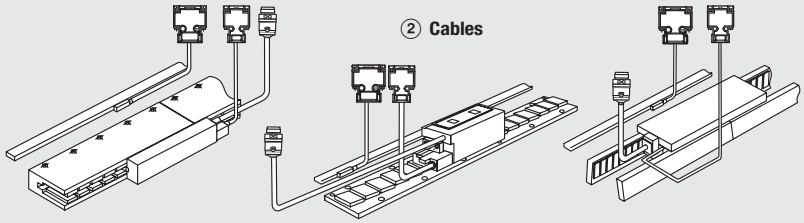
(Refer to chapter Sigma-II rotary motors)



① SGMAH, SGMPH servo motor

① SGMGH, SGMUH, SGMSH, SGMBH servo motor

(Refer to chapter Sigma-II linear motors)



① SGLG_ linear servo motor

① SGLF_ linear servo motor

① SGLT_ linear servo motor

Note: The symbols ①②③④⑤... show the recommended sequence to select the components in a Sigma-II servo system

Servo motors, power & encoder cables

Note: ①② Refer to the servo motors chapter for detailed motor specifications and selection

Servo drives

Symbol	Specifications		Compatible rotary servo motors ①	Compatible linear motors ①	Order code
③	1 Phase 200 VAC	30 W	SGMAH-A3A_	–	SGDH-A3AE-OY
		50 W	SGMAH-A5D_	SGLGW-30A050_	SGDH-A5AE-OY
		100 W	SGMAH-01A_, SGMPH-01A_	SGLGW-30A080_, SGLGW-40A140_	SGDH-01AE-OY
		200 W	SGMAH-02A_, SGMPH-02A_	SGLFW-20A_, SGLFW-35A120_, SGLGW-40A253A_,SGLGW-60A140_	SGDH-02AE-OY
		400 W	SGMAH-04A_, SGMPH-04A_	SGLGW-40A365A_, SGLGW-60A253A_	SGDH-04AE-OY
		750 W	SGMAH-08A_, SGMPH-08A_	SGLFW-35A230_, SGLFW-50A200_, SGLGW-60A365A_	SGDH-08AE-S-OY
		1500 W	SGMPH-15A_	SGLFW-50A380_, SGLFW-1ZA200_, SGLGW-90A200A_	SGDH-15AE-S-OY

Symbol	Specifications		Compatible rotary servo motors ①	Compatible linear motors ①	Order code
③	3 Phase 400 VAC	0.5 kW	SGMGH-05D_, SGMAH-03D_, SGMPH-02D_/04D_	SGLFW-35D_	SGDH-05DE-OY
		1.0 kW	SGMGH-09D_, SGMSH/UH-10D_, SGMAH-07D_, SGMPH-08D_	SGLFW-50D200_, SGLTW-35D170_, SGLTW-50D170_	SGDH-10DE-OY
		1.5 kW	SGMGH-13D_, SGMSH/UH-15D_, SGMPH-15D_	SGLFW-50D380_, SGLFW-1ZD200_	SGDH-15DE-OY
		2 kW	SGMGH-20D_, SGMSH-20D_	SGLTW-35D320_, SGLTW-50D320_	SGDH-20DE-OY
		3 kW	SGMGH-30D_, SGMSH/UH-30D_	SGLFW-1ZD380_, SGLTW-40D400_	SGDH-30DE-OY
		5 kW	SGMGH-44D_, SGMSH/UH-40D_, SGMSH-50D_	SGLTW-40D60_, SGLTW-80D400_	SGDH-50DE-OY
		6 kW	SGMGH-55D_	–	SGDH-60DE-OY
		7.5 kW	SGMGH-75D_	SGLTW-80D600_	SGDH-75DE-OY
		11 kW	SGMGH-1AD_	–	SGDH-1ADE-OY
		15 kW	SGMGH-1ED_	–	SGDH-1EDE-OY
		22 kW	SGMBH-2BD_	–	SGDH-2BDE
		30 kW	SGMBH-3ZD_	–	SGDH-3ZDE
		37 kW	SGMBH-3GD_	–	SGDH-3GDE
		45 kW	SGMBH-4ED_	–	SGDH-4EDE
		55 kW	SGMBH-5ED_	–	SGDH-5EDE

Option units (for CN10)

Symbol	Name	Order code
④	1.5 axis advanced motion controller with host link interface	R88A-MCW151-E
	1.5 axis advanced motion controller with DeviceNet interface	R88A-MCW151-DRT-E
	MECHATROLINK-I interface unit	JUSP-NS100
	MECHATROLINK-II interface unit	JUSP-NS115
	DeviceNet interface unit with positioning functionality	JUSP-NS300
	PROFIBUS-DP interface unit with positioning functionality	JUSP-NS500
	Indexer unit. versatile point to point positioning	JUSP-NS600

Note:④ Refer to the servo drive option unit chapter for detailed specifications and selection

Control cables (for CN1)

Symbol	Description	Connect to	Length	Order code
⑤	Control cable (1 axis)	Motion control units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M1
			2 m	R88A-CPW002M1
			3 m	R88A-CPW003M1
			5 m	R88A-CPW005M1
	Control cable (2 axes)	Motion control units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M2
			2 m	R88A-CPW002M2
			3 m	R88A-CPW003M2
			5 m	R88A-CPW005M2
	Terminal block (4 axes)	Motion control unit C200HW-MC402-E	–	R88A-TC04-E
	Servo drive connecting cable (1 axis)		1 m	R88A-CMUK001J3-E2
	PLC unit control cables (4 axes)		1 m	R88A-CMX001S-E
			1 m	R88A-CMX001J1-E
⑥	Servo relay unit	CS1W-NC1_3, CJ1W-NC1_3, or C200HW-NC113 position control unit	–	XW2B-20J6-1B (1 axis)
		CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3, or C200HW-NC213/413 position control unit	–	XW2B-40J6-2B (2 axes)
		CQM1H-PLB21 CQM1-CPU43	–	XW2B-20J6-3B (1 axis)
		CJ1M-CPU22/23	–	XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes)
⑦	Cable to servo drive	Servo relay units XW2B-_0J6-_B	1 m	XW2Z-100J-B4
			2 m	XW2Z-200J-B4
⑧	Position control unit connecting cable	C200H-NC112	0.5 m	XW2Z-050J-A1
			1 m	XW2Z-100J-A1
		C200H-NC211	0.5 m	XW2Z-050J-A2
			1 m	XW2Z-100J-A2
		CQM1-CPU43-V1 and CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 and C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 and C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11

Symbol	Description	Connect to	Length	Order code
⑧	Position control unit connecting cable	CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU22/23	0.5 m	XW2Z-050J-A27
			1 m	XW2Z-100J-A27
⑨	Control cable	For general purpose controllers	1 m	R88A-CPW001S
				JZSP-CKI01-1
			2 m	R88A-CPW002S
				JZSP-CKI01-1
⑩	Relay terminal block cable	General purpose controller	1 m	R88A-CTW001N
			2 m	R88A-CTW002N
	Relay terminal block		–	XW2B-50G5

Battery backup for absolute encoder (for CN8)

Symbol	Name	Order code
⑪	Battery for 30 W to 5 kW drives	JZSP-BA01
	Battery for 6 kW to 15 kW drives	JZSP-BA01-1

Cable (for CN5)

Symbol	Name	Order code
⑫	Analogue monitor cable	R88A-CMW001S or DE9404559

Options (for CN3)

Symbol	Name	Order code
⑬	Parameter unit with cable	JUSP-OP02A-2 or R88A-PR02W
⑭	Computer connecting cable	R88A-CCW002P2 or JZSP-CMS02

Filters

Symbol	Applicable servo drive	Rated current	Rated voltage	Order code
⑮	SGDH-A3AE-OY,SGDH-A5AE-OY, SGDH-01AE-OY, SGDH-02AE-OY	4 A	250 VAC single-phase	R88A-FIW104-SE
	SGDH-04AE-OY	7A		R88A-FIW107-SE
	SGDH-08AE-S-OY	15 A		R88A-FIW115-SE
	SGDH-15AE-S-OY	25 A		R88A-FIW125-SE
	SGDH-05DE-OY, SGDH-10DE-OY,SGDH-15DE-OY	6 A	400 VAC three-phase	R88A-FIW4006-SE
	SGDH-20DE-OY, SGDH-30DE-OY	10 A		R88A-FIW4010-SE
	SGDH-50DE-OY	20 A		R88A-FIW4020-SE
	SGDH-60DE-OY, SGDH-75DE-OY	30 A		R88A-FIW4030-SE
	SGDH-1ADE-OY, SGDH-1EDE-OY	55 A		R88A-FIW4055-SE
	SGDH-2BDE, SGDH-3ZDE, SGDH-3GDE	180 A		FN258-180-07
	SGDH-4EDE, SGDH-5EDE	250 A		FN359-250-99

External regenerative resistor

Symbol	Applicable servo drive	Specifications	Order code
⑯	SGDH-60DE-OY to -75DE-OY	18 Ω , 880 W	JUSP-RA18
	SGDH-1ADE-OY to -1EDE-OY	14.25 Ω , 1760 W	JUSP-RA19
	SGDH-2BDE	9 Ω, 3600 W	JUSP-RA12
	SGDH-3ZDE	6.7 Ω, 3600 W	JUSP-RA13
	SGDH-3GDE	5 Ω, 4800 W	JUSP-RA14
	SGDH-4EDE	4 Ω, 6000 W	JUSP-RA15
	SGDH-5EDE	3.8 Ω, 7200 W	JUSP-RA16

DB resistor units

Symbol	Servo drive model	Specifications. star wiring	Order code
⑰	SGDH-2BDE, SGDH-3ZDE	180 W, 0.8 Ω	JUSP-DB03
	SGDH-3GDE	180 W, 0.8 Ω	JUSP-DB04
	SGDH-4EDE	180 W, 0.8 Ω	JUSP-DB05
	SGDH-5EDE	300 W, 0.8 Ω	JUSP-DB06

Connectors

Specification	Order code
Control I/O connector (For CN1)	R88A-CNU11C or JZSP-CKI9
Sigma-II drive encoder connector (For CN2)	JZSP-CMP9-1
Communications connector (For CN3)	R7A-CNA01R

Computer software

Specifications	Order code
Configuration and monitoring software tool for servo drives and inverters. (CX-Drive version 1.11 or higher)	CX-DRIVE
Complete Omron software package including CX-Drive (CX-One version 1.1 or higher)	CX-ONE

For full specifications please refer to chapter software on page 582.

Specifications

Single-phase, 230 V

Servo drive type		**SGDH-_**	**A3AE-OY**	**A5AE-OY**	**01AE-OY**	**02AE-OY**	**04AE-OY**	**08AE-S-OY**	**15AE-S-OY**
Applicable servo motor		**SGMAH-_**	**A3A_**	**A5A_**	**01A_**	**02A_**	**04A_**	**08A_**	**–**
		SGMPH-_	**–**	**–**	**01A_**	**02A_**	**04A_**	**08A_**	**15A_**
Basic specifications	Max. applicable motor capacity W		30	50	100	200	400	750	1500
	Continuous output current A(rms)		0.44	0.64	0.91	2.1	2.8	5.7	11.6
	Max. output current A(rms)		1.3	2.0	2.8	6.5	8.5	13.9	28
	Input power	Main circuit	For single-phase, 200 to 230 VAC + 10 to -15%					220 to 230 VAC +10 to -15% (50/60 Hz)	
	Supply	Control circuit	For single-phase, 200 to 230 VAC + 10 to -15%						
	Control method		Single phase full-wave rectification/IGBT/PWM/sine-wave current drive method						
	Feedback		Serial encoder (incremental/absolute value)						
	Conditions: Usage/storage temperature		0 to +55°C/-20 to 85°C						
	Conditions: Usage/storage humidity		90% RH or less (non-condensing)						
	Conditions: Altitude		1000 m or less above sea level						
	Conditions: Vibration/shock resistance		4.9 m/s^2/19.6 m/s^2						
	Configuration		Base mounted						
	Approx. weight kg		0.8				1.1	1.7	3.8

Three-phase, 400 V (up to 15 kW)

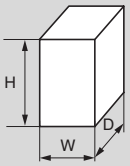
Servo drive type		**SGDH-_**	**05DE-OY**	**10DE-OY**	**15DE-OY**	**20DE-OY**	**30DE-OY**	**50DE-OY**	**60DE-OY**	**75DE-OY**	**1ADE-OY**	**1EDE-OY**
Applicable servo motor		**SGMGH-_**	**05D_**	**09D_**	**13D_**	**20D_**	**30D_**	**44D_**	**55D_**	**75D_**	**1AD_**	**1ED_**
		SGMSH-_	**–**	**10D_**	**15D_**	**20D_**	**30D_**	**40D_/50D_**	**–**	**–**	**–**	**–**
		SGMUH-_	**–**	**10D_**	**15D_**	**–**	**30D_**	**40D_**	**–**	**–**	**–**	**–**
Basic specifications	Max. applicable motor capacitykW		0.45	1.0	1.5	2.0	3.0	5.0	6.0	7.5	11	15
	Continuous output currentA(rms)		1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.4	28.1	37.2
	Max. output currentA(rms)		5.5	8.5	14	20	28	40.5	55	65	70	85
	Input power	Main circuit	For three-phase, 380 to 480 VAC + 10 to -15% (50/60 Hz)									
	Supply	Control circuit	24 VDC + 15%									
	Control method		Three phase full-wave rectification/IGBT/PWM/sine-wave current drive method									
	Feedback		Serial encoder (incremental/absolute)									
	Conditions: Usage/storage temperature		0 to +55°C/-20 to +85°C									
	Conditions: Usage/storage humidity		90% RH or less (non-condensing)									
	Conditions: Altitude		1000 m or less above sea level									
	Conditions: Vibration/shock resistance		4.9 m/s^2/19.6 m/s^2									
	Configuration		Base mounted									
	Approx. weight kg		2.8			3.8		5.5	15		22	

Three-phase, 400 V (from 22 kW to 55 kW)

Servo drive type		**SGDH-_**	**2BDE**	**3ZDE**	**3GDE**	**4EDE**	**5EDE**
Applicable servo motor		**SGMBH-_**	**2BD_A**	**3ZD_A**	**3GD_A**	**4ED_A**	**5ED_A**
Basic specifications	Max. applicable motor capacitykW		22	30	37	45	55
	Continuous output currentA(rms)		58	80	100	127	150
	Max. output currentA(rms)		120	170	210	260	310
	Input power	Main circuit	For three-phase, 380 to 480 VAC + 10 to -15% (50/60 Hz)				
	Supply	Control circuit	24 VDC+ 15%				
	Control method		Three phase full-wave rectification/IGBT/PWM/sine-wave current drive method				
	Feedback		Serial encoder (incremental/absolute)				
	Conditions: Usage/storage temperature		0 to +55°C/-20 to +85°C				
	Conditions: Usage/storage humidity		90% RH or less (non-condensing)				
	Conditions: Altitude		1000 m or less above sea level				
	Conditions: Vibration/shock resistance		4.9 m/s^2/19.6 m/s^2				
	Configuration		Base mounted				
	Approx. weight kg		40		60	65	

Dimensions

Servo drives

Specifications		Drive model	H	W	D	
1-phase 200 VAC	30 W	SGDH-A3AE-0Y	160	55	130	
	50 W	SGDH-A5AE-0Y				
	100 W	SGDH-01AE-0Y				
	200 W	SGDH-02AE-0Y				
	400 W	SGDH-04AE-0Y	160	75	130	
	750 W	SGDH-08AE-S-0Y	160	90	180	
	1.5 kW	SGDH-15AE-S-0Y	250	110	180	
3-phase 400 VAC	0.5 kW	SGDH-05DE-0Y	160	110	180	
	1.0 kW	SGDH-10-DE-0Y				
	1.5 kW	SGDH-15AE-0Y				
	2.0 kW	SGDH-20DE-0Y	250	110	180	
	3.0 kW	SGDH-30DE-0Y				
	5.0 kW	SGDH-50DE-0Y	250	125	230	
	6.0 kW	SGDH-60DE-0Y	350	230	235	
	7.5 kW	SGDH-75DE-0Y				
	11 kW	SGDH-1ADE-0Y	450	260	285	
	15 kW	SGDH-1EDE-0Y				
	22 kW	SGDH-2BDE	500	370	348	
	30 kW	SGDH-3ZDE				
	37 kW	SGDH-3GDE	475	500	348	
	45 kW	SGDH-4EDE	475	550	348	
	55 kW	SGDH-5EDE				

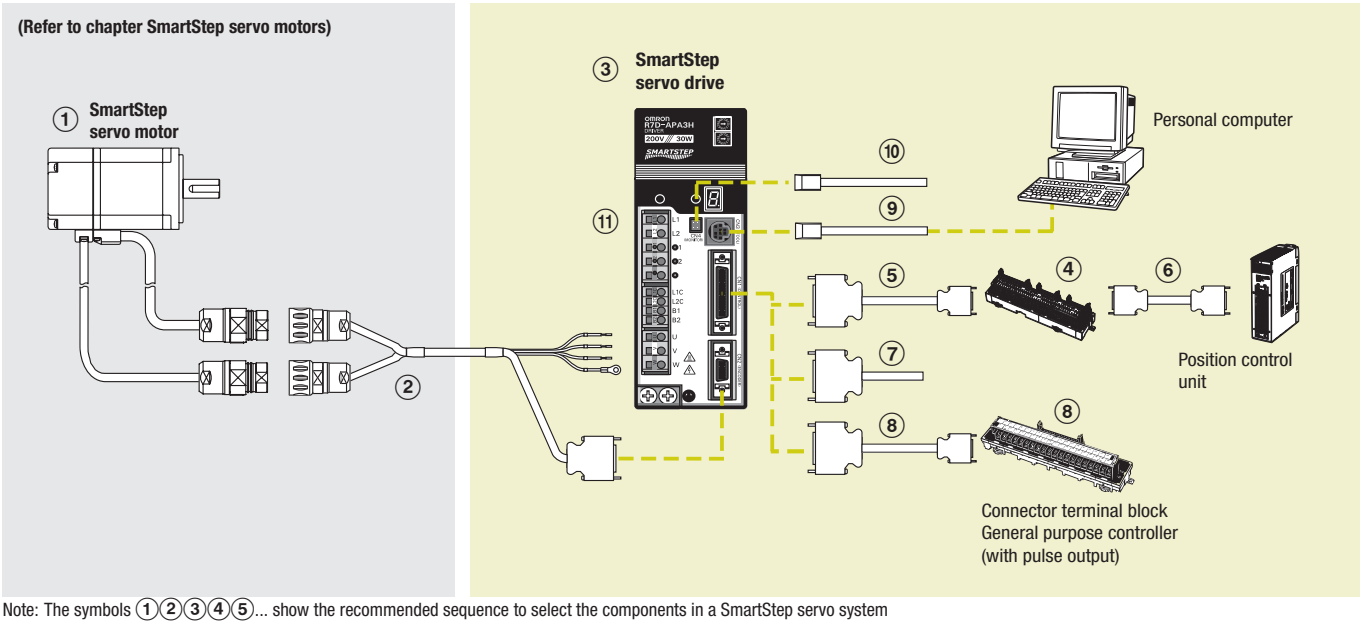


Servo capability with stepper simplicity

SmartStep is designed and engineered to provide you with an easy way to migrate from steppers to servos in minutes. It accepts pulse-train input, can be configured quickly via simple dip switches and has an online auto-tuning function. Thus, the SmartStep offers all the simplicity and cost-effectiveness of a stepper with the added advantages of the servo drive capability.

- Output range from 30 W to 750 W
- 300% peak current over nominal
- Control via pulse train (speed and position)
- Position resolution of 8,000 steps per revolution
- On-line auto-tuning with 10 levels of rigidity

Ordering information



Note: The symbols ①②③④⑤... show the recommended sequence to select the components in a SmartStep servo system

Servo motors, power & encoder cables

Note: ①② Refer to the SmartStep servo motor chapter for detailed motor specifications and selection

Servo drives

Symbol	Specifications		Order code		
			SmartStep drive model	Compatible servo motors ①	
				Cylindrical type	Flat type
③	200 VAC	30 W	R7D-APA3H	R7M-A03030-_	–
		50 W	R7D-APA5H	R7M-A05030-_	–
		100 W	R7D-AP01H	R7M-A10030-_	R7M-AP10030-_
		200 W	R7D-AP02H	R7M-A20030-_	R7M-AP20030-_
		400 W	R7D-AP04H	R7M-A40030-_	R7M-AP40030-_
		750 W	R7D-AP08H	R7M-A75030-_	R7M-AP75030-_

Control cables (For CN1)

Symbol	Name	Compatible units	Available lengths	Order code*1
④	Servo relay unit	Use with position control units (does not support communications functions.) Units: CS1W-NC113/133, CJ1W-NC113/133, C200HW-NC113, and C200H-NC112	–	XW2B-20J6-1B (1 axis)
		Use with position control units (does not support communications functions.) Units: CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433, C200HW-NC213/413, C500-NC113/211, and C200H-NC211		XW2B-40J6-2B (2 axes)
		Use with position control units (does not support communications functions.) Units: CQM1H-PLB21, and CQM1-CPU43-V1		XW2B-20J6-3B (1 axis)
		Use with position control units (supports communications functions.) Units: CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433		XW2B-40J6-4A (2 axes)
		Use with CJ1M-CPU22/23 (does not support communications functions.)		XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes)

Symbol	Name	Compatible units	Available lengths	Order code*1
⑤	Cable to servo drive	Does not support communications functions. (for the XW2B-__J6-_B)	1 m or 2 m	XW2Z-___J-B5
		Supports communications functions. (for the XW2B-__J6-4B)		XW2Z-___J-B7
⑥	Cable to position control unit	CQM1H-PLB21 and CQM1-CPU43-V1	0.5 m or 1 m	XW2Z-___J-A3
		C200H-NC112		XW2Z-___J-A4
		C200H-NC211 and C500-NC113/211		XW2Z-___J-A5
		CS1W-NC113 and C200HW-NC113		XW2Z-___J-A8
		CS1W-NC213/413 and C200HW-NC213/413		XW2Z-___J-A9
		CS1W-NC133		XW2Z-___J-A12
		CS1W-NC233/433		XW2Z-___J-A13
		CJ1W-NC113		XW2Z-___J-A16
		CJ1W-NC213/413		XW2Z-___J-A17
		CJ1W-NC133		XW2Z-___J-A20
		CS1W-NC233/433		XW2Z-___J-A21
		CJ1M-CPU22/23		XW2Z-___J-A26
⑦	Control cable	For general-purpose controllers	1 m or 2 m	R88A-CPU___S
⑧	Connector terminal block cable	For general-purpose controllers		R88A-CTU___N
	Connector terminal block		–	XW2B-40F5-P

*1 Replace the placeholder "_" by cable length from column "Available lengths".

Cable for CN3

Symbol	Name	Order code
⑨	Computer monitor cable	R7A-CCA002P2

Cable for CN4

Symbol	Name	Order code
⑩	Analogue monitor cable	R88A-CMW001S

Filters

Symbol	Applicable servo drive	Rated current	Rated voltage	Order code
⑪	R7D-APA3H, R7D-APA5H, R7D-AP01H, R7D-AP02H	4 A	250 VAC Single phase	R88A-FIW104-E
	R7D-AP04H	7 A		R88A-FIW107-E
	R7D-AP08H	15 A		R88A-FIW115-E

Connectors

Specifications		Order code
Control I/O connector (For CN1)		R88A-CNU01C
SmartStep connectors kit	Models included in kit	R7A-CNA00K-DE
SmartStep encoder connector (For CN2)	R7A-CNA01R	
Hypertac power connectors female	SPOC-06K-FSDN169	
Hypertac encoder connectors female	SPOC-17H-FRON169	

External regeneration resistor

Specification	Order code
220 W, 47 Ω	R88A-RR22047S

Parameter unit & computer software

Specifications	Order code
Parameter copy unit (with cable)	R7A-PR02A
Configuration and monitoring software tool for servo drives and inverters. (CX-Drive version 1.11 or higher)	CX-DRIVE
Complete Omron software package including CX-Drive (CX-One version 1.1 or higher)	CX-ONE

Specifications

General specifications

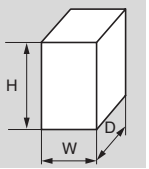
Item	Specification
Ambient operating temperature	0 to 55°C
Ambient operating humidity	90% max. (with no condensation)
Ambient storage temperature	-20 to 85°C
Ambient storage humidity	90% max. (with no condensation)
Storage/operating atmosphere	No corrosive gases.
Vibration resistance	10 to 55 Hz in X, Y, and Z directions with 0.1-mm double amplitude or acceleration of 4.9 m/s^2 max., whichever is smaller
Impact resistance	Acceleration 19.6 m/s^2 max., in X, Y, and Z directions, three times
Insulation resistance	Between power line terminals and case: 0.5 MΩ min. (at 500 VDC)
Dielectric strength	Between power line terminals and case: 1,500 VAC for 1 min at 50/60 Hz Between each control signal and case: 500 VAC for 1 min
Protective structure	Built into panel (IP10).
International standards	Approval obtained for UL, cUL, and EN (EMC directive and low-voltage directive)

Performance specifications

Item	200 VAC input type					
	30 W	50 W	100 W	200 W	400 W	750 W
	R7D-APA3H	R7D-APA5H	R7D-AP01H	R7D-AP02H	R7D-AP04H	R7D-AP08H
Continuous output current (rms)	0.42	0.6	0.89	2.0	2.6	4.4
Momentary maximum output current (rms)	1.3	1.9	2.8	6.0	8.0	13.9
Control power supply	Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz					
Main-circuit power supply	Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz (Three-phase 200/230 VAC can be used with the 750 W model.)					
Control method	All-digital servo					
Speed feedback	2,000 pulses/revolution incremental encoder					
Inverter method	PWM method based on IGBT					
PWM frequency	11.7 kHz					
Weight	0.8	0.8	0.8	0.8	1.1	1.7
Compatible motor voltage	200 V					
Compatible motor capacity	30 W	50 W	100 W	200 W	400 W	750 W
Command pulse response	250 kHz					
Applicable servo motor (R7M-)	A03030	A05030	A10030 AP10030	A20030 AP20030	A40030 AP40030	A75030 AP75030

Dimensions

Servo drives

Specifications		Drive model	H	W	D	
1-phase 200 VAC	30 W	R7D-APA3H	160	55	130	
	50 W	R7D-APA5H				
	100 W	R7D-AP01H				
	200 W	R7D-AP02H				
	400 W	R7D-AP04H	160	75	130	
	750 W	R7D-AP08H	160	90	180	

Junma ML-II servo drive



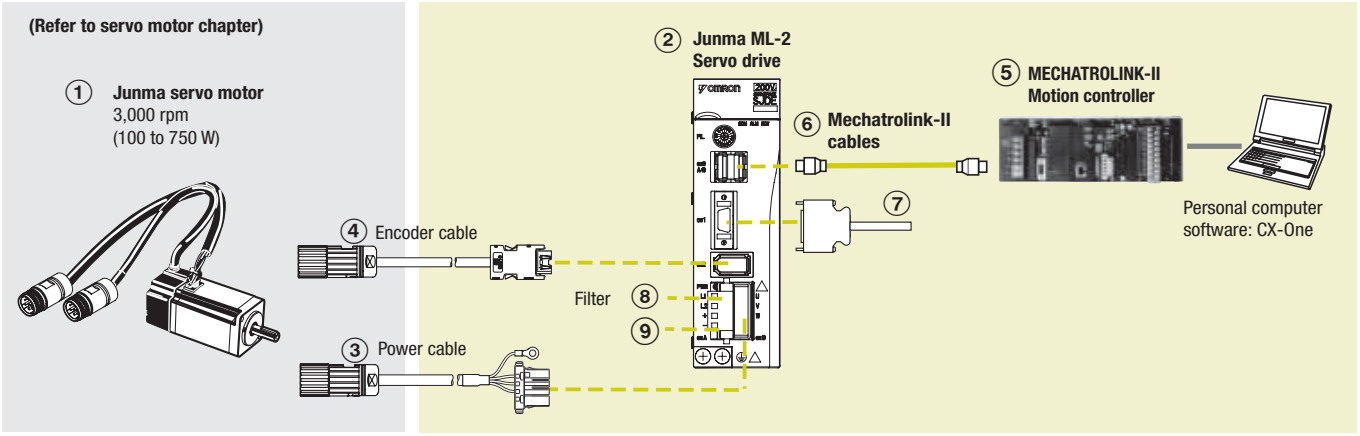
A new concept in drive simplicity – save space, save wiring, save time

Junma compact servo drive with built-in MECHATROLINK-II significantly reduces wiring and set-up time, while saving up to 30% of cabinet space. The Junma series is the first in the world to be fully tuning-free and programless.

- Output range from 100 W to 750 W
- Drive with built-in MECHATROLINK-II port
- Tuning-free technology, no gain parameters need to be set
- Peak torque 300% of nominal for 3 seconds
- Position resolution of 8,192 steps per revolution

Ordering information

Junma MECHATROLINK-II servo drive configuration



Servomotors and servo drives

Symbol	Specifications					Order code	
	Voltage	Encoder and design		Rated torque	Capacity	① Servomotor model	② Servo drive model
①②	1 Phase 200 VAC	Analogue incremental encoder Straight shaft with key	Without brake	0.318 Nm	100 W	SJME-01AMC41-0Y	SJDE-01ANA-0Y
				0.637 Nm	200 W	SJME-02AMC41-0Y	SJDE-02ANA-0Y
				1.27 Nm	400 W	SJME-04AMC41-0Y	SJDE-04ANA-0Y
				2.39 Nm	750 W	SJME-08AMC41-0Y	SJDE-08ANA-0Y
			With brake	0.318 Nm	100 W	SJME-01AMC4C-0Y	SJDE-01ANA-0Y
				0.637 Nm	200 W	SJME-02AMC4C-0Y	SJDE-02ANA-0Y
				1.27 Nm	400 W	SJME-04AMC4C-0Y	SJDE-04ANA-0Y
				2.39 Nm	750 W	SJME-08AMC4C-0Y	SJDE-08ANA-0Y

Power and encoder cables

Note: ③④ Refer to the Junma servo motor section for motor cables or connectors selection

MECHATROLINK-II motion controllers

Symbol	Name	Order code
⑤	Position controller unit for CJ1 PLC	CJ1W-NCF71
	Position controller unit for CS1 PLC	CS1W-NCF71
	Trajexia PLC motion controller, 30 axes	CJ1W-MCH72
	Trajexia stand-alone motion controller, 16 Axes	TJ1-MC16
	Trajexia stand-alone motion controller, 4 Axes	TJ1-MC04

MECHATROLINK-II cables

Symbol	Specifications		Order code
⑥	MECHATROLINK-II terminator resistor		JEPMC-W6022
	MECHATROLINK-II cables	0.5 m	JEPMC-W6003-A5
		1 m	JEPMC-W6003-01
		3 m	JEPMC-W6003-03
		5 m	JEPMC-W6003-05
		10 m	JEPMC-W6003-10
		20 m	JEPMC-W6003-20
		30 m	JEPMC-W6003-30

Cables for I/Os (for CN1)

Symbol	Name	Compatible units		Order code
⑦	Control cable	Cable for servo drive I/O signals	1 m	R7A-CPZ001S or JZSP-CHI003-01
			2 m	R7A-CPZ002S or JZSP-CHI003-02
			3 m	JZSP-CHI003-03

Filters

Symbol	Applicable servo drive	Rated current	Leakage current	Rated voltage	Order code
⑧	SJDE-01ANA-0Y SJDE-02ANA-0Y SJDE-04ANA-0Y	5A	1.7 mA	250 VAC 1-phase	R7A-FIZN105-BE
	SJDE-08ANA-0Y	9A	1.7 mA		R7A-FIZN109-BE

Regenerative unit Model (Option)

Symbol	Specifications	Order code (Omron)	Order code (Yaskawa)
⑨	External regenerative unit (optional)	R88A-RG08UA	JUSP-RG08D

Connectors

Specification	Order code (Omron)	Order code (Yaskawa)
Control I/O connector (for CN1)	R7A-CNA01R	JZSP-CHI9-1
Power input connector (for CNB). (Included in drive the box)	R7A-CNZ01P	JZSP-CHG9-1

Computer software

Specifications	Order code
Configuration and monitoring software tool via ML2 (CX-Drive version 1.3 or higher)	CX-DRIVE
Complete Omron software package including CX-Drive (CX-One 2.0 or higher)	CX-ONE

For full specifications please refer to chapter software on page 582.

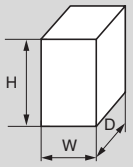
Servo drive specifications

Junma MECHATROLINK-II servo drive

	Servo drive type	SJDE-_	01ANA-OY	02ANA-OY	04ANA-OY	08ANA-OY
	Applicable servomotor	SJME-_	01A_	02A_	04A_	08A_
Basic specifications	Max. applicable motor capacity	W	100	200	400	750
	Continuous output current	Arms	0.84	1.1	2.0	3.7
	Max. output current	Arms	2.5	3.3	6.0	11.1
	Input power supply (Main circuit and control circuit)	Voltage	Single-phase, 200 to 230 VAC, +10 to -15% (50/60 Hz)			
		Capacity KVA	0.40	0.75	1.2	2.2
	Control method		PWM control, sine wave current drive system			
	Feedback		Analogue incremental encoder (13 bits incremental equivalent)			
	Allowable load inertia*1	$kg \cdot m^2$	0.6×10^{-4}	3.0×10^{-4}	5.0×10^{-4}	10.0×10^{-4}
	Usage/Storage temperature		0 to +55°C / -20 to 70°C			
	Usage/Storage humidity		90%RH or less (non-condensing)			
	Altitude		1000 m or less above sea level			
	Vibration/Shock resistance		4.9 m/s^2 (0.5G) / 19.6 m/s^2 (2G)			
	Configuration		Base mounted			
	Approx. mass	kg	1.0			1.4
Built-in functions	Dynamic brake (DB)		Operated at main power OFF, servo alarm, servo OFF.(OFF after motor stops; ON when motor power is off.)			
	Regenerative processing		Optional (If the regenerated energy is too large, install a regenerative unit JUSP-RG08D)			
	Over-travel (OT) prevention function		P_OT, N_OT			
	Emergency stop		Emergency stop (E-STP)			
	LED display		4 LEDs (PWR, RDY, COM, ALM)			
	MECHATROLINK-II monitor		MECHATROLINK-II under communication : COM LED (Light ON)			
	Servo ON/OFF monitor		At Servo OFF : RDY LED (Light OFF), at Servo ON : RDY LED (Light Blinks)			
	Power supply status monitor		Control/main-circuit power-supply OFF state: PWR LED (Light OFF) Control/main-circuit power-supply ON state: PWR LED (Light ON)			
	Electronic gearing		0,01< A/B<100			
	Protection		Overcurrent, overvoltage, undervoltage, overload, main circuit sensor error, board temperature error, excessive position error overflow, overspeed, encoder signal error, overrun protection, system error, parameter error			
	MECHATROLINK communication	Comm. protocol	MECHATROLINK-II			
		Transmission rate	10 Mbps			
		Transmission cycle	1 ms, 1.5 ms, 2 ms, 3 ms, 4 ms			
		Data length	17 byte and 32 byte			
	Command input	MECHATROLINK communication	MECHATROLINK-II commands (For sequence, motion, data setting/reference, monitor, adjustment, and other commands)			
	Sequence input signal	Fixed input	5 points (fixed layout: external latch signal, zero return reduced speed signal, forward drive inhibiting signal, reverse run inhibiting signal, emergency stop signal)			
	Sequence output signal	Fixed output	2 points (fixed layout: servo alarm, brake interlock)			

*1 Value without external regeneration unit.

Dimensions

Specifications		Drive model	H	W	D	
1-phase 200 VAC	100 W	SJDE-01ANA-OY	150	45	130	
	200 W	SJDE-02ANA-OY				
	400 W	SJDE-04ANA-OY				
	750 W	SJDE-08ANA-OY	150	70	180	



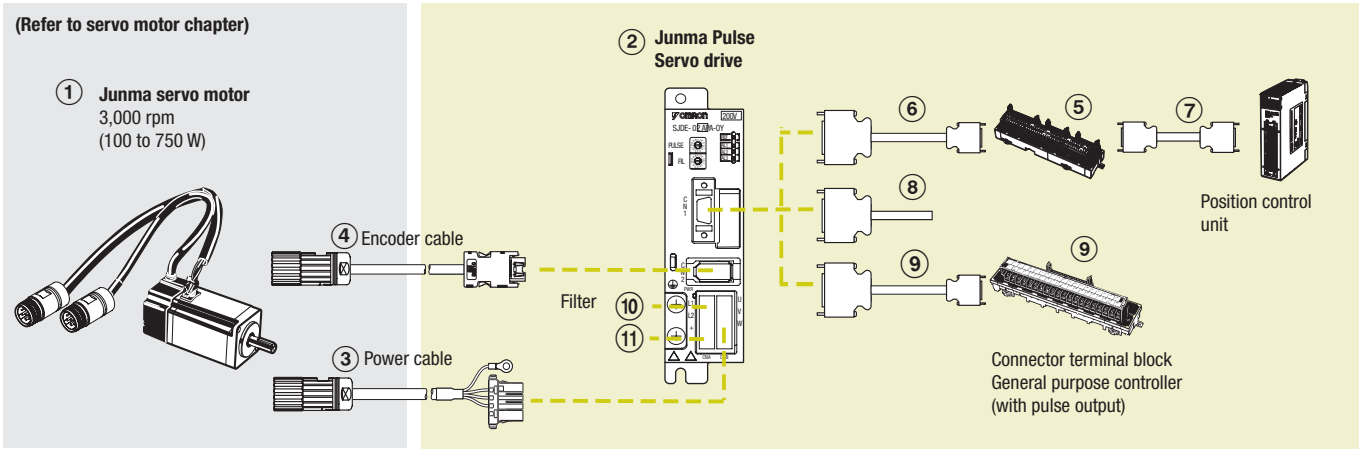
No more parameter set up – save space, save time

Junma series of ultra-compact, pulse-train-controlled servo drives, significantly reduces set-up time, while saving up to 44% of cabinet space. The series is the first in the world to be fully tuning-free and programless.

- Output range from 100 W to 750 W
- Fully "parameterless" drive, just plug and run
- Tuning-free technology, no gain parameters need to be set
- Peak torque 300% of nominal for 3 seconds
- Position resolution of 10,000 steps per revolution

Ordering information

Junma pulse servo drive configuration



Servomotors and servo drives

Symbol	Specifications					Order code	
						① Servomotor model	② Servo drive model
	Voltage	Encoder and design		Rated torque	Capacity		Pulse control
①②	1 Phase 200 VAC	Analogue incremental encoder Straight shaft with key	Without brake	0.318 Nm	100 W	SJME-01AMC41-0Y	SJDE-01APA-0Y
				0.637 Nm	200 W	SJME-02AMC41-0Y	SJDE-02APA-0Y
				1.27 Nm	400 W	SJME-04AMC41-0Y	SJDE-04APA-0Y
				2.39 Nm	750 W	SJME-08AMC41-0Y	SJDE-08APA-0Y
			With brake	0.318 Nm	100 W	SJME-01AMC4C-0Y	SJDE-01APA-0Y
				0.637 Nm	200 W	SJME-02AMC4C-0Y	SJDE-02APA-0Y
				1.27 Nm	400 W	SJME-04AMC4C-0Y	SJDE-04APA-0Y
				2.39 Nm	750 W	SJME-08AMC4C-0Y	SJDE-08APA-0Y

Power and encoder cables

Note: ③④ Refer to the Junma servo motor section for motor cables or connectors selection

Control cables (for CN1)

Symbol	Name	Compatible units		Order code
⑤	Servo relay unit	Units: CS1W-NC113/133, CJ1W-NC113/133, C200HW-NC113	–	XW2B-20J6-1B (1 axis)
		Units: CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433, C200HW-NC213/413	–	XW2B-40J6-2B (2 axes)
		Units: CQM1H-PLB21 and CQM1-CPU43-V1	–	XW2B-20J6-3B (1 axis)
		Use with CJ1M-CPU21/22/23	–	XW2B-20J6-8A (1 axis)
			–	XW2B-40J6-9A (2 axes)
⑥	Cable to servo drive	For the servo relay unit XW2B-__J6-_B, XW2B-20J6-8A, XW2B-40J6-9A	1 m	XW2Z-100J-B17
			2 m	XW2Z-200J-B17
⑦	Cable to position control unit	CQM1H-PLB21 and CQM1-CPU43-V1	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 and C200HW-NC113	0.5 m	XW2Z-050J-A8
			1 m	XW2Z-100J-A8
		CS1W-NC213/413 and C200HW-NC213/413	0.5 m	XW2Z-050J-A9
			1 m	XW2Z-100J-A9
		CS1W-NC133	0.5 m	XW2Z-050J-A12
			1 m	XW2Z-100J-A12
		CS1W-NC233/433	0.5 m	XW2Z-050J-A13
			1 m	XW2Z-100J-A13
		CJ1W-NC113	0.5 m	XW2Z-050J-A16
			1 m	XW2Z-100J-A16
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A17
			1 m	XW2Z-100J-A17
		CJ1W-NC133	0.5 m	XW2Z-050J-A20
			1 m	XW2Z-100J-A20
		CS1W-NC233/433	0.5 m	XW2Z-050J-A21
			1 m	XW2Z-100J-A21
		CJ1M-CPU21/22/23	0.5 m	XW2Z-050J-A26
			1 m	XW2Z-100J-A26
⑧	Control cable	For general-purpose controllers	1 m	R7A-CPZ001S or JZSP-CHI003-01
			2 m	R7A-CPZ002S or JZSP-CHI003-02
			3 m	JZSP-CHI003-03
⑨	Connector terminal block cable	For general-purpose controllers	1 m	XW2Z-100J-B19
			2 m	XW2Z-200J-B19
	Connector terminal block		–	XW2B-20G5

Filters

Symbol	Applicable servo drive	Rated current	Leakage current	Rated voltage	Filter model
⑩	SJDE-01APA-OY SJDE-02APA-OY SJDE-04APA-OY	5A	1.7 mA	250 VAC 1-phase	R7A-FIZP105-BE
	SJDE-08APA-OY	9A	1.7 mA		R7A-FIZP109-BE

Regenerative unit model (option)

Symbol	Specifications	Order code (Omron)	Order code (Yaskawa)
⑪	External regenerative unit (Optional)	R88A-RG08UA	JUSP-RG08D

Connectors

Specification	Order code (Omron)	Order code (Yaskawa)
Control I/O connector (for CN1)	R7A-CNA01R	JZSP-CHI9-1
Power input connector (for CNB). (Included in drive the box)	R7A-CNZ01P	JZSP-CHG9-1

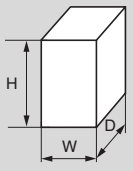
Specifications

Junma pulse servo drives

Servo drive type		**SJDE -_**	**01APA-OY**	**02APA-OY**	**04APA-OY**	**08APA-OY**
Applicable servomotor		**SJME-_**	**01A_**	**02A_**	**04A_**	**08A_**
Basic specifications	Max. applicable motor capacity	W	100	200	400	750
	Continuous output current	Arms	0.84	1.1	2.0	3.7
	Max. output current	Arms	2.5	3.3	6.0	11.1
	Input power supply (Main circuit and control circuit)	Voltage	Single-phase, 200 to 230 VAC, + 10 to -15% (50/60 Hz)			
		Capacity KVA	0.40	0.75	1.2	2.2
	Control method		PWM control, sine wave current drive system			
	Feedback		Analogue incremental encoder (10000 steps per revolution)			
	Allowable load inertia *1	kg·m^2	0.6×10^{-4}	3.0×10^{-4}	5.0×10^{-4}	10.0×10^{-4}
	Usage/Storage temperature		0 to +55°C / -20 to 70°C			
	Usage/Storage humidity		90%RH or less (non-condensing)			
	Altitude		1000 m or less above sea level			
	Vibration/Shock resistance		4.9 m/s^2 (0.5G) / 19.6 m/s^2 (2G)			
	Configuration		Base mounted			
	Cooling method		Forced cooling (built-in fan)			
	Approx. mass	kg	0.5			1.0
Built-in functions	Dynamic brake (DB)		Operated at main power OFF, servo alarm, servo OFF.(OFF after motor stops; ON when motor power is off.)			
	Regenerative processing		Optional (If the regenerated energy is too large, install a regenerative unit JUSP-RG08D)			
	LED display		5 (PWE, REF, AL1, AL2, AL3)			
	Reference filter		Select one of eight levels with FIL switch			
	Protection		Speed errors, overload, encoder errors, voltage errors, overcurrents, disablement of the built-in cooling fan, system errors			
I/O Signals	Input signal for reference Designated pulse type and pulse resolution with PULSE switch.	Pulse type	Select one of the following signals: 1. CCW + CW 2. Sign + pulse train 3. CCW + CW (logic reversal) 4. Sign + pulse train (logic reversal)			
		Pulse resolution	Select one of the following signals: 1. 1000 pulses/rev (Open collector/line driver) 75 kpps max. 2. 2500 pulses/rev (Open collector/line driver) 187.5 kpps max. 3. 5000 pulses/rev (Line driver) 375 kpps max. 4. 10000 pulses/rev (Line driver) 750 kpps max.			
	Clear input signal		Clears the positioning error when turned ON			
	Servo ON input signal		Turns the servomotor ON or OFF			
	Alarm output signal		OFF if an alarm occurs. (Note: OFF for 2s when power is turned ON)			
	Brake output signal		External signal to control brakes. Turn ON to release the brake			
	Positioning completed output signal		ON if the current position is equal to the reference position ±10 pulses.External signal to control brakes.			
	Origin output signal		ON if the motor is at the origin. (Width: 1/500 rev) (Note: Use the pulse edge that changes the signal from OFF to ON)			

*1 Value without external regeneration unit

Dimensions

Specifications		Drive model	H	W	D	
1-phase 200 VAC	100 W	SJDE-01APA-OY	120	35	105	
	200 W	SJDE-02APA-OY				
	400 W	SJDE-04APA-OY	120	40	105	
	750 W	SJDE-08APA-OY	120	70	145	



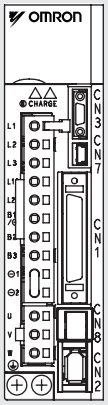
A wide servo family for high speed and high accuracy motion control.

- Sizes from 50 W to 15 kW, rated speeds of 1500 and 3000 rpm
- Peak torque 350% of nominal during 3 seconds
- Automatic motor recognition by servo drive
- IP67 and shaft oil seal available
- High resolution encoders
- Absolute multiturn encoder solution
- Compact design and robust construction

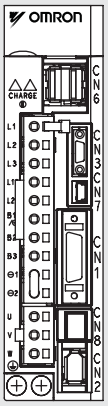
Ordering information

(Refer to servo drive chapter)

Drive options

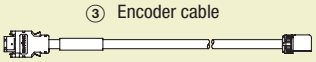


② Analog Pulse Models

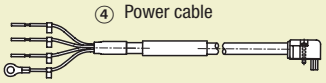


② MECHATROLINK-II Models

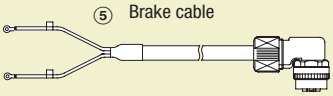
Power, encoder and brake cables



③ Encoder cable



④ Power cable



⑤ Brake cable

(a separate brake cable to use only for SGMGV and SGMSV servo motors from 850 W)

Servo motors



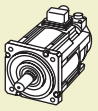
① **SGMJV Servo Motor 3000 rpm (50-750 W)**



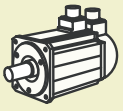
① **SGMAV Servo Motor 3000 rpm (50 W-1 kW)**



① **SGMEV Servo Motor 3000 rpm (100 W-1.5 kW)**



① **SGMGV Servo Motor 1500 rpm (300 W-15 kW)**



① **SGMSV Servo Motor 3000 rpm (1-5 kW)**

Note: The symbols ①②③... show the recommended sequence to select the servo motor and cables

Servo motor

① Select motor from families SGMJV, SGMAV, SGMEV, SGMGV, SGMSV using motor tables in next pages.

Servo drive

② Refer to Sigma-5 servo drive chapter for detailed drive specifications and selection of drive accessories.

Servo motor

SGMJV - servo motors 3000 r/min (50 - 750 W)

Symbol	Specifications					Compatible servo drives ②	Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-5	
① 	230 V	Incremental encoder (13 bit) Straight shaft with key and tap	Without brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMJV-A5AAA61
				0.318 Nm	100 W	SGDV-R90A_1A	SGMJV-01AAA61
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMJV-02AAA61
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMJV-04AAA61
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMJV-08AAA61
			With brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMJV-A5AAA6C
				0.318 Nm	100 W	SGDV-R90A_1A	SGMJV-01AAA6C
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMJV-02AAA6C
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMJV-04AAA6C
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMJV-08AAA6C
		Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMJV-A5ADA61
				0.318 Nm	100 W	SGDV-R90A_1A	SGMJV-01ADA61
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMJV-02ADA61
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMJV-04ADA61
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMJV-08ADA61
			With brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMJV-A5ADA6C
				0.318 Nm	100 W	SGDV-R90A_1A	SGMJV-01ADA6C
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMJV-02ADA6C
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMJV-04ADA6C
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMJV-08ADA6C
		Absolute encoder (20 bit) Straight shaft with key and tap	Without brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMJV-A5A3A61
				0.318 Nm	100 W	SGDV-R90A_1A	SGMJV-01A3A61
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMJV-02A3A61
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMJV-04A3A61
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMJV-08A3A61
			With brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMJV-A5A3A6C
				0.318 Nm	100 W	SGDV-R90A_1A	SGMJV-01A3A6C
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMJV-02A3A6C
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMJV-04A3A6C
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMJV-08A3A6C

SGMAV - servo motors 3000 r/min (50 W - 1 kW)

Symbol	Specifications					Compatible servo drives ②	Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-5	
① 	230 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMAV-A5ADA61
				0.318 Nm	100 W	SGDV-R90A_1A	SGMAV-01ADA61
				0.477 Nm	150 W	SGDV-1R6A_1A	SGMAV-C2ADA61
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMAV-02ADA61
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMAV-04ADA61
				1.75 Nm	550 W	SGDV-5R5A_1A	SGMAV-06ADA61
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMAV-08ADA61
				3.18 Nm	1 kW	SGDV-120A_1A008000	SGMAV-10ADA61
			With brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMAV-A5ADA6C
				0.318 Nm	100 W	SGDV-R90A_1A	SGMAV-01ADA6C
				0.477 Nm	150 W	SGDV-1R6A_1A	SGMAV-C2ADA6C
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMAV-02ADA6C
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMAV-04ADA6C
				1.75 Nm	550 W	SGDV-5R5A_1A	SGMAV-06ADA6C
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMAV-08ADA6C
				3.18 Nm	1 kW	SGDV-120A_1A008000	SGMAV-10ADA6C
		Absolute encoder (20 bit) Straight shaft with key and tap	Without brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMAV-A5A3A61
				0.318 Nm	100 W	SGDV-R90A_1A	SGMAV-01A3A61
				0.477 Nm	150 W	SGDV-1R6A_1A	SGMAV-C2A3A61
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMAV-02A3A61
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMAV-04A3A61
				1.75 Nm	550 W	SGDV-5R5A_1A	SGMAV-06A3A61
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMAV-08A3A61
				3.18 Nm	1 kW	SGDV-120A_1A008000	SGMAV-10A3A61
			With brake	0.159 Nm	50 W	SGDV-R70A_1A	SGMAV-A5A3A6C
				0.318 Nm	100 W	SGDV-R90A_1A	SGMAV-01A3A6C
				0.477 Nm	150 W	SGDV-1R6A_1A	SGMAV-C2A3A6C
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMAV-02A3A6C
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMAV-04A3A6C
				1.75 Nm	550 W	SGDV-5R5A_1A	SGMAV-06A3A6C
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMAV-08A3A6C
				3.18 Nm	1 kW	SGDV-120A_1A008000	SGMAV-10A3A6C

SGMEV - servo motors 3000 r/min (100 W - 1.5 kW)

Symbol	Specifications					Compatible servo drives ②	Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-5	
①	230 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	0.318 Nm	100 W	SGDV-R90A_1A	SGMEV-01ADA61
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMEV-02ADA61
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMEV-04ADA61
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMEV-08ADA61
				4.77 Nm	1.5 kW	SGDV-120A_1A008000	SGMEV-15ADA61
			With brake	0.318 Nm	100 W	SGDV-R90A_1A	SGMEV-01ADA6C
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMEV-02ADA6C
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMEV-04ADA6C
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMEV-08ADA6C
				4.77 Nm	1.5 kW	SGDV-120A_1A008000	SGMEV-15ADA6C
		Absolute encoder (20 bit) Straight shaft with key and tap	Without brake	0.318 Nm	100 W	SGDV-R90A_1A	SGMEV-01A3A61
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMEV-02A3A61
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMEV-04A3A61
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMEV-08A3A61
				4.77 Nm	1.5 kW	SGDV-120A_1A008000	SGMEV-15A3A61
			With brake	0.318 Nm	100 W	SGDV-R90A_1A	SGMEV-01A3A6C
				0.637 Nm	200 W	SGDV-1R6A_1A	SGMEV-02A3A6C
				1.27 Nm	400 W	SGDV-2R8A_1A	SGMEV-04A3A6C
				2.39 Nm	750 W	SGDV-5R5A_1A	SGMEV-08A3A6C
				4.77 Nm	1.5 kW	SGDV-120A_1A008000	SGMEV-15A3A6C
	400 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	0.637 Nm	200 W	SGDV-1R9D_1A	SGMEV-02DDA61
				0.955 Nm	300 W	SGDV-1R9D_1A	SGMEV-03DDA61
				1.27 Nm	400 W	SGDV-1R9D_1A	SGMEV-04DDA61
				2.07 Nm	650 W	SGDV-3R5D_1A	SGMEV-07DDA61
				2.39 Nm	750 W	SGDV-3R5D_1A	SGMEV-08DDA61
				4.77 Nm	1.5 kW	SGDV-5R4D_1A	SGMEV-15DDA61
			With brake	0.637 Nm	200 W	SGDV-1R9D_1A	SGMEV-02DDA6C
				0.955 Nm	300 W	SGDV-1R9D_1A	SGMEV-03DDA6C
				1.27 Nm	400 W	SGDV-1R9D_1A	SGMEV-04DDA6C
				2.07 Nm	650 W	SGDV-3R5D_1A	SGMEV-07DDA2C
				2.39 Nm	750 W	SGDV-3R5D_1A	SGMEV-08DDA2C
				4.77 Nm	1.5 kW	SGDV-5R4D_1A	SGMEV-15DDA2C
		Absolute encoder (20 bit) Straight shaft with key and tap	Without brake	0.637 Nm	200 W	SGDV-1R9D_1A	SGMEV-02D3A61
				0.955 Nm	300 W	SGDV-1R9D_1A	SGMEV-03D3A61
				1.27 Nm	400 W	SGDV-1R9D_1A	SGMEV-04D3A61
				2.07 Nm	650 W	SGDV-3R5D_1A	SGMEV-07D3A61
				2.39 Nm	750 W	SGDV-3R5D_1A	SGMEV-08D3A61
				4.77 Nm	1.5 kW	SGDV-5R4D_1A	SGMEV-15D3A61
			With brake	0.637 Nm	200 W	SGDV-1R9D_1A	SGMEV-02D3A6C
				0.955 Nm	300 W	SGDV-1R9D_1A	SGMEV-03D3A6C
				1.27 Nm	400 W	SGDV-1R9D_1A	SGMEV-04D3A6C
				2.07 Nm	650 W	SGDV-3R5D_1A	SGMEV-07D3A6C
				2.39 Nm	750 W	SGDV-3R5D_1A	SGMEV-08D3A6C
				4.77 Nm	1.5 kW	SGDV-5R4D_1A	SGMEV-15D3A6C

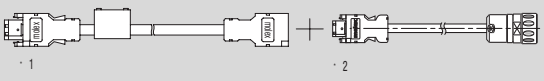
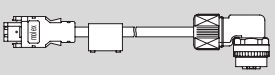
SGMGV - servo motors 1500 r/min (300 W - 15 kW)

Symbol	Specifications					Compatible servo drives ②	Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-5	
① 	400 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	1.96 Nm	300 W	SGDV-1R9D_1A	SGMGV-03DDA6F
				2.86 Nm	450 W	SGDV-1R9D_1A	SGMGV-05DDA6F
				5.39 Nm	850 W	SGDV-3R5D_1A	SGMGV-09DDA6F
				8.34 Nm	1.3 kW	SGDV-5R4D_1A	SGMGV-13DDA6F
				11.5 Nm	1.8 kW	SGDV-8R4D_1A	SGMGV-20DDA6F
				18.6 Nm	2.9 kW	SGDV-120D_1A	SGMGV-30DDA6F
				28.4 Nm	4.4 kW	SGDV-170D_1A	SGMGV-44DDA6F
				35.0 Nm	5.5 kW	SGDV-210D_1A	SGMGV-55DDA6F
				48.0 Nm	7.5 kW	SGDV-260D_1A	SGMGV-75DDA6F
				70.0 Nm	11 kW	SGDV-280D_1A	SGMGV-1ADDA6F
				95.4 Nm	15 kW	SGDV-370D_1A	SGMGV-1EDDA6F
			With brake	1.96 Nm	300 W	SGDV-1R9D_1A	SGMGV-03DDA6H
				2.86 Nm	450 W	SGDV-1R9D_1A	SGMGV-05DDA6H
				5.39 Nm	850 W	SGDV-3R5D_1A	SGMGV-09DDA6H
				8.34 Nm	1.3 kW	SGDV-5R4D_1A	SGMGV-13DDA6H
				11.5 Nm	1.8 kW	SGDV-8R4D_1A	SGMGV-20DDA6H
				18.6 Nm	2.9 kW	SGDV-120D_1A	SGMGV-30DDA6H
				28.4 Nm	4.4 kW	SGDV-170D_1A	SGMGV-44DDA6H
				35.0 Nm	5.5 kW	SGDV-210D_1A	SGMGV-55DDA6H
				48.0 Nm	7.5 kW	SGDV-260D_1A	SGMGV-75DDA6H
				70.0 Nm	11 kW	SGDV-280D_1A	SGMGV-1ADDA6H
				95.4 Nm	15 kW	SGDV-370D_1A	SGMGV-1EDDA6H
		Absolute encoder (20 bit) Straight shaft with key and tap	Without brake	1.96 Nm	300 W	SGDV-1R9D_1A	SGMGV-03D3A6F
				2.86 Nm	450 W	SGDV-1R9D_1A	SGMGV-05D3A6F
				5.39 Nm	850 W	SGDV-3R5D_1A	SGMGV-09D3A6F
				8.34 Nm	1.3 kW	SGDV-5R4D_1A	SGMGV-13D3A6F
				11.5 Nm	1.8 kW	SGDV-8R4D_1A	SGMGV-20D3A6F
				18.6 Nm	2.9 kW	SGDV-120D_1A	SGMGV-30D3A6F
				28.4 Nm	4.4 kW	SGDV-170D_1A	SGMGV-44D3A6F
				35.0 Nm	5.5 kW	SGDV-210D_1A	SGMGV-55D3A6F
				48.0 Nm	7.5 kW	SGDV-260D_1A	SGMGV-75D3A6F
				70.0 Nm	11 kW	SGDV-280D_1A	SGMGV-1AD3A6F
				95.4 Nm	15 kW	SGDV-370D_1A	SGMGV-1ED3A6F
			With brake	1.96 Nm	300 W	SGDV-1R9D_1A	SGMGV-03D3A6H
				2.86 Nm	450 W	SGDV-1R9D_1A	SGMGV-05D3A6H
				5.39 Nm	850 W	SGDV-3R5D_1A	SGMGV-09D3A6H
				8.34 Nm	1.3 kW	SGDV-5R4D_1A	SGMGV-13D3A6H
				11.5 Nm	1.8 kW	SGDV-8R4D_1A	SGMGV-20D3A6H
				18.6 Nm	2.9 kW	SGDV-120D_1A	SGMGV-30D3A6H
				28.4 Nm	4.4 kW	SGDV-170D_1A	SGMGV-44D3A6H
				35.0 Nm	5.5 kW	SGDV-210D_1A	SGMGV-55D3A6H
				48.0 Nm	7.5 kW	SGDV-260D_1A	SGMGV-75D3A6H
				70.0 Nm	11 kW	SGDV-280D_1A	SGMGV-1AD3A6H
				95.4 Nm	15 kW	SGDV-370D_1A	SGMGV-1ED3A6H

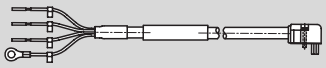
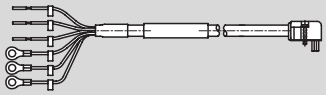
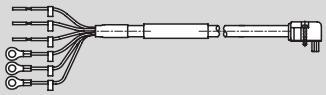
SGMSV - servo motors 3000 r/min (1 - 5 kW)

Symbol	Specifications					Compatible servo drives ②	Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-5	
① 	400 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	3.18 Nm	1 kW	SGDV-3R5D_1A	SGMSV-10DDA6F
				4.9 Nm	1.5 kW	SGDV-5R4D_1A	SGMSV-15DDA6F
				6.36 Nm	2 kW	SGDV-8R4D_1A	SGMSV-20DDA6F
				7.96 Nm	2.5 kW	SGDV-120D_1A	SGMSV-25DDA6F
				9.8 Nm	3 kW	SGDV-120D_1A	SGMSV-30DDA6F
				12.6 Nm	4 kW	SGDV-170D_1A	SGMSV-40DDA6F
				15.8 Nm	5 kW	SGDV-170D_1A	SGMSV-50DDA6F
			With brake	3.18 Nm	1 kW	SGDV-3R5D_1A	SGMSV-10DDA6H
				4.9 Nm	1.5 kW	SGDV-5R4D_1A	SGMSV-15DDA6H
				6.36 Nm	2 kW	SGDV-8R4D_1A	SGMSV-20DDA6H
				7.96 Nm	2.5 kW	SGDV-120D_1A	SGMSV-25DDA6H
				9.8 Nm	3 kW	SGDV-120D_1A	SGMSV-30DDA6H
				12.6 Nm	4 kW	SGDV-170D_1A	SGMSV-40DDA6H
				15.8 Nm	5 kW	SGDV-170D_1A	SGMSV-50DDA6H
		Absolute encoder (20 bit) Straight shaft with key and tap	Without brake	3.18 Nm	1 kW	SGDV-3R5D_1A	SGMSV-10D3A6F
				4.9 Nm	1.5 kW	SGDV-5R4D_1A	SGMSV-15D3A6F
				6.36 Nm	2 kW	SGDV-8R4D_1A	SGMSV-20D3A6F
				7.96 Nm	2.5 kW	SGDV-120D_1A	SGMSV-25D3A6F
				9.8 Nm	3 kW	SGDV-120D_1A	SGMSV-30D3A6F
				12.6 Nm	4 kW	SGDV-170D_1A	SGMSV-40D3A6F
				15.8 Nm	5 kW	SGDV-170D_1A	SGMSV-50D3A6F
			With brake	3.18 Nm	1 kW	SGDV-3R5D_1A	SGMSV-10D3A6H
				4.9 Nm	1.5 kW	SGDV-5R4D_1A	SGMSV-15D3A6H
				6.36 Nm	2 kW	SGDV-8R4D_1A	SGMSV-20D3A6H
				7.96 Nm	2.5 kW	SGDV-120D_1A	SGMSV-25D3A6H
				9.8 Nm	3 kW	SGDV-120D_1A	SGMSV-30D3A6H
				12.6 Nm	4 kW	SGDV-170D_1A	SGMSV-40D3A6H
				15.8 Nm	5 kW	SGDV-170D_1A	SGMSV-50D3A6H

Encoder Cables
for sigma-5 servo drive

Symbol	Appearance	Specifications		Order code
③		Sigma-5 incremental encoder cable for SGMJV/AV Servo motors SGMJV-__ADA__, SGMJV-__AAA__, SGMAV-__ADA__	1.5 m	JZSP-CSP21-01-5E-E
			3 m	JZSP-CSP21-03-E-E
			5 m	JZSP-CSP21-05-E-E
			10 m	JZSP-CSP21-10-E-E
			15 m	JZSP-CSP21-15-E-E
			20 m	JZSP-CSP21-20-E-E
		Sigma-5 absolute encoder cable (with a battery case) for SG-MJV/AV Servo motors SGMJV-__A3A__ SGMAV-__A3A__	3 m	JZSP-CSP25-03-G1
			5 m	JZSP-CSP25-05-G1
			10 m	JZSP-CSP25-10-G1
			15 m	JZSP-CSP25-15-G1
			20 m	JZSP-CSP25-20-G1
		Sigma-5 incremental encoder cable for SGMEV Servo motors	1.5 m	R88A-CRWA001-5C-DE
			3 m	R88A-CRWA003C-DE
			5 m	R88A-CRWA005C-DE
			10 m	R88A-CRWA010C-DE
			15 m	R88A-CRWA015C-DE
			20 m	R88A-CRWA020C-DE
		Sigma-5 absolute encoder cable extension with a battery case for SGMEV Servo motors Note: *1 This cable is only an extension and must be used in conjunction with incremental encoder cable *2 R88A-CRWA0__C-DE	0.3 m	JZSP-CSP12-E
		Sigma-5 incremental encoder cable for SGMGV/SV Servo motors SGMGV-__DD_ SGMSV-__DD_	1.5 m	JZSP-CVP12-01-5E-E
			3 m	JZSP-CVP12-03-E-E
			5 m	JZSP-CVP12-05-E-E
			10 m	JZSP-CVP12-10-E-E
			15 m	JZSP-CVP12-15-E-E
			20 m	JZSP-CVP12-20-E-E
		Sigma-5 absolute encoder cable (with a battery case) for SG-MGV/SV Servo motors SGMGV-__D3_ SGMSV-__D3_	3 m	JZSP-CVP27-03-G1
			5 m	JZSP-CVP27-05-G1
			10 m	JZSP-CVP27-10-G1
			15 m	JZSP-CVP27-15-G1
			20 m	JZSP-CVP27-20-G1

Power cables

Symbol	Appearance	Specifications		Order code
④		For 200 V servo motors without brake SGMJV-(A5/01)A_A_1 SGMAV-(A5/01/C2)ADA_1	1.5 m	JZSP-CSM21-01-5E-E
			3 m	JZSP-CSM21-03-E-E
			5 m	JZSP-CSM21-05-E-E
			10 m	JZSP-CSM21-10-E-E
			15 m	JZSP-CSM21-15-E-E
			20 m	JZSP-CSM21-20-E-E
		For 200 V servo motors with brake SGMJV-(A5/01)A_A_C SGMAV-(A5/01/C2)A_A_C	1.5 m	JZSP-CSM31-01-5E-E
			3 m	JZSP-CSM31-03-E-E
			5 m	JZSP-CSM31-05-E-E
			10 m	JZSP-CSM31-10-E-E
			15 m	JZSP-CSM31-15-E-E
			20 m	JZSP-CSM31-20-E-E
		For 200 V servo motors without brake SGMJV-(02/04)A_A_1 SGMAV-(02/04/06)A_A_1	1.5 m	JZSP-CSM22-01-5E-E
			3 m	JZSP-CSM22-03-E-E
			5 m	JZSP-CSM22-05-E-E
			10 m	JZSP-CSM22-10-E-E
			15 m	JZSP-CSM22-15-E-E
			20 m	JZSP-CSM22-20-E-E
		For 200 V servo motors with brake SGMJV-(02/04)A_A_C SGMAV-(02/04/06)A_A_C	1.5 m	JZSP-CSM32-01-5E-E
			3 m	JZSP-CSM32-03-E-E
			5 m	JZSP-CSM32-05-E-E
			10 m	JZSP-CSM32-10-E-E
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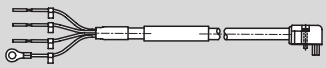
			20 m	JZSP-CSM32-20-E-E
		For 200 V servo motors without brake SGMJV-08A_A_1 SGMAV-08A_A_1 SGMAV-10A_A_1	1.5 m	JZSP-CSM23-01-5E-E
			3 m	JZSP-CSM23-03-E-E
			5 m	JZSP-CSM23-05-E-E
			10 m	JZSP-CSM23-10-E-E
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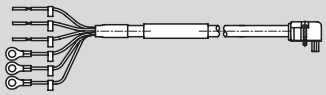
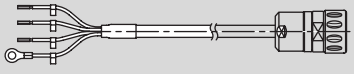
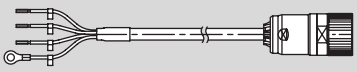
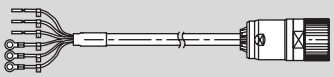
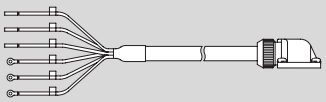
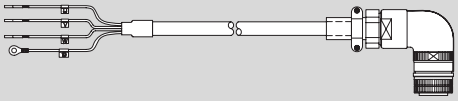
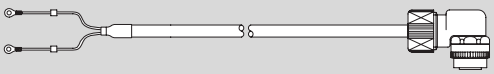
			20 m	JZSP-CSM23-20-E-E
		For 200 V servo motors with brake SGMJV-08A_A_C SGMAV-08A_A_C SGMAV-10A_A_C	1.5 m	JZSP-CSM33-01-5E-E
			3 m	JZSP-CSM33-03-E-E
			5 m	JZSP-CSM33-05-E-E
			10 m	JZSP-CSM33-10-E-E
			15 m	JZSP-CSM33-15-E-E
			20 m	JZSP-CSM33-20-E-E
		For 200 V servo motors without brake SGMEV-(01/02/04/08)A_A_1	1.5 m	R88A-CAWA001-5S-DE
			3 m	R88A-CAWA003S-DE
			5 m	R88A-CAWA005S-DE
			10 m	R88A-CAWA010S-DE
			15 m	R88A-CAWA015S-DE
			20 m	R88A-CAWA020S-DE
		For 200 V servo motors with brake SGMEV-(01/02/04/08)A_A_C	1.5 m	R88A-CAWA001-5B-DE
			3 m	R88A-CAWA003B-DE
			5 m	R88A-CAWA005B-DE
			10 m	R88A-CAWA010B-DE
			15 m	R88A-CAWA015B-DE
			20 m	R88A-CAWA020B-DE
		For 200 V servo motors without brake SGMEV-15A_A_1	1.5 m	R88A-CAWB001-5S-DE
			3 m	R88A-CAWB003S-DE
			5 m	R88A-CAWB005S-DE
			10 m	R88A-CAWB010S-DE
			15 m	R88A-CAWB015S-DE
			20 m	R88A-CAWB020S-DE
		For 200 V servo motors with brake SGMEV-15A_A_C	1.5 m	R88A-CAWB001-5B-DE
			3 m	R88A-CAWB003B-DE
			5 m	R88A-CAWB005B-DE
			10 m	R88A-CAWB010B-DE
			15 m	R88A-CAWB015B-DE
			20 m	R88A-CAWB020B-DE
		For 400 V servo motors without brake SGMEV-(02/03/04/07/08/15)D_A_1	1.5 m	R88A-CAWK001-5S-DE
			3 m	R88A-CAWK003S-DE
			5 m	R88A-CAWK005S-DE
			10 m	R88A-CAWK010S-DE
			15 m	R88A-CAWK015S-DE
			20 m	R88A-CAWK020S-DE

Symbol	Appearance	Specifications		Order code
④		For 400 V servo motors without brake SGMEV-(02/03/04/07/08/15)D_A_C	1.5 m	R88A-CAWK001-5B-DE
			3 m	R88A-CAWK003B-DE
			5 m	R88A-CAWK005B-DE
			10 m	R88A-CAWK010B-DE
			15 m	R88A-CAWK015B-DE
			20 m	R88A-CAWK020B-DE
		For 400 V servo motors without brake SGMGV-(03/05)D_A_1	1.5 m	JZSP-VVM21-01-5E-E
			3 m	JZSP-VVM21-03-E-E
			5 m	JZSP-VVM21-05-E-E
			10 m	JZSP-VVM21-10-E-E
			15 m	JZSP-VVM21-15-E-E
			20 m	JZSP-VVM21-20-E-E
		For 400 V servo motors with brake SGMGV-(03/05)D_A_C	1.5 m	JZSP-VVM41-01-5E-E
			3 m	JZSP-VVM41-03-E-E
			5 m	JZSP-VVM41-05-E-E
			10 m	JZSP-VVM41-10-E-E
			15 m	JZSP-VVM41-15-E-E
			20 m	JZSP-VVM41-20-E-E
		For 400 V servo motors SGMGV-(09/13/20)D_ SGMSV-(10/15/20/25)D_ For servomotors with brake, a separate cable (JZSP-CVB12-__-E-E) is needed	1.5 m	R88A-CAWC001-5S-E
			3 m	R88A-CAWC003S-E
			5 m	R88A-CAWC005S-E
			10 m	R88A-CAWC010S-E
			15 m	R88A-CAWC015S-E
			20 m	R88A-CAWC020S-E
		For 400 V servo motors SGMGV-(30/44)D_ SGMSV-(30/40/50)D_ For servomortors with brake, a separate cable (JZSP-CVB12-__-E-E) is needed	1.5 m	R88A-CAWG001-5S-E
			3 m	R88A-CAWG003S-E
			5 m	R88A-CAWG005S-E
			10 m	R88A-CAWG010S-E
			15 m	R88A-CAWG015S-E
			20 m	R88A-CAWG020S-E
		For 400 V servo motors SGMGV-55D_ For servomortors with brake, a separate cable (JZSP-CVB12-__-E-E) is needed	1.5 m	R88A-CAWF001-5S-E
			3 m	R88A-CAWF003S-E
			5 m	R88A-CAWF005S-E
			10 m	R88A-CAWF010S-E
			15 m	R88A-CAWF015S-E
			20 m	R88A-CAWF020S-E
		For 400 V servo motors SGMGV-(75/1A)D_ For servomortors with brake, a separate cable (JZSP-CVB12-__-E-E) is needed	1.5 m	R88A-CAWH001-5S-E
			3 m	R88A-CAWH003S-E
			5 m	R88A-CAWH005S-E
			10 m	R88A-CAWH010S-E
			15 m	R88A-CAWH015S-E
			20 m	R88A-CAWH020S-E
		For 400 V servo motors SGMGV-1ED_ For servomortors with brake, a separate cable (JZSP-CVB12-__-E-E) is needed	1.5 m	R88A-CAWJ001-5S-E
			3 m	R88A-CAWJ003S-E
			5 m	R88A-CAWJ005S-E
			10 m	R88A-CAWJ010S-E
			15 m	R88A-CAWJ015S-E
			20 m	R88A-CAWJ020S-E

Brake cable (for SGMGV-09/13/20/30/44/55/75/1A/1E and SGMSV-10/15/20/25/30/40/50 Motors)

Symbol	Appearance	Specifications		Order code
⑤		Brake cable only. For 400 V servo motors with brake SGMGV-(09/13/20/30/44/55/75/1A/1E)D_A_C_ SGMSV-(10/15/20/25/30/40/50)D_A_C	1.5 m	JZSP-CVB12-01-5E-E
			3 m	JZSP-CVB12-03-E-E
			5 m	JZSP-CVB12-05-E-E
			10 m	JZSP-CVB12-10-E-E
			15 m	JZSP-CVB12-15-E-E
			20 m	JZSP-CVB12-20-E-E

Specifications

Type SGMJV, 230 V

Ratings and specifications

Applied voltage			230 V				
Servo motor model SGMJV- _			A5A_	01A_	02A_	04A_	08A_
Rated output*1		W	50	100	200	400	750
Rated torque*1,*2		N·m	0.159	0.318	0.637	1.27	2.39
Instantaneous peak torque*1		N·m	0.557	1.11	2.23	4.46	8.36
Rated current*1		A (rms)	0.61	0.84	1.6	2.7	4.7
Instantaneous max. current*1		A (rms)	2.1	2.9	5.8	9.3	16.9
Rated speed*1		min^{-1}	3000				
Max. speed*1		min^{-1}	6000				
Torque constant		N·m/A (rms)	0.285	0.413	0.435	0.512	0.544
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$ (without brake)	0.0414	0.0665	0.259	0.442	1.57
		$kg·m^2x10^{-4}$ (with brake)	0.0489	0.0740	0.323	0.506	1.74
Allowable load moment of inertia (JL)		Multiple of (JM)	15			10	
Rated power rate*1		kW/s	6.11	15.2	15.7	36.5	36.3
Rated angular acceleration*1		rad/s^2	38400	47800	24600	28800	15200
Encoder		Standard	Incremental encoder (20 bits)				
		Option	Incremental encoder (13 bits)/ Absolute encoder (20 bits)				
Allowable radial load		N	78		245		392
Allowable thrust load		N	54		74		147
Approx. mass		Kg (without brake)	0.3	0.4	0.9	1.3	2.7
		Kg (with brake)	0.6	0.7	1.5	1.9	3.6
Brake specifications	Rated voltage		24 VDC				
	Power consumption (at 20°C)	W	6		6.9		7.7
	Current consumption (at 20°C)	A	0.25		0.29		0.32
	Holding torque	N·m	0.159	0.318	0.637	1.27	2.39
	Rise time for holding torque	ms (max)	100				
	Release time	ms (max)	60				80
Basic specifications	Time rating		Continuous				
	Thermal class		Class B				
	Usage/ storage temperature		0 to +40 °C/ -20 to 60 °C without freezing				
	Usage/ storage humidity		20 to 80% RH (non-condensing)				
	Vibration class		15 µm or below				
	Insulation resistance		500 VDC, 10 MOhm min.				
	Withstand voltage		1500 VAC for one minute				
	Enclosure		Totally-enclosed, self-cooled, IP65 (excluding shaft opening)				
	Vibration resistance		Vibration acceleration 49 m/s^2				
	Altitude		1000 m or less above sea level				
	Mounting		Flange-mounted				

*1 These items and torque/speed characteristics quoted in combination with an SGDV servo drive are at an armature winding temperature of 100°C. Other values quoted are at 20°C.
*2 The rated torques listed here are the values for the continuous allowable torque at 40°C with an aluminium heatsink of the following dimensions attached: SGMJV-A5/01: 200 mm x 200 mm x 6 mm, SGMJV-02/04/08: 250 mm x 250 mm x 6 mm

Type SGMAV, 230 V

Ratings and specifications

Applied voltage			230 V							
Servo motor model SGMAV- _			A5A_	01A_	C2A_	02A_	04A_	06A_	08A_	10A_
Rated output*1		W	50	100	150	200	400	550	750	1000
Rated torque*1,*2		N·m	0.159	0.318	0.477	0.637	1.27	1.75	2.39	3.18
Instantaneous peak torque*1		N·m	0.477	0.955	1.43	1.91	3.82	5.25	7.16	9.55
Rated current*1		A (rms)	0.66	0.91	1.3	1.5	2.6	3.8	5.3	7.4
Instantaneous max. current*1		A (rms)	2.1	2.8	4.2	5.3	8.5	12.2	16.6	23.9
Rated speed*1		min^{-1}	3000							
Max. speed*1		min^{-1}	6000							
Torque constant		N·m/A (rms)	0.265	0.375	0.381	0.450	0.539	0.496	0.487	0.467
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$ (without brake)	0.0242	0.0380	0.0531	0.116	0.190	0.326	0.769	1.2
		$kg·m^2x10^{-4}$ (with brake)	0.0312	0.0450	0.0601	0.180	0.254	0.390	0.940	1.41
Allowable load moment of inertia (JL)		Multiple of (JM)	30				20			10
Rated power rate*1		kW/s	10.4	26.6	42.8	35.0	84.9	93.9	74.1	84.3
Rated angular acceleration*1		rad/s^2	65800	83800	89900	54900	67000	53700	31000	26500
Encoder		Standard	Incremental encoder (20 bits)							
		Option	Absolute encoder (20 bits)							
Allowable radial load		N	68	78		245			392	
Allowable thrust load		N		54		74			147	
Approx. mass		Kg (without brake)	0.3	0.4	0.5	0.9	1.2	1.7	2.3	3.6
		Kg (with brake)	0.6	0.7	0.8	1.5	1.8	2.4	3.2	4.6

Applied voltage			230 V							
Servo motor model SGMAV- _			A5A_	01A_	C2A_	02A_	04A_	06A_	08A_	10A_
Brake specifications	Rated voltage		24 VDC							
	Power consumption (at 20°C)	W	6			6.9		8.7	7.7	7
	Current consumption (at 20°C)	A	0.25			0.29		0.36	0.32	0.29
	Holding torque	N·m	0.159	0.318	0.477	0.637	1.27	1.75	2.39	3.18
	Rise time for holding torque	ms (max)	100							
	Release time	ms (max)	60							80
Basic specifications	Time rating		Continuous							
	Thermal class		Class B							
	Usage/ storage temperature		0 to +40 °C/ -20 to 60 °C without freezing							
	Usage/ storage humidity		20 to 80% RH (non-condensing)							
	Vibration class		15 µm or below							
	Insulation resistance		500 VDC, 10 MOhm min.							
	Withstand voltage		1500 VAC for one minute							
	Enclosure		Totally-enclosed, self-cooled, IP65 (excluding shaft opening)							
	Vibration resistance		Vibration acceleration 49 m/s²							
	Altitude		1000 m or less above sea level							
	Mounting		Flange-mounted							

*1 These items and torque/speed characteristics quoted in combination with an SGDV servo drive are at an armature winding temperature of 100°C. Other values quoted are at 20°C.
*2 The rated torques listed here are the values for the continuous allowable torque at 40ºC with an aluminium heatsink of the following dimensions attached (SGMJV-A5/01: 200 mm x 200 mm x 6 mm, SGMJV-02/04/08: 250 mm x 250 mm x 6 mm).

Type SGMEV, 230 V/400 V

Ratings and specifications

Applied voltage		230 V					400 V					
Servo motor model SGMEV- _		01A_	02A_	04A_	08A_	15A_	02D_	03D_	04D_	07D_	08D_	15D_
Rated output*1	W	100	200	400	750	1500	200	300	400	650	750	1500
Rated torque*1,*2	N·m	0.318	0.637	1.27	2.39	4.77	0.637	0.955	1.27	2.07	2.39	4.77
Instantaneous peak torque*1	N·m	0.955	1.91	3.82	7.16	14.3	0.191	3.82	3.82	7.16	7.16	14.3
Rated current*1	A (rms)	0.89	2.0	2.6	4.1	7.5	1.4	1.3	1.4	2.2	2.6	4.5
Instantaneous max. current*1	A (rms)	2.8	6.5	8.5	13.9	23.0	4.5	5.1	4.4	8.4	7.8	13.7
Rated speed*1	min^{-1}	3000										
Max. speed*1	min^{-1}	5000										
Torque constant	N·m/A (rms)	0.392	0.349	0.535	0.641	0.687	0.481	0.837	0.963	1.02	0.994	1.135
Rotor moment of inertia (JM)	$kg·m^2x10^{-4}$ (without brake)	0.049	0.193	0.331	2.1	4.02	0.193	0.173	0.331	0.672	2.1	4.02
	$kg·m^2x10^{-4}$ (with brake)	0.078	0.302	0.440	2.975	4.895	0.302	0.231	0.440	0.812	2.975	4.895
Allowable load moment of inertia (JL)	Multiple of (JM)	25	15	7	5		15	20	7	20	5	
Rated power rate*1	kW/s	20.6	21.0	49.0	27.1	56.7	21	52.9	49.0	63.8	27.1	56.7
Rated angular acceleration*1	rad/s^2	64800	33000	38500	11400	11900	33000	55300	38500	30800	11400	11900
Encoder	Standard	Incremental encoder (20 bits)										
	Option	Absolute encoder (20 bits)										
Allowable radial load	N	78	245		392	490	245	345	245	392		490
Allowable thrust load	N	49	68		147		68	74	68	147		
Approx. mass	Kg (without brake)	0.7	1.4	2.1	4.2	6.6	1.4	1.7	2.1	3.4	4.2	6.6
	Kg (with brake)	0.9	1.9	2.6	5.7	8.1	1.9	2.2	2.6	4.3	5.7	8.1
Holding brake moment of inertia J	$kg·m^2x10^{-4}$	0.029	0.109		0.875		0.109	0.058	0.109	0.140	0.875	
Basic specifications	Time rating	Continuous										
	Thermal class	Class B										
	Usage/ storage temperature	0 to +40 °C/ -20 to 60 °C without freezing										
	Usage/ storage humidity	20 to 80% RH (non-condensing)										
	Vibration class	15 µm or below										
	Insulation resistance	500 VDC, 10 MOhm min.										
	Withstand voltage	1500 VAC for one minute										
	Enclosure	Totally-enclosed, self-cooled, IP55*3										
	Altitude	1000 m or less above sea level										
	Mounting	Flange-mounted										

*1 These items and torque/speed characteristics quoted in combination with an SGDV servo drive are at an armature winding temperature of 100°C. Other values quoted are at 20°C.
*2 The rated torques listed here are the values for the continuous allowable torque at 40°C with an aluminium heatsink of the following dimensions attached (SGMEV-01A/02A/04A/02D/03D/04D/07D: 250 mm x 250 mm x 6 mm, SGMEV-08A/15A/08D/15D: 300 mm x 300 mm x 12 mm)
*3 IP55 in case of standard cable attaching. IP67 is possible unless SGMEV-03D/07D servomotors.

Type SGMGV, 400 V

Ratings and specifications

Applied voltage			400 V									
Servo motor model SGMGV- _			03D_	05D_	09D_	13D_	20D_	30D_	44D_	55D_	75D_	1AD_	1ED_
Rated output*1		kW	0.3	0.45	0.85	1.3	1.8	2.9	4.4	5.5	7.5	11	15
Rated torque*1		N·m	1.96	2.86	5.39	8.34	11.5	18.6	28.4	35.0	48.0	70.0	95.4
Instantaneous peak torque*1		N·m	5.88	8.92	13.8	23.3	28.7	45.1	71.1	87.6	119	175	224
Rated current*1		A (rms)	1.4	1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.7	28.1	37.2
Instantaneous max. current*1		A (rms)	4	5.5	8.5	14	20	28	40.5	52	65	70	85
Rated speed*1		min^{-1}	1500										
Max. speed*1		min^{-1}	3000									2000	
Torque constant		N·m/A (rms)	1.55	1.71	1.72	1.78	1.50	1.70	1.93	1.80	1.92	2.64	2.74
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$ (without brake)	2.48	3.33	13.9	19.9	26	46	67.5	89.0	125	242	303
		$kg·m^2x10^{-4}$ (with brake)	2.69	3.54	16	22	28.1	54.5	76	97.5	134	261	322
Allowable load moment of inertia (JL)		Multiple of (JM)	5										
Rated power rate*1		kW/s (without brake)	15.5	24.6	20.9	35.0	50.9	75.2	119	138	184	202	300
		kW/s (with brake)	14.3	23.1	18.2	31.6	47.1	63.5	106	126	172	188	283
Rated angular acceleration*1		rad/s^2 (without brake)	7900	8590	3880	4190	4420	4040	4210	3930	3840	2890	3150
		rad/s^2 (with brake)	7290	8080	3370	3790	4090	3410	3740	3590	3580	2680	2960
Encoder		Standard	Incremental encoder (20 bits)										
		Option	Absolute encoder (20 bits)										
Allowable radial load		N			490	686	980	1470		1764			4998
Allowable thrust load		N			98	343	392	490		588			2156
Approx. mass		Kg (without brake)	2.6	3.2	5.5	7.1	8.6	13.4	17.5	21.5	29.5	57	67
		Kg (with brake)	4.5	5.0	7.5	9.0	11.0	19.5	23.5	27.5	35	65	85
Brake specifications	Rated voltage		24 /90 VDC										
	Power consumption (at 20°C)	W (24 VDC)	10		9.8			18.5		25		32	35
		W (90 VDC)	10		10.1			18.5		25		32	35
	Current consumption (at 20°C)	A (24 VDC)	0.42		0.41			0.77		1.05		1.33	1.46
		A (90 VDC)	0.11					0.21		0.28		0.36	0.39
	Holding torque	N·m	4.5		12.7	19.6		43.1		72.6		84.3	114.6
	Rise time for holding torque	ms (max)	80					100 (24 V), 80 (90 V)		80			
	Release time	ms (max)	100					170					
Basic specifications	Time rating		Continuous										
	Thermal class		Class F										
	Usage/ storage temperature		0 to +40 °C/ -20 to 60 °C without freezing										
	Usage/ storage humidity		20 to 80% RH (non-condensing)										
	Insulation resistance		500 VDC, 10 MOhm min.										
	Withstand voltage		1800 VAC for one minute										
	Vibration class		15 µm or below										
	Enclosure		Totally-enclosed, self-cooled, IP67 (excluding shaft opening)										
	Vibration resistance		Vibration acceleration 24.5 m/s²										
	Altitude		1000 m or less above sea level										
	Mounting		Flange-mounted										

*1 These items and torque/speed characteristics quoted in combination with an SGDV servo drive are at an armature winding temperature of 20°C.

Type SGMSV, 400 V

Ratings and specifications

Applied voltage		400 V						
Servo motor model SGMSV- _		10D_	15D_	20D_	25D_	30D_	40D_	50D_
Rated output*1	kW	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Rated torque*1,*2	N·m	3.18	4.9	6.36	7.96	9.8	12.6	15.8
Instantaneous peak torque*1	N·m	9.54	14.7	19.1	23.9	29.4	37.8	47.6
Rated current*1	A (rms)	2.8	4.7	6.1	7.4	8.9	12.5	13.8
Instantaneous max. current*1	A (rms)	8.5	14	19.5	22.3	28	38	42
Rated speed*1	min^{-1}	3000						
Max. speed*1	min^{-1}	6000	5000					
Torque constant	N·m/A (rms)	1.27	1.15	1.12	1.15	1.16	1.06	1.21
Rotor moment of inertia (JM)	$kg·m^2x10^{-4}$ (without brake)	1.74	2.0	2.47	3.19	7.0	9.60	12.3
	$kg·m^2x10^{-4}$ (with brake)	1.99	2.25	2.72	3.44	9.2	11.8	14.5
Allowable load moment of inertia (JL)	Multiple of (JM)	5						
Rated power rate*1	kW/s	57.9	97.2	127	199	137	165	203
Rated angular acceleration*1	rad/s^2	18300	24500	25700	25000	14000	13100	12800
Encoder	Standard	Incremental encoder (20 bits)						
	Option	Absolute encoder (20 bits)						
Allowable radial load	N	686				980	1176	
Allowable thrust load	N	196				392		

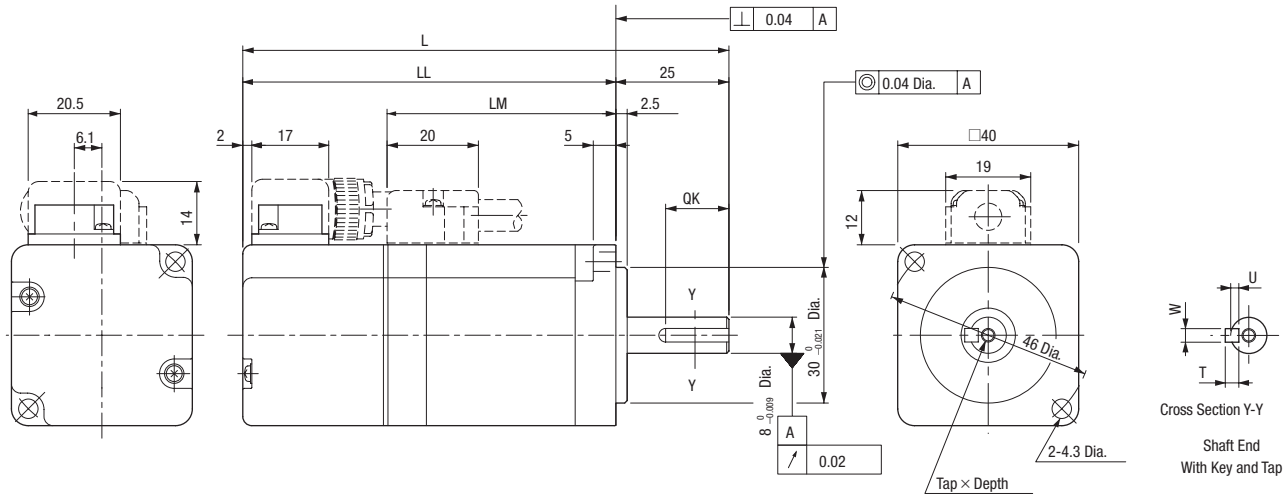
Applied voltage			400 V						
Servo motor model SGMSV- _			10D_	15D_	20D_	25D_	30D_	40D_	50D_
Approx. mass		Kg (without brake)	4.6	5.1	5.8	7.0	11	14	17
		Kg (with brake)	5.5	6	6.8	8.7	13	16	19
Basic specifications	Time rating		Continuous						
	Thermal class		Class F						
	Usage/ storage temperature		0 to +40 °C/ -20 to 60°C without freezing						
	Usage/ storage humidity		20 to 80% RH (non-condensing)						
	Vibration class		15 µm or below						
	Insulation resistance		500 VDC, 10 MOhm min.						
	Withstand voltage		1500 VAC for one minute						
	Enclosure		Totally-enclosed, self-cooled, IP67 (excluding shaft opening)						
	Altitude		1000 m or less above sea level						
	Mounting		Flange-mounted						

*1 These items and torque/speed characteristics quoted in combination with an SGDV servo drive are at an armature winding temperature of 20°C.
*2 The rated torques listed here are the values for the continuous allowable torque value with an aluminium heatsink of the following dimensions attached (SGMSV-10/15/20/25: 300 mm x 300 mm x 12 mm, SGMSV-30/40/50: 400 mm x 400 mm x 20 mm).

Dimensions

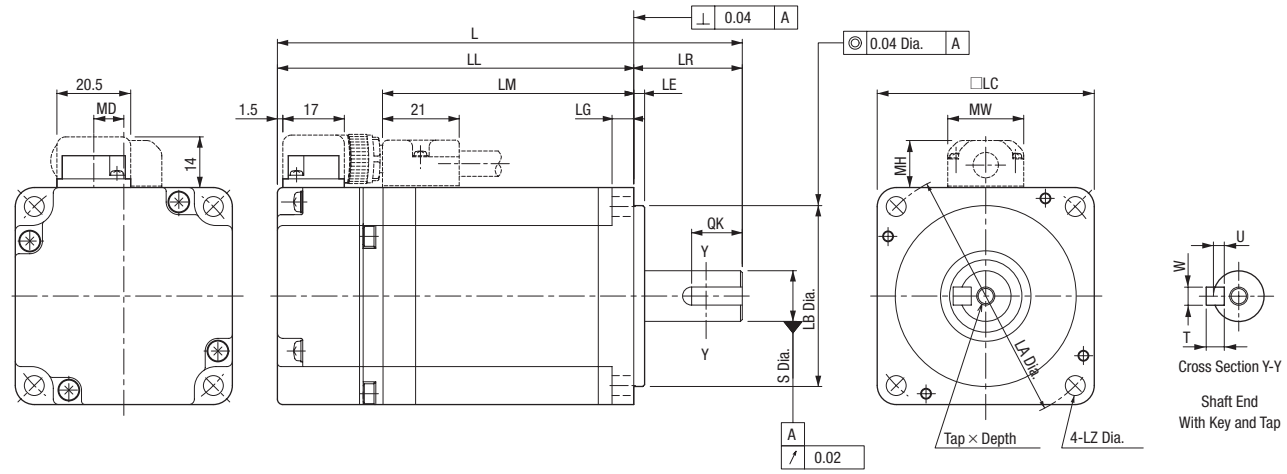
Type SGMJV (230 V, 50-100 W)

Dimensions (mm)	Without brake		With brake		LM	Shaft End Dimensions					Approx. Mass (Kg)	
Model	L	LL	L	LL		Tap × Depth	QK	U	W	T	Without brake	With brake
SGMJV-A5A_A6_	94	69	139	114	37	M3 x 6L	14	1.8	3	3	0.3	0.6
SGMJV-01A_A6_	107.5	82.5	152.5	127.5	50.5						0.4	0.7



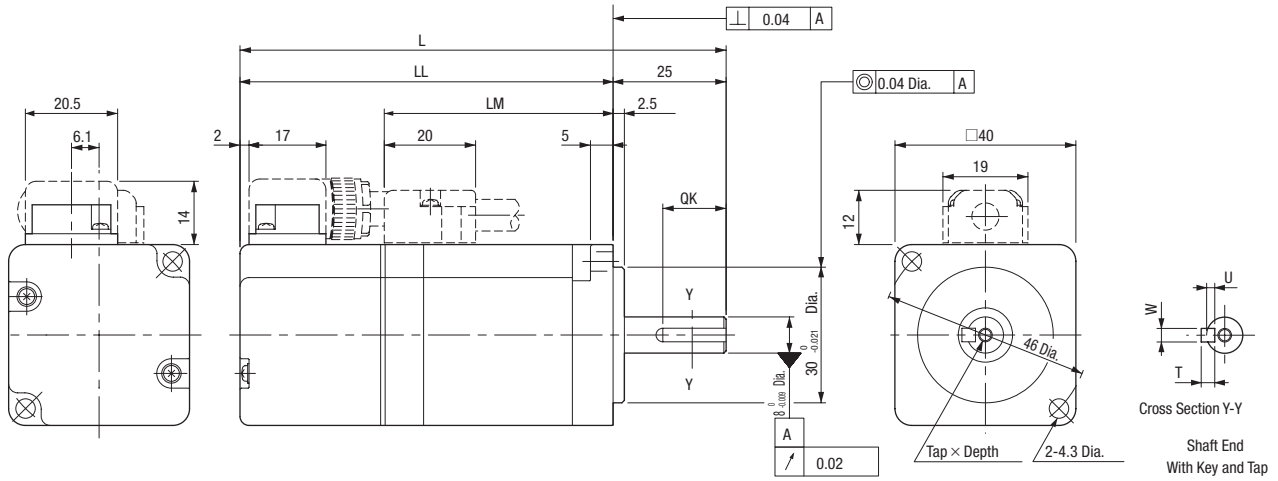
Type SGMJV (230 V, 200-750 W)

Dimensions (mm)	Without brake		With brake		LM	Flange Face Dimensions							Shaft End Dimensions					MD	MW	MH	Approx. Mass Kg	
Model	L	LL	L	LL		LR	LE	LG	LC	LA	LB	LZ	S	Tap × Depth	QK	U	W	T				Without brake	With brake
SGMJV-02A_A6_	110	80	150	120	51	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$	M5x8L	14	3	5	5	8.3	21	13	0.9	1.5
SGMJV-04A_A6_	128.5	98.5	168.5	138.5	69.5																	1.3	1.9
SGMJV-08A_A6_	155	115	200	160	85	40		8	80	90	$70^{0}_{-0.030}$	7	$19^{0}_{-0.013}$	M6x10L	22	3.5	6	6	13.8	27	15	2.3	3.2



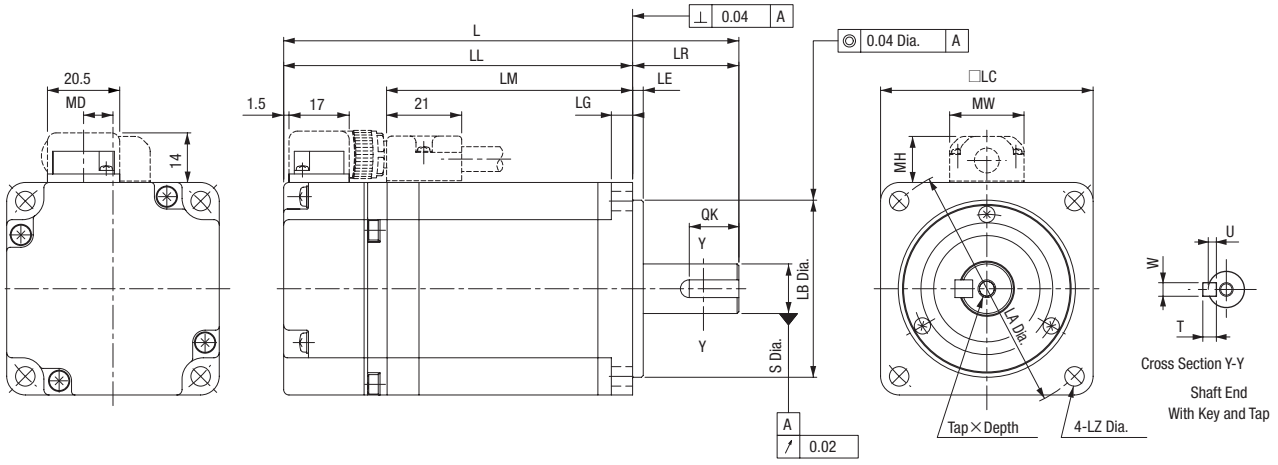
Type SGMAV (230 V, 50-150 W)

Dimensions (mm)	Without brake		With brake		LM	Shaft End Dimensions					Approx. Mass (Kg)	
Model	L	LL	L	LL		Tap x Depth	QK	U	W	T	Without brake	With brake
SGMAV-A5A_A6_	95.5	70.5	140.5	115.5	38.5	M3x6L	14	1.8	3	3	0.3	0.6
SGMAV-01A_A6_	107.5	82.5	152.5	127.5	50.5						0.4	0.7
SGMAV-C2A_A6_	119.5	94.5	164.5	139.5	62.5						0.5	0.8



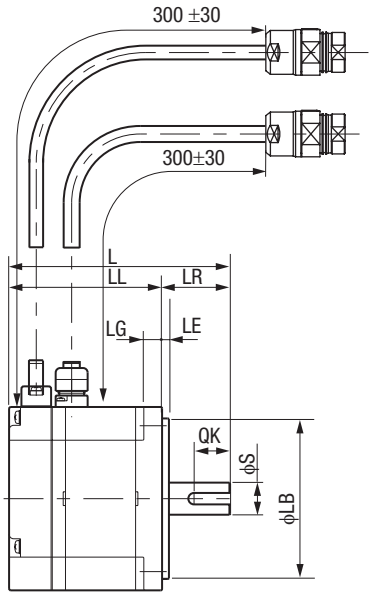
Type SGMAV (230 V, 200-750 W)

Dimensions (mm)	Without brake		With brake		LM	Flange Face Dimensions							Shaft End Dimensions						MD	MW	MH	Approx. Mass (Kg)	
Model	L	LL	L	LL		LR	LE	LG	LC	LA	LB	LZ	S	Tap x Depth	QK	U	W	T				Without brake	With brake
SGMAV-02A_A6_	110	80	150	120	51	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$	M5x8L	20	3	5	5	8.5	21	13	0..9	1.5
SGMAV-04A_A6_	128.5	98.5	168.5	138.5	69.5										14							1.2	1.9
SGMAV-06A_A6_	154.5	124.5	200.5	170.5	95.5																	1.7	2.4
SGMAV-08A_A6_	155	115	200	160	85	40		8	80	90	$70^{0}_{-0.030}$	7	$19^{0}_{-0.013}$	M6x10L	22	3.5	6	6	13.8	27	15	2.3	3.2
SGMAV-10A_A6_	185	145	235	195	115																	3.6	4.6

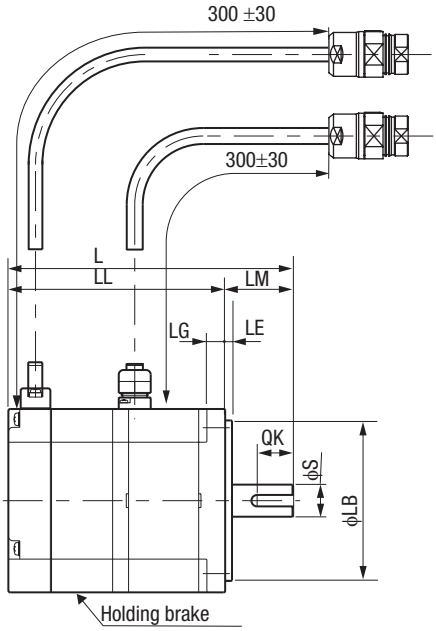


Type SGMEV (230/400 V, 100-1,500 W)

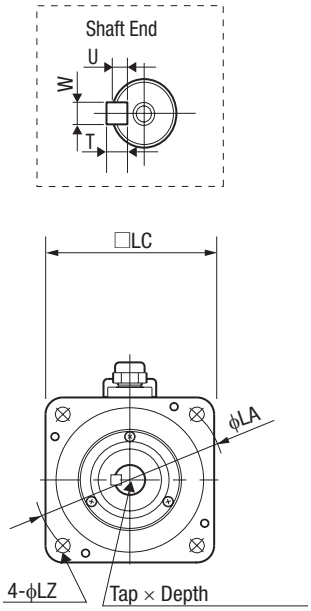
Dimensions (mm)	Without brake		With brake		LM	Flange Face Dimensions						Shaft End Dimensions						Approx. Mass (Kg)	
Model	L	LL	L	LL		LA	LB	LC	LE	LG	LZ	S	QK	W	T	U	Tap x Depth	Without brake	With brake
SGMEV-01A_A6_	87	62	116	91	25	70	$50^{0}_{-0.030}$	60	3	6	5.5	$8^{0}_{-0.011}$	14	3	3	1.8	M3 x 6L	0.7	0.9
SGMEV-02A_A6_	97	67	128.5	98.5	30	90	$70^{0}_{-0.030}$	80		8	7	$14^{0}_{-0.011}$	16	5	5	3	M5 x 8L	1.4	1.9
SGMEV-02D_A6_																			
SGMEV-04A_A6_	117	87	148.5	118.5														2.1	2.6
SGMEV-04D_A6_																			
SGMEV-08A_A6_	126.5	86.5	160	120	40	145	$110^{0}_{-0.035}$	120	3.5	10	10	$16^{0}_{-0.011}$	22					4.2	4.7
SGMEV-08D_A6_																			
SGMEV-15A_A6_	154.5	114.5	188	148								$19^{0}_{-0.013}$		6	6	3.5	M6 x 10L	6.6	8.1
SGMEV-15D_A6_																			



Models without Brake

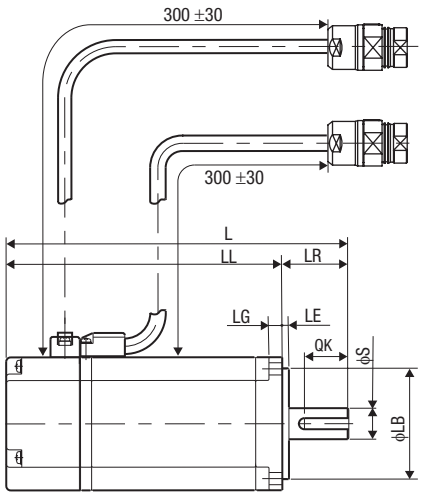


Models with Brake

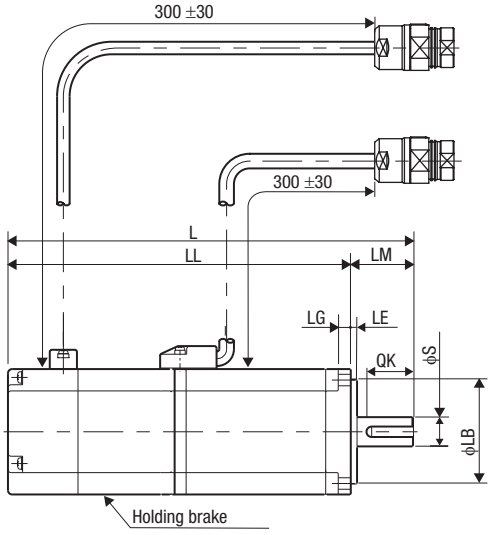


Type SGMEV (400 V, 300-650 W)

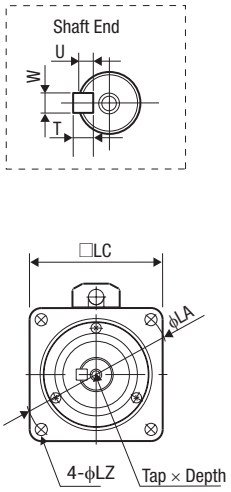
Dimensions (mm)	Without brake		With brake		LM	Flange Face Dimensions						Shaft End Dimensions						Approx. Mass (Kg)	
Model	L	LL	L	LL		LA	LB	LC	LE	LG	LZ	S	QK	W	T	U	Tap x Depth	Without brake	With brake
SGMEV-03D_A6_	154.5	124.5	194	164	30	70	$50^{0}_{-0.025}$	60	3	6	5.5	$14^{0}_{-0.011}$	20	5	5	3	M5 x 8L	1.7	2.2
SGMEV-07D_A6_	185	145	229.5	189.5	40	90	$70^{0}_{-0.030}$	80	3	8	70	$16^{0}_{-0.011}$	30					3.4	4.3



Models without Brake

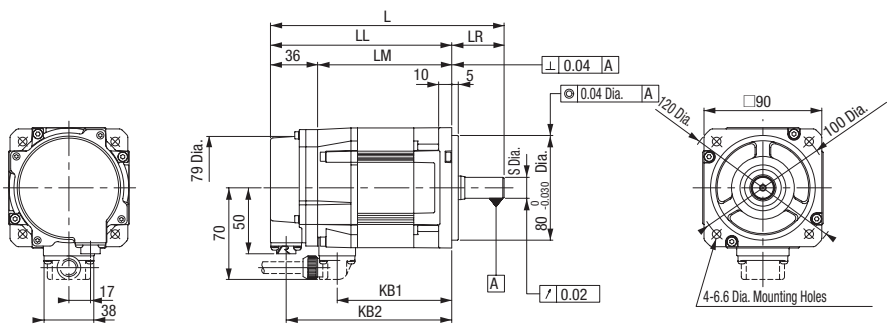


Models with Brake

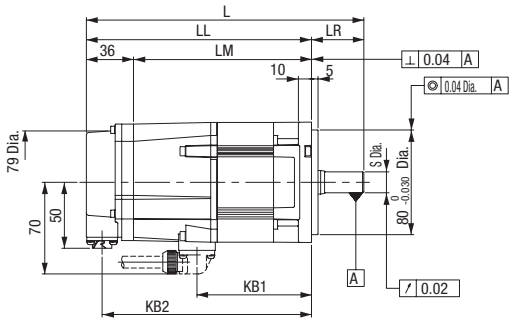


Type SGMGV (400 V, 300-450 W)

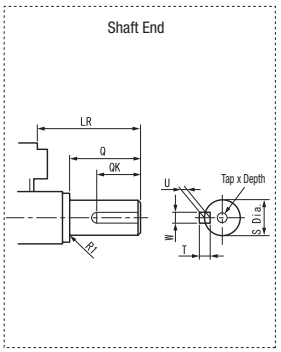
Dimensions (mm)	Without brake				With brake				LR	KB1	Shaft End Dimensions							Approx. Mass (Kg)	
Model	L	LL	LM	KB2	L	LL	LM	KB2			S	Q	QK	W	T	U	Tap x Depth	Without brake	With brake
SGMGV-03D_A6_	163	126	90	114	196	159	123	147	37	75	$14^{0}_{-0.011}$	25	15	5	5	3	M4 x 10L	2.6	3.6
SGMGV-05D_A6_	179	139	103	127	212	172	136	160	40	88	$16^{0}_{-0.011}$	30	20				M4 x 12L	3.2	4.2



Models without brake

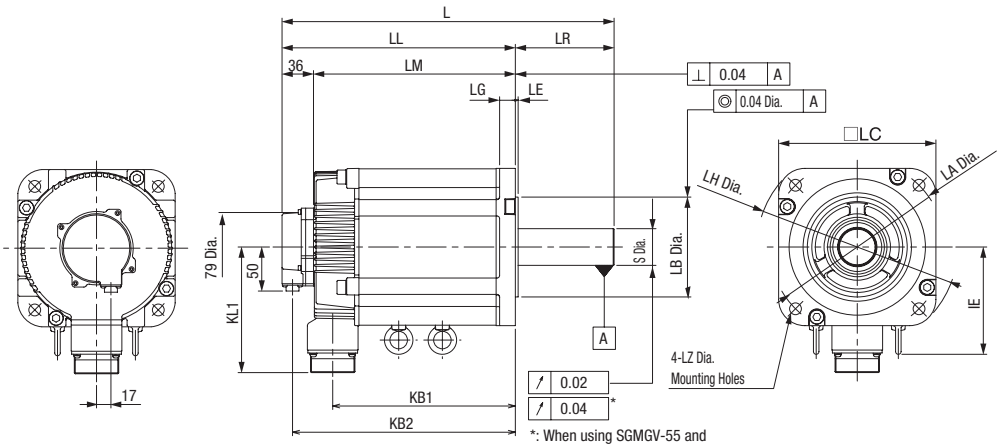


Models with brake

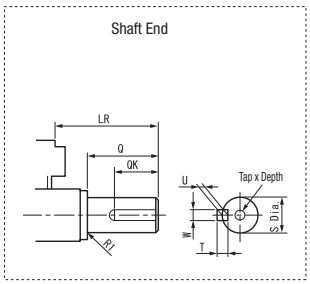


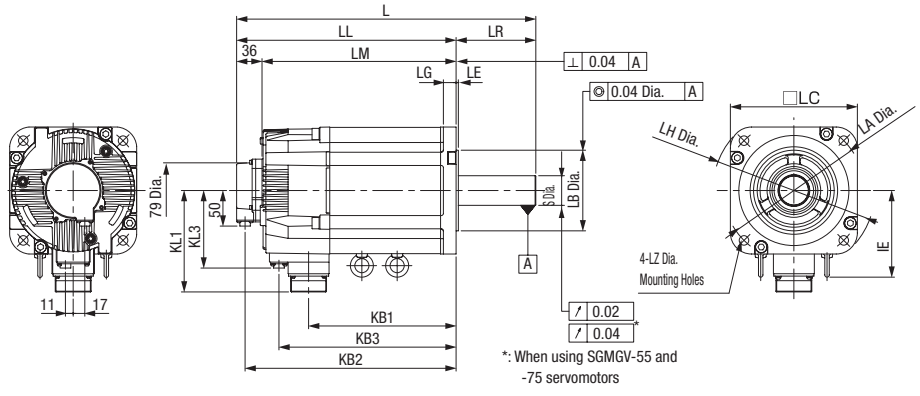
Type SGMGV (400 V, 850 W-7.5 kW)

Dimensions (mm)	Without brake				With brake						LR	KB1	IE	KL1	Flange Face Dimensions							Shaft End Dimensions							Approx. Mass (Kg)	
Model	L	LL	LM	KB2	L	LL	LM	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	Tap x Depth	Without brake	With brake
SGMGV-09D_A6_	195	137	101	125	231	173	137	161	115	80	58	83	-	104	145	$110^{0}_{-0.035}$	130	6	12	165	9	$19^{0}_{-0.013}$	40	25	5	5	3	M5 x 12L	5.5	7.5
SGMGV-13D_A6_	211	153	117	141	247	189	153	177	131			99	-									$22^{0}_{-0.013}$			6	6	3.5		7.1	9.0
SGMGV-20D_A6_	229	171	135	159	265	207	171	195	149			117	-									$24^{0}_{-0.013}$			8	7	4		8.6	11.0
SGMGV-30D_A6_	239	160	124	148	287	208	172	196	148	110	79	108	-	134	200	$114.3^{0}_{-0.025}$	180	3.2	18	230	13.5	$35^{+0.01}_{0}$	76	60	10	8	5	M12 x 25L	13.4	19.5
SGMGV-44D_A6_	263	184	148	172	311	232	196	220	172			132	-																17.5	23.5
SGMGV-55D_A6_	334	221	185	209	378	265	229	253	205		113	163	123	144								$42^{0}_{0.016}$	110	90	12			M16 x 32L	21.5	27.5
SGMGV-75D_A6_	380	267	231	255	424	311	275	299	251			209																	29.5	35



Models without brake

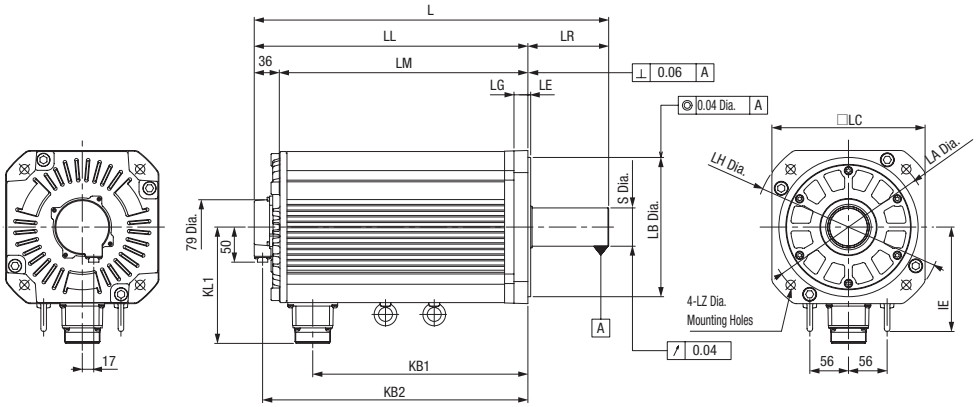




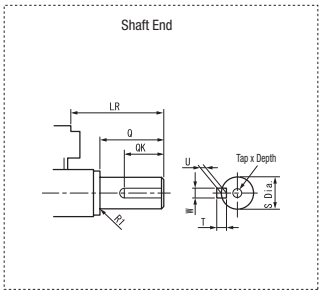
Models with brake

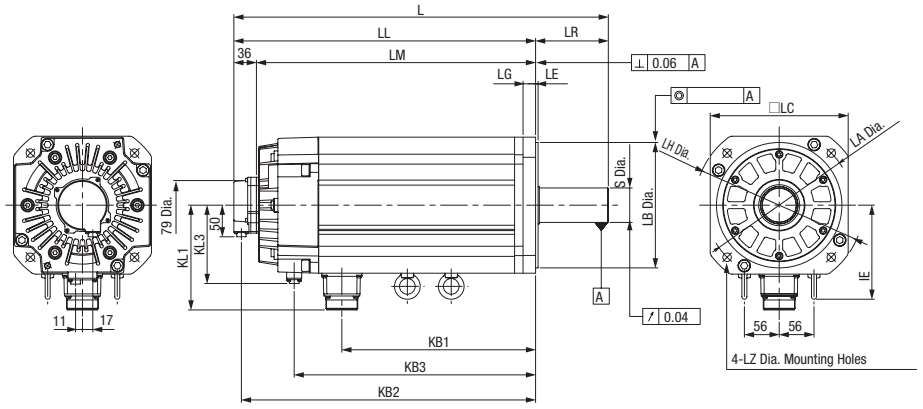
Type SGMGV (400 V, 11 - 15 kW)

Dimensions (mm)	Without brake				With brake						LR	KB1	IE	KL1	Flange Face Dimensions							Shaft End Dimensions							Approx. Mass (Kg)	
Model	L	LL	LM	KB2	L	LL	LM	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	Tap x Depth	Without brake	With brake
SGMGV-1AD_A6_	447	331	295	319	498	382	346	370	315	125	116	247	150	168	235	$200^{0}_{-0.046}$	220	4	20	270	13.5	$42^{0}_{-0..016}$	110	90	12	8	5	M16 x 32L	57	65
SGMGV-1ED_A6_	509	393	357	381	598	482	446	470	385			309										$55^{0.030}_{0.010}$			16	10	6	M20 x 40L	67	85



Models without brake

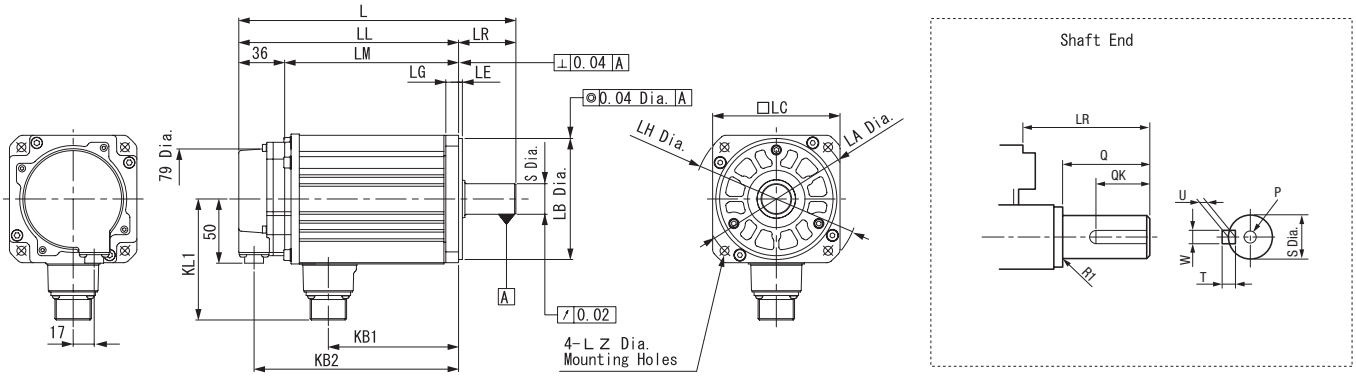




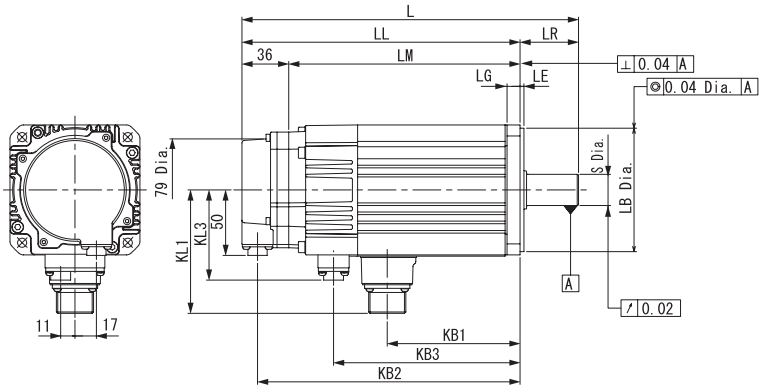
Models with brake

Type SGMSV (400 V, 1 - 5 kW)

Dimensions (mm)	Without brake					With brake							KB1	KL1	Flange Face Dimensions								Shaft End Dimensions						Approx. Mass (Kg)	
Model	L	LL	LM	LR	KB2	L	LL	LM	LR	KB2	KB3	KL2			LA	LB	LC	LE	LF	LG	LH	LZ	S	Q	QK	W	T	U	Tap x Depth	Without brake	With brake
SGMSV-10D_A2_	192	147	111	45	135	233	188	152	45	118	176	69	76	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	32	8	7	4	M8 x 16L	4.1	5.5
SGMSV-15D_A2_	211	153	117	58	141	243	198	162	45	128	186		99																	4.6	6
SGMSV-20D_A2_	229	171	135	58	159	259	214	178	45	144	202		117																	5.4	6.8
SGMSV-25D_A2_	239	160	124	79	148	292	247	211	45	177	225		108																	6.8	8.7
SGMSV-30D_A2_	259	196	160	63	184	295	232	196	63	176	220	81	124	114	145	$110^{0}_{-0.035}$	130	6	6	12	165	9	$28^{0}_{-0.013}$	55	50					10.5	13
SGMSV-40D_A2_	296	233	197	63	221	332	269	233	63	213	257		161																	13.5	16
SGMSV-50D_A2_	336	273	237	63	261	372	309	273	63	253	297		201																	16.5	19



Models without brake



Models with brake

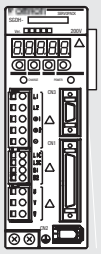


Fast response, high speed and high accuracy

- 6 different designs provide a complete range of servo motors to meet the power, speed and performance required for each application.
- Peak torque 300% of nominal during 3 seconds
- Automatic motor recognition by servo drive
- IP67 and shaft oil seal available
- High resolution encoders

Ordering information

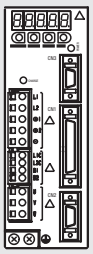
(Refer to servo drive chapter)



Servo drive with option boards for flexible system configuration

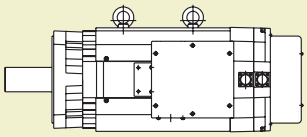
② **Sigma-II servo drive**

Drive options

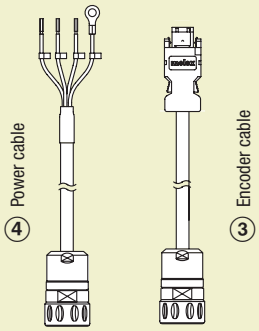


Intelligent servo drive

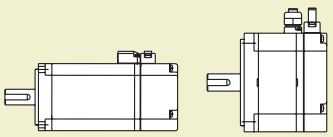
② **XtraDrive**



① **SGMBH servo motor 1500 rpm (22 kW-55 kW)**

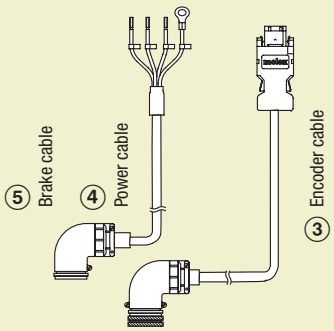


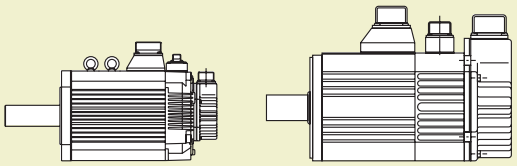
Power and encoder cables



① **SGMAH servo motor 3000 rpm (30-750 W)**

① **SGMPH servo motor 3000 rpm (100-1500 W)**





① **SGMGH servo motor 1500 rpm (450W-15 kW)**

① **SGMUH servo motor 3000 rpm (1-5 kW)**

① **SGMSH servo motor 6000 rpm (1-4 kW)**

Note: The symbols ①②③... show the recommended sequence to select the servo motor and cables

Servo motor

① A select motor from families SGMAH, SGMPH, SGMGH, SGMUH, SGMSH, SGMBH using motor tables in next pages

Servo drive

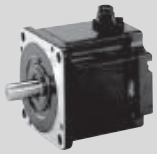
Note: Choosing Sigma-II drive or XtraDrive affects to the encoder cable needed

② Refer to Sigma-II servo drive or XtraDrive chapter for detailed drive specifications and selection of drive accessories

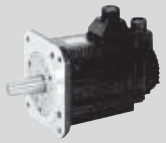
SGMAH - cylindrical servo motors 3000 r/min (30 to 750 W), 200 VAC

Symbol	Specifications					Compatible servo drives ②		Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-II	XtraDrive	Servo motor model
① 	230 V	Incremental encoder (13 bit) Straight shaft with key & tap	Without brake	0.096 Nm	30 W	SGDH-A3AE-OY	XD-P3-MN01	SGMAH-A3AAA61D-OY
				0.159 Nm	50 W	SGDH-A5AE-OY	XD-P5-MN01	SGMAH-A5AAA61D-OY
				0.318 Nm	100 W	SGDH-01AE-OY	XD-01-MN01	SGMAH-01AAA61D-OY
				0.637 Nm	200 W	SGDH-02AE-OY	XD-02-MN01	SGMAH-02AAA61D-OY
				1.27 Nm	400 W	SGDH-04AE-OY	XD-04-MN01	SGMAH-04AAA61D-OY
				2.39 Nm	750 W	SGDH-08AE-S-OY	XD-08-MN	SGMAH-08AAA61D-OY
			With brake	0.096 Nm	30 W	SGDH-A3AE-OY	XD-P3-MN01	SGMAH-A3AAA6CD-OY
				0.159 Nm	50 W	SGDH-A5AE-OY	XD-P5-MN01	SGMAH-A5AAA6CD-OY
				0.318 Nm	100 W	SGDH-01AE-OY	XD-01-MN01	SGMAH-01AAA6CD-OY
				0.637 Nm	200 W	SGDH-02AE-OY	XD-02-MN01	SGMAH-02AAA6CD-OY
				1.27 Nm	400 W	SGDH-04AE-OY	XD-04-MN01	SGMAH-04AAA6CD-OY
				2.39 Nm	750 W	SGDH-08AE-S-OY	XD-08-MN	SGMAH-08AAA6CD-OY
		Absolute encoder (16 bit) Straight shaft with key & tap	Without brake	0.096 Nm	30 W	SGDH-A3AE-OY	XD-P3-MN01	SGMAH-A3A1A61D-OY
				0.159 Nm	50 W	SGDH-A5AE-OY	XD-P5-MN01	SGMAH-A5A1A61D-OY
				0.318 Nm	100 W	SGDH-01AE-OY	XD-01-MN01	SGMAH-01A1A61D-OY
				0.637 Nm	200 W	SGDH-02AE-OY	XD-02-MN01	SGMAH-02A1A61D-OY
				1.27 Nm	400 W	SGDH-04AE-OY	XD-04-MN01	SGMAH-04A1A61D-OY
				2.39 Nm	750 W	SGDH-08AE-S-OY	XD-08-MN	SGMAH-08A1A61D-OY
			With brake	0.096 Nm	30 W	SGDH-A3AE-OY	XD-P3-MN01	SGMAH-A3A1A6CD-OY
				0.159 Nm	50 W	SGDH-A5AE-OY	XD-P5-MN01	SGMAH-A5A1A6CD-OY
				0.318 Nm	100 W	SGDH-01AE-OY	XD-01-MN01	SGMAH-01A1A6CD-OY
				0.637 Nm	200 W	SGDH-02AE-OY	XD-02-MN01	SGMAH-02A1A6CD-OY
				1.27 Nm	400 W	SGDH-04AE-OY	XD-04-MN01	SGMAH-04A1A6CD-OY
				2.39 Nm	750 W	SGDH-08AE-S-OY	XD-08-MN	SGMAH-08A1A6CD-OY
	400 V	Incremental encoder (13 bit) Straight shaft with key	Without brake	0.955 Nm	300 W	SGDH-05DE-OY	XD-05-TN	SGMAH-03DAA61D-OY
				2.07 Nm	650 W	SGDH-10DE-OY	XD-10-TN	SGMAH-07DAA61D-OY
			With brake	0.955 Nm	300 W	SGDH-05DE-OY	XD-05-TN	SGMAH-03DAA6CD-OY
				2.07 Nm	650 W	SGDH-10DE-OY	XD-10-TN	SGMAH-07DAA6CD-OY
		Absolute encoder (16 bit) Straight shaft with key	Without brake	0.955 Nm	300 W	SGDH-05DE-OY	XD-05-TN	SGMAH-03D1A61D-OY
				2.07 Nm	650 W	SGDH-10DE-OY	XD-10-TN	SGMAH-07D1A61D-OY
			With brake	0.955 Nm	300 W	SGDH-05DE-OY	XD-05-TN	SGMAH-03D1A6CD-OY
				2.07 Nm	650 W	SGDH-10DE-OY	XD-10-TN	SGMAH-07D1A6CD-OY

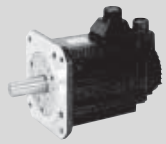
SGMPH - flat type servo motors 3000 r/min (100 to 1500 W), 200 VAC

Symbol	Specifications					Compatible servo drives ②		Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-II	XtraDrive	Servo motor model
① 	230 V	Incremental encoder (13 bit) Straight shaft with key & tap	Without brake	0.318 Nm	100 W	SGDH-01AE-OY	XD-01-MN01	SGMPH-01AAA61D-OY
				0.637 Nm	200 W	SGDH-02AE-OY	XD-02-MN01	SGMPH-02AAA61D-OY
				1.27 Nm	400 W	SGDH-04AE-OY	XD-04-MN01	SGMPH-04AAA61D-OY
				2.39 Nm	750 W	SGDH-08AE-S-OY	XD-08-MN	SGMPH-08AAA61D-OY
				4.77 Nm	1500 W	SGDH-15AE-S-OY	XD-15-MN	SGMPH-15AAA61D-OY
			With brake	0.318 Nm	100 W	SGDH-01AE-OY	XD-01-MN01	SGMPH-01AAA6CD-OY
				0.637 Nm	200 W	SGDH-02AE-OY	XD-02-MN01	SGMPH-02AAA6CD-OY
				1.27 Nm	400 W	SGDH-04AE-OY	XD-04-MN01	SGMPH-04AAA6CD-OY
				2.39 Nm	750 W	SGDH-08AE-S-OY	XD-08-MN	SGMPH-08AAA6CD-OY
				4.77 Nm	1500 W	SGDH-15AE-S-OY	XD-15-MN	SGMPH-15AAA6CD-OY
		Absolute encoder (16 bit) Straight shaft with key & tap	Without brake	0.318 Nm	100 W	SGDH-01AE-OY	XD-01-MN01	SGMPH-01A1A61D-OY
				0.637 Nm	200 W	SGDH-02AE-OY	XD-02-MN01	SGMPH-02A1A61D-OY
				1.27 Nm	400 W	SGDH-04AE-OY	XD-04-MN01	SGMPH-04A1A61D-OY
				2.39 Nm	750 W	SGDH-08AE-S-OY	XD-08-MN	SGMPH-08A1A61D-OY
				4.77 Nm	1500 W	SGDH-15AE-S-OY	XD-15-MN	SGMPH-15A1A61D-OY
			With brake	0.318 Nm	100 W	SGDH-01AE-OY	XD-01-MN01	SGMPH-01A1A6CD-OY
				0.637 Nm	200 W	SGDH-02AE-OY	XD-02-MN01	SGMPH-02A1A6CD-OY
				1.27 Nm	400 W	SGDH-04AE-OY	XD-04-MN01	SGMPH-04A1A6CD-OY
				2.39 Nm	750 W	SGDH-08AE-S-OY	XD-08-MN	SGMPH-08A1A6CD-OY
				4.77 Nm	1500 W	SGDH-15AE-S-OY	XD-15-MN	SGMPH-15A1A6CD-OY
	400 V	Incremental encoder (13 bit) Straight shaft with key	Without brake	0.637 Nm	200 W	SGDH-05DE-OY	XD-05-TN	SGMPH-02DAA61D-OY
				1.27 Nm	400 W	SGDH-05DE-OY	XD-05-TN	SGMPH-04DAA61D-OY
				2.39 Nm	750 W	SGDH-10DE-OY	XD-10-TN	SGMPH-08DAA61D-OY
				4.77 Nm	1500 W	SGDH-15DE-OY	XD-15-TN	SGMPH-15DAA61D-OY
			With brake	0.637 Nm	200 W	SGDH-05DE-OY	XD-05-TN	SGMPH-02DAA6CD-OY
				1.27 Nm	400 W	SGDH-05DE-OY	XD-05-TN	SGMPH-04DAA6CD-OY
				2.39 Nm	750 W	SGDH-10DE-OY	XD-10-TN	SGMPH-08DAA6CD-OY
				4.77 Nm	1500 W	SGDH-15DE-OY	XD-15-TN	SGMPH-15DAA6CD-OY
		Absolute Encoder (16 bit) Straight shaft with key	Without brake	0.637 Nm	200 W	SGDH-05DE-OY	XD-05-TN	SGMPH-02D1A61D-OY
				1.27 Nm	400 W	SGDH-05DE-OY	XD-05-TN	SGMPH-04D1A61D-OY
				2.39 Nm	750 W	SGDH-10DE-OY	XD-10-TN	SGMPH-08D1A61D-OY
				4.77 Nm	1500 W	SGDH-15DE-OY	XD-15-TN	SGMPH-15D1A61D-OY
			With brake	0.637 Nm	200 W	SGDH-05DE-OY	XD-05-TN	SGMPH-02D1A6CD-OY
				1.27 Nm	400 W	SGDH-05DE-OY	XD-05-TN	SGMPH-04D1A6CD-OY
				2.39 Nm	750 W	SGDH-10DE-OY	XD-10-TN	SGMPH-08D1A6CD-OY
				4.77 Nm	1500 W	SGDH-15DE-OY	XD-15-TN	SGMPH-15D1A6CD-OY

SGMGH - servo motors 1500 r/min (0.45 to 15 kW), 400 VAC

Symbol	Specifications					Compatible servo drives ②		Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-II	XtraDrive	Servo motor model
① 	400 V	Incremental encoder (17 bit) Straight shaft with key & tap	Without brake	2.84 Nm	0.45 kW	SGDH-05DE-0Y	XD-05-TN	SGMGH-05DCA6F-0Y
				5.39 Nm	0.85 kW	SGDH-10DE-0Y	XD-10-TN	SGMGH-09DCA6F-0Y
				8.34 Nm	1.3 kW	SGDH-15DE-0Y	XD-15-TN	SGMGH-13DCA6F-0Y
				11.5 Nm	1.8 kW	SGDH-20DE-0Y	XD-20-TN	SGMGH-20DCA6F-0Y
				18.6 Nm	2.9 kW	SGDH-30DE-0Y	XD-30-TN	SGMGH-30DCA6F-0Y
				28.4 Nm	4.4 kW	SGDH-50DE-0Y	XD-50-TN	SGMGH-44DCA6F-0Y
				35.0 Nm	5.5 kW	SGDH-60DE-0Y	–	SGMGH-55DCA6F-0Y
				48.0 Nm	7.5 kW	SGDH-75DE-0Y	–	SGMGH-75DCA6F-0Y
				70.0 Nm	11.5 kW	SGDH-1ADE-0Y	–	SGMGH-1ADCA6F-0Y
				95.4 Nm	15.0 kW	SGDH-1EDE-0Y	–	SGMGH-1EDCA6F-0Y
			With brake	2.84 Nm	0.45 kW	SGDH-05DE-0Y	XD-05-TN	SGMGH-05DCA6H-0Y
				5.39 Nm	0.85 kW	SGDH-10DE-0Y	XD-10-TN	SGMGH-09DCA6H-0Y
				8.34 Nm	1.3 kW	SGDH-15DE-0Y	XD-15-TN	SGMGH-13DCA6H-0Y
				11.5 Nm	1.8 kW	SGDH-20DE-0Y	XD-20-TN	SGMGH-20DCA6H-0Y
				18.6 Nm	2.9 kW	SGDH-30DE-0Y	XD-30-TN	SGMGH-30DCA6H-0Y
				28.4 Nm	4.4 kW	SGDH-50DE-0Y	XD-50-TN	SGMGH-44DCA6H-0Y
				35.0 Nm	5.5 kW	SGDH-60DE-0Y	–	SGMGH-55DCA6H-0Y
				48.0 Nm	7.5 kW	SGDH-75DE-0Y	–	SGMGH-75DCA6H-0Y
				70.0 Nm	11.5 kW	SGDH-1ADE-0Y	–	SGMGH-1ADCA6H-0Y
				95.4 Nm	15.0 kW	SGDH-1EDE-0Y	–	SGMGH-1EDCA6H-0Y
		Absolute encoder (17 bit) Straight shaft with key & tap	Without brake	2.84 Nm	0.45 kW	SGDH-05DE-0Y	XD-05-TN	SGMGH-05D2A6F-0Y
				5.39 Nm	0.85 kW	SGDH-10DE-0Y	XD-10-TN	SGMGH-09D2A6F-0Y
				8.34 Nm	1.3 kW	SGDH-15DE-0Y	XD-15-TN	SGMGH-13D2A6F-0Y
				11.5 Nm	1.8 kW	SGDH-20DE-0Y	XD-20-TN	SGMGH-20D2A6F-0Y
				18.6 Nm	2.9 kW	SGDH-30DE-0Y	XD-30-TN	SGMGH-30D2A6F-0Y
				28.4 Nm	4.4 kW	SGDH-50DE-0Y	XD-50-TN	SGMGH-44D2A6F-0Y
				35.0 Nm	5.5 kW	SGDH-60DE-0Y	–	SGMGH-55D2A6F-0Y
				48.0 Nm	7.5 kW	SGDH-75DE-0Y	–	SGMGH-75D2A6F-0Y
				70.0 Nm	11.5 kW	SGDH-1ADE-0Y	–	SGMGH-1AD2A6F-0Y
				95.4 Nm	15.0 kW	SGDH-1EDE-0Y	–	SGMGH-1ED2A6F-0Y
			With brake	2.84 Nm	0.45 kW	SGDH-05DE-0Y	XD-05-TN	SGMGH-05D2A6H-0Y
				5.39 Nm	0.85 kW	SGDH-10DE-0Y	XD-10-TN	SGMGH-09D2A6H-0Y
				8.34 Nm	1.3 kW	SGDH-15DE-0Y	XD-15-TN	SGMGH-13D2A6H-0Y
				11.5 Nm	1.8 kW	SGDH-20DE-0Y	XD-20-TN	SGMGH-20D2A6H-0Y
				18.6 Nm	2.9 kW	SGDH-30DE-0Y	XD-30-TN	SGMGH-30D2A6H-0Y
				28.4 Nm	4.4 kW	SGDH-50DE-0Y	XD-50-TN	SGMGH-44D2A6H-0Y
				35.0 Nm	5.5 kW	SGDH-60DE-0Y	–	SGMGH-55D2A6H-0Y
				48.0 Nm	7.5 kW	SGDH-75DE-0Y	–	SGMGH-75D2A6H-0Y
				70.0 Nm	11.5 kW	SGDH-1ADE-0Y	–	SGMGH-1AD2A6H-0Y
				95.4 Nm	15.0 kW	SGDH-1EDE-0Y	–	SGMGH-1ED2A6H-0Y

SGMSH - servo motors 3000 r/min (1 to 5 KW), 400 VAC

Symbol	Specifications					Compatible servo drives ②		Order code
	Voltage	Encoder and design		Rated torque	Capacity	Sigma-II	XtraDrive	Servo motor model
① 	400 V	Incremental encoder (17 bit) Straight shaft with key & tap	Without brake	3.18 Nm	1.0 kW	SGDH-10DE-0Y	XD-10-TN	SGMSH-10DCA6F-0Y
				4.9 Nm	1.5 kW	SGDH-15DE-0Y	XD-15-TN	SGMSH-15DCA6F-0Y
				6.36 Nm	2.0 kW	SGDH-20DE-0Y	XD-20-TN	SGMSH-20DCA6F-0Y
				9.8 Nm	3.0 kW	SGDH-30DE-0Y	XD-30-TN	SGMSH-30DCA6F-0Y
				12.6 Nm	4.0 kW	SGDH-50DE-0Y	XD-50-TN	SGMSH-40DCA6F-0Y
				15.8 Nm	5.0 kW	SGDH-50DE-0Y	XD-50-TN	SGMSH-50DCA6F-0Y
			With brake	3.18 Nm	1.0 kW	SGDH-10DE-0Y	XD-10-TN	SGMSH-10DCA6H-0Y
				4.9 Nm	1.5 kW	SGDH-15DE-0Y	XD-15-TN	SGMSH-15DCA6H-0Y
				6.36 Nm	2.0 kW	SGDH-20DE-0Y	XD-20-TN	SGMSH-20DCA6H-0Y
				9.8 Nm	3.0 kW	SGDH-30DE-0Y	XD-30-TN	SGMSH-30DCA6H-0Y
				12.6 Nm	4.0 kW	SGDH-50DE-0Y	XD-50-TN	SGMSH-40DCA6H-0Y
				15.8 Nm	5.0 kW	SGDH-50DE-0Y	XD-50-TN	SGMSH-50DCA6H-0Y
		Absolute encoder (17 bit) Straight shaft with key & tap	Without brake	3.18 Nm	1.0 kW	SGDH-10DE-0Y	XD-10-TN	SGMSH-10D2A6F-0Y
				4.9 Nm	1.5 kW	SGDH-15DE-0Y	XD-15-TN	SGMSH-15D2A6F-0Y
				6.36 Nm	2.0 kW	SGDH-20DE-0Y	XD-20-TN	SGMSH-20D2A6F-0Y
				9.8 Nm	3.0 kW	SGDH-30DE-0Y	XD-30-TN	SGMSH-30D2A6F-0Y
				12.6 Nm	4.0 kW	SGDH-50DE-0Y	XD-50-TN	SGMSH-40D2A6F-0Y
				15.8 Nm	5.0 kW	SGDH-50DE-0Y	XD-50-TN	SGMSH-50D2A6F-0Y
			With brake	3.18 Nm	1.0 kW	SGDH-10DE-0Y	XD-10-TN	SGMSH-10D2A6H-0Y
				4.9 Nm	1.5 kW	SGDH-15DE-0Y	XD-15-TN	SGMSH-15D2A6H-0Y
				6.36 Nm	2.0 kW	SGDH-20DE-0Y	XD-20-TN	SGMSH-20D2A6H-0Y
				9.8 Nm	3.0 kW	SGDH-30DE-0Y	XD-30-TN	SGMSH-30D2A6H-0Y
				12.6 Nm	4.0 kW	SGDH-50DE-0Y	XD-50-TN	SGMSH-40D2A6H-0Y
				15.8 Nm	5.0 kW	SGDH-50DE-0Y	XD-50-TN	SGMSH-50D2A6H-0Y

Sigma-II rotary servo motors

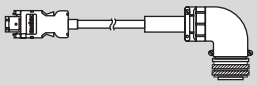
SGMUH - servo motors 6000 r/min (1 to 4 kW), 400 VAC

Symbol	Specifications					Servo motor model	Order code	
							Compatible servo drives ②	
	Voltage	Encoder and design		Rated torque	Capacity		Sigma-II	XtraDrive
① 	400 V	Incremental encoder (17 bit) Straight shaft with key	Without brake	1.59 Nm	1.0 kW	SGMUH-10DCA61-0Y	SGDH-10DE-0Y	XD-10-TN
				2.45 Nm	1.5 kW	SGMUH-15DCA61-0Y	SGDH-15DE-0Y	XD-15-TN
				4.9 Nm	3.0 kW	SGMUH-30DCA610Y	SGDH-30DE-0Y	XD-30-TN
				6.3 Nm	4.0 kW	SGMUH-40DCA61-0Y	SGDH-50DE-0Y	XD-50-TN
			With brake	1.59 Nm	1.0 kW	SGMUH-10DCA6C-0Y	SGDH-10DE-0Y	XD-10-TN
				2.45 Nm	1.5 kW	SGMUH-15DCA6C-0Y	SGDH-15DE-0Y	XD-15-TN
				4.9 Nm	3.0 kW	SGMUH-30DCA6C-0Y	SGDH-30DE-0Y	XD-30-TN
				6.3 Nm	4.0 kW	SGMUH-40DCA6C-0Y	SGDH-50DE-0Y	XD-50-TN

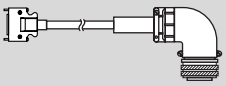
SGMBH - servo motors 1500 r/min (22 to 55 kW)

Symbol	Specifications					Servo motor model	Order code
							Compatible drives ②
	Voltage	Encoder and design		Rated torque	Capacity		Sigma-II
① 	400 V	Incremental encoder (17 bit) Straight shaft with key & tap	Without brake flange mount	140 Nm	22 kW	SGMBH-2BDCA61	SGDH-2BDE
				191 Nm	30 kW	SGMBH-3ZDCA61	SGDH-3ZDE
				236 Nm	37 kW	SGMBH-3GDCA61	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4EDCA61	SGDH-4EDE
			Without brake foot mount	236 Nm	37 kW	SGMBH-3GDCAL1	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4EDCAL1	SGDH-4EDE
				350 Nm	55 kW	SGMBH-5EDCAL1	SGDH-5EDE
			With brake flange mount	140 Nm	22 kW	SGMBH-2BDCA6C	SGDH-2BDE
				191 Nm	30 kW	SGMBH-3ZDCA6C	SGDH-3ZDE
			With brake foot mount	236 Nm	37 kW	SGMBH-3GDCALC	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4EDCALC	SGDH-4EDE
		Absolute encoder (17 bit) Straight shaft with key & tap	Without brake flange mount	140 Nm	22 kW	SGMBH-2BD2A61	SGDH-2BDE
				191 Nm	30 kW	SGMBH-3ZD2A61	SGDH-3ZDE
				236 Nm	37 kW	SGMBH-3GD2A61	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4ED2A61	SGDH-4EDE
			Without brake foot mount	236 Nm	37 kW	SGMBH-3GD2AL1	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4ED2AL1	SGDH-4EDE
				350 Nm	55 kW	SGMBH-5ED2AL1	SGDH-5EDE
			With brake flange mount	140 Nm	22 kW	SGMBH-2BD2A6C	SGDH-2BDE
				191 Nm	30 kW	SGMBH-3ZD2A6C	SGDH-3ZDE
			With brake foot mount	236 Nm	37 kW	SGMBH-3GD2ALC	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4ED2ALC	SGDH-4EDE

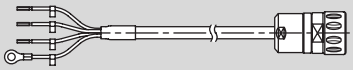
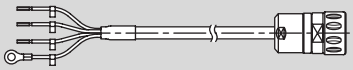
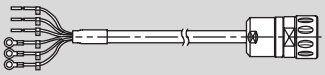
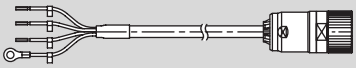
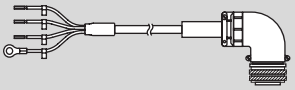
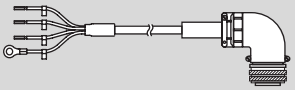
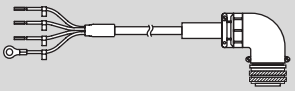
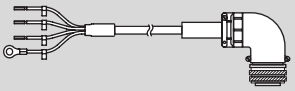
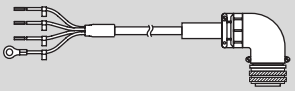
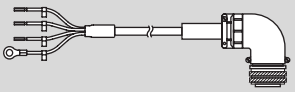
Encoder cables for Sigma-II servo drive

Symbol	Appearance	Specifications		Order code
③		Sigma-II encoder cable for SGMAH/PH servo motors SGMAH-_____D-0Y SGMPH-_____D-0Y	3 m	R88A-CRWA003C-DE
			5 m	R88A-CRWA005C-DE
			10 m	R88A-CRWA010C-DE
			15 m	R88A-CRWA015C-DE
			20 m	R88A-CRWA020C-DE
		Sigma-II encoder cable for SGMGH/SH/UH servo motors SGMGH-_ SGMSH-_ SGMUH-_, SGMBH-_	3 m	R88A-CRWB003N-E
			5 m	R88A-CRWB005N-E
			10 m	R88A-CRWB010N-E
			15 m	R88A-CRWB015N-E
			20 m	R88A-CRWB020N-E

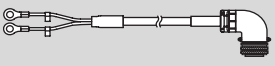
for XtraDrive servo drive

Symbol	Appearance	Specifications		Order code
③		XtraDrive encoder cable for Sigma-II (SGMAH/PH) servo motors SGMAH-_____D-0Y SGMPH-_____D-0Y	3 m	XD-CRWA003-DE
			5 m	XD-CRWA005-DE
			10 m	XD-CRWA010-DE
			15 m	XD-CRWA015-DE
			20 m	XD-CRWA020-DE
		XtraDrive encoder cable for Sigma-II (SGMGH/SH/UH/BH) servo motors SGMGH-_ SGMSH-_ SGMUH-_	3 m	XD-CRWB003N-E
			5 m	XD-CRWB005N-E
			10 m	XD-CRWB010N-E
			15 m	XD-CRWB015N-E
			20 m	XD-CRWB020N-E

Power cables

Symbol	Appearance	Specifications		Order code
④		For 200 V servo motors without brake SGMAH-___A___1D-OY SGMPH-(01/02/04/08)A__41D-OY	3 m	R88A-CAWA003S-DE
			5 m	R88A-CAWA005S-DE
			10 m	R88A-CAWA010S-DE
			15 m	R88A-CAWA015S-DE
			20 m	R88A-CAWA020S-DE
		For 200 V servo motors with brake SGMAH-___A___CD-OY SGMPH-(01/02/04/08)A__4CD-OY	3 m	R88A-CAWA003B-DE
			5 m	R88A-CAWA005B-DE
			10 m	R88A-CAWA010B-DE
			15 m	R88A-CAWA015B-DE
			20 m	R88A-CAWA020B-DE
		For 200 V servo motors without brake SGMPH-15A___1D-OY	3 m	R88A-CAWB003S-DE
			5 m	R88A-CAWB005S-DE
			10 m	R88A-CAWB010S-DE
			15 m	R88A-CAWB015S-DE
			20 m	R88A-CAWB020S-DE
		For 200 V servo motors with brake SGMPH-15A___CD-OY	3 m	R88A-CAWB003B-DE
			5 m	R88A-CAWB005B-DE
			10 m	R88A-CAWB010B-DE
			15 m	R88A-CAWB015B-DE
			20 m	R88A-CAWB020B-DE
		For 400 V servo motors without brake SGMAH-___D___1D-OY SGMPH-__D___1D-OY	3 m	R88A-CAWK003S-DE
			5 m	R88A-CAWK005S-DE
			10 m	R88A-CAWK010S-DE
			15 m	R88A-CAWK015S-DE
			20 m	R88A-CAWK020S-DE
		For 400 V servo motors with brake SGMAH-___D___CD-OY SGMPH-__D___CD-OY	3 m	R88A-CAWK003B-DE
			5 m	R88A-CAWK005B-DE
			10 m	R88A-CAWK010B-DE
			15 m	R88A-CAWK015B-DE
			20 m	R88A-CAWK020B-DE
		For 400 V servo motors SGMGH-(05/09/13)D_ SGMSH-(10/15/20)D_ SGMUH-(10/15)D_ For servo motors with brake a separate cable (R88A-CAWC0__B-E) is needed	3 m	R88A-CAWC003S-E
			5 m	R88A-CAWC005S-E
			10 m	R88A-CAWC010S-E
			15 m	R88A-CAWC015S-E
			20 m	R88A-CAWC020S-E
		For 400 V servo motors SGMGH-(20/30)D_ SGMSH-(30/40/50)D_ SGMUH-(30/40)D_ For servo motors with brake a separate cable (R88A-CAWC0__B-E) is needed	3 m	R88A-CAWD003S-E
			5 m	R88A-CAWD005S-E
			10 m	R88A-CAWD010S-E
			15 m	R88A-CAWD015S-E
			20 m	R88A-CAWD020S-E
		For 400 V servo motors SGMGH-44D_ For servo motors with brake a separate cable (R88A-CAWC0__B-E) is needed	3 m	R88A-CAWG003S-E
			5 m	R88A-CAWG005S-E
			10 m	R88A-CAWG010S-E
			15 m	R88A-CAWG015S-E
			20 m	R88A-CAWG020S-E
		For 400 V servo motors SGMGH-55D_ For servo motors with brake a separate cable (R88A-CAWC0__B-E) is needed	3 m	R88A-CAWF003S-E
			5 m	R88A-CAWF005S-E
			10 m	R88A-CAWF010S-E
			15 m	R88A-CAWF015S-E
			20 m	R88A-CAWF020S-E
		For 400 V servo motors SGMGH-(75/1A)D_ For servo motors with brake a separate cable (R88A-CAWC0__B-E) is needed	3 m	R88A-CAWH003S-E
			5 m	R88A-CAWH005S-E
			10 m	R88A-CAWH010S-E
			15 m	R88A-CAWH015S-E
			20 m	R88A-CAWH020S-E
		For 400 V servo motors SGMGH-1ED_ For servo motors with brake a separate cable (R88A-CAWC0__B-E) is needed	3 m	R88A-CAWJ003S-E
			5 m	R88A-CAWJ005S-E
			10 m	R88A-CAWJ010S-E
			15 m	R88A-CAWJ015S-E
			20 m	R88A-CAWJ020S-E

Brake cable (For SGMGH/SH/UH motors)

Symbol	Appearance	Specifications		Order code
⑤		Brake cable only. For 400 V servo motors with brake SGMGH-__D_ SGMSH-__D_ SGMUH-__D_	3 m	R88A-CAWC003B-E
			5 m	R88A-CAWC005B-E
			10 m	R88A-CAWC010B-E
			15 m	R88A-CAWC015B-E
			20 m	R88A-CAWC020B-E

Connectors

Specification	Order code
Hypertac power connector IP67 (for 200 V motors SGMAH/PH-__A____D-OY)	SPOC-06K-FSDN169
Hypertac power connector IP67 (for 400 V motors SGMAH/PH-__D____D-OY)	LPRA-06B-FRBN170
Hypertac encoder connector IP67 (for motors SGMAH/PH-_____D-OY)	SPOC-17H-FRON169
Military power connector IP67 (for 400 V motors SGMGH-(05/10/13)D_, SGMSH-(10/15/20)D_ , SGMUH-(10/15)D_)) (for SGMBH-_ fan)	MS3108E18-10S
Military power connector IP67 (for 400 V motors SGMGH-(20/30/44)D_, SGMSH-(30/40/50)D_, SGMUH-(30/40)D_)	MS3108E22-22S
Military power connector IP67 (for 400 V motors SGMGH-(55/75/1A/1E)D_)	MS3108E32-17S
Military brake connector IP67 (for 400 V servo motors SGMGH-_, SGMSH-_, SGMUH-_)	MS3108E10SL-3S
Military encoder connector IP67 (for motors SGMGH-_, SGMSH-_, SGMUH-_, SGMBH-_)	MS3108E20-29S

Specifications

Type SGMAH, 230V/400 V

Ratings and specifications

Applied voltage		230 V						400 V	
Servo motor model SGMAH-_		A3A_	A5A_	01A_	02A_	04A_	08A_	03D_	07D_
Rated output	W	30	50	100	200	400	750	300	650
Rated torque	Nm	0.096	0.159	0.318	0.637	1.27	2.39	0.955	2.07
Instantaneous peak torque	Nm	0.286	0.477	0.955	1.91	3.82	7.16	3.82	7.16
Rated current	A (rms)	0.44	0.64	0.91	2.1	2.8	4.4	1.3	2.2
Instantaneous max. current	A (rms)	1.3	2.0	2.8	6.5	8.5	13.4	5.1	7.7
Rated speed	min^{-1}	3000							
Max. speed	min^{-1}	5000							
Torque constant	Nm/A (rms)	0.238	0.268	0.378	0.327	0.498	0.590	0.837	1.02
Rotor moment of inertia (JM)	$kg{\cdot}m^2x10^{-4}$	0.017	0.022	0.036	0.106	0.173	0.672	0.173	0.672
Allowable load moment of inertia (JL)	Multiple of (JM)	30				20			
Rated power rate	kW/s	5.49	11.5	27.8	38.2	93.7	84.8	52.9	63.8
Rated angular acceleration	rad/s^2	57,500	72,300	87,400	60,100	73,600	35,500	55,300	30,800
Applicable encoder	Standard	Incremental encoder (13 bits: 2048P/R)							
	Option	Incremental/absolute encoder (16 bits: 16384P/R)							
Holding brake moment of inertia J	$kg{\cdot}m^2x10^{-4}$	0.0085			0.058		0.14	0.058	0.14
Basic specifications: Time rating		Continuous							
Basic specifications: Insulation class		Class B							
Basic specifications: Ambient temperature		0 to +40°C							
Basic specifications: Ambient humidity		20 to 80% (non-condensing)							
Basic specifications: Vibration class		15 µm or below							
Basic specifications: Enclosure		Totally-enclosed, self-cooled, IP55 (excluding shaft opening)							
Basic specifications: Vibration resistance		Vibration acceleration 49 m/s^2							
Basic specifications: Mounting		Flange-mounted							

Type SGMPH, 230V/400 V

Ratings and specifications

Applied voltage		230 V					400 V			
Servo motor model SGMPH-_		01A_	02A_	04A_	08A_	15A_	02D_	04D_	08D_	15D_
Rated output	W	100	200	400	750	1500	200	400	750	1500
Rated torque	Nm	0.318	0.637	1.27	2.39	4.77	0.637	1.27	2.39	4.77
Instantaneous peak torque	Nm	0.955	1.91	3.82	7.16	14.3	1.91	3.82	7.16	14.3
Rated current	A (rms)	0.89	2.0	2.6	4.1	7.5	1.4	1.4	2.6	4.5
Instantaneous max. current	A (rms)	2.8	6.0	8.0	13.9	23.0	4.6	4.4	7.8	13.7
Rated speed	min^{-1}	3000								
Max. speed	min^{-1}	5000								
Torque constant	Nm/A (rms)	0.392	0.349	0.535	0.641	0.687	0.481	0.963	0.994	1.14
Rotor moment of inertia (JM)	$kg{\cdot}m^2x10^{-4}$	0.0491	0.193	0.331	2.10	4.02	0.193	0.331	2.10	4.02
Allowable load moment of inertia (JL)	Multiple of (JM)	25	15	7	5		15	7	5	
Rated power rate	kW/s	20.6	21.0	49.0	27.1	56.7	21.0	49.0	27.1	56.7
Rated angular acceleration	rad/s^2	64,800	33,000	38,500	11,400	11,900	33,000	38,500	11,400	11,900
Applicable encoder	Standard	Incremental encoder (13 bits: 2048P/R)								
	Option	Incremental/absolute encoder (16 bits: 16384P/R)								
Holding brake moment of inertia J	$kg{\cdot}m^2x10^{-4}$	0.029	0.109		0.875		0.109		0.875	
Basic specifications: Time rating		Continuous								
Basic specifications: Insulation class		Class B								
Basic specifications: Ambient temperature		0 to +40°C								
Basic specifications: Ambient humidity		20 to 80% (non-condensing)								
Basic specifications: Vibration class		15 µm or below								
Basic specifications: Enclosure		Totally-enclosed, self-cooled, IP55 (excluding shaft opening)								
Basic specifications: Vibration resistance		Vibration acceleration 49 m/s^2								
Basic specifications: Mounting		Flange-mounted								

Type SGMGH, 400 V

Ratings and specifications

Applied voltage		400 V									
Servo motor model SGMGH-_		**05D_**	**09D_**	**13D_**	**20D_**	**30D_**	**44D_**	**55D_**	**75D_**	**1AD_**	**1ED_**
Rated output	kW	0.45	0.85	1.3	1.8	2.9	4.4	5.5	7.5	11	15
Rated torque	Nm	2.84	5.39	8.34	11.5	18.6	28.4	35.0	48.0	70.0	95.4
Instantaneous peak torque	Nm	8.92	13.8	23.3	28.7	45.1	71.1	90.7	123	175	221
Rated current	A (rms)	1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.4	28.1	37.2
Instantaneous max. current	A (rms)	5.5	8.5	14	20	28	40.5	55	65	70	85
Rated speed	min^{-1}	1500									
Max. speed	min^{-1}	3000								2,000	
Torque constant	Nm/A (rms)	1.64	1.65	1.68	1.46	1.66	1.82	1.74	2.0	2.56	2.64
Rotor moment of inertia (JM)	$kg{\cdot}m^2x10^{-4}$	7.24	13.9	20.5	31.7	46.0	67.5	89.0	125	281	315
Allowable load moment of inertia (JL)	Multiple of (JM)	5									
Rated power rate	kW/s	11.2	20.9	33.8	41.5	75.3	120	137	184	174	289
Rated angular acceleration	rad/s^2	3,930	3,880	4,060	3,620	4,050	4,210	3,930	3,850	2,490	3,030
Applicable encoder	Standard	Incremental encoder (17 bits: 16384P/R)									
	Option	Absolute encoder (17 bits: 16384P/R)									
Holding brake moment of inertia J	$kg{\cdot}m^2x10^{-4}$	2.10			8.50					18.8	37.5
Basic specifications	Time rating	Continuous									
	Insulation class	Class F									
	Ambient temperature	0 to +40°C									
	Ambient humidity	20 to 80% (non-condensing)									
	Vibration class	15 µm or below									
	Enclosure	Totally-enclosed, self-cooled, IP67 (excluding shaft opening)									
	Vibration resistance	Vibration acceleration 24.5 m/s^2									
	Mounting	Flange-mounted									

Type SGMSH, 400 V

Ratings and specifications

Applied voltage		400 V					
Servo motor model SGMSH-_		**10D_**	**15D_**	**20D_**	**30D_**	**40D_**	**50D_**
Rated output	kW	1.0	1.5	2.0	3.0	4.0	5.0
Rated torque	Nm	3.18	4.9	6.36	9.8	12.6	15.8
Instantaneous peak torque	Nm	9.54	14.7	19.1	29.4	37.8	47.6
Rated current	A (rms)	2.8	4.7	6.2	8.9	12.5	13.8
Instantaneous max. current	A (rms)	8.5	14	19.5	28	38	42
Rated speed	min^{-1}	3,000					
Max. speed	min^{-1}	5,000					
Torque constant	Nm/A (rms)	1.27	1.15	1.12	1.19	1.07	1.24
Rotor moment of inertia (JM)	$kg{\cdot}m^2x10^{-4}$	1.74	2.47	3.19	7.0	9.60	12.3
Allowable load moment of inertia (JL)	Multiple of (JM)	5					
Rated power rate	kW/s	57.9	97.2	127	137	166	202
Rated angular acceleration	rad/s^2	18,250	19,840	19,970	14,000	13,160	12,780
Applicable encoder	Standard	Incremental encoder (17 bits: 16384P/R)					
	Option	Absolute encoder (17 bits: 16384P/R)					
Holding brake moment of inertia J	$kg{\cdot}m^2x10^{-4}$	0.325			2.10		
Basic specifications	Time rating	Continuous					
	Insulation class	Class F					
	Ambient temperature	0 to +40°C					
	Ambient humidity	20 to 80% (non-condensing)					
	Vibration class	15 µm or below					
	Enclosure	Totally-enclosed, self-cooled, IP67 (excluding shaft opening)					
	Vibration resistance	Vibration acceleration 24.5 m/s^2					
	Mounting	Flange-mounted					

Type SGMUH, 400 V

Ratings and specifications

Applied voltage			400 V			
Servo motor model SGMUH-_			10D_	15D_	30D_	40D_
Rated output		kW	1.0	1.5	3.0	4.0
Rated torque		Nm	1.59	2.45	4.9	6.3
Instantaneous peak torque		Nm	6.5	11	21.5	29
Rated current		A (rms)	2.7	4.1	8.1	9.6
Instantaneous max. current		A (rms)	8.5	14	28	38.5
Rated speed		min^{-1}	6000			
Max. speed		min^{-1}	6000			
Torque constant		Nm/A (rms)	0.81	0.83	0.81	0.80
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$	1.74	2.47	7.0	9.6
Allowable load moment of inertia (JL)		Multiple of (JM)	5			
Rated power rate		kW/s	14.5	24.3	34.3	41.3
Rated angular acceleration		rad/s^2	9130	9910	7000	6550
Applicable encoder		Standard	Incremental Encoder (17 bits: 16384P/R)			
		Option	–			
Holding brake moment of inertia J		$kg·m^2x10^{-4}$	0.25		2.10	
Basic specifications	Time rating		Continuous			
	Insulation class		Class F			
	Ambient temperature		0 to +40°C			
	Ambient humidity		20 to 80% (non-condensing)			
	Vibration class		15 µm or below			
	Enclosure		Totally-enclosed, self-cooled, IP67 (excluding shaft opening)			
	Vibration resistance		Vibration acceleration 24.5 m/s^2			
	Mounting		Flange-mounted			

Type SGMBH, 400 V

Ratings and specifications

Type	SGMBH-_		2BD_A	3ZD_A	3GD_A	4ED_A	5ED_A
Performance	Rated output	kW	22	30	37	45	55
	Rated torque	Nm	140	191	236	286	350
	Stalling torque	Nm	140	191	236	286	350
	Instantaneous peak torque	Nm	280	382	471	572	700
	Rated current	A(rms)	58	80	100	127	150
	Instantaneous max. current	A(rms)	120	170	210	260	310
	Rated/max. speed	min^{-1}	1500/2000				
	Rotor inertia	$kg·m^2$	0.0592	0.0773	0.139	0.151	0.197
Structure	Protective enclosure		IP44				
	Mounting method		Flange		Flange foot mount *1		Foot mount
Encoder		Standard	Incremental, absolute: 17 bits 16384P/R or equivalent *2				
		Option	Absolute: 20 bits 16384P/R or equivalent				
Usage temperature			0 to 40°C				
Usage humidity			20 to 80% (non-condensing)				

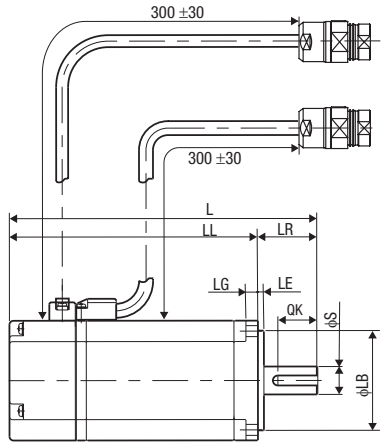
*1 37 kW and 45 kW motors with brakes are foot mount type
*2 The number of output pulses of servo drive is 16384P/R for both 17-bit and 20-bit encoders (no dividing).

Dimensions

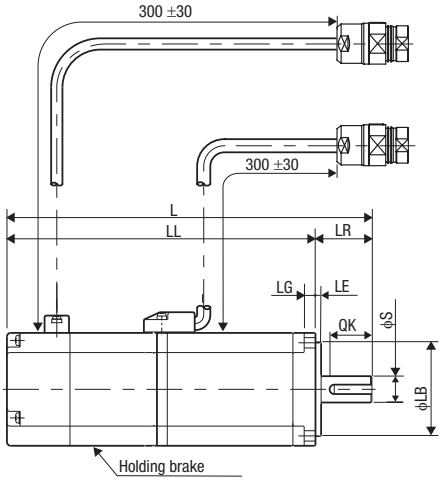
Servo motors

Type SGMAH (230/400 V)

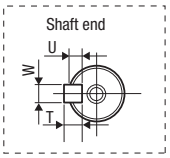
Dimensions (mm)	Without brake		With brake		LR	Flange surface						Shaft end					
Order code	L	LL	L	LL		LA	LB	LC	LE	LG	LZ	S	QK	W	T	U	Tap × Depth
SGMAH-A3A_A6_D-0Y	94.5	69.5	126	101	25	46	30^{h7}	40	2.5	5	4.3	6^{h6}	14	2	2	1.2	M2.5 x 5L
SGMAH-A5A_A6_D-0Y	102.0	77	133.5	108.5													
SGMAH-01A_A6_D-0Y	119.5	94.5	160	135								8^{h6}		3	3	1.8	M3 x 6L
SGMAH-02A_A6_D-0Y	126.5	96.5	166	136	30	70	50^{h7}	60	3	6	5.5	14^{h6}	20	5	5	3	M5 x8L
SGMAH-03D_A6_D-0Y	154.5	124.5	194	164													
SGMAH-04A_A6_D-0Y																	
SGMAH-07D_A6_D-0Y	185	145	229.5	189.5	40	90	70^{h7}	80	3	8	7	16^{h6}	30				
SGMAH-08A_A6_D-0Y																	

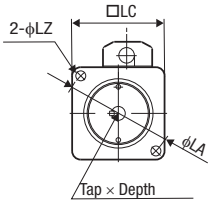


Models without brake

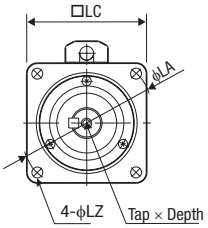


Models with brake





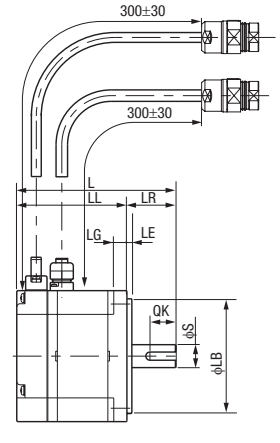
SGMAH-A3,-A5,-01



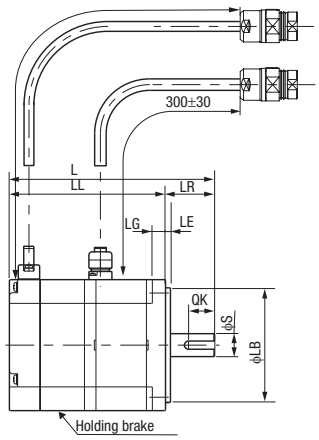
SGMAH-02 to -08

Type SGMPH (230/400 V)

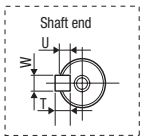
Dimensions (mm)	Without brake		With brake		LR	Flange surface						Shaft end					
Order code	L	LL	L	LL		LA	LB	LC	LE	LG	LZ	S	QK	W	T	U	Tap × Depth
SGMPH-01___6_D-0Y	87	62	116	91	25	70	50^{h7}	60	3	6	5.5	8^{h6}	14	3	3	1.8	M3x6L
SGMPH-02___6_D-0Y	97	67	128.5	98.5	30	90	70^{h7}	80	3	8	7	14^{h6}	16	5	5	3	M5x8L
SGMPH-04___6_D-0Y	117	87	148.5	118.5													
SGMPH-08___6_D-0Y	126.5	86.5	160	120	40	145	110^{h7}	120	3.5	10	10	16^{h6}	22				
SGMPH-15___6_D-0Y	154.5	114.5	188	148								19^{h6}		6	6	3.5	M6x10L

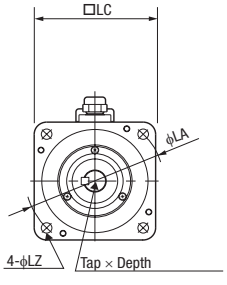


Models without brake



Models with brake

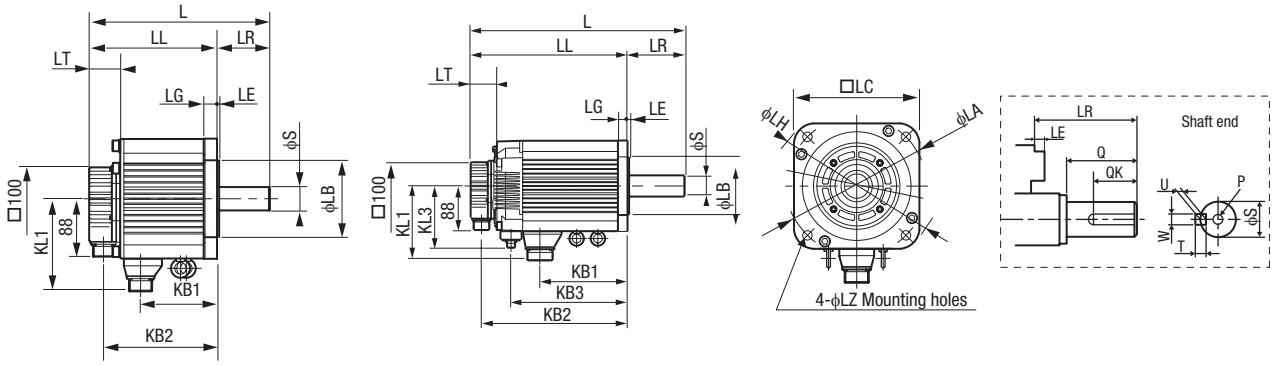




Type SGMGH (400 V)

Dimensions (mm)	Without brake			With brake					LR	LT	KB1	KL1	Flange surface							Shaft end						
Order code	L	LL	KB2	L	LL	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	P
SGMGH-05D_A6_-0Y	196	138	117	234	176	154	109	98	58	46	65	109	145	110	130	6	12	165	9	19	40	25	5	5	3	M5x12L
SGMGH-09D_A6_-0Y	219	161	140	257	199	177	132				88															
SGMGH-13D_A6_-0Y	243	185	164	281	223	201	156				112									22			6	6	3.5	

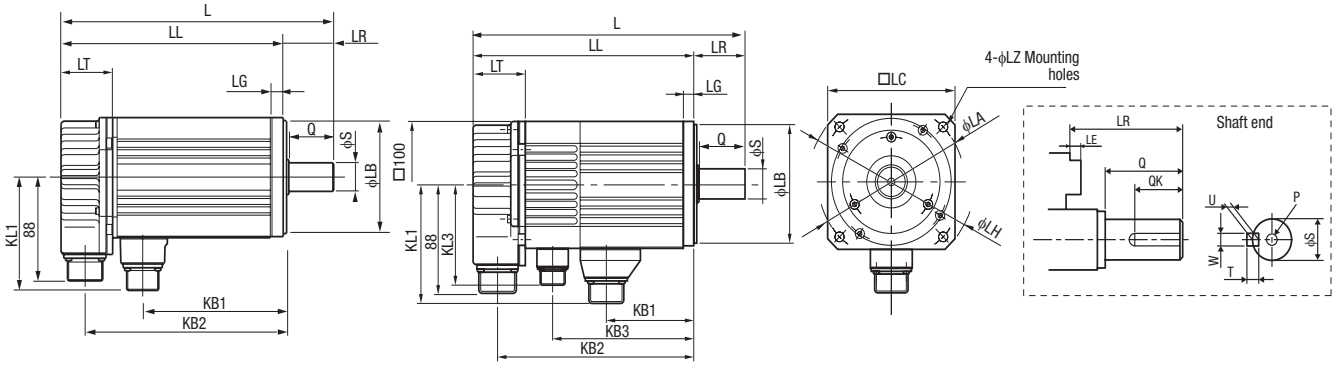
Dimensions (mm)	Without brake			With brake					LR	LT	KB1	KL1	Flange surface							Shaft end						
Order code	L	LL	KB2	L	LL	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	P
SGMGH-20D_A6_-0Y	245	166	144	296	217	195	137	123	79	47	89	140	200	114.3	180	3.2	18	230	13.5	35	76	60	10	8	5	M12x25L
SGMGH-30D_A6_-0Y	271	192	170	322	243	221	163				115															
SGMGH-44D_A6_-0Y	305	226	204	356	277	255	197				149															
SGMGH-55D_A6_-0Y	373	260	238	424	311	289	231		113		174	150								42	110	90	12			M16x32L
SGMGH-75D_A6_-0Y	447	334	312	498	385	363	305				248															
SGMGH-1AD_A6_-0Y	454	338	316	499	383	362	315	142	116	47	251	168	235	200	220	4	18	270	13.5	42	110	90	12	8	5	M16x32L
SGMGH-1ED_A6_-0Y	573	457	435	635	519	497	415			48	343						20			55			16	10	6	M20x40L



Models without brake Models with brake

Type SGMSH (400 V)

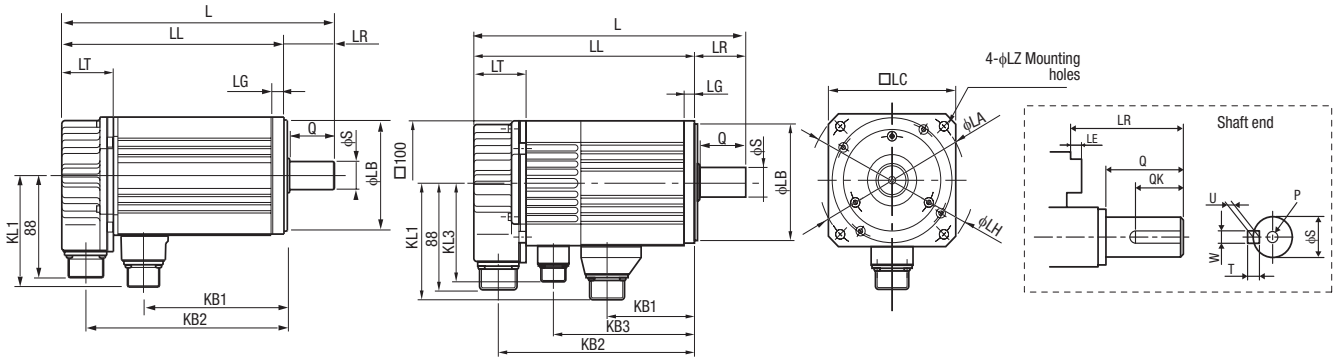
Dimensions (mm)	Without brake			With brake					LR	LT	KB1	KL1	Flange surface							Shaft end						
Order code	L	LL	KB2	L	LL	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	P
SGMSH-10D_A6_-0Y	194	149	128	238	193	171	120	85	45	46	76	96	115	95^{h7}	100	3	10	130	7	24^{h6}	40	32	8	7	4	M8x16L
SGMSH-15D_A6_-0Y	220	175	154	264	219	197	146				102															
SGMSH-20D_A6_-0Y	243	198	177	287	242	220	169				125															
SGMSH-30D_A6_-0Y	262	199	178	300	237	216	170	98	63		124	114	145	110^{h7}	130	6	12	165	9	28^{h6}	55	50				
SGMSH-40D_A6_-0Y	299	236	215	337	274	253	207				161															
SGMSH-50D_A_-0Y	339	276	255	377	314	293	247				201															



Models without brake Models with brake

Type SGMUH (400 V)

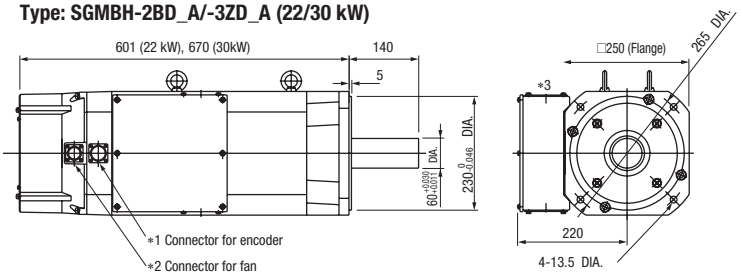
Dimensions (mm)	Without brake			With brake					LR	LT	KB1	KL1	Flange surface							Shaft end						
Order code	L	LL	KB2	L	LL	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	P
SGMUH-10D_A6_-0Y	194	149	128	238	193	171	120	85	45	46	76	96	130	110	116	3.5	10	150	9	24^{h6}	40	32	8	7	4	M8x16L
SGMUH-15D_A6_-0Y	220	175	154	264	219	197	146				102															
SGMUH-30D_A6_-0Y	262	202	181	300	237	219	173	98	60		127	114	165	130	155		12	190	11	28^{h6}	55	50				
SGMUH-40D_A6_0Y	327	269	245	362	302	281	210			71	164															



Models without brake Models with brake

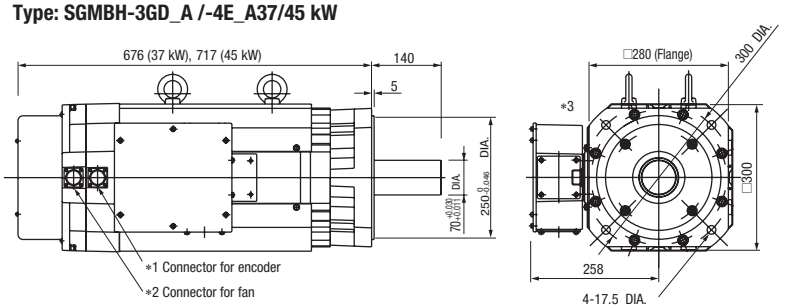
Type SGMBH (400 V)

Type: SGMBH-2BD_A/-3ZD_A (22/30 kW)



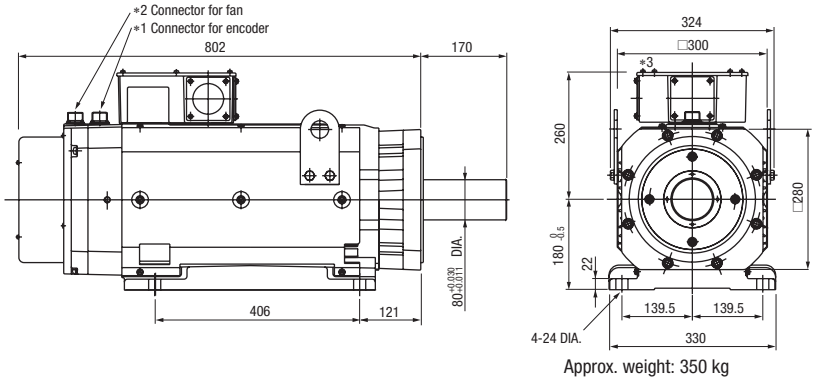
Approx. weight: 120 kg (22 kW)
140 kg (30 kW)

Type: SGMBH-3GD_A /-4E_A37/45 kW



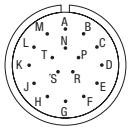
Approx. weight: 230 kg (37 kW)
250 kg (45 kW)

Type: SGMBH-5ED_A (55 kW)



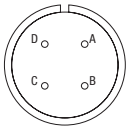
Approx. weight: 350 kg

∗1 Connector for encoder



Receptacle:	97F-3102E20-29P
Plug IP67 (L-shape):	MS3108E20-29S

∗2 Connector for fan



Receptacle:	CE05-2A18-10PD-B
Plug IP67 (L-shape):	MS3108E18-10S



Ultra-compact motor

The SmartStep motors offer the simplicity and cost-effectiveness of a stepper with the added advantages of a servo system.

- Sizes 30 W to 750 W, rated speed 3,000 rpm
- Cylindrical and flat servo motor types are available
- Peak torque up to three times continuous torque during 3 seconds
- Easy to install with prebuilt cables
- Motors with brake are available

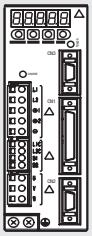
Ordering information

(Refer to servo drive chapter)



Servodrive controlled by pulses

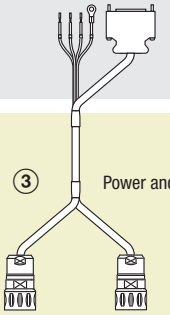
② **SmartStep servo drive**



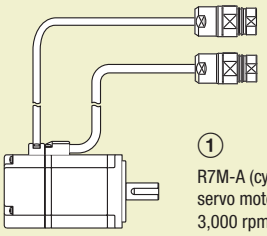
Intelligent servo drive

② **XtraDrive**

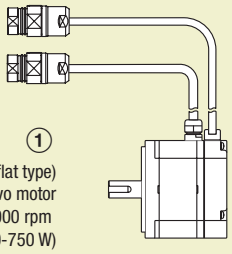
Drive options



③ Power and encoder cables



① R7M-A (cylindrical type) servo motor 3,000 rpm (30-750 W)



① R7M-AP (flat type) servo motor 3,000 rpm (100-750 W)

Note: The symbols ①②③... show the recommended sequence to select the servo motor and cables

Servo motor

Cylindrical servo motors (3,000-r/min)

Symbol	Specifications				Order code		
					Servo motor model	Compatible servo drives ②	
	Design		Rated torque	Capacity		SmartStep	XtraDrive
①	Cylindrical servo motors (3,000-r/min) Straight shaft with key	Without brake	0.095 Nm	30 W	R7M-A03030-S1-D	R7D-APA3H	XD-P3-MN01
			0.159 Nm	50 W	R7M-A05030-S1-D	R7D-APA5H	XD-P5-MN01
			0.318 Nm	100 W	R7M-A10030-S1-D	R7D-AP01H	XD-01-MN01
			0.637 Nm	200 W	R7M-A20030-S1-D	R7D-AP02H	XD-02-MN01
			1.27 Nm	400 W	R7M-A40030-S1-D	R7D-AP04H	XD-04-MN01
			2.39 Nm	750 W	R7M-A75030-S1-D	R7D-AP08H	XD-08-MN
		With brake	0.095 Nm	30 W	R7M-A03030-BS1-D	R7D-APA3H	XD-P3-MN01
			0.159 Nm	50 W	R7M-A05030-BS1-D	R7D-APA5H	XD-P5-MN01
			0.318 Nm	100 W	R7M-A10030-BS1-D	R7D-AP01H	XD-01-MN01
			0.637 Nm	200 W	R7M-A20030-BS1-D	R7D-AP02H	XD-02-MN01
			1.27 Nm	400 W	R7M-A40030-BS1-D	R7D-AP04H	XD-04-MN01
			2.39 Nm	750 W	R7M-A75030-BS1-D	R7D-AP08H	XD-08-MN

Flat servo motors (3,000-r/min)

Symbol	Specifications				Order code		
					Servo motor model	Compatible servo drives ②	
	Design		Rated torque	Capacity		SmartStep	XtraDrive
①	Flat servo motors (3,000-r/min) Straight shaft with key	Without brake	0.318 Nm	100 W	R7M-AP10030-S1-D	R7D-AP01H	XD-01-MN01
			0.637 Nm	200 W	R7M-AP20030-S1-D	R7D-AP02H	XD-02-MN01
			1.27 Nm	400 W	R7M-AP40030-S1-D	R7D-AP04H	XD-04-MN01
			2.39 Nm	750 W	R7M-AP75030-S1-D	R7D-AP08H	XD-08-MN
		With brake	0.318 Nm	100 W	R7M-AP10030-BS1-D	R7D-AP01H	XD-01-MN01
			0.637 Nm	200 W	R7M-AP20030-BS1-D	R7D-AP02H	XD-02-MN01
			1.27 Nm	400 W	R7M-AP40030-BS1-D	R7D-AP04H	XD-04-MN01
			2.39 Nm	750 W	R7M-AP75030-BS1-D	R7D-AP08H	XD-08-MN

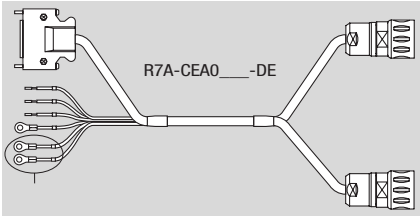
Servo drive

Note: Choosing SmartStep drive or XtraDrive affects to the encoder cable needed

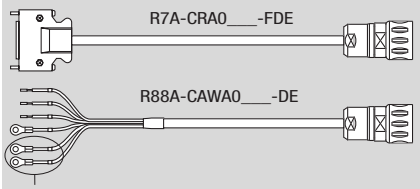
② Refer to SmartStep servo drive or XtraDrive chapter for detailed drive specifications and selection of drive accessories

Servo motor cables for SmartStep drive

Standard cable (power + encoder)

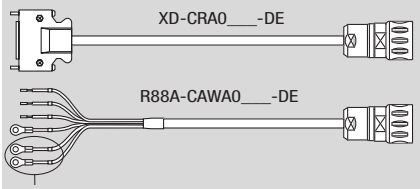
Symbol	Drive	Appearance	Specifications		Order code	
					Power cable model	Encoder cable model
③	SmartStep	 Only for brake models	For servo motors without brake R7M-A(P)___30-S1-D	3 m	R7A-CEA003S-DE	–
				5 m	R7A-CEA005S-DE	–
				10 m	R7A-CEA010S-DE	–
				15 m	R7A-CEA015S-DE	–
				20 m	R7A-CEA020S-DE	–
			For servo motors with brake R7M-A(P)___30-BS1-D	3 m	R7A-CEA003B-DE	–
				5 m	R7A-CEA005B-DE	–
				10 m	R7A-CEA010B-DE	–
				15 m	R7A-CEA015B-DE	–
				20 m	R7A-CEA020B-DE	–

Flexible cables (power + encoder)

Symbol	Drive	Appearance	Specifications		Order code	
					Power cable model	Encoder cable model
③	SmartStep	 Only for brake models	For servo motors without brake R7M-A(P)___30-S1-D	3 m	R88A-CAWA003S-DE	R7A-CRA003-FDE
				5 m	R88A-CAWA005S-DE	R7A-CRA005-FDE
				10 m	R88A-CAWA010S-DE	R7A-CRA010-FDE
				15 m	R88A-CAWA015S-DE	R7A-CRA015-FDE
				20 m	R88A-CAWA020S-DE	R7A-CRA020-FDE
			For servo motors with brake R7M-A(P)___30-BS1-D	3 m	R88A-CAWA003B-DE	R7A-CRA003-FDE
				5 m	R88A-CAWA005B-DE	R7A-CRA005-FDE
				10 m	R88A-CAWA010B-DE	R7A-CRA010-FDE
				15 m	R88A-CAWA015B-DE	R7A-CRA015-FDE
				20 m	R88A-CAWA020B-DE	R7A-CRA020-FDE

Servo motor cables for XtraDrive drive

Flexible cables (power + encoder)

Symbol	Drive	Appearance	Specifications		Power cable model	Encoder cable model
③	XtraDrive	 Only for brake models	For servo motors without brake R7M-A(P)___30-S1-D	3 m	R88A-CAWA003S-DE	XD-CRA003-DE
				5 m	R88A-CAWA005S-DE	XD-CRA005-DE
				10 m	R88A-CAWA010S-DE	XD-CRA010-DE
				15 m	R88A-CAWA015S-DE	XD-CRA015-DE
				20 m	R88A-CAWA020S-DE	XD-CRA020-DE
			For servo motors with brake R7M-A(P)___30-BS1-D	3 m	R88A-CAWA003B-DE	XD-CRA003-DE
				5 m	R88A-CAWA005B-DE	XD-CRA005-DE
				10 m	R88A-CAWA010B-DE	XD-CRA010-DE
				15 m	R88A-CAWA015B-DE	XD-CRA015-DE
				20 m	R88A-CAWA020B-DE	XD-CRA020-DE

Connectors

Specifications	Order code
SmartStep connectors kit (models included in kit)	R7A-CNA00K-DE
SmartStep encoder connector (for CN2)	R7A-CNA01R
Hypertac power connector female	SPOC-06K-FSDN169
Hypertac encoder connector female	SPOC-17H-FRON169

Specifications

General specifications

Item	Specification
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20 to 80% (with no condensation)
Ambient storage temperature	-20 to 60°C
Ambient storage humidity	20 to 80% (with no condensation)
Storage/operating atmosphere	No corrosive gases.
Vibration resistance	10 to 2,500 Hz in X, Y, and Z directions with 0.2 mm double amplitude or acceleration of 24.5 m/s^2 max., whichever is smaller
Impact resistance	Acceleration 98 m/s^2 max., in a vertical direction, two times
Insulation resistance	Between power line terminals and FG: 10 MΩ min. (at 500 VDC)
Dielectric strength	Between power line terminals and FG: 1,500 VAC for 1 min at 50/60 Hz
Run position	Any direction
Insulation grade	Type B
Structure	Totally-enclosed self-cooling
Protective structure	IP55 for both the cylindrical and flat servo motors
Vibration grade	V-15
Mounting method	Flange-mounting
International standards	Approval obtained for UL, cUL, and EN (EMC directive and low-voltage directive)

Performance specifications

Flat servo motors

Item		R7M-AP10030-_	R7M-AP20030-_	R7M-AP40030-_	R7M-AP75030-_
Rated output		100 W	200 W	400 W	750 W
Rated torque		0.318 Nm	0.637 Nm	1.27 Nm	2.39 Nm
Rated rotation speed		3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min
Momentary maximum rotation speed		4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min
Momentary maximum torque		0.96 Nm	1.91 Nm	3.82 Nm	7.1 Nm
Rated current		0.89 A (rms)	2.0 A (rms)	2.6 A (rms)	4.1 A (rms)
Momentary maximum current		2.8 A (rms)	6.0 A (rms)	8.0 A (rms)	13.9 A (rms)
Rotor inertia		6.5×10^{-6} kg·m^2	2.09×10^{-5} kg·m^2	3.47×10^{-5} kg·m^2	2.11×10^{-4} kg·m^2
Power rate		15.7 kW/s	19.4 kW/s	46.8 kW/s	26.9 kW/s
Allowable radial load		78 N	245 N	245 N	392 N
Allowable thrust load		49 N	68 N	68 N	147 N
Weight	Without brake	0.7 kg	1.4 kg	2.1 kg	4.2 kg
	With brake	0.9 kg	1.9 kg	2.6 kg	5.7 kg
Encoder resolution		2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z			
Radiation shield dimensions		t6 × 250 mm square			t12 × 300 mm square
Brake specifications	Brake inertia	3.1×10^{-6} kg·m^2	1.52×10^{-5} kg·m^2	1.52×10^{-5} kg·m^2	8.75×10^{-5} kg·m^2
	Excitation voltage	24 VDC ±10%			
	Power consumption (at 20°C)	7.5 W	7.6 W	8.2 W	7.5 W
	Current consumption (at 20°C)	0.31 A	0.32 A	0.34 A	0.31 A
	Static friction torque	0.4 Nm min.	0.9 Nm min.	1.9 Nm min.	3.5 Nm min.
	Attraction time	60 ms max.	40 ms max.	60 ms max.	20 ms max.
	Release time	20 ms max.	20 ms max.	20 ms max.	40 ms max.
	Backlash	1°	1°	1°	1°
	Rating	Continuous	Continuous	Continuous	Continuous
	Insulation grade	Type F	Type F	Type F	Type F
Applicable servo driver (R7D-)		AP01H	AP02H	AP04H	AP08H

Cylindrical servo motors

Item		R7M-A03030-_	R7M-A05030-_	R7M-A10030-_	R7M-A20030-_	R7M-A40030-_	R7M-A75030-_
Rated output		30 W	50 W	100 W	200 W	400 W	750 W
Rated torque		0.095 Nm	0.159 Nm	0.318 Nm	0.637 NmNm	1.27 Nm	2.39 Nm
Rated rotation speed		3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min
Momentary maximum rotation speed		4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min
Momentary maximum torque		0.29 Nm	0.48 Nm	0.96 Nm	1.91 Nm	3.82 Nm	7.1 Nm
Rated current		0.42 A (rms)	0.6 A (rms)	0.87 A (rms)	2.0 A (rms)	2.6 A (rms)	4.4 A (rms)
Momentary maximum current		1.3 A (rms)	1.9 A (rms)	2.8 A (rms)	6.0 A (rms)	8.0 A (rms)	13.9 A (rms)
Rotor inertia		1.7×10^{-6} kg·m^2	2.2×10^{-6} kg·m^2	3.6×10^{-6} kg·m^2	1.19×10^{-5} kg·m^2	1.87×10^{-5} kg·m^2	6.67×10^{-5} kg·m^2
Power rate		5.31 kW/s	11.5 kW/s	28.1 kW/s	34.1 kW/s	86.3 kW/s	85.6 kW/s
Allowable radial load		68 N	68 N	78 N	245 N	245 N	392 N
Allowable thrust load		54 N	54 N	54 N	74 N	74 N	147 N
Weight	Without brake	0.3 kg	0.4 kg	0.5 kg	1.1 kg	1.7 kg	3.4 kg
	With brake	0.6 kg	0.7 kg	0.8 kg	1.6 kg	2.2 kg	4.3 kg
Encoder resolution		2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z					
Radiation shield dimensions		t6×250 mm square					

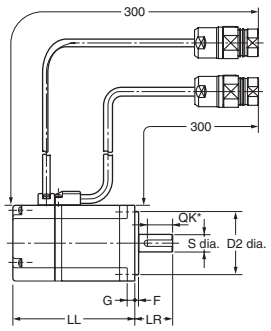
Item		R7M-A03030-_	R7M-A05030-_	R7M-A10030-_	R7M-A20030-_	R7M-A40030-_	R7M-A75030-_
Brake specifications	Brake inertia	0.85×10^{-6} kg·m^2	0.85×10^{-6} kg·m^2	0.85×10^{-6} kg·m^2	6.4×10^{-6} kg·m^2	6.4×10^{-6} kg·m^2	1.7×10^{-5} kg·m^2
	Excitation voltage	24 VDC ±10% V					
	Power consumption (at 20°C)	6 W	6 W	6 W	7 W	7 W	7.7 W
	Current consumption (at 20°C)	0.25 A	0.25 A	0.25 A	0.29 A	0.29 A	0.32 A
	Static friction torque	0.2 Nm min.	0.2 Nm min.	0.34 Nm min.	1.47 Nm min.	1.47 Nm min.	2.45 Nm min.
	Attraction time	30 ms max.	30 ms max.	30 ms max.	60 ms max.	60 ms max.	60 ms max.
	Release time	60 ms max.	60 ms max.	60 ms max.	20 ms max.	20 ms max.	20 ms max.
	Backlash	1°	1°	1°	1°	1°	1°
	Rating	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
	Insulation grade	Type F	Type F	Type F	Type F	Type F	Type F
Applicable servo driver (R7D-)		APA3H	APA5H	AP01H	AP02H	AP04H	AP08H

Dimensions

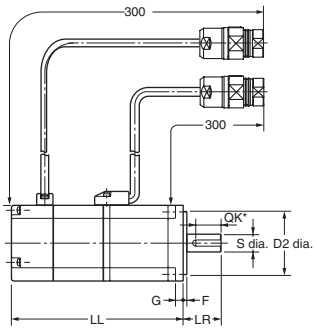
Cylindrical servo motors (3,000 r/min)
200 VAC: 30 W/50 W/100 W/200 W/400 W/750 W
Without brake: R7M-A03030-S1-D/A05030-S1-D/A10030-S1-D/A20030-S1-D/A40030-S1-D/A75030-S1-D
With brake: R7M-A03030-BS1-D/A05030-BS1-D/A10030-BS1-D/A20030-BS1-D/A40030-BS1-D/A75030-BS1-D

Order code	Dimensions (mm)													
	LL		LR	Flange surface						Axis end				
	Without brake	With brake		C	D1	D2	F	G	Z	S	QK	b	h	t1
R7M-A03030_	69.5	101	25	40	46	30h7	2.5	5	Two, 4.3 dia.	6h6	14	2	2	1.2
R7M-A05030_	77	108.5												
R7M-A10030_	94.5	135								8h6		3	3	1.8
R7M-A20030_	96.5	136	30	60	70	50h7	3	6	Four, 5.5 dia.	14h6	20	5	5	3
R7M-A40030_	124.5	164												
R7M-A75030_	145	189.5	40	80	90	70h7	3	8	Four, 7 dia.	16h6	30			

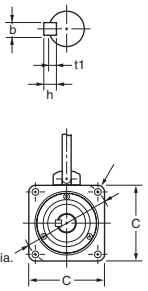
R7M-A___30-S1-D (without brake)



R7M-A___30-BS1-D (with brake)



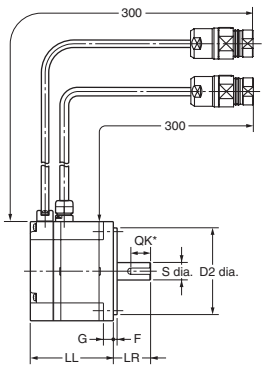
Axis end dimensions



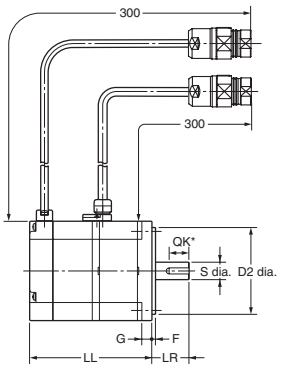
Flat servo motors (3,000 r/min)
200 VAC: 100 W/200 W/400 W/750 W
Without brake: R7M-AP10030-S1-D/AP20030-S1-D/AP40030-S1-D/AP75030-S1-D
With brake: R7M-AP10030-BS1-D/AP20030-BS1-D/AP40030-BS1-D/AP75030-BS1-D

Order code	Dimensions (mm)													
	LL		LR	Flange surface						Axis end				
	Without brake	With brake		C	D1	D2	F	G	Z	S	QK	b	h	t1
R7M-AP10030_	62	91	25	60	70	50h7	3	6	5.5	8h6	14	3	3	1.8
R7M-AP20030_	67	98.5	30	80	90	70h7	3	8	7	14h6	16	5	5	3
R7M-AP40030_	87	118.5												
R7M-AP75030_	86.5	120	40	120	145	110h7	3.5	10	10	16h6	22			

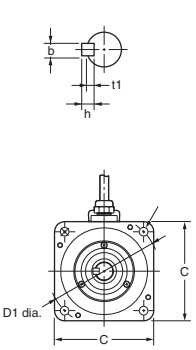
R7M-AP___30-S1-D (without brake)



R7M-AP___30-BS1-D (with brake)



Axis end dimensions





Junma compact motor

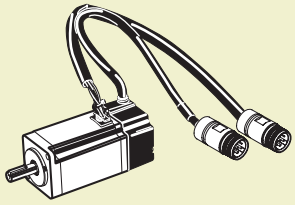
The Junma motors offer the simplicity and cost-effectiveness of a stepper motor with the added advantages of a servo system.

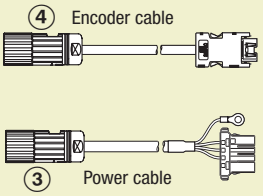
- Sizes 100 W to 750 W, rated speed 3,000 rpm
- Peak torque up to three times continuous torque for 3 seconds
- Easy to install with prebuilt cables
- Motors with brakes are available
- No motor settings required, just plug and run

Ordering information

Junma servo motor configuration

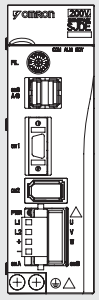
① **Junma servo motor**
3,000 rpm
(100 to 750 W)



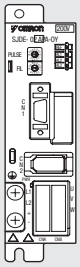


(Refer to servo drive chapter)

② **Junma MECHATROLINK-II Servo drive**



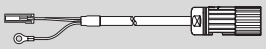
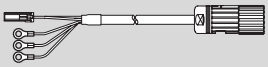
② **Junma pulse Servo drive**



Servomotors and servo drives

Symbol	Specifications					Order code		
						① Servomotor model	② Servo drive model	
	Voltage	Encoder and design		Rated torque	Capacity		MECHATROLINK-II	Pulse control
①②	1 Phase 200 VAC	Analogue incremental encoder Straight shaft with key	Without brake	0.318 Nm	100 W	SJME-01AMC41-0Y	SJDE-01ANA-0Y	SJDE-01APA-0Y
				0.637 Nm	200 W	SJME-02AMC41-0Y	SJDE-02ANA-0Y	SJDE-02APA-0Y
				1.27 Nm	400 W	SJME-04AMC41-0Y	SJDE-04ANA-0Y	SJDE-04APA-0Y
				2.39 Nm	750 W	SJME-08AMC41-0Y	SJDE-08ANA-0Y	SJDE-08APA-0Y
			With brake	0.318 Nm	100 W	SJME-01AMC4C-0Y	SJDE-01ANA-0Y	SJDE-01APA-0Y
				0.637 Nm	200 W	SJME-02AMC4C-0Y	SJDE-02ANA-0Y	SJDE-02APA-0Y
				1.27 Nm	400 W	SJME-04AMC4C-0Y	SJDE-04ANA-0Y	SJDE-04APA-0Y
				2.39 Nm	750 W	SJME-08AMC4C-0Y	SJDE-08ANA-0Y	SJDE-08APA-0Y

Power cables

Symbol	Appearance	Specifications			Order code
③		Power cable for Junma servomotors without brake SJME-0_AMB41-0Y	Flexible cables (standard) Shielded cable Bending radius (dynamic) > 10x diameter Bending cycles > 5 Million	1.5 m	JZSP-CHM000-01-5ME
				3 m	JZSP-CHM000-03-ME
				5 m	JZSP-CHM000-05-ME
				10 m	JZSP-CHM000-10-ME
				15 m	JZSP-CHM000-15-ME
				20 m	JZSP-CHM000-20-ME
			Non flexible cables	3 m	R7A-CAZ003S
				5 m	R7A-CAZ005S
				10 m	R7A-CAZ010S
		Power cable for Junma servomotors with brake SJME-0_AMB4C-0Y	Flexible cables (standard) Shielded cable Bending radius (dynamic) > 10x diameter Bending cycles > 5 Million	1.5 m	JZSP-CHM030-01-5ME
				3 m	JZSP-CHM030-03-ME
				5 m	JZSP-CHM030-05-ME
				10 m	JZSP-CHM030-10-ME
				15 m	JZSP-CHM030-15-ME
				20 m	JZSP-CHM030-20-ME
			Non flexible cables	3 m	R7A-CAZ003B
				5 m	R7A-CAZ005B
				10 m	R7A-CAZ010B

Encoder cables

Symbol	Appearance	Specifications			Order code
④		Encoder cable for Junma servomotors SJME-0_AMB4_-0Y	Flexible cables (standard) Shielded cable Bending radius (dynamic) > 10x diameter Bending cycles > 5 Million	1.5 m	JZSP-CHP800-01-5ME
				3 m	JZSP-CHP800-03-ME
				5 m	JZSP-CHP800-05-ME
				10 m	JZSP-CHP800-10-ME
				15 m	JZSP-CHP800-15-ME
				20 m	JZSP-CHP800-20-ME
			Non flexible cables	3 m	R7A-CRZ003C
				5 m	R7A-CRZ005C
				10 m	R7A-CRZ010C

Connectors for power and encoder cables

Specifications			Order code
Connectors for making power cables	Drive side (CNB)	Manufacturer: Intercontec	R7A-CNZ01AFE
	Motor side	Manufacturer: Intercontec	R7A-CNZ02AFE
Connectors for making encoder cables	Drive side (CN2)	Manufacturer: Intercontec	R7A-CNZ01RFE
	Motor side	Manufacturer: Intercontec	R7A-CNZ02RFE

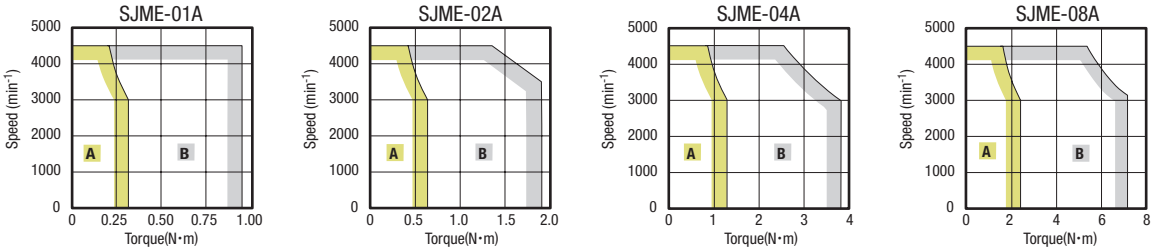
Servomotor specifications

Voltage			230 V			
Servomotor model SJME-_			01A_	02A_	04A_	08A_
Rated output *1		W	100	200	400	750
Rated torque *1 *2		N·m	0.318	0.637	1.27	2.39
Instantaneous peak torque *1		N·m	0.955	1.91	3.82	7.16
Rated current *1		Arms	0.84	1.1	2.0	3.7
Instantaneous max. current *1		Arms	2.5	3.3	6.0	11.1
Rated speed *1		min^{-1}	3000			
Max. speed *1		min^{-1}	4500			
Torque constant		N·m/Arms	0.413	0.645	0.682	0.699
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$	0.0634	0.330	0.603	1.50
Allowable load inertia *3		$kg·m^2x10^{-4}$	0.6	3.0	5.0	10.0
Rated power rate		kW/s	16.0	12.3	26.7	38.1
Rated angular acceleration		rad/s^2	50,200	19,300	21,100	15,900
Encoder		Standard	Analogue output encoder			
Allowable radial load			78	245	245	392
Allowable thrust load			54	74	74	147
Approx. mass		kg (without brake)	0.5	0.9	1.3	2.6
		kg (with brake)	0.8	1.5	1.9	3.5
Brake specifications	Rated voltage		24 VDC ±10%			
	Holding brake moment of inertia	$kg·m^2x10^{-4}$	0.0075	0.064		0.171
	Power consumption (at 20°C)	W	6	6.9		7.7
	Current consumption (at 20°C)	A	0.25	0.29		0.32
	Static friction torque	N·m (minimum)	0.318	1.27		2.39
	Rise time for holding torque	ms (max)	100			
	Release time	ms (max)	80			
Basic specifications	Time rating		Continuous			
	Thermal class		Class B			
	Vibration class		15 µm or below			
	Withstand voltage		1500 VAC for one minute			
	Insulation resistance		500 VDC, 10 MΩ min.			
	Enclosure		Totally-enclosed, self-cooled, IP55 (excluding shaft opening and connectors)			
	Vibration resistance		Vibration acceleration 49 m/s^2			
	Usage/Storage temperature		0 to +40°C / -20 to 60°C without freezing			
	Usage/Storage humidity		20 to 80% RH (non-condensing)			
	Altitude		1000 m or less above sea level			
	Mounting		Flange-mounted			

*1 These items and speed/torque characteristics quoted in combination with an SJDE servo drive are at an armature winding temperature of 100°C. Other values quoted at 20°C.
*2 The rated torques listed here are the values for the continuous allowable torque at 40°C with an aluminium heatsink (250x250x6 mm) attached.
*3 Value using the appropriate SJDE drive without of external regeneration unit.

Torque-Speed Characteristics

(A : Continuous duty zone B : Intermittent duty zone)

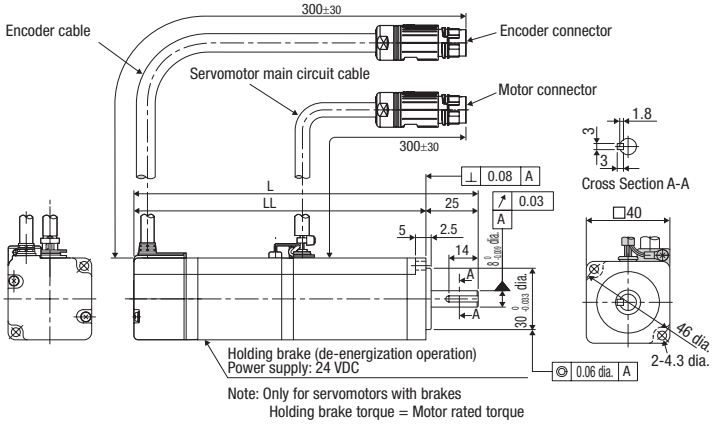


Dimensions

Junma servomotors

SJME-01 (200 V, 200 to 750 W)

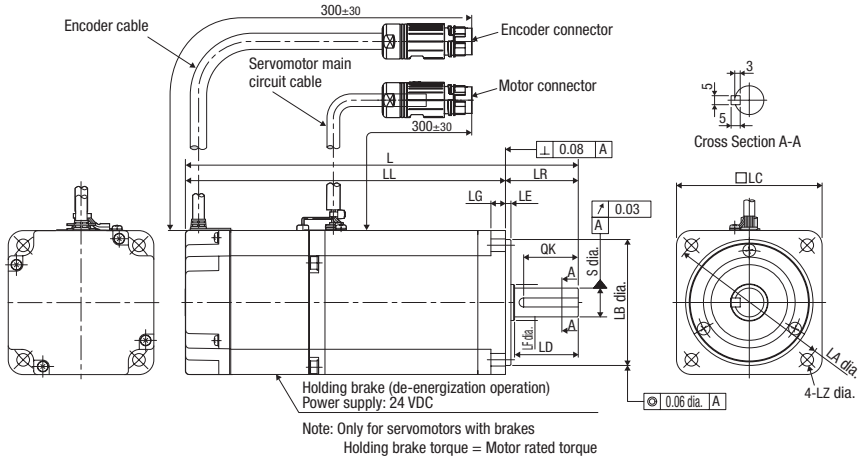
Order code	L	LL	Approx. mass (kg)
SJME-01AMB41-OY	119	94	0.5
SJME-01AMB4C-OY	164	139	0.8



Units: mm

SJME-02, 04, 08 (200V, 200 to 750W)

Order code	L	LL	LR	LG	LE	S	LB	LC	LD	LF	LA	LZ	QK	Approx. mass (kg)
SJME-02AMB41-OY	125.5	95.5	30	6	3	$14^{0}_{-0.011}$	$50^{0}_{-0.039}$	60	–	–	70	5.5	20	0.9
SJME-02AMB4C-OY	165.5	135.5												1.5
SJME-04AMB41-OY	148.5	118.5							–	–				1.3
SJME-04AMB4C-OY	188.5	158.5												1.9
SJME-08AMB41-OY	173	133	40	8	3	$16^{0}_{-0.011}$	$70^{0}_{-0.046}$	80	35	20	90	7	30	2.6
SJME-08AMB4C-OY	216	176												3.5



Units: mm

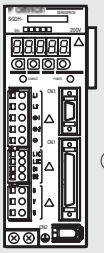


Direct drive linear servo motors for faster machine cycles

- Direct control of the motors using XtraDrive and Sigma-II drives
- Improved machine performance
- Easy of operation & high reliability
- Designed for high force density in compact packages
- Exhibits exceptional force linearity even at near the peak force regions
- Extremely energy efficient, due to its optimised magnetic circuitry design and high-density windings

Ordering information

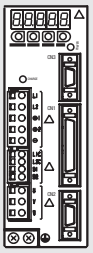
(Refer to servo drive chapter)



Servo drive with option boards for flexible system configuration

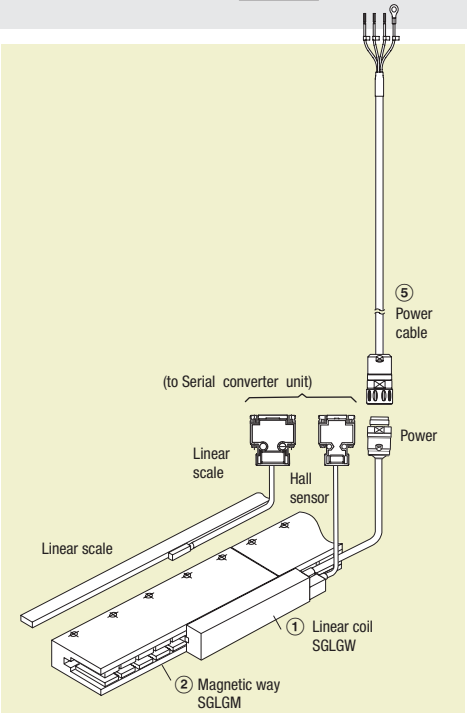
④ **Sigma-II servo drive**

Drive options

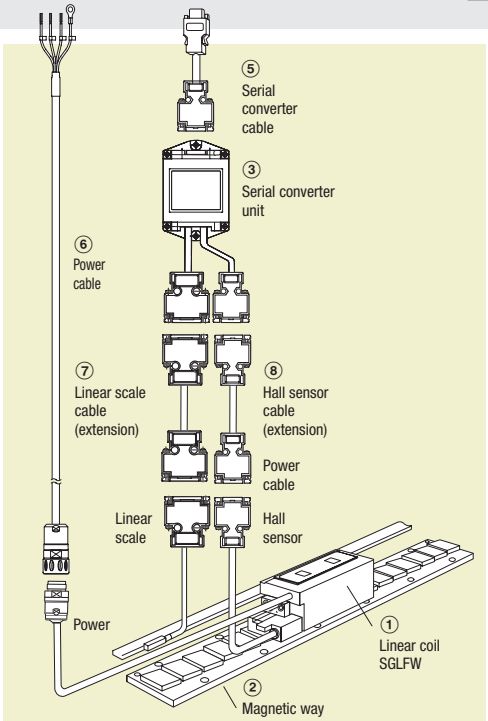


Intelligent servo drive

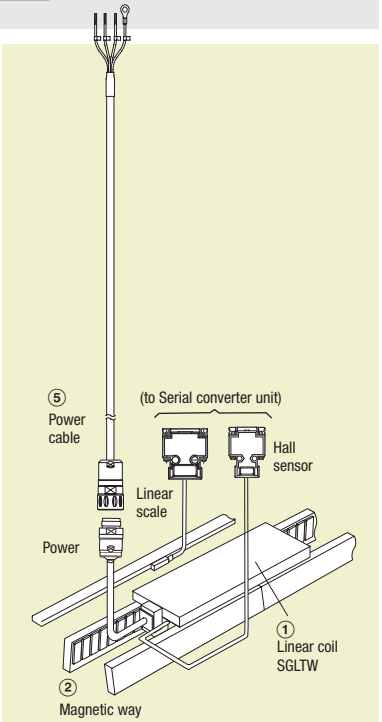
④ **XtraDrive**



SGLG_ Linear servo motor



SGLF_ Linear servo motor



SGLT_ Linear servo motor

Note: The symbols ①②③ .. show the recommended sequence to select the servo motor, cables and serial converter for a linear motor system

Servo motor

GLGW/SGLGM coreless type (200 V)

With standard-force magnetic ways - 230VAC single phase

Symbol	Specifications		Order code				
	Rated force	Peak force	① Linear coil	② Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
ABCD 	13.5 N	40 N	SGLGW-30A050CPD	SGLGM-30108A SGLGM-30216A SGLGM-30432A	JZDP-D008-250	SGDH-A5AE-OY	XD-P5-MN01
	27 N	80 N	SGLGW-30A080CPD		JZDP-D008-251	SGDH-01AE-OY	XD-01-MN01
	47 N	140 N	SGLGW-40A140CPD	SGLGM-40090CT SGLGM-40225CT SGLGM-40360CT SGLGM-40405CT SGLGM-40450CT	JZDP-D008-252	SGDH-01AE-OY	XD-01-MN01
	93 N	280 N	SGLGW-40A253CPD		JZDP-D008-253	SGDH-02AE-OY	XD-02-MN01
	140 N	420 N	SGLGW-40A365CPD		JZDP-D008-254	SGDH-04AE-OY	XD-04-MN01
	73 N	220 N	SGLGW-60A140CPD	SGLGM-60090CT SGLGM-60225CT SGLGM-60360CT SGLGM-60405CT SGLGM-60450CT	JZDP-D008-258	SGDH-02AE-OY	XD-02-MN01
	147 N	440 N	SGLGW-60A253CPD		JZDP-D008-259	SGDH-04AE-OY	XD-04-MN01
	220 N	660 N	SGLGW-60A365CPD		JZDP-D008-260	SGDH-08AE-S-OY	XD-08-MN
	325 N	1300 N	SGLGW-90A200CPD	SGLGM-90252A SGLGM-90504A	JZDP-D008-260	SGDH-15AE-S-OY	XD-15-MN

Note: - Linear coils with design revision C are equivalent to previous versions. The serial converter required for revision C coil has changed from previous version, select it according to the table above.

- Magnetic ways with design revision C and revision B can be combined.

With high-force magnetic ways - 230VAC single phase

Symbol	Specifications		Order code				
	Rated force	Peak force	① Linear coil	② Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
ABCD 	57 N	230 N	SGLGW-40A140CPD	SGLGM-40090CT-M SGLGM-40225CT-M SGLGM-40360CT-M SGLGM-40405CT-M SGLGM-40450CT-M	JZDP-D008-255	SGDH-02AE-OY	XD-02-MN01
	114 N	460 N	SGLGW-40A253CPD		JZDP-D008-256	SGDH-04AE-OY	XD-04-MN01
	171 N	690 N	SGLGW-40A365CPD		JZDP-D008-257	SGDH-08AE-S-OY	XD-08-MN
	89 N	360 N	SGLGW-60A140CPD	SGLGM-60090CT-M SGLGM-60225CT-M SGLGM-60360CT-M SGLGM-60405CT-M SGLGM-60450CT-M	JZDP-D008-261	SGDH-02AE-OY	XD-02-MN01
	178 N	720 N	SGLGW-60A253CPD		JZDP-D008-262	SGDH-08AE-S-OY	XD-08-MN
	267 N	1080 N	SGLGW-60A365CPD		JZDP-D008-263	SGDH-15AE-S-OY	XD-15-MN

Note: - Linear coils with design revision C are equivalent to previous versions. The serial converter required for revision C coil has changed from previous version, select it according to the table above.

- Magnetic ways with design revision C and revision B can be combined.

SGLFW/SGLFM iron-core type

230 VAC single phase

Symbol	Specifications		Order code				
	Rated force	Peak force	① Linear coil	② Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
①②③④ 	25 N	86 N	SGLFW-20A090APD	SGLFM-20324AC SGLFM-20540AC SGLFM-20756AC	JZDP-A008-017	SGDH-02AE-OY	XD-02-MN01
	40 N	125 N	SGLFW-20A120APD		JZDP-A008-018	SGDH-02AE-OY	XD-02-MN01
	80 N	220 N	SGLFW-35A120APD	SGLFM-35324AC SGLFM-35540AC SGLFM-35756AC	JZDP-A008-019	SGDH-02AE-OY	XD-02-MN01
	160 N	440 N	SGLFW-35A230APD		JZDP-A008-020	SGDH-08AE-S-OY	XD-08-MN01
	280 N	600 N	SGLFW-50A200BPD	SGLFM-50405AC SGLFM-50675AC SGLFM-50945AC	JZDP-A008-181	SGDH-08AE-S-OY	XD-08-MN
	560 N	1200 N	SGLFW-50A380BPD		JZDP-A008-182	SGDH-15AE-S-OY	XD-15-MN
	560 N	1200 N	SGLFW-1ZA200BPD	SGLFM-1Z405AC SGLFM-1Z675AC SGLFM-1Z945AC	JZDP-A008-183	SGDH-15AE-S-OY	XD-15-MN

Note: Serial converters with design revision A (JZDP-A008-xxx) will be replaced by revision D (JZDP-D008-xxx), both models are fully compatible.

400 VAC three phase

Symbol	Specifications		Order code				
	Rated force	Peak force	① Linear coil	② Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
①②③④ 	80 N	220 N	SGLFW-35D120APD	SGLFM-35324AC SGLFM-35540AC SGLFM-35756AC	JZDP-A008-211	SGDH-05DE-OY	XD-05-TN
	160 N	440 N	SGLFW-35D230APD		JZDP-A008-212	SGDH-05DE-OY	XD-05-TN
	280 N	600 N	SGLFW-50D200BPD	SGLFM-50405AC SGLFM-50675AC SGLFM-50945AC	JZDP-A008-189	SGDH-10DE-OY	XD-10-TN
	560 N	1200 N	SGLFW-50D380BPD		JZDP-A008-190	SGDH-15DE-OY	XD-15-TN
	560 N	1200 N	SGLFW-1ZD200BPD	SGLFM-1Z405AC SGLFM-1Z675AC SGLFM-1Z945AC	JZDP-A008-191	SGDH-15DE-OY	XD-15-TN
	1120 N	2400 N	SGLFW-1ZD380BPD		JZDP-A008-192	SGDH-30DE-OY	XD-30-TN
	1500 N	3600 N	SGLFW-1ED380BP	SGLFM-1E135AC	JZDP-D008-333	SGDH-20DE-OY	XD-20-TN
	2250 N	5400 N	SGLFW-1ED560BP		JZDP-D008-334	SGDH-30DE-OY	XD-30-TN

Note: Serial converters with design revision A (JZDP-A008-xxx) will be replaced by revision D (JZDP-D008-xxx), both models are fully compatible.

SGLTW/SGLTM iron-core type

400 VAC three phase

Symbol	Specifications		Order code				
	Rated force	Peak force	① Linear coil	② Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
①②③④ 	300 N	600 N	SGLTW-35D170HPD	SGLTM-35324HC	JZDP-A008-193	SGDH-10DE-0Y	XD-10-TN
	600 N	1200 N	SGLTW-35D320HPD	SGLTM-35540HC SGLTM-35756HC	JZDP-A008-194	SGDH-20DE-0Y	XD-20-TN
	450 N	900 N	SGLTW-50D170HPD	SGLTM-50324HC	JZDP-A008-195	SGDH-10DE-0Y	XD-10-TN
	900 N	1800 N	SGLTW-50D320HPD	SGLTM-50540HC SGLTM-50756HC	JZDP-A008-196	SGDH-20DE-0Y	XD-20-TN
	670 N	2600 N	SGLTW-40D400BP	SGLTM-40405AC	JZDP-A008-197	SGDH-30DE-0Y	XD-30-TN
	1000 N	4000 N	SGLTW-40D600BP	SGLTM-40675AC SGLTM-40945AC	JZDP-A008-198	SGDH-50DE-0Y	XD-50-TN
	1300 N	5000 N	SGLTW-80D400BP	SGLTM-80405AC	JZDP-A008-199	SGDH-50DE-0Y	XD-50-TN
	2000 N	7500 N	SGLTW-80D600BP	SGLTM-80675AC SGLTM-80945AC	JZDP-A008-200	SGDH-75DE-0Y	–

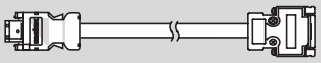
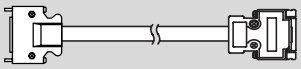
Note: Serial converters with design revision A (JZDP-A008-xxx) will be replaced by revision D (JZDP-D008-xxx), both models are fully compatible.

Servo drive

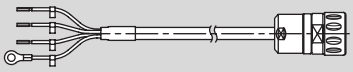
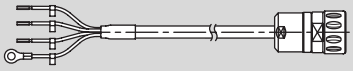
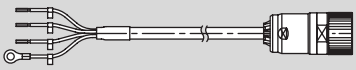
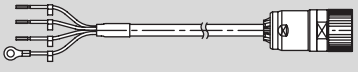
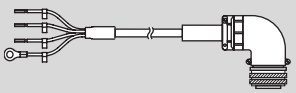
Note: Choosing Sigma-II drive or XtraDrive affects to the serial converter cable needed.

④ Refer to Sigma-II servo drive or XtraDrive chapter for detailed drive specifications and selection of drive accessories.

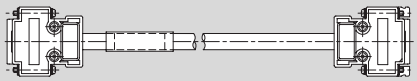
Serial converter cable to servo drive

Symbol	Appearance	Specifications		Order code
⑤		Sigma-II drive to serial converter cable	3 m	JZSP-CLP70-03-E
			5 m	JZSP-CLP70-05-E
			10 m	JZSP-CLP70-10-E
			15 m	JZSP-CLP70-15-E
			20 m	JZSP-CLP70-20-E
		XtraDrive drive to serial converter cable	3 m	XD-CLP70-03-E
			5 m	XD-CLP70-05-E
			10 m	XD-CLP70-10-E
			15 m	XD-CLP70-15-E
			20 m	XD-CLP70-20-E

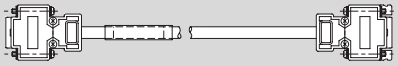
Power cables

Symbol	Appearance	Specifications		Order code
⑥		For 200 V servo motors SGLGW-30A_____D SGLGW-40A_____D SGLGW-60A_____D SGLFW-20A___A_D SGLFW-35A___A_D	3 m	R88A-CAWA003S-DE
			5 m	R88A-CAWA005S-DE
			10 m	R88A-CAWA010S-DE
			15 m	R88A-CAWA015S-DE
			20 m	R88A-CAWA020S-DE
		For 200 V servo motors SGLGW-90A200__D SGLFW-50A___B_D SGLFW-1ZA200B_D	3 m	R88A-CAWB003S-DE
			5 m	R88A-CAWB005S-DE
			10 m	R88A-CAWB010S-DE
			15 m	R88A-CAWB015S-DE
			20 m	R88A-CAWB020S-DE
		For 400 V servo motors SGLFW-35D___A_D SGLFW-50D200_D SGLTW-35D170H_D SGLTW-50D170H_D	3 m	R88A-CAWK003S-DE
			5 m	R88A-CAWK005S-DE
			10 m	R88A-CAWK010S-DE
			15 m	R88A-CAWK015S-DE
			20 m	R88A-CAWK020S-DE
		For 400 V servo motors SGLFW-50D380_D SGLFW-1ZD___B_D SGLTW-35D320H_D SGLTW-50D320H_D	3 m	R88A-CAWL003S-DE
			5 m	R88A-CAWL005S-DE
			10 m	R88A-CAWL010S-DE
			15 m	R88A-CAWL015S-DE
			20 m	R88A-CAWL020S-DE
		For 400 V servo motors SGLFW-1ED___B_ SGLTW-40D___B_ SGLTW-80D___B_	3 m	R88A-CAWD003S-E
			5 m	R88A-CAWD005S-E
			10 m	R88A-CAWD010S-E
			15 m	R88A-CAWD015S-E
			20 m	R88A-CAWD020S-E

Linear scale cable to serial converter

Symbol	Appearance	Specifications		Order code
⑦		Extension cable for Renishaw linear scale to serial converter. (connector DB-15) (the extension cable is optional)	1 m	JZSP-CLL00-01-E
			3 m	JZSP-CLL00-03-E
			5 m	JZSP-CLL00-05-E
			10 m	JZSP-CLL00-10-E
			15 m	JZSP-CLL00-15-E
		Extension cable for Heidenhain linear scale to serial converter (connector DB-15) (when a Heidenhain scale is used the extension cable is required)	1 m	JZSP-CLL20-01-E
			3 m	JZSP-CLL20-03-E
			5 m	JZSP-CLL20-05-E
			10 m	JZSP-CLL20-10-E
			15 m	JZSP-CLL20-15-E

Hall sensor cable to serial converter

Symbol	Appearance	Specifications		Order code
⑧		Extension cable for linear scale to serial converter (the extension cable is optional)	1 m	JZSP-CLL10-01-E
			3 m	JZSP-CLL10-03-E
			5 m	JZSP-CLL10-05-E
			10 m	JZSP-CLL10-10-E
			15 m	JZSP-CLL10-15-E

Connectors

Specification	Order code
Hypertac power connector IP67 (for 200V motor coils SGL_W-__A_____D)	SPOC-06K-FSDN169
Hypertac power connector IP67 (for 400V motor coils SGL_W-__D_____D)	LPRA-06B-FRBN170
Military power connector IP67 (for motor coils SGLTW-40_/80_ and SGLFW-1ED_)	MS3108E22-22S

Dimensioning software

Specifications	Order code
SigmaSize	MOTION TOOLS CD

Servo motor specifications

Coreless SGLGW/SGLGM - (with standard-force magnetic ways)

Voltage		230 V								
Linear servo motor model SGLGW-		30A		40A			60A			90A
		050C	080C	140C	253C	365C	140C	253C	365C	200C
Rated force*	N	12.5	25	47	93	140	70	140	210	325
Rated current*	A(rms)	0,51	0,79	0.8	1.6	2.4	1,16	2,2	3,3	4.4
Instantaneous peak force*	N	40	80	140	280	420	220	440	660	1300
Instantaneous peak current*	A(rms)	1.62	2.53	2.4	4.9	7.3	3.5	7.0	10.5	17.6
Coil assembly mass	kg	0.10	0.15	0.34	0.60	0.87	0.42	0.76	1.10	2.15
Force constant	N/A(rms)	26.4	33.9	61.5	61.5	61.5	66.6	66.6	66.6	78
BEMF constant	V/(m/s)	8.8	11.3	20.5	20.5	20.5	22.2	22.2	22.2	26.0
Motor constant	$N/\sqrt{W}$	3.7	5.6	7.8	11.0	13.5	11.1	15.7	19.2	26.0
Electrical time constant	ms	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.5	1.4
Mechanical time constant	ms	7.30	4.78	5.59	4.96	4.77	3.41	3.08	2.98	3.18
Thermal resistance (with heat sink)	K/W	5,19	3,11	1,67	0,87	0,58	1,56	0,77	0,51	0,39
Thermal resistance (without heat sink)	K/W	–	–	3,02	1,80	1,23	2,59	1,48	1,15	–
Magnetic attraction	N	0	0	0	0	0	0	0	0	0
Heat sink size (HxWxD)	mm			200x300x12	300x400x12	400x500x12	200x300x12	300x400x12	400x500x12	800x900x12
Basic specifications	Time rating	Continuous								
	Insulation class	Class B								
	Ambient temperature	0 to +40°C								
	Ambient humidity	20 to 80% (non-condensing)								
	Insulation resistance	500 VDC, 10 MΩ min.								
	Excitation	Permanent magnet								
	Dielectric strength	1500 VAC for 1 minute								
	Protection methods	Self-cooled, air-cooling								
	Allowable winding temperature	130°C								

Note: - The items marked with an * and "force and speed characteristics" are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68 °F).

- The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

Coreless SGLGW/SGLGM - (with high-force magnetic ways)

Voltage		230 V					
Linear servo motor model SGLGW-		40A			60A		
		140C	253C	365C	140C	253C	365C
Rated force*	N	57	114	171	85	170	255
Rated current*	A(rms)	0.8	1.6	2.4	1.2	2.2	3.3
Instantaneous peak force*	N	230	460	690	360	720	1080
Instantaneous peak current*	A(rms)	3.2	6.5	9.7	5.0	10.0	14.9
Coil assembly mass	kg	0.34	0.60	0.87	0.42	0.76	1.10
Force constant	N/A(rms)	76.0	76.0	76.0	77.4	77.4	77.4
BEMF constant	V/(m/s)	25.3	25.3	25.3	25.8	25.8	25.8
Motor constant	$N/\sqrt{W}$	9.6	13.6	16.7	12.9	18.2	22.3
Electrical time constant	ms	0.4	0.4	0.4	0.5	0.5	0.5
Mechanical time constant	ms	3.69	3.24	3.12	2.52	2.29	2.21
Thermal resistance (with heat sink)	K/W	1.67	0.87	0.58	1.56	0.77	0.51
Thermal resistance (without heat sink)	K/W	3.02	1.80	1.23	2.59	1.48	1.15
Magnetic attraction	N	0	0	0	0	0	0
Heat sink size (HxWxD)	mm	200x300x12	300x400x12	400x500x12	200x300x12	300x400x12	400x500x12
Basic specifications	Time rating	Continuous					
	Insulation class	Class B					
	Ambient temperature	0 to +40°C					
	Ambienthumidity	20 to 80% (non-condensing)					
	Insulation resistance	500 VDC, 10 MΩ min.					
	Excitation	Permanent magnet					
	Dielectric strength	1500 VAC for 1 minute					
	Protection methods	Self-cooled, air-cooling					
	Allowable winding temperature	130°C					

Note: - The item servo drive. The others are at 20 °C (68 °F).

- The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

Iron-core SGLFW/SGLFM (200V)

Voltage		230 V						
Linear servo motor model SGLFW-		20A		35A		50A		1ZA
		090A	120A	120A	230A	200B	380B	200B
Rated force*	N	25	40	80	160	280	560	560
Rated current*	A(rms)	0.7	0.8	1.4	2.8	5.0	10.0	8.7
Instantaneous peak force*	N	86	125	220	440	600	1200	1200
Instantaneous peak current*	A(rms)	3.0	2.9	4.4	8.8	12.4	25.0	21.6
Coil assembly mass	kg	0.7	0.9	1.3	2.3	3.5	6.9	6.4
Force constant	N/A(rms)	36.0	54.0	62.4	62.4	60.2	60.2	69.0
BEMF constant	V/(m/s)	12.0	18.0	20.8	20.8	20.1	20.1	23.0
Motor constant	$N/\sqrt{W}$	7.9	9.8	14.4	20.4	34.3	48.5	52.4
Electrical time constant	ms	3.2	3.3	3.6	3.6	15.9	15.8	18.3
Mechanical time constant	ms	11.0	9.3	6.2	5.5	3.0	2.9	2.3
Thermal resistance (with heat sink)	K/W	4.35	3.19	1.57	0.96	0.82	0.32	0.6
Thermal resistance (without heat sink)	K/W	7.69	5.02	4.10	1.94	1.48	0.74	0.92
Magnetic attraction	N	314	462	809	1586	1650	3260	3300
Heat sink size (HxWxD)	mm	125x125x13				254x254x25	400x500x40	254x254x25
Basic specifications	Time rating	Continuous						
	Insulation class	Class B						
	Ambient temperature	0 to +40°C						
	Ambient humidity	20 to 80% (non-condensing)						
	Insulation resistance	500 VDC, 10 MΩ min.						
	Excitation	Permanent magnet						
	Dielectric strength	1500 VAC for 1 minute						
	Protection methods	Self-cooled						
	Allowable winding temperature	130°C						

Note: - The items marked with an * and "Force and speed characteristics" are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68 °F).

- The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

Iron-core SGLFW/SGLFM (400V)

Voltage		400 V							
Linear servo motor model SGLFW-		35D		50D		1ZD		1ED	
		120A	230A	200B	380B	200B	380B	380B	560B
Rated force*	N	80	160	280	560	560	1,120	1,500	2,250
Rated current*	A(rms)	0.7	1.4	2.3	4.5	4.9	9.8	6.4	9.6
Instantaneous peak force*	N	220	440	600	1,200	1,200	2,400	3,600	5,400
Instantaneous peak current*	A(rms)	2.3	4.6	5.6	11.0	12.3	24.6	18.1	27.2
Coil assembly mass	kg	1.3	2.3	3.5	6.9	6.4	11.5	22.0	33.0
Force constant	N/A(rms)	120.2	120.2	134.7	134.7	122.6	122.6	250	250
BEMF constant	V/(m/s)	40.1	40.1	44.9	44.9	40.9	40.9	83.2	83.2
Motor constant	N /√W	13.8	19.5	33.4	47.2	51.0	72.1	95.4	117
Electrical time constant	ms	3.5	3.5	15.0	15.0	17.4	17.2	19.7	19.6
Mechanical time constant	ms	5.5	5.5	3.2	3.2	2.5	2.2	1.8	1.8
Thermal resistance (with heat sink)	K/W	1.57	0.96	0.82	0.32	0.6	0.28	0.21	0.13
Thermal resistance (without heat sink)	K/W	4.1	1.94	1.48	0.74	0.92	0.55	0.50	0.35
Magnetic attraction	N	810	1,590	1,650	3,260	3,300	6,520	9,780	14,600
Heat sink size (HxWxD)	mm			254x254x25	400x500x40	254x254x25	400x500x40	609x762x50	762x1270x64
Basic specifications	Time rating	Continuous							
	Insulation class	Class B							
	Ambient temperature	0 to +40°C							
	Ambient humidity	20 to 80% (non-condensing)							
	Insulation resistance	500 VDC, 10 MΩ min.							
	Excitation	Permanent magnet							
	Dielectric strength	1500 VAC for 1 minute							
	Protection methods	Self-cooled							
	Allowable winding temperature	130°C							

Note: - The items marked with an * and "force and speed characteristics" are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68 °F).

- The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

Iron-core SGLTW/SGLTM (400 V)

Voltage		400 V							
Linear servo motor model SGLTW-		35D		50D		40D		80D	
		170H	320H	170H	320H	400B	600B	400B	600B
Rated force*	N	300	600	450	900	670	1,000	1,300	2,000
Rated current*	A(rms)	3.2	6.5	3.2	6.3	3.7	5.5	7.2	11.1
Instantaneous peak force*	N	600	1,200	900	1,800	2,600	4,000	5,000	7,500
Instantaneous peak current*	A(rms)	7.5	15.1	7.3	14.6	20.7	30.6	37.6	56.4
Coil assembly mass	kg	4.7	8.8	6	11	15	23	25	36
Force constant	N/A(rms)	99.6	99.6	153.3	153.3	196.1	196.1	194.4	194.4
BEMF constant	V/(m/s)	33.2	33.2	51.1	51.1	65.4	65.4	64.8	64.8
Motor constant	N /√W	36.3	51.4	48.9	69.1	59.6	73	85.9	105.2
Electrical time constant	ms	14.3	14.3	15.6	15.6	14.4	14.4	15.4	15.4
Mechanical time constant	ms	3.5	3.5	2.5	2.5	4.2	4.2	3.2	3.2
Thermal resistance (with heat sink)	K/W	0.76	0.4	0.61	0.3	0.24	0.2	0.22	0.18
Thermal resistance (without heat sink)	K/W	1.26	0.83	0.97	0.8	0.57	0.4	0.47	0.33
Magnetic attraction*1	N	0	0	0	0	0	0	0	0
Magnetic attraction*2	N	1,400	2,780	2,000	3,980	3,950	5,890	7,650	11,400
Heat sink size (HxWxD)	mm			400x500x40					609x762x50
Basic specifications	Time rating	Continuous							
	Insulation class	Class B							
	Ambient temperature	0 to +40°C							
	Ambient humidity	20 to 80% (non-condensing)							
	Insulation resistance	500 VDC, 10 MW min.							
	Excitation	Permanent magnet							
	Dielectric strength	1500 VAC for 1 minute							
	Protection methods	Self-cooled							
	Allowable winding temperature	130°C							

*1. The unbalanced magnetic gap resulting from the coil assembly installation condition causes a magnetic attraction of the coil assembly.

*2. The value indicates the magnetic attraction generated on one side of the magnetic way.

Note: - The items marked with an * and "force and speed characteristics" are the values at a motor winding temperature of 100°C during operation in combination with a servo drive. The others are at 20°C (68°F).

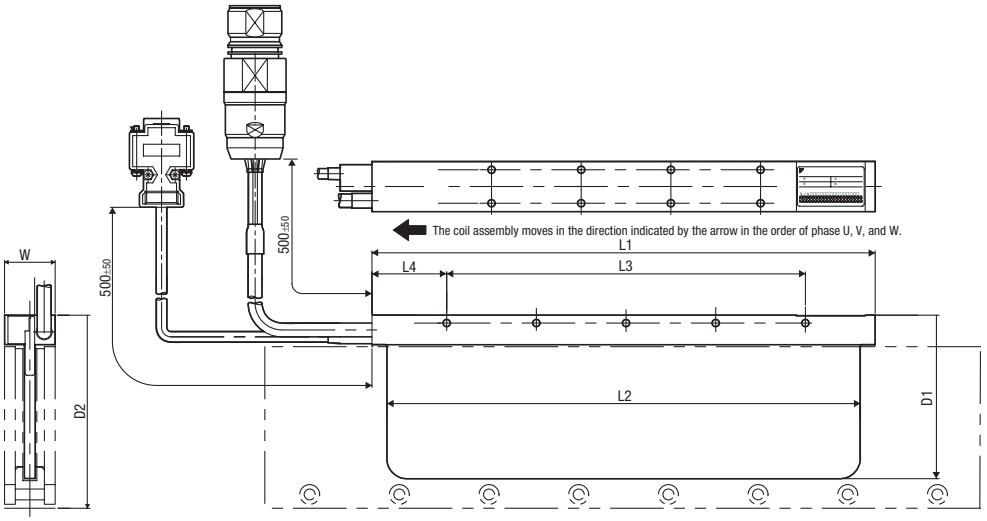
- The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

Dimensions

Coreless SGLG_-_

Coil assembly: SGLGW-_

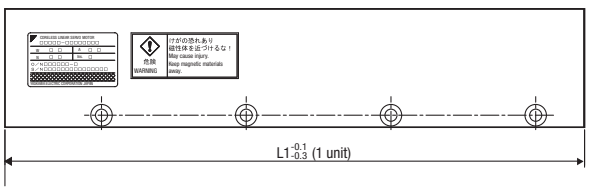
Coil assembly model SGLGW-	L1	L2	L3	L4	D1	D2	W	Approx. weight kg
30A050__D	50	48	30	15	48.5	57	22	0.14
30A080__D	80	72	50	15	48.5	57	22	0.19
40A140__D	140	125	90	30	63	78	25.4	0.40
40A253__D	252.5	237.5	180	37.5	63	78	25.4	0.66
40A365__D	365	350	315	30	63	78	25.4	0.93
60A140__D	140	125	90	30	83	98	25.4	0.48
60A253__D	252.5	237.5	180	37.5	83	98	25.4	0.82
60A365__D	365	350	315	30	83	98	25.4	1.16
90A200__D	199	189	130	40	121	138	49	2.2

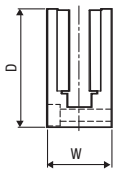


Units: mm

Magnetic way: SGLGM-_

Magnetic way model SGLGM-	L1	D	Standard-force magnetic way		High-force magnetic way	
			W	Approx. weight kg	W	Approx. weight kg
30108A	108	44	24	0.6	–	–
30216A	216	44	24	1.1	–	–
30432A	432	44	24	2.3	–	–
40090C_	90	62	25.4	0.8	31.8	1.0
40225C_	225	62	25.4	2.0	31.8	2.6
40360C_	360	62	25.4	3.1	31.8	4.1
40405C_	405	62	25.4	3.5	31.8	4.6
40450C_	450	62	25.4	3.9	31.8	5.1
60090C_	90	82	25.4	1.1	31.8	1.3
60225C_	225	82	25.4	2.6	31.8	3.3
60360C_	360	82	25.4	4.1	31.8	5.2
60405C_	405	82	25.4	4.6	31.8	5.9
60450C_	450	82	25.4	5.1	31.8	6.6
90252A	252	110	50.8	7.3	–	–
90504A	504	110	50.8	14.7	–	–



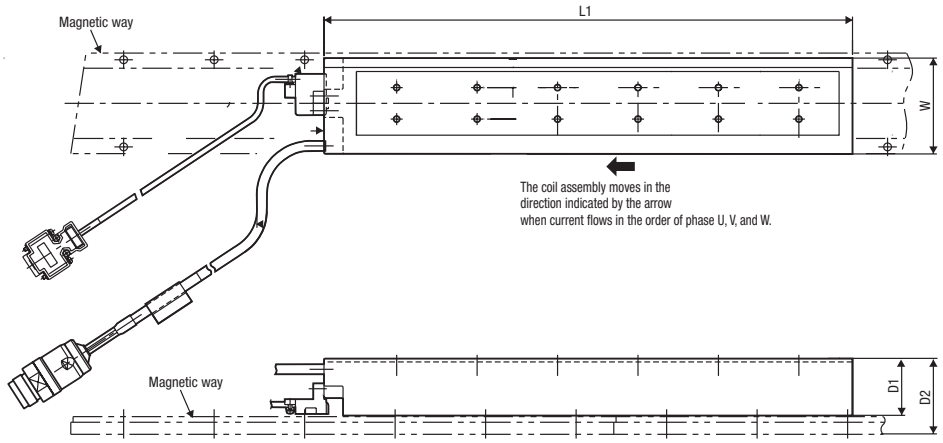


Units: mm

Iron-core SGLF_-_

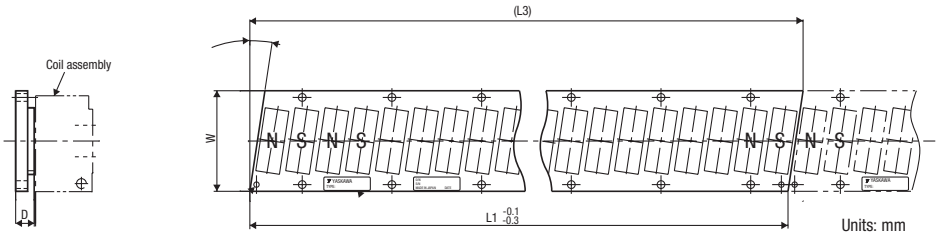
Coil assembly: SGLFW-_

Coil assembly model SGLFW-	L1	D1	D2	W	Approx. weight kg
20A090A_	91	34	45	40	0.7
20A120A_	127	34	45	40	0.9
35_120A_D	127	34	45	55	1.3
35_230A_D	235	34	45	55	2.3
50_200B_D	215	43	58	71.5	3.5
50_380B_D	395	43	58	71.5	6.9
1Z_200B_D	215	43	58	119	6.4
1ZD380B_D	395	43	58	119	11.5
1ED380B_	395	61	76	175	22
1ED560B_	605	61	76	175	33



Magnetic way: SGLFM-_

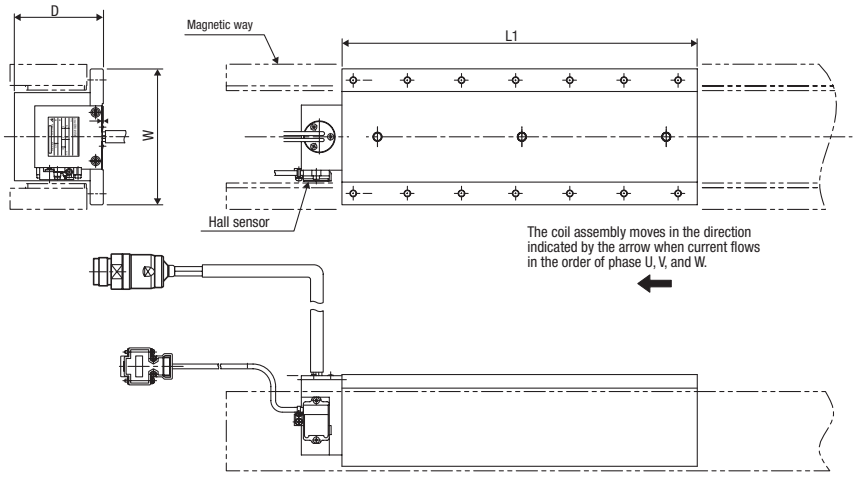
Magnetic way model SGLFM-	L1 $^{-0.1}_{-0.3}$	(L3)	D	W	Approx. weight kg
20324A	324	(331.6)	10	44	0.9
20540A	540	(547.6)	10	44	1.4
20756A	756	(763.6)	10	44	2
35324A	324	(334.4)	10	60	1.2
35540A	540	(550.4)	10	60	2
35756A	756	(766.4)	10	60	2.9
50405A	405	(416.3)	14	75	2.8
50675A	675	(686.3)	14	75	4.6
50945A	945	(956.3)	14	75	6.5
1Z405A	405	(423.9)	14	125	7.3
1Z675A	675	(693.9)	14	125	12
1Z945A	945	(963.9)	14	125	17
1E135A	135	(145.5)	14.2	200	2.4



Iron-core SGLT_-_

Coil assembly: SGLTW-_

Coil assembly model SGLTW-	L1	D	W	Approx. weight kg
35D320H_D	315	66	120	8.8
50D170H_D	170	81	120	6
50D320H_D	315	81	120	11
40D400B_	395	78	150	15
40D600B_	585	78	150	23
80D400B_	395	115	150	25
80D600B_	585	115	150	36

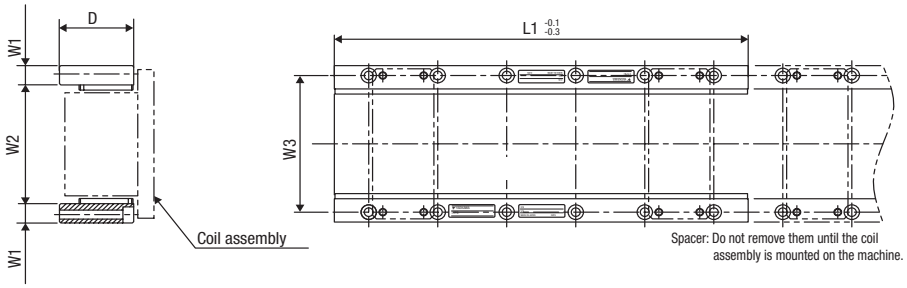


Units: mm

Magnetic way: SGLTM-_

Magnetic way model SGLTM-	L1 $^{-0.1}_{-0.3}$	D	W1	W2	W3	Approx. weight kg
35324H	324	55	15	90	107	4.8
35540H	540	55	15	90	107	8
35756H	756	55	15	90	107	11
50324H	324	70	19.1	90	112	8
50540H	540	70	19.1	90	112	13
50756H	756	70	19.1	90	112	18
40405A	405	63	19.1	111.8	131	9
40675A	675	63	19.1	111.8	131	15
40945A	945	63	19.1	111.8	131	21
80405A	405	100	19.1	111.8	131	14
80675A	675	100	19.1	111.8	131	24
80945A	945	100	19.1	111.8	131	34

Note: - Two magnetic ways for both ends of coil assembly make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the coil assembly is mounted on a machine.
- The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way.
- Two magnetic ways in a set can be connected to each other.
- The dimensions marked with an * are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in assembly dimensions. The values with an * are the dimensions at pre-shipment.
- Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws



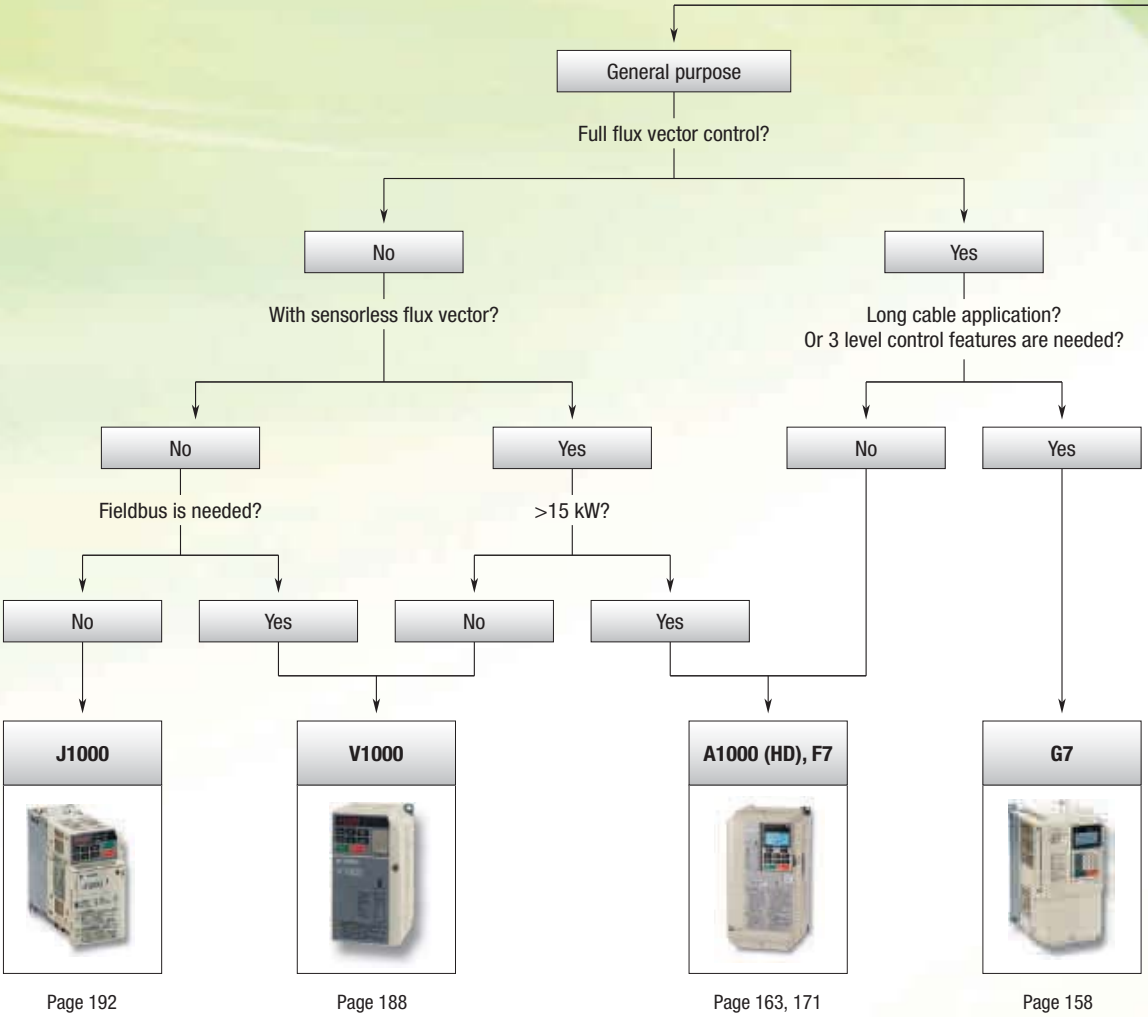
10 X 100 = 1

Quality has a new formula

Thanks to patented design of the V1000 series and modern manufacturing we can promise at least **10** years trouble-free operation. These new features guarantee a **100**% expectation match. And with a field failure rate of less than **1** in 10.000, the new V1000 series inverter will outperform all other inverters long after it has been implemented.

- 54% less mechanical elements – reduced size, improved reliability
- On-line tuning technology – optimal motor performance, no matter the circumstance variations
- Function Block Diagram – saves up to 70% programming time

How on-line tuning and built-in safety works in our inverters, check:
www.1000drives.com



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What is your application?

- Pumps & fans
  - **A1000 (ND), E7**



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- Lift application
  - **L1000A, L7**



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Selection table

Model	G7	A1000	F7	E7
				
Type	**World´s first three level inverter architecture**	**High performance motor control**	**The industrial workhorse**	**Drive your energy cost down**
400 V Three-phase **200 V Three-phase** **200 V Single-phase**	0.4 kW to 300 kW 0.4 kW to 110 kW –	0.4 kW to 315 kW 0.4 kW to 110 kW –	0.4 kW to 300 kW 0.4 kW to 110 kW –	0.4 kW to 300 kW 0.4 kW to 110 kW –
Application	High performance, long cable lines	High performance, current vector control	General and high-end applications	Pumps and fans (variable torque)
Control method	Open and close loop for vector and V/F control.	Open and closed loop for vector and V/F control. Open and closed loop control of PM motors.	Open and close loop for vector and V/F control.	V/F control
Torque features	150% at 0.0 Hz (CLV) 150% at 0.3 Hz (OLV)	200% at 0.0 Hz (CLV) 200% at 0.3 Hz (OLV)	150% at zero speed (CLV) 150% at 0.5 Hz (OLV)	120% at 0.5 Hz
Connectivity	Memobus DeviceNet PROFIBUS-DP CANopen LONWorks Ethernet	Modbus Profibus CANopen DeviceNet MECHATROLINK-II	Memobus DeviceNet PROFIBUS-DP CANopen LONWorks Ethernet MECHATROLINK-II	Memobus Metasys N2 L&S Apogee LONWorks DeviceNet PROFIBUS-DP CANopen Ethernet
Customisation options	- PLC option board - Inverter application software	–	- PLC option board - Inverter application software	- PLC option board - Inverter application software - IP54 enclosure
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Model	L1000A	L7	V1000	J1000
				
Type	**High performance Vector Control**	**Made to drive lifts**	**Quality has a new formula**	**The basic inverter**
400V Three-Phase **200V Three-Phase** **200V Single-Phase**	4.0 kW to 75 kW 4.0 kW to 55 kW –	4.0 kW to 55 kW 3.7 kW to 55 kW –	0.2 kW to 15 kW 0.1 kW to 15 kW 0.1 kW to 4.0 kW	0.2 kW to 4.0 kW 0.1 kW to 4.0 kW 0.1 kW to 1.5 kW
Application	Lift control with asynchronous or synchronous motors	Lift control with asynchronous or synchronous motors	High speed accuracy and high starting torque for compact general purpose	Simple speed control
Control method	Open and closed loop for vector and V/F control. Open and closed loop	Open and close loop for vector and V/F control.	Open loop for vector and open and close loop for V/F control.	V/F control
Torque features	200% at 0.0 Hz (CLV) 200% at 0.3 Hz (OLV)	150% at zero speed (CLV) 150% at 0.5 Hz (OLV)	150% at 0.6 Hz	150% at 3 Hz
Connectivity	CANopen	Memobus DeviceNet PROFIBUS-DP CANopen LONWorks Ethernet	Memobus DeviceNet PROFIBUS-DP CANopen CompoNet	Memobus
Customisation options	–	- PLC option board - Inverter application software	- Customised Application Software	–
Page	180	184	188	192

Model	G7/F7/L7/E7 inverter PLC		
			
Type	**The Omron PLC embedded into the Omron-Yaskawa inverter family**		
Supported inverter	Varispeed G7/F7/L7/E7		
I/O's	6 DI, 4DO in PLC board. 256 I/O's by Comopbus/S distributed network.		
Calendar/clock	Yes		
Encoder interface	Yes		
Connectivity	Peripheral port RS-232C RS-422/485 CompoBus/S master DeviceNet slave		
Software	CX-Programmer CX-One		
Page	196		



World first three level inverter architecture

The G7 has the world's first 400V 3-level inverter architecture that eliminates or minimises the installation problems associated with IGBT switching (very long cable lengths, bearing currents and common-mode currents) and protects the entire motor-drive system. The G7 can be programmed using DriveWorksEZ™. This is a PC-based, object-orientated, user-friendly, graphical icon programming tool.

- 3-level control reduces voltage peaks on motor windings by up to 50%. There is no need for an AC reactor on long motor cables.
- Flux-vector control. Excellent performance in open-loop mode with 150% torque at 0.3 Hz.
- Silent operation. No current de-rating in silent mode (high carrier frequency)
- Wide selection of option cards: fieldbus, PLC unit, MECHATROLINK, analogue and digital I/Os, etc.
- Programming software: CX-Drive for parameter configuration. DriveWorkEZ™ for object-orientated programming.

Ordering information

3G3IV-PCN329-E
Inverter to PC cable



⑦

CX-Drive
DriveWorkEZ



⑦

JVOP-160 OY
Digital operator
(LCD display)



⑦

JVOP-161-OY
Digital operator
(LED display)



⑦

3G3IV-PCN126/326
Digital operator
extension cable



⑦

Line filter

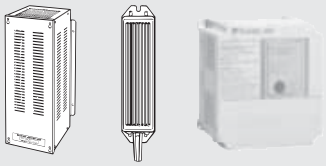


①



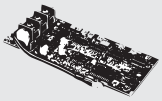
Varispeed G7

Braking accessories



⑧

Monitor option card



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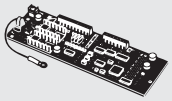
Feedback speed control card



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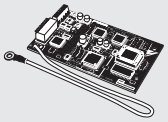
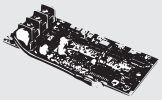
Communication option cards



④

Reference option cards



⑤

PLC option card



⑥

Varispeed G7

200 V

Specifications			Order code
IP20	0.4 kW	3.2 A	CIMR-G7C20P41
	0.75 kW	6.0 A	CIMR-G7C20P71
	1.5 kW	8.0 A	CIMR-G7C21P51
	2.2 kW	12 A	CIMR-G7C22P21
	3.7 kW	18 A	CIMR-G7C23P71
	5.5 kW	27 A	CIMR-G7C25P51
	7.5 kW	34 A	CIMR-G7C27P51
	11 kW	49 A	CIMR-G7C20111
	15 kW	66 A	CIMR-G7C20151
	18.5 kW	80 A	CIMR-G7C20181
IP00	22 kW	96 A	CIMR-G7C20220
	30 kW	130 A	CIMR-G7C20300
	37 kW	160 A	CIMR-G7C20370
	45 kW	183 A	CIMR-G7C20450
	55 kW	224 A	CIMR-G7C20550
	75 kW	300 A	CIMR-G7C20750
	90 kW	358 A	CIMR-G7C20900
	110 kW	415 A	CIMR-G7C21100

400 V

Specifications			Order code
IP20	0.4 kW	1.8 A	CIMR-G7C40P41
	0.75 kW	3.4 A	CIMR-G7C40P71
	1.5 kW	4.8 A	CIMR-G7C41P51
	2.2 kW	6.2 A	CIMR-G7C42P21
	3.7 kW	9 A	CIMR-G7C43P71
	5.5 kW	15 A	CIMR-G7C45P51
	7.5 kW	21 A	CIMR-G7C47P51
	11 kW	27 A	CIMR-G7C40111
	15 kW	34 A	CIMR-G7C40151
	18.5 kW	42 A	CIMR-G7C40181
IP00	22 kW	52 A	CIMR-G7C40220
	30 kW	65 A	CIMR-G7C40300
	37 kW	80 A	CIMR-G7C40370
	45 kW	97 A	CIMR-G7C40450
	55 kW	128 A	CIMR-G7C40550
	75 kW	165 A	CIMR-G7C40750
	90 kW	195 A	CIMR-G7C40900
	110 kW	240 A	CIMR-G7C41100
	132 kW	270 A	CIMR-G7C41320
	160 kW	235 A	CIMR-G7C41600
	185 kW	370 A	CIMR-G7C41850
	220 kW	450 A	CIMR-G7C42200
	300 kW	605 A	CIMR-G7C43000

① Line filters

200 V

Inverters	Line filters			
	EN55011 class	Current (A)	Weight (kg)	Order code
CIMR-G7C20P4	B, 25 m A, 100 m	10	1.2	3G3RV-PFI3010-SE
CIMR-G7C20P7				
CIMR-G7C21P5	B, 25 m A, 100 m	18	1.3	3G3RV-PFI3018-SE
CIMR-G7C22P2	B, 25 m A, 100 m	35	1.4	3G3RV-PFI2035-SE
CIMR-G7C23P7				
CIMR-G7C25P5	B, 25 m A, 100 m	60	3	3G3RV-PFI2060-SE
CIMR-G7C27P5				
CIMR-G7C2011	B, 25 m A, 100 m	100	4.9	3G3RV-PFI2100-SE
CIMR-G7C2015				
CIMR-G7C2018				
CIMR-G7C2022	A, 100 m	130	4.3	3G3RV-PFI2130-SE
CIMR-G7C2030	A, 100 m	160	6.0	3G3RV-PFI2160-SE
CIMR-G7C2037	A, 100 m	200	11.0	3G3RV-PFI2200-SE
CIMR-G7C2045				
CIMR-G7C2055	A, 100 m	400	8.6	3G3RV-PFI3410-SE
CIMR-G7C2075				
CIMR-G7C2090				
CIMR-G7C2110	A, 100 m	600	11.0	3G3RV-PFI3600-SE

400 V

Inverters	Line filters			
	EN 55011 class	Current (A)	Weight (kg)	Order code
CIMR-G7C40P4	B, 25 m A, 100 m	10	1.1	3G3RV-PFI3010-SE
CIMR-G7C40P7				
CIMR-G7C41P5				
CIMR-G7C42P2	B, 25 m A, 100 m	18	1.3	3G3RV-PFI3018-SE
CIMR-G7C43P7				
CIMR-G7C44P0				
CIMR-G7C45P5	B, 25 m A, 100 m	21	1.8	3G3RV-PFI3021-SE
CIMR-G7C47P5	B, 25 m	35	2.2	3G3RV-PFI3035-SE
CIMR-G7C4011	B, 25 m A, 100 m	60	4.0	3G3RV-PFI3060-SE
CIMR-G7C4015				
CIMR-G7C4018	B, 25 m A, 100 m	70	3.4	3G3RV-PFI3070-SE
CIMR-G7C4022				
CIMR-G7C4030	A, 100 m	100	4.5	3G3RV-PFI3100-SE
CIMR-G7C4037				
CIMR-G7C4045	A, 100 m	130	4.7	3G3RV-PFI3130-SE
CIMR-G7C4055	A, 100 m	170	6.0	3G3RV-PFI3170-SE
CIMR-G7C4075	A, 100 m	250	11	3G3RV-PFI3200-SE
CIMR-G7C4090	A, 100 m	400	8.6	3G3RV-PFI3410-SE
CIMR-G7C4110				
CIMR-G7C4132				
CIMR-G7C4160				
CIMR-G7C4185	A, 100 m	600	11,0	3G3RV-PFI3600-SE
CIMR-G7C4220	A, 100 m	800	31.0	3G3RV-PFI3800-SE
CIMR-G7C4300				

② Monitor option cards

Type	Description	Function	Order code
Monitor option card	Analogue monitor card	Outputs analogue signal for monitoring inverter output state (output freq., output current etc.) after absolute value conversion. Output resolution: 8 bits (1/256) Output voltage: 0 to 10 V (non isolated) Output channel: 2 channels	AO-08
		Outputs analogue signal for monitoring inverter output state (output freq., output current etc.) Output resolution: 11 bits (1/2048) + code Output voltage: 0 to 10 V (non isolated) Output channel: 2 channels	AO-12
	Digital output card	Outputs isolated type digital signal for monitoring inverter run state (alarm signal, zero speed detection etc.). Output channel: Photo coupler 6 channels (48 V, 50 mA or less) Relay contact output 2 channels (250 VAC, 1 A or less 30 VDC, 1 A or less)	DO-08
	2C-relay output card	Two multi-function contact outputs (2C-relay) can be used other than those of the inverter proper unit.	DO-02C

③ Feedback speed control cards

Type	Description	Function	Order code
Feedback speed control card	PG speed controller card (used for V/f control with PG or flux vector)	Phase A pulse (single pulse) inputs (voltage, complementary, open collector input) PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, max. current 200 mA] Pulse monitor output: +12 V, 20 mA	PG-A2
		Phase A and B pulse inputs (exclusively for complementary input) PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, Max. current 200 mA] Pulse monitor output: Open collector, +24 V, Max. current 30 mA	PG-B2
		Phase A pulse (differential pulse) input for V/f control (RS-422 input) PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] Pulse monitor output: RS-422	PG-D2
		Phase A, B and Z pulse (differential pulse) inputs (RS-422 input) PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] Pulse monitor output: RS-422	PG-X2

④ Communication option cards

Type	Description	Function	Order code
Communication option card	DeviceNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.	SI-N1
	PROFIBUS-DP option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.	SI-P1
	CANopen option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI-S1
	LONWORKS option card	Used for HVAC control, running or stopping the inverter, setting or referencing parameters, and monitoring output current, watt-hours, or similar items through LONWORKS communications with peripheral devices.	SI-J
	Ethernet option card	Modbus TCP/IP Ethernet interface unit	CM090
	MECHATROLINK-II option board	High speed motion bus. Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through MECHATROLINK-II communication with the host controller. Host controller : Trajexia, MCH or MP Series *1	SI-T

*1 Please refer to Trajexia, MCH or MP Series section for host controllers detailed information.

⑤ Reference option Cards

Type	Description	Function	Order code
Reference option card	Analogue input card	2 channel high resolution analogue input card Channel 1: 0 to 10 V (20 KΩ) Channel 2: 4 to 20 mA (250 Ω) Resolution 14 bit	AI-14U
		3 Channel high resolution analogue input card Signal level: -10 to +10V (20 KΩ) 4 to 20 mA (250 Ω) Resolution: 13 bit + sign	AI-14B
	Digital reference card	8 bit digital speed reference input card	DI-08
		16 bit digital speed reference input card	DI-16H2

⑥ PLC option boards

Type	Description	Function	Order code
PLC option	PLC option	Full PLC features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs. Embedded CompuBus/S fieldbus Standard Omron tools can be used for programming	3G3RV-P10ST8-E
	PLC option with DeviceNet	Same features than standard models with DeviceNet support.	3G3RV-P10ST8-DRT-E

⑦ Accessories

Type	Description	Function	Order code
Digital operator	5 lines LCD digital operator 7 language support	Configuration and monitoring device.	JVOP-160-OY
	7 segment LED digital operator		JVOP-161-OY
Accessories	Digital operator extension cable 1 meter 3 meters	Cable to connect the inverter and the digital operator when it's not plugged into the inverter.	3G3IV-PCN126 3G3IV-PCN326
	PC configuration cable	Cable to connect inverter and PC	3G3IV-PCN329-E

⑦ Software

Description	Function	Order code
Computer software	Configuration and monitoring software tool for drives. (Version 1.1 or higher)	CX-DRIVE
Computer software	Complete automation software including CX-Drive	CX-ONE

For full specifications please refer to chapter software on page 582.

⑧ Braking unit, braking resistor unit

Note: For braking units specifications and models refer to the G7 datasheet Cat-No: I37E-EN-02

Specifications

200 V

Order code CIMR-G7C_			20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Max. applicable motor output *1		kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output characteristics	Inverter	kVA	1.2	2.3	3.0	4.6	6.9	10	13	19	25	30	37	50	61	70	85	110	140	160
	Rated current	A	3.2	6	8	12	18	27	34	49	66	80	96	130	160	183	224	300	358	415
	Max. voltage		3-phase, 200/208/220/230/240 V (proportional to input voltage)																	
	Max. output frequency		400 Hz (programmable)																	
Power supply	Rated input voltage and frequency		3-phase 200/208/220/230/240 V, 50/60 Hz *2																	
	Allowable voltage fluctuation		+10%, -15%																	
	Allowable frequency fluctuation		±5%																	
Harmonic wave prevention	DC reactor		Option									Provided								
	12-Pulse input		Not available									Available *3								

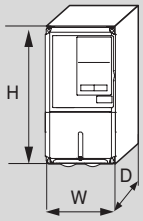
*1 Standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
*2 When using the inverter of 200 V class 30 kW or more with a cooling fan of three-phase 230 V 50 Hz or 240 V 50/60 Hz power supply, a transformer for the cooling fan is required.
*3 A 3-wired transformer is required at 12-pulse input.

400 V

Order code CIMR-G7C_			40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
Max. applicable motor output *1		kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	300
Output characteristics	Inverter	kVA	1.4	2.6	3.7	4.7	6.9	11	16	21	26	32	40	50	61	74	98	130	150	180	210	250	280	340	460
	Rated current	A	1.8	3.4	4.8	6.2	9	15	21	27	34	42	52	65	80	97	128	165	195	240	270	325	370	450	605
	Max. voltage		3-phase, 380/400/415/440/460/480 V (proportional to input voltage)																						
	Max. output frequency		400 Hz (programmable)																						
Power supply	Rated input voltage and frequency		3-phase 380/400/415/440/460/480 V, 50/60 Hz																						
	Allowable voltage fluctuation		+10%, -15%																						
	Allowable frequency fluctuation		±5%																						
Harmonic wave prevention	DC reactor		Option									Provided													
	12-Pulse input		Not available									Available *2													

*1 Standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
*2 A 3-wired transformer is required at 12-pulse input.

Dimensions

Specifications		Drive model	H	W	D	
3 phase 200 VAC	0.4 kW	CIMR-G7C20P41	280	140	157	
	0.75 kW	CIMR-G7C20P71				
	1.5 kW	CIMR-G7C21P51				
	2.2 kW	CIMR-G7C22P21			177	
	3.7 kW	CIMR-G7C23P71				
	5.5 kW	CIMR-G7C25P51	300	200	197	
	7.5 kW	CIMR-G7C27P51				
	11 kW	CIMR-G7C20111	350	240	207	
	15 kW	CIMR-G7C20151				
	18.5 kW	CIMR-G7C20181	400	250	258	
	22 kW	CIMR-G7C20220	450	275	258	
	30 kW	CIMR-G7C20300	600	375	298	
	37 kW	CIMR-G7C20370			328	
	45 kW	CIMR-G7C20450	725	450	348	
	55 kW	CIMR-G7C20550				
	75 kW	CIMR-G7C20750	850	500	358	
	90 kW	CIMR-G7C20900	885	575	378	
	110 kW	CIMR-G7C21100				
3 phase 400 VAC	0.4 kW	CIMR-G7C40P41	280	140	157	
	0.75 kW	CIMR-G7C40P71				
	1.5 kW	CIMR-G7C41P51			177	
	2.2 kW	CIMR-G7C42P21				
	3.7 kW	CIMR-G7C43P71				
	5.5 kW	CIMR-G7C45P51	300	200	197	
	7.5 kW	CIMR-G7C47P51				
	11 kW	CIMR-G7C40111	350	240	207	
	15 kW	CIMR-G7C40151				
	18.5 kW	CIMR-G7C40181	450	275	258	
	22 kW	CIMR-G7C40220				
	30 kW	CIMR-G7C40300	550	325	283	
	37 kW	CIMR-G7C40370				
	45 kW	CIMR-G7C40450				
	55 kW	CIMR-G7C40550	725	450	348	
	75 kW	CIMR-G7C40750				
	90 kW	CIMR-G7C40900	850	500	358	
	110 kW	CIMR-G7C41100				
	132 kW	CIMR-G7C41320	916	575	378	
	160 kW	CIMR-G7C41600				
	185 kW	CIMR-G7C41850	1305	710	415	
	220 kW	CIMR-G7C42200				
	300 kW	CIMR-G7C43000	1475	916		

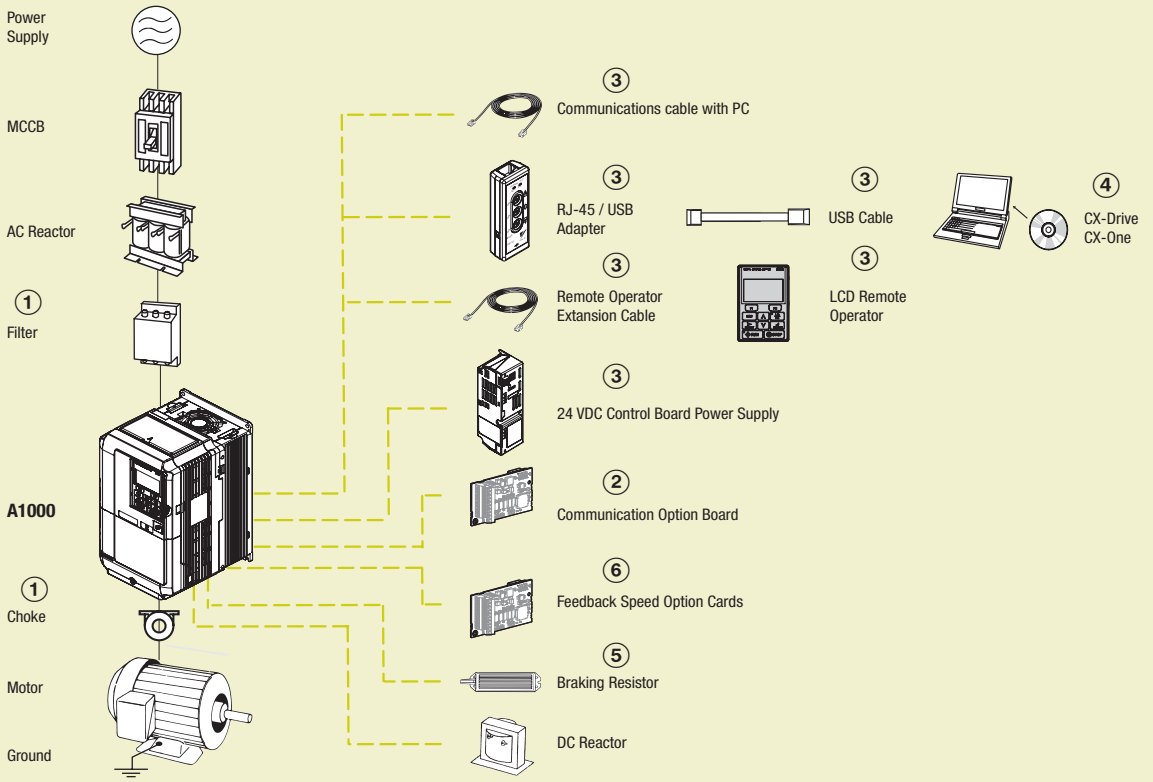


High performance Vector Control

The A1000 provides remarkable advantatges through excellent motor drive performance, enviromental benefits and energy savings, as well as many user oriented operational features. Moreover, the A1000 offers advanced characteristics that are included as standard.

- Current vector control, with or without PG
- High starting torque (200% at 0.3 Hz spd range 1:200 OLV), (200% at 0 r/min, spd range 1:1500 CLV)
- Double rating ND 120%/1 min and HD 150%/1 min
- IM&PM motor control. Open Loop control of PM motors.
- Low-noise Low carrier technology
- 24 VDC control board power supply option
- Fieldbus communications: Modbus, PROFIBUS, CANopen, DeviceNet, ML-II
- Safety built-in: EN954-1 Cat3, IEC61508 SIL2 and EN61800-5-1 with EDM

Ordering information



A1000

Specifications					Order code
	Heavy Duty		Normal Duty		Standard
200 V	0.4 kW	3.2 A	0.75 kW	3.5 A	CIMR-AC2A0004FAA
	0.75 kW	5.0 A	1.1 kW	6.0 A	CIMR-AC2A0006FAA
	1.5 kW	8.0 A	2.2 kW	9.6 A	CIMR-AC2A0010FAA
	2.2 kW	11.0 A	3.0 kW	12.0 A	CIMR-AC2A0012FAA
	4.0 kW	17.5 A	5.5 kW	21.0 A	CIMR-AC2A0021FAA
	5.5 kW	25.0 A	7.5 kW	30.0 A	CIMR-AC2A0030FAA
	7.5 kW	33.0 A	11.0 kW	40.0 A	CIMR-AC2A0040FAA
	11 kW	47.0 A	15.0 kW	56.0 A	CIMR-AC2A0056FAA
	15 kW	60.0 A	18.5 kW	69.0 A	CIMR-AC2A0069FAA
	18.5 kW	75 A	22 kW	81 A	CIMR-AC2A0081FAA
	22 kW	85 A	30 kW	110 A	CIMR-AC2A0110AAA
	30 kW	115 A	37 kW	138 A	CIMR-AC2A0138AAA
	37 kW	145 A	45 kW	169 A	CIMR-AC2A0169AAA
	45 kW	180 A	55 kW	211 A	CIMR-AC2A0211AAA
	55 kW	215 A	75 kW	250 A	CIMR-AC2A0250AAA
	75 kW	283 A	90 kW	312 A	CIMR-AC2A0312AAA
	90 kW	346 A	110 kW	360 A	CIMR-AC2A0360AAA
	110 kW	415	110 kW	415 A	CIMR-AC2A0415AAA
400 V	0.4 kW	1.8 A	0.75 kW	2.1 A	CIMR-AC4A0002FAA
	0.75 kW	3.4 A	1.5 kW	4.1 A	CIMR-AC4A0004FAA
	1.5 kW	4.8 A	2.2 kW	5.4 A	CIMR-AC4A0005FAA
	2.2 kW	5.5 A	3.0 kW	6.9 A	CIMR-AC4A0007FAA
	3.0 kW	7.2 A	4.0 kW	8.8 A	CIMR-AC4A0009FAA
	4.0 kW	9.2 A	5.5 kW	11.1 A	CIMR-AC4A0011FAA
	5.5 kW	14.8 A	7.5 kW	17.5 A	CIMR-AC4A0018FAA
	7.5 kW	18.0 A	11.0 kW	23.0 A	CIMR-AC4A0023FAA
	11 kW	24.0 A	15.0 kW	31.0 A	CIMR-AC4A0031FAA
	15 kW	31.0 A	18.5 kW	38.0 A	CIMR-AC4A0038FAA
	18.5 kW	39 A	22 kW	44 A	CIMR-AC4A0044FAA
	22 kW	45 A	30 kW	58 A	CIMR-AC4A0058AAA
	30 kW	60 A	37 kW	72 A	CIMR-AC4A0072AAA
	37 kW	75 A	45 kW	88 A	CIMR-AC4A0088AAA
	45 kW	91 A	55 kW	103 A	CIMR-AC4A0103AAA
	55 kW	112 A	75 kW	139 A	CIMR-AC4A0139AAA
	75 kW	150 A	90 kW	165 A	CIMR-AC4A0165AAA
	90 kW	180 A	110 kW	208 A	CIMR-AC4A0208AAA
	110 kW	216 A	132 kW	250 A	CIMR-AC4A0250AAA
	132 kW	260 A	160 kW	296 A	CIMR-AC4A0296AAA
	160 kW	304 A	185 kW	362 A	CIMR-AC4A0362AAA
	185 kW	370 A	220 kW	414 A	CIMR-AC4A0414AAA
	220 kW	450 A	250 kW	515 A	CIMR-AC4A0515AAA
	315 kW	605 A	355 kW	675 A	CIMR-AC4A0675AAA

① Line filters

Inverter		Line filter			
Voltage	**Model CIMR-AC_ (Normal duty)**	**Rated current (A)**	**Weight (kg)**	**Order code**	
3-Phase 200 VAC	2A0004 / 2A0006 / 2A0010 / 2A0012 / 2A0021	24	2.0	A1000-FIA3024-RE	Rasmi (footprint)
	2A0030 / 2A0040	52	2.4	A1000-FIA2052-RE	Rasmi (footprint)
	2A0056	68	4.2	A1000-FIA2068-RE	Rasmi (footprint)
	2A0069 / 2A0081	96	4.4	A1000-FIA2096-RE	Rasmi (footprint)
	2A0110 / 2A0138 / 2A0169	170	9.0	A1000-FIA3170-RE	Rasmi
	2A0211 / 2A0250	300	13.2	A1000-FIA3300-RE	Rasmi
	2A0312 / 2A0360 / 2A0415	480	13.6	A1000-FIA3480-RE	Rasmi
3-Phase 400 VAC	4A0002 / 4A0004 / 4A0005 / 4A0007 / 4A0009 / 4A0011 / 4A0018 / 4A0023	24	2.0	A1000-FIA3024-RE	Rasmi (footprint)
	4A0031 / 4A0038	44	2.8	A1000-FIA3044-RE	Rasmi (footprint)
	4A0044	52	–	A1000-FIA3052-RE	Rasmi (footprint)
	4A0058 / 4A0072	71	5.3	A1000-FIA3071-RE	Rasmi
	4A0088 / 4A0103	105	6.5	A1000-FIA3105-RE	Rasmi
	4A0139 / 4A0165	170	9.0	A1000-FIA3170-RE	Rasmi
	4A0208 / 4A0250 / 4A0296	300	13.2	A1000-FIA3300-RE	Rasmi
	4A0362 / 4A0414 / 4A0515	480	13.6	A1000-FIA3480-RE	Rasmi
	4A0675	660	23.7	A1000-FIA3660-RE	Rasmi

Inverter		Line filter			
Voltage	**Model CIMR-AC_ (Normal duty)**	**Rated current (A)**	**Weight (kg)**	**Order code**	
3-Phase 200 VAC	2A0004 / 2A0006 / 2A0008	10	1.2	3G3RV-PFI3010-SE	Schaffner
	2A0010 / 2A0012 / 2A0018 / 2A0021	18	1.3	3G3RV-PFI3018-SE	Schaffner
	2A0030 / 2A0040 / 2A0056	35	1.4	3G3RV-PFI2035-SE	Schaffner
	2A0069 / 2A0081	60	3	3G3RV-PFI2060-SE	Schaffner
	2A00110 / 2A0138	100	4.9	3G3RV-PFI2100-SE	Schaffner
	2A0169 / 2A0211	170	6.0	3G3RV-PFI3170-SE	Schaffner
3-Phase 400 VAC	4A0002 / 4A0004 / 4A0005 / 4A0007	10	1.2	3G3RV-PFI3010-SE	Schaffner
	4A0009 / 4A0011	18	1.3	3G3RV-PFI3018-SE	Schaffner
	4A0018 / 4A0023 / 4A0031	35	2.2	3G3RV-PFI3035-SE	Schaffner
	4A0038 / 4A0044 / 4A0058	60	4.0	3G3RV-PFI3060-SE	Schaffner
	4A0072 / 4A0088	100	4.5	3G3RV-PFI3100-SE	Schaffner
	4A0103 / 4A0139 / 4A0165	170	6.0	3G3RV-PFI3170-SE	Schaffner
	4A0208 / 4A0250	250	11	3G3RV-PFI3200-SE	Schaffner
	4A0296 / 4A0362	400	8.5	3G3RV-PFI3400-SE	Schaffner
	4A0414 / 4A0515	600	11.0	3G3RV-PFI3600-SE	Schaffner
	4A0675	800	31.0	3G3RV-PFI3800-SE	Schaffner

Chokes

Diameter	Description	Order code
21	Recommended for motors below 2.2 KW	A1000-FEV2102-RE
25	Recommended for motors below 15 KW	A1000-FEV2515-RE
50	Recommended for motors below 45 KW	A1000-FEV5045-RE
60	Recommended for motors above 45 KW	A1000-FEV6045-RE

② Communication cards

Type	Description	Function	Order code
Communication option board	DeviceNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.	SI-N3
	PROFIBUS-DP option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.	SI-P3
	Can open option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI-S3
	Mechatrolink II option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through Mechatrolink II communication with the host controller.	SI-T3

③ Accessories

Types	Description	Functions	Order code
Digital operator	LCD remote operator	LCD Display operator with language support	JVOP-180
	Remote operator cable	3 meters cable for connecting remote operator	3G3AX-CAJOP300-EE
Accessories	USB converter / USB cable	USB converter unit with copy and backup function	JVOP-181
	24 VDC option board	24 VDC control board power supply VZA-B/2/4 from 0.1 to 4 KW	PS-V10S
		24 VDC control board power supply VZA-2/4 from 5.5 to 15 KW	PS-V10M
	PC connection cable	RS232 PC tool connection cable	A1000-CAVPC232-EE

④ Computer software

Types	Description	Installation	Order code
Software	Computer software	Configuration and monitoring software tool	CX-drive
	Computer software	Configuration and monitoring software tool	CX-One

⑤ Braking unit, braking resistor unit

Inverter			Braking unit		Braking Resistor*1											
					Type											
Max. Applicable Motor kW		Model CIMR-A_2A_	Order code CDBR_	No. of used	Order code A1000-RE_	Specifications of Resistor		Qty	Braking torque % (3% ED)	Order code LKEB-	Specifications of Resistor		Qty	Braking torque % (10% ED)	Min Resist Value Ω
200 V Class	0.4	0004 HD	Built-in		J0K15200-IE	190W	200 Ω	1	220	-	-		-	-	48
	0.75	0004 ND							125	-	-		-	-	48
		0006 HD								-	-		-	-	
	1.1	0006 ND							85	-	-		-	-	48
		0008 HD			J0K15100-IE	190 W	100 Ω	1	150	21P5	260W	100 Ω	1	150	
	1.5	0008 ND							125	21P5	260W	100 Ω	1	125	48
		0010 HD											1		
	2.2	0010 ND			J0K15070-IE	190 W	70 Ω	1	120	22P2	260W	70 Ω	1	120	48
		0012 HD											1		16
	3	0012 ND			J0K15062-IE	190 W	62 Ω	1	100	23P7	390W	40 Ω	1	150	16
		0018 HD											1		
	3.7	0018 ND							80	23P7	390W	40 Ω	1	125	16
		0021 HD											1		
	5.5	0021 ND						2	110	25P5	520W	30 Ω	1	115	16
		0030 HD			-	-	-	-	-				1		
	7.5	0030 ND			-					27P5	780W	20 Ω	1	125	16
		0040 HD			-								1		9.6
	11	0040 ND			-					2011	2400W	13.6 Ω	1	125	9.6
		0056 HD			-								1		
	15	0056 ND			-					2015	3000W	10 Ω	1	125	9.6
		0069 HD			-								1		
	18.5	0069 ND			-					2015	3000W	10 Ω	1	100	9.6
		0081 HD			-								1		
	22	0081 ND			-					2015	3000W	10 Ω	1	85	9.6
		0110 HD			-					2022	4800W	6.8 Ω	1	125	6.4
	30	0110 ND			-					2022	4800W	6.8 Ω	1	90	6.4
		0138 HD			-								1		
	37	0138 ND			-					2022	4800W	6.8 Ω	1	70	6.4
		0169 HD	2015B	2	-					2015	3000W	10 Ω	2	100	9.6
	45	0169 ND	2022B	2	-					2015	3000W	10 Ω	2	80	6.4
		0211 HD			-					2022	4800W	6.8 Ω	2	120	
	55	0211 ND	2022B	2	-					2022	4800W	6.8 Ω	2	100	6.4
		0250 HD			-										6.4
200 V Class	75	0250 ND	2110B	1	-	-	-	-	-	2022	4800W	6.8 Ω	3	110	1.6
		0312 HD			-										
	90	0312 ND	2110B	1	-					2022	4800W	6.8 Ω	4	120	1.6
		0360 HD			-										
	110	0360 ND	2110B	1	-					2018	4800W	8 Ω	5	100	1.6
		0415 HD			-										

Inverter			Braking unit		Braking Resistor*1										
					Type										
Max. Applicable Motor kW		Model CIMR-A_2A_	Order code CDBR_	No. of used	Order code A1000-RE_	Specifications of Resistor		Qty	Braking torque % (3% ED)	Order code LKEB-	Specifications of Resistor		Qty	Braking torque % (10% ED)	Min Resist Value Ω
400 V Class	0.4	0002 HD	Built in		J0K10750-IE	60 W	750 Ω	1	230	-	-	-	-	-	96
	0.75	0002 ND			J0K10750-IE	60 W	750 Ω	1	130	-	-	-	-	-	96
		0004 HD								-	-	-	-	-	
	1.5	0004 ND			J0k15400-IE	190 W	400 Ω	1	125	41P5	260W	400 Ω	1	125	96
		0005 HD													64
	2.2	0005 ND			J0k15300-IE	190 W	300 Ω	1	115	42P2	260W	250 Ω	1	135	64
		0007 HD													
	3	0007 ND			J0k15200-IE	190 W	200 Ω	1	125	42P2	260W	250 Ω	1	100	64
		0009 HD								43P7	390W	150 Ω	1	150	32
	3.7	0009 ND			J0k15200-IE	190 W	200 Ω	1	105	43P7	390W	150 Ω	1	135	32
		0011 HD													
	5.5	0011 ND			J0k15200-IE	190 W	100 Ω	2	135	45P5	520W	100 Ω	1	135	32
		0018 HD			-	-	-	-	-						
	7.5	0018 ND			-					47P5	780W	75 Ω	1	130	32
		0023 HD			-										
	11	0023 ND			-					4011	1040W	50 Ω	1	135	32
		0031 HD			-										20
	15	0031 ND			-					4015	1560W	40 Ω	1	125	20
		0038 HD			-										
	18.5	0038 ND			-					4018	4800W	32 Ω	1	125	20
		0044 HD			-										19.2
	22	0044 ND			-					4022	4800W	27.2 Ω	1	125	19.2
		0058 HD			-										
	30	0058 ND			-					4030	6000W	20 Ω	1	125	19.2
		0072 HD			-										
	37	0072 ND			-					4030	6000W	20 Ω	1	100	19.8
		0088 HD	4045B	1	-					4037	9600W	16 Ω	1	125	12.8
	45	0088 ND	4045B	1	-					4045	9600W	13.6 Ω	1	125	12.8
		0103 HD			-										
	55	0103 ND	4045B	2	-					4045	9600W	13.6 Ω	1	100	12.8
		0139 HD	4030B	2	-					4030	6000W	20 Ω	2	135	19.2
	75	0139 ND	4030B	2	-					4030	6000W	20 Ω	2	100	19.2
		0165 HD	4045B	2	-					4045	9600W	13.6 Ω	2	145	12.8
	90	0165 ND	4045B	2	-					4045	9600W	13.6 Ω	2	120	12.8
		0208 HD			-										
	110	0208 ND	4220B	1	-					4030	6000W	20 Ω	3	100	3.2
		0250 HD			-										
	132	0250 ND	4220B	1	-	-	-	-	-	4045	9600W	13.6 Ω	4	140	3.2
		0296 HD			-										
	160	0296 ND	4220B	1	-					4045	9600W	13.6 Ω	4	120	3.2
		0362 HD			-										
	185	0362 ND	4220B	1	-					4045	9600W	13.6 Ω	4	100	3.2
		0414 HD			-										
	220	0414 ND	4220B	1	-					4037	9600W	16 Ω	5	110	3.2
		0515 HD			-										
	250	0515 ND	4220B	1	-									95	3.2
	315	0675 HD	4220B	2	-					4045	9600W	13.6 Ω	6	105	3.2
	355	0675 ND	4220B	2	-									90	

*1 When connecting a mounting type resistor or braking resistor unit, set system constant L3-04 to 0 (Stall prevention disabled during deceleration). Motor will not stop at set deceleration time if this constant is not changed. Additionally the Internal braking transistor protection (L8-55) should be set to "0" when a external braking unit (CDBR-) is used.

⑥ Feedback speed option card

Type	Description	Function	Order code
PG option card	Complementary PG	• For speed feedback input by connecting a motor encoder Input: 3 track (one or two tracks), for HTL encoder connection, 50 KHz max Output: 3 track open collector Encoder power supply: 12 V, 200 mA max	PG-B3
	Line Driver PG	• For speed feedback input by connecting a motor encoder Input: 3 track, line driver, 300 kHz max Output: 3 track, line driver Encoder power supply: 5 V or 12 V, 200 mA max	PG-X3

Specifications

200 V class

Three-phase: CIMR-A_2A		0004	0006	0010	0012	0021	0030	0040	0056	0069	0081	0110	0138	0169	0211	0250	0312	0360	0415
Motor kW*1	For HD setting	0.40	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
	For ND setting	0.75	1.1	2.2	3.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	110
Output characteristics	Inverter capacity kVA at HD*2	1.2	1.9	3	4.2	6.7	9.5	12.6	17.9	23	29	32	44	55	69	82	108	132	158
	Inverter capacity kVA at ND*2	1.3	2.3	3.7	4.6	8	11.4	15.2	21	26	31	42	53	64	80	95	119	137	158
	Rated output current (A) at HD	3.2*3	5*3	8*3	11*3	17.5*3	25*3	33*3	47*3	60*3	75*3	85*3	115*3	145*4	180*4	215*4	283*4	346*4	415*5
	Rated output current (A) at ND*5	3.5	6	9.6	12	21	30	40	56	69	81	110	138	169	211	250	312	360	415
	Max. output voltage	Proportional to input voltage: 0..240 V																	
	Max. output frequency	400 Hz																	
Power supply	Rated input voltage and frequency	3-phase 200..240 V 50/60 Hz																	
	Allowable voltage fluctuation	-15%..+10%																	
	Allowable frequency fluctuation	+5%																	
	Input Current (A) at HD*6	2.9	5.8	7.5	11	18.9	28	37	52	68	80	82	111	136	164	200	271	324	394
	Input Current (A) at ND*6	3.9	7.3	10.8	13.9	24	37	52	68	80	96	111	136	164	200	271	324	394	471

*1 Based on a standard 4-pole motor for maximum applicable motor output.
*2 Rated Motor Capacity is calculated with a rated output voltage of 220 V.
*3 Carrier frequency can be increased up to 8 kHz while keeping this current rating. Higher carrier frequency settings require derating.
*4 Carrier frequency can be increased up to 5 kHz while keeping this current rating. Higher carrier frequency settings require derating.
*5 Carrier frequency is set to 2 kHz. Current derating is required in order to raise the carrier frequency.
*6 Assumes operation at rated output current. Input current rating varies depending on the power supply transformer, input reactor, Wiring conditions, and power supply impedance.

400 V class

Three-phase: CIMR-A_4A		0002	0004	0005	0007	0009	0011	0018	0023	0031	0038	0044	0058
Motor kW*1	For HD setting	0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5	22
	For ND setting	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5	22	30
Output characteristics	Inverter capacity kVA at HD*2	1.4	2.6	3.7	4.2	5.5	7	11.3	13.7	18.3	24	30	34
	Inverter capacity kVA at ND*2	1.6	3.1	4.1	5.3	6.7	8.5	13.3	17.5	24	29	34	44
	Rated output current (A) at HD	1.8*3	3.4*3	4.8*3	5.5*3	7.2*3	9.2*3	14.8*3	18*3	24*3	31*3	39*3	45*3
	Rated output current (A) at ND*5	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23	31	38	44	58
	Max. output voltage	380..480V (proportional to input voltage)											
	Max. output frequency	400 Hz											
Power supply	Rated input voltage and frequency	3-phase 380..480 VAC, 50/60 Hz											
	Allowable voltage fluctuation	-15%..+10%											
	Allowable frequency fluctuation	+5%											
	Input Current (A) at HD*6	1.8	3.2	4.4	6	8.2	10.4	15	20	29	39	44	49
	Input Current (A) at ND*6	2.1	4.3	5.9	8.1	9.4	14	20	24	38	44	52	58

Three-phase: CIMR-A_4A		0072	0088	0103	0139	0165	0208	0250	0296	0362	0414	0515	0675
Motor kW*1	For HD setting	30	37	45	55	75	90	110	132	160	185	220	315
	For ND setting	37	45	55	75	90	110	132	160	185	220	250	355
Output characteristics	Inverter capacity kVA at HD*2	48	57	69	85	114	137	165	198	232	282	343	461
	Inverter capacity kVA at ND*2	55	67	78	106	126	159	191	226	276	316	392	514
	Rated output current (A) at HD	60*3	75*3	91*3	112*4	150*4	180*4	216*4	260*4	304*5	370	450	605
	Rated output current (A) at ND*5	72	88	103	139	165	208	250	296	362	414	515	675
	Max. output voltage	380..480V (proportional to input voltage)											
	Max. output frequency	400 Hz											
Power supply	Rated input voltage and frequency	3-phase 380..480 VAC, 50/60 Hz											
	Allowable voltage fluctuation	-15%..+10%											
	Allowable frequency fluctuation	+5%											
	Input Current (A) at HD*6	58	71	86	105	142	170	207	248	300	346	410	584
	Input Current (A) at ND*6	71	86	105	142	170	207	248	300	346	410	465	657

*1 Based on a standard 4-pole motor for maximum applicable motor output.
*2 Rated Motor Capacity is calculated with a rated output voltage of 440 V.
*3 Carrier frequency can be increased up to 8 kHz while keeping this current rating. Higher carrier frequency settings require derating.
*4 Carrier frequency can be increased up to 5 kHz while keeping this current rating. Higher carrier frequency settings require derating.
*5 Carrier frequency is set to 2 kHz. Current derating is required in order to raise the carrier frequency.
*6 Assumes operation at rated output current. Input current rating varies depending on the power supply transformer, input reactor, wiring conditions, and power supply impedance.

Dimensions

Open-Chassis [IP00]

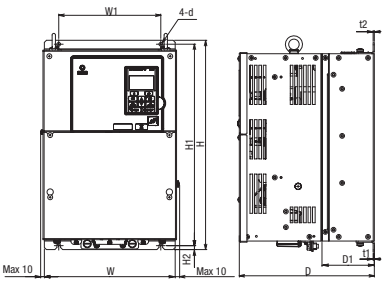


Figure 1

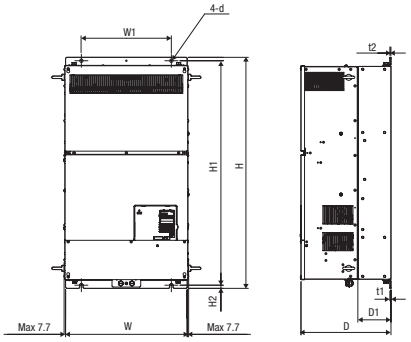


Figure 2

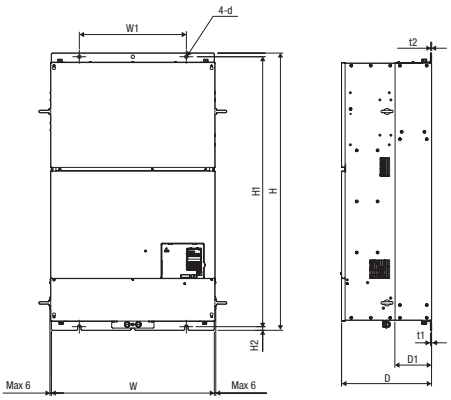


Figure 3

Voltage class	Max. applicable motor output kW		Inverter model CIMR-A_	Figure	Dimensions in mm										
	ND	HD			W	H	D	W1	H1	H2	D1	t1	t2	d	Weight (kg)
Three-phase 200 V	30	22	0110	1	250	400	258	195	385	7.5	100	2.3	2.3	M6	21
	37	30	0138		275	450		220	435						25
	45	37	0169		325	550	283	260	535		110				37
	55	45	0211												38
	75	55	0250		450	705	330	325	680	12.5	130	3.2	3.2	M10	76
	90	75	0312												80
	110	90	0360		500	800	350	370	773	13		4.5	4.5	M12	98
	110	110	0415												99
Three-phase 400 V	30	22	0058	1	250	400	258	195	385	7.5	100	2.3	2.3	M6	21
	37	30	0072		275	450		220	435						25
	45	37	0088		325	510		260	495		105		3.2		36
	55	45	0103												36
	75	55	0139			550	283		535		110		2.3		41
	90	75	0165												42
	110	90	0208		450	705	330	325	680	12.5	130	3.2	3.2	M10	79
	132	110	0250		500	800	350	370	773	13		4.5	4.5	M12	96
	160	132	0296												102
	185	160	0362												107
	220	185	0414	2		950	370		923		135				125
	250	220	0515	3	670	1140		440	1110	15	150				216
	355	315	0675												221

Enclosed Panel [NEMA Type1]

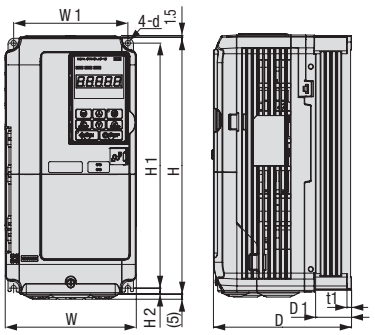


Figure 1

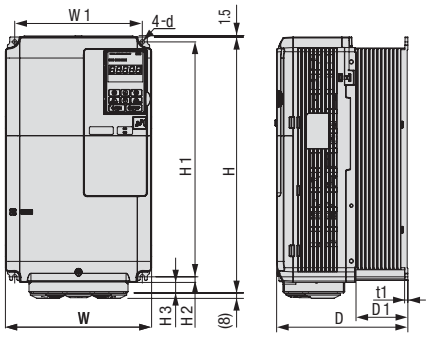


Figure 2

Voltage class	Max. applicable motor output kW		Inverter model CIMR-A_	Figure	Dimensions in mm										
	ND	HD			W	H	D	W1	H1	H2	D1	t1	t2	d	Weight (kg)
Three-phase 200 V	0.75	0.4	0004	1	140	260	147	122	248	6	38	5	-	M5	3.1
	1.1	0.75	0006												3.1
	2.2	1.5	0010												3.2
	3	2.2	0012												3.2
	5.5	4.0	0021				164				55				3.5
	7.5	5.5	0030				167								4.0
	11	7.5	0040												4.0
	15	11	0056		180	300	187	160	284	8	75				5.6
	18.5	15	0069		220	350	197	192	335		78			M6	8.7
	22	18.5	0081	2		365									9.7
Three-phase 400 V	0.75	0.4	0002	1	140	260	147	122	248	6	38	5	-	M5	3.2
	1.5	0.75	0004												3.2
	2.2	1.5	0005												3.2
	3	2.2	0007				164				55				3.4
	4.0	3	0009												3.5
	5.5	4.0	0011												3.5
	7.5	5.5	0018				167								3.9
	11	7.5	0023												3.9
	15	11	0031		180	300		160	284	8					5.4
	18.5	15	0038				187				75				5.7
	22	18.5	0044		220	350	197	192	335		78			M6	8.3



The industrial workhorse

The F7 drive is the industrial workhorse of adjustable frequency drives. It is intended to handle every conventional drive application found in a typical industrial manufacturing plant from simple variable torque pumping to sophisticated networked material handling. With excellent performance and a wide array of configurations and options, the F7 can be the single drive platform for an entire facility. Network communications, plug-in I/O cards, custom software and power/packaging options are among the many choices. For new installations or retrofits, the F7 is truly the industrial workhorse, perfect for every conventional application… and even some unconventional ones.

- Flux vector control. Excellent performance in open-loop mode with 150% torque at 0.5 Hz
- Silent operation. No current de-rating in silent mode (high carrier frequency)
- Wide selection of option cards: fieldbus, PLC unit, MECHATROLINK, analogue and digital I/Os, etc.
- CASE (inverter application software) and PLC option board

Ordering information

3G3IV-PCN329-E
Inverter to PC cable



⑥

CX-Drive



⑥

JVOP-160 OY
Digital operator
(LCD display)



⑥

JVOP-161-OY
Digital operator
(LED display)



⑥

3G3IV-PCN126/326
Digital operator
extension cable



⑥

Line filter

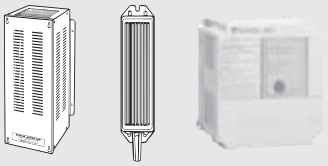


①



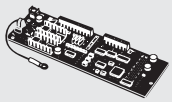
Varispeed
F7

Braking accessories



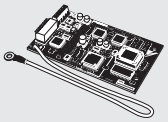
⑦

Feedback speed option card



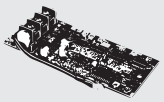
②

Communication option cards



③

Reference option card



④

PLC option card



⑤

Varispeed F7

200 V

Specifications			Order code
IP20	0.55 kW	3.2 A	CIMR-F7Z20P41
	0.75 kW	4.1 A	CIMR-F7Z20P71
	1.5 kW	7.0 A	CIMR-F7Z21P51
	2.2 kW	9.6 A	CIMR-F7Z22P21
	3.7 kW	15 A	CIMR-F7Z23P71
	5.5 kW	23 A	CIMR-F7Z25P51
	7.5 kW	31 A	CIMR-F7Z27P51
	11 kW	45 A	CIMR-F7Z20111
	15 kW	58 A	CIMR-F7Z20151
	18.5 kW	71 A	CIMR-F7Z20181
IP00	22 kW	85 A	CIMR-F7Z20220
	30 kW	115 A	CIMR-F7Z20300
	37 kW	145 A	CIMR-F7Z20370
	45 kW	180 A	CIMR-F7Z20450
	55 kW	215 A	CIMR-F7Z20550
	75 kW	283 A	CIMR-F7Z20750
	90 kW	346 A	CIMR-F7Z20900
	110 kW	415 A	CIMR-F7Z21100

400 V

Specifications			Order code
IP20	0.55 kW	1.8 A	CIMR-F7Z40P41
	0.75 kW	2.1 A	CIMR-F7Z40P71
	1.5 kW	3.7 A	CIMR-F7Z41P51
	2.2 kW	5.3 A	CIMR-F7Z42P21
	3.7 kW	7.6 A	CIMR-F7Z43P71
	4.0 kW	8.7 A	CIMR-F7Z44P01
	5.5 kW	12.5 A	CIMR-F7Z45P51
	7.5 kW	17 A	CIMR-F7Z47P51
	11 kW	24 A	CIMR-F7Z40111
	15 kW	31 A	CIMR-F7Z40151
	18.5 kW	39 A	CIMR-F7Z40181
IP00	22 kW	45 A	CIMR-F7Z40220
	30 kW	60 A	CIMR-F7Z40300
	37 kW	75 A	CIMR-F7Z40370
	45 kW	91 A	CIMR-F7Z40450
	55 kW	112 A	CIMR-F7Z40550
	75 kW	150 A	CIMR-F7Z40750
	90 kW	180 A	CIMR-F7Z40900
	110 kW	216 A	CIMR-F7Z41100
	132 kW	260 A	CIMR-F7Z41320
	160 kW	304 A	CIMR-F7Z41600
	185 kW	370 A	CIMR-F7Z41850
	220 kW	506 A	CIMR-F7Z42200
	300 kW	675 A	CIMR-F7Z43000

① Line filters

200 V

Inverters	Line filters			
	EN55011 class	Current (A)	Weight (kg)	Order code
CIMR-F7Z20P4	B, 25 m A, 100 m	10	1.2	3G3RV-PFI3010-SE
CIMR-F7Z20P7				
CIMR-F7Z21P5				
CIMR-F7Z22P2	B, 25 m A, 100 m	18	1.3	3G3RV-PFI3018-SE
CIMR-F7Z23P7	B, 25 m A, 100 m	35	1.4	3G3RV-PFI2035-SE
CIMR-F7Z25P5				
CIMR-F7Z27P5	B, 25 m A, 100 m	60	3	3G3RV-PFI2060-SE
CIMR-F7Z2011				
CIMR-F7Z2015	B, 25 m A, 100 m	100	4.9	3G3RV-PFI2100-SE
CIMR-F7Z2018				
CIMR-F7Z2022	A, 100 m	130	4.3	3G3RV-PFI2130-SE
CIMR-F7Z2030				
CIMR-F7Z2037	A, 100 m	160	6.0	3G3RV-PFI2160-SE
CIMR-F7Z2045	A, 100 m	200	11.0	3G3RV-PFI2200-SE
CIMR-F7Z2055				
CIMR-F7Z2075	A, 100 m	400	8.6	3G3RV-PFI3410-SE
CIMR-F7Z2090				
CIMR-F7Z2110	A, 100 m	600	11.0	3G3RV-PFI3600-SE

400 V

Inverters	Line filters			
	EN 55011 class*	Current (A)	Weight (kg)	Order code
CIMR-F7Z40P4	B, 25 m A, 100 m	10	1.2	3G3RV-PFI3010-SE
CIMR-F7Z40P7				
CIMR-F7Z41P5				
CIMR-F7Z42P2				
CIMR-F7Z43P7	B, 25 m A, 100 m	18	1.3	3G3RV-PFI3018-SE
CIMR-F7Z44P0				
CIMR-F7Z45P5				
CIMR-F7Z47P5	B, 25 m A, 100 m	21	1.8	3G3RV-PFI3021-SE
CIMR-F7Z4011	B, 25 m A, 100 m	35	2.2	3G3RV-PFI3035-SE
CIMR-F7Z4015	B, 25 m A, 100 m	60	4.0	3G3RV-PFI3060-SE
CIMR-F7Z4018				
CIMR-F7Z4022	A, 100 m	70	3.4	3G3RV-PFI3070-SE
CIMR-F7Z4030				
CIMR-F7Z4037	A, 100 m	100	4.5	3G3RV-PFI3100-SE
CIMR-F7Z4045				
CIMR-F7Z4055	A, 100 m	130	4.7	3G3RV-PFI3130-SE
CIMR-F7Z4075	A, 100 m	170	6.0	3G3RV-PFI3170-SE
CIMR-F7Z4090	A, 100 m	250	11.0	3G3RV-PFI3200-SE
CIMR-F7Z4110				
CIMR-F7Z4132	A, 100 m	400	8.6	3G3RV-PFI3410-SE
CIMR-F7Z4160				
CIMR-F7Z4185	A, 100 m	600	11.0	3G3RV-PFI3600-SE
CIMR-F7Z4220				
CIMR-F7Z4300	A, 100 m	800	31.0	3G3RV-PFI3800-SE

② Feedback speed control cards

Type	Description	Function	Order code
Feedback speed control card	PG speed controller card (Used for V/f control with PG or flux vector)	Phase A pulse (single pulse) inputs (voltage, complementary, open collector input) PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, max. current 200 mA] Pulse monitor output: +12 V, 20 mA	PG-A2
		Phase A and B pulse inputs (exclusively for complementary input) PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, Max. current 200 mA] Pulse monitor output: Open collector, +24 V, Max. current 30 mA	PG-B2
		Phase A pulse (differential pulse) input for V/f control (RS-422 input) PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] Pulse monitor output: RS-422	PG-D2
		Phase A, B and Z pulse (differential pulse) inputs (RS-422 input) PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] Pulse monitor output: RS-422	PG-X2
		Phase A, B and Z pulse (differential pulse) inputs (RS-422 input) PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] Pulse monitor output: RS-422 Dual channel encoder: 1st channel A, B, Z/2nd channel A, B, Z or open collector	PG-Z2

③ Communication option cards

Type	Description	Function	Order code
Communication option card	DeviceNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.	3G3RV-PDRT2
	PROFIBUS-DP option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.	SI-P1
	CANopen option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI-S1
	LONWORKS option card	Used for HVAC control, running or stopping the inverter, setting or referencing parameters, and monitoring output current, watt-hours, or similar items through LONWORKS communications with peripheral devices.	SI-J
	Ethernet option card	MODBUS TCP/IP Ethernet interface unit.	CM090
	MECHATROLINK-II option board	High speed motion bus. Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through MECHATROLINK-II communication with the host controller. Host controller : Trajexia, MCH or MP Series *1	SI-T

*1 Please refer to Trajexia, MCH or MP Series section for host controllers detailed information.

④ Reference option cards

Type	Description	Function	Order code
Reference option card	Analogue input card	2 channel high resolution analogue input card Channel 1: 0 to 10 V (20 KΩ) Channel 2: 4 to 20 mA (250 Ω) Resolution 14 bit	AI-14U
		3 Channel high resolution analogue input card Signal level: -10 to +10V (20 KΩ) 4 to 20 mA (250 Ω) Resolution: 13 bit + sign	AI-14B
	Digital reference card	8 bit digital speed reference input card	DI-08
		16 bit digital speed reference input card	DI-16H2

⑤ PLC option cards

Type	Description	Function	Order code
PLC option card	PLC option	Full PLC features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs. Embedded CompuBus/S fieldbus Standard Omron tools can be used for programming	3G3RV-P10ST8-E
	PLC option with DeviceNet	Same features than standard model with DeviceNet support.	3G3RV-P10ST8-DRT-E

⑥ Accessories

Type	Description	Function	Order code
Digital operator	5 lines LCD digital operator 7 Language support	Configuration and monitoring device	JVOP-160-OY
	7 segment LED digital operator		JVOP-161-OY
Accessories	Digital operator extension cable 1 meters 3 meters	Cable to connect the inverter and the digital operator when it's not plugged into the inverter	 3G3IV-PCN126 3G3IV-PCN326
	PC configuration cable	Cable to connect inverter and PC	3G3IV-PCN329-E

⑥ Computer Software

Type	Description	Function	Order code
Software	Computer software	Configuration and monitoring software tool for drives	CX-DRIVE
	Computer software	Complete Omron automation software including CX-Drive	CX-ONE

For full specifications please refer to chapter software on page 582.

⑦ Braking unit, braking resistor unit

Note: For braking units specifications and models refer to the F7 datasheet Cat-No: I23E-EN-02

Specifications

200 V Class

Order code CIMR-F7Z_			20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Max. applicable motor output[*1]		kW	0.55	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output characteristics	Inverter capacity	kVA	1.2	1.6	2.7	3.7	5.7	8.8	12	17	22	27	32	44	55	69	82	110	130	160
	Rated current	A	3.2	4.1	7.0	9.6	15	23	31	45	58	71	85	115	145	180	215	283	346	415[*2]
	Max. voltage		3-phase, 200/208/220/230/240 V (proportional to input voltage)																	
	Max. output frequency		Heavy duty (low carrier, constant torque applications): 150 Hz max Normal duty 1 or 2 (high/reduced carrier, variable torque applications): 400 Hz max																	
Power supply	Rated input voltage and frequency		3-phase 200/208/220/230/240 V, 50/60 Hz [*3]																	
	Allowable voltage fluctuation		+10%, -15%																	
	Allowable frequency fluctuation		±5%																	
Harmonic wave prevention	DC reactor		Option										Provided							
	12-pulse input		Not available										Available [*4]							

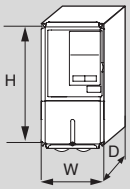
[*1] Our standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
[*2] 322 A in case of heavy duty mode
[*3] When using the inverter of 200 V class 37 kW or more with a cooling fan of three-phase 230 V 50 Hz or 240 V 50/60 Hz power supply, a transformer for the cooling fan is required.
[*4] A 3-wired transformer is required at 12-pulse input.

400 V Class

Order code CIMR-F7Z_			40P4	40P7	41P5	42P2	43P7	44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
Max. applicable motor output[*1]		kW	0.55	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	300
Output characteristics	Inverter capacity	kVA	1.4	1.6	2.8	4.0	5.8	6.6	9.5	13	18	24	30	34	46	57	69	85	110	140	160	200	230	280	390	510
	Rated current	A	1.8	2.1	3.7	5.3	7.6	8.7	12.5	17	24	31	39	45	60	75	91	112	150	180	216	260	304	370	506[*2]	675[*3]
	Max. voltage		3-phase, 380/400/415/440/460/480 V (proportional to input voltage)																							
	Max. output frequency		Heavy duty (low carrier, constant torque applications): 150 Hz max Normal duty 1 or 2 (high/reduced carrier, variable torque applications): 400 Hz max																							
Power supply	Rated input voltage and frequency		3-phase 380/400/415/440/460/480 V, 50/60 Hz																							
	Allowable voltage fluctuation		+10%, -15%																							
	Allowable frequency fluctuation		±5%																							
Harmonic wave prevention	DC reactor		Option											Provided												
	12-pulse input		Not available											Available [*4]												

[*1] Our standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
[*2] 405 A in case of heavy duty mode
[*3] 540 A in case of heavy duty mode
[*4] A 3-wired transformer is required at 12-pulse input.

Dimensions

Specifications		Drive model	H	W	D	
3 phase 200 VAC	0.55 kW	CIMR-F7Z20P41	280	140	157	
	0.75 kW	CIMR-F7Z20P71				
	1.5 kW	CIMR-F7Z21P51				
	2.2 kW	CIMR-F7Z22P21				
	3.7 kW	CIMR-F7Z23P71			177	
	5.5 kW	CIMR-F7Z25P51				
	7.5 kW	CIMR-F7Z27P51	300	200	197	
	11 kW	CIMR-F7Z20111	310			
	15 kW	CIMR-F7Z20151	350	240	207	
	18.5 kW	CIMR-F7Z20181	380			
	22 kW	CIMR-F7Z20220	400	250	258	
	30 kW	CIMR-F7Z20300	450	275		
	37 kW	CIMR-F7Z20370	600	375	298	
	45 kW	CIMR-F7Z20450			328	
	55 kW	CIMR-F7Z20550	725	450	348	
	75 kW	CIMR-F7Z20750				
	90 kW	CIMR-F7Z20900	850	500	358	
	110 kW	CIMR-F7Z21100	885	575	378	
3 phase 400 VAC	0.55 kW	CIMR-F7Z40P41	280	140	157	
	0.75 kW	CIMR-F7Z40P71				
	1.5 kW	CIMR-F7Z41P51				
	2.2 kW	CIMR-F7Z42P21			177	
	3.7 kW	CIMR-F7Z43P71				
	4.0 kW	CIMR-F7Z44P71				
	5.5 kW	CIMR-F7Z45P51				
	7.5 kW	CIMR-F7Z47P51	300	200	197	
	11 kW	CIMR-F7Z40111				
	15 kW	CIMR-F7Z40151	350	240	207	
	18.5 kW	CIMR-F7Z40181				
	22 kW	CIMR-F7Z40220	450	275	258	
	30 kW	CIMR-F7Z40330				
	37 kW	CIMR-F7Z40370	550	325	283	
	45 kW	CIMR-F7Z40450				
	55 kW	CIMR-F7Z40550				
	75 kW	CIMR-F7Z40750	725	450	348	
	90 kW	CIMR-F7Z40900				
	110 kW	CIMR-F7Z41100	850	500	358	
	132 kW	CIMR-F7Z41320				
	160 kW	CIMR-F7Z41600	916	575	378	
	185 kW	CIMR-F7Z41850	1305	710	413	
	220 kW	CIMR-F7Z42200				
	300 kW	CIMR-F7Z43000	1475	916	413	



Drive your energy costs down

The E7 is designed for variable torque applications such as fans and centrifugal pumps. It is supplied with V/f control and normal duty overload rating of 110% for one minute. A unique feature of the E7 is the energy-saving algorithm, which allows an extra saving of up to 20%. With an optional phase-shifting input transformer, the E7 dual-diode bridge can be operated in 12-pulse rectification mode, reducing input current harmonic distortion.

- E7 IP54 solution with robust metal chassis and built-in RFI filter
- Adaptive energy-saving algorithm
- Silent operation
- 12-pulse configuration for low-harmonic distortion
- Programming software: CX-Drive for parameter configuration

Ordering information

3G3IV-PCN329-E
Inverter to PC cable



④

CX-Drive



④

JVOP-160 OY
Digital operator
(LCD display)



④

JVOP-161-OY
Digital operator
(LED display)



④

3G3IV-PCN126/326
Digital operator
extension cable



④

Line Filter

3G3RV-PFI_
Input noise filter



* see note

①



Varispeed E7

Braking accessories



LKEB_ braking
resistor unit

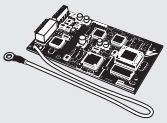


CDBR_B
braking unit

⑤

* E7 IP54 types are built-in filter inverters.

Communication card



②

PLC option card



③

Varispeed E7

200 V

Specifications			Order code
IP20	0.55 kW	3.2 A	CIMR-E7Z20P41
	0.75 kW	4.1 A	CIMR-E7Z20P71
	1.5 kW	7.0 A	CIMR-E7Z21P51
	2.2 kW	9.6 A	CIMR-E7Z22P21
	3.7 kW	15 A	CIMR-E7Z23P71
	5.5 kW	23 A	CIMR-E7Z25P51
	7.5 kW	31 A	CIMR-E7Z27P51
	11 kW	45 A	CIMR-E7Z20111
	15 kW	58 A	CIMR-E7Z20151
	18.5 kW	71 A	CIMR-E7Z20181
IP00	22 kW	85 A	CIMR-E7Z20220
	30 kW	115 A	CIMR-E7Z20300
	37 kW	145 A	CIMR-E7Z20370
	45 kW	180 A	CIMR-E7Z20450
	55 kW	215 A	CIMR-E7Z20550
	75 kW	283 A	CIMR-E7Z20750
	90 kW	345 A	CIMR-E7Z20900
	110 kW	415 A	CIMR-E7Z21100

400 V

Specifications			Order code
IP20	0.55 kW	1.8 A	CIMR-E7Z40P41
	0.75 kW	2.1 A	CIMR-E7Z40P71
	1.5 kW	3.7 A	CIMR-E7Z41P51
	2.2 kW	5.3 A	CIMR-E7Z42P21
	3.7 kW	7.6 A	CIMR-E7Z43P71
	4.0 kW	8.7 A	CIMR-E7Z44P01
	5.5 kW	12.5 A	CIMR-E7Z45P51
	7.5 kW	17 A	CIMR-E7Z47P51
	11 kW	24 A	CIMR-E7Z40111
	15 kW	31 A	CIMR-E7Z40151
	18.5 kW	39 A	CIMR-E7Z40181

400 V

Specifications			Order code
IP00	22 kW	45 A	CIMR-E7Z40220
	30 kW	60 A	CIMR-E7Z40300
	37 kW	75 A	CIMR-E7Z40370
	45 kW	91 A	CIMR-E7Z40450
	55 kW	112 A	CIMR-E7Z40550
	75 kW	150 A	CIMR-E7Z40750
	90 kW	180 A	CIMR-E7Z40900
	110 kW	216 A	CIMR-E7Z41100
	132 kW	260 A	CIMR-E7Z41320
	160 kW	304 A	CIMR-E7Z41600
	185 kW	370 A	CIMR-E7Z41850
	220 kW	506 A	CIMR-E7Z42200
	300 kW	675 A	CIMR-E7Z43000

Varispeed E7 IP54

400 V

Specifications			Order code
IP54	7.5 kW	17 A	CIMR-E7Z47P52
	11 kW	24 A	CIMR-E7Z40112
	15 kW	31 A	CIMR-E7Z40152
	18.5 kW	39 A	CIMR-E7Z40182
	22 kW	45 A	CIMR-E7Z40222
	30 kW	60 A	CIMR-E7Z40302
	37 kW	75 A	CIMR-E7Z40372
	45 kW	91 A	CIMR-E7Z40452
	55 kW	112 A	CIMR-E7Z40552

① Line filters *1

200 V

Inverters	Line filters			
	EN55011 Class	Current (A)	Weight (kg)	Order code
CIMR-E7Z20P4	B, 25 m A, 100 m	10	1.2	3G3RV-PFI3010-SE
CIMR-E7Z20P7				
CIMR-E7Z21P5				
CIMR-E7Z22P2	B, 25 m A, 100 m	18	1.3	3G3RV-PFI3018-SE
CIMR-E7Z23P7	B, 25 m A, 100 m	35	1.4	3G3RV-PFI2035-SE
CIMR-E7Z25P5				
CIMR-E7Z27P5	B, 25 m A, 100 m	60	3	3G3RV-PFI2060E-SE
CIMR-E7Z2011				
CIMR-E7Z2015	B, 25 m A, 100 m	100	4.9	3G3RV-PFI2100-SE
CIMR-E7Z2018				
CIMR-E7Z2022	A, 100 m	130	4.3	3G3RV-PFI2130-SE
CIMR-E7Z2030				
CIMR-E7Z2037	A, 100 m	160	6.0	3G3RV-PFI2160-SE
CIMR-E7Z2045	A, 100 m	200	11.0	3G3RV-PFI2200-SE
CIMR-E7Z2055				
CIMR-E7Z2075	A, 100 m	400	8.6	3G3RV-PFI3410-SE
CIMR-E7Z2090				
CIMR-E7Z2110	A, 100 m	600	11.0	3G3RV-PFI3600-SE

*1. E7 IP54 types are built-in filter inverters.

400 V

Inverters	Line filters			
	EN 55011 class	Current (A)	Weight (kg)	Order code
CIMR-E7Z40P4	B, 25 m A, 100 m	10	1.2	3G3RV-PFI3010-SE
CIMR-E7Z40P7				
CIMR-E7Z41P5				
CIMR-E7Z42P2				
CIMR-E7Z43P7	B, 25 m A, 100 m	18	1.3	3G3RV-PFI3018-SE
CIMR-E7Z44P0				
CIMR-E7Z45P5				
CIMR-E7Z47P5	B, 25 m A, 100 m	21	1.8	3G3RV-PFI3021-SE
CIMR-E7Z4011	B, 25 m A, 100 m	35	2.2	3G3RV-PFI3035-SE
CIMR-E7Z4015	B, 25 m A, 100 m	60	4.0	3G3RV-PFI3060-SE
CIMR-E7Z4018				
CIMR-E7Z4022	B, 25 m A, 100 m	70	3.4	3G3RV-PFI3070-SE
CIMR-E7Z4030				
CIMR-E7Z4037	A, 100 m	100	4.5	3G3RV-PFI3100-SE
CIMR-E7Z4045				
CIMR-E7Z4055	A, 100 m	130	4.7	3G3RV-PFI3130-SE
CIMR-E7Z4075	A, 100 m	170	6.0	3G3RV-PFI3170-SE
CIMR-E7Z4090	A, 100 m	250	11	3G3RV-PFI3200-SE
CIMR-E7Z4110				
CIMR-E7Z4132	A, 100 m	400	8.6	3G3RV-PFI3410-SE
CIMR-E7Z4160				
CIMR-E7Z4185	A, 100 m	600	11.0	3G3RV-PFI3600-SE
CIMR-E7Z4220				
CIMR-E7Z4300	A, 100 m	800	31.0	3G3RV-PFI3800-SE

② Communication cards

Type	Description	Function	Order code
Communication option cards	DeviceNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.	3G3RV-PDRT2
	PROFIBUS-DP option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.	SI-P1
	CANopen option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI-S1
	Ethernet option card	MODBUS TCP/IP Ethernet interface unit.	CM090
	LONWORKS option card	Used for HVAC control, running or stopping the inverter, setting or referencing parameters, and monitoring output current, watt-hours, or similar items through LONWORKS communications with peripheral devices.	SI-J1

③ PLC Option card

Type	Description	Function	Order code
PLC option cards	PLC option	Full features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs Embedded CompoBus/S fieldbus Standard Omron tools can be used for programming	3G3RV-P10CDT-E
	PLC option with DeviceNet	Same features than standard models with DeviceNet support	3G3-P10CDT-E-DRT

④ Accessories

Type	Description	Function	Order code
Digital operators	5 lines LCD digital operator *1	Configuration and monitoring device.	JVOP-160-OY
	7 segment LED digital operator		JVOP-161-OY
	Hand-Off auto operator		JVOP-162
Accessories	Digital operator extension cable 1 meter 3 meters	Cable to connect the inverter and the digital operator when it's not plugged into the inverter.	 3G3IV-PCN126 3G3IV-PCN326
	PC configuration cable	Cable to connect inverter and PC	3G3IV-PCN329-E

*1 LCD digital operator is the standard in IP54 types

④ Computer software

Type	Description	Function	Order code
Software	Computer software	Configuration and monitoring software tool for drives	CX-DRIVE
	Computer software	Complete Omron automation software including CX-Drive	CX-ONE

For full specifications please refer to chapter software on page 582.

⑤ Braking unit, braking resistor unit

Note: For braking units specifications and models refer to the E7 datasheet Cat-No: I21E-EN-02

Specifications

200 V class

Order code CIMR-E7Z_			20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Max. applicable motor output *1		kW	0.55	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output characteristics	Inverter Capacity	kVA	1.2	1.6	2.7	3.7	5.7	8.8	12	17	22	27	32	44	55	69	82	110	130	160
	Rated current	A	3.2	4.1	7.0	9.6	15	23	31	45	58	71	85	115	145	180	215	283	346	415
	Max. voltage		3-phase; 200, 220, 230, or 240 VAC (Proportional to input voltage.)																	
	Max. output frequency		200.0																	
Power supply	Rated input voltage and frequency		3-phase, 200/208/220/230/240 VAC, 50/60 Hz																	
	Allowable voltage fluctuation		+10%, -15%																	
	Allowable frequency fluctuation		±5%																	
Harmonic wave prevention	DC reactor		Optional										Built in							
	12-pulse input		Not possible										Possible *2							

*1 Standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
*2 A 3-wire transformer is required on the power supply for 12-phase rectification

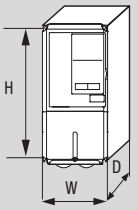
400 V class

Order code CIMR-E7ZZ4_			0P4	0P7	1P5	2P2	3P7	4P0	5P5	7P5	011	015	018	022	030	037	045	055	075	090	110	132	160	185	220	300
IP54 model: CIMR-E7Z4_			–	–	–	–	–	–	–	7P52	0112	0152	0182	0222	0302	0372	0452	0552	–	–	–	–	–	–	–	–
Max. applicable motor output *1		kW	0.55	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	300
Output characteristics	Inverter Capacity	kVA	1.4	1.6	2.8	4.0	5.8	6.6	9.5	13	18	24	30	34	46	57	69	85	110	140	160	200	230	280	390	510
	Rated current	A	1.8	2.1	3.7	5.3	7.6	8.7	12.5	17	24	31	39	45	60	75	91	112	150	180	216	260	304	370	506	675
	Max. voltage		3-phase; 380, 400, 415, 440, 460, or 480 VAC (Proportional to input voltage.)																							
	Max. output frequency		200.0																							
Power supply	Rated input voltage and frequency		3-phase, 380, 400, 415, 440, 460 or 480 VAC, 50/60 Hz																							
	Allowable voltage fluctuation		+10%, -15%																							
	Allowable frequency fluctuation		±5%																							
Harmonic wave prevention	DC reactor		Optional											Built in												
	12-pulse input		Not possible											Possible *2												

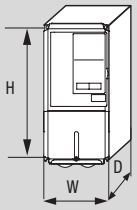
*1 Standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
*2 A 3-wire transformer is required on the power supply for 12-phase rectification
To agg 400 V class

Dimensions

Varispeed E7

Specifications		Drive model	H	W	D	
3 phase 200 VAC	0.55 kW	CIMR-E7Z20P41	280	140	157	
	0.75 kW	CIMR-E7Z20P71				
	1.5 kW	CIMR-E7Z21P51				
	2.2 kW	CIMR-E7Z22P21				
	3.7 kW	CIMR-E7Z23P71			177	
	5.5 kW	CIMR-E7Z25P51				
	7.5 kW	CIMR-E7Z27P51	300	200	197	
	11 kW	CIMR-E7Z20111	310			
	15 kW	CIMR-E7Z20151	350	240	207	
	18.5 kW	CIMR-E7Z20181	380			
	22 kW	CIMR-E7Z20220	400	250	258	
	30 kW	CIMR-E7Z20300	450	275		
	37 kW	CIMR-E7Z20370	600	375	298	
	45 kW	CIMR-E7Z20450			328	
	55 kW	CIMR-E7Z20550	725	450	348	
	75 kW	CIMR-E7Z20750				
	90 kW	CIMR-E7Z20900	850	500	358	
	110 kW	CIMR-E7Z21100	885	575	378	
3 phase 400 VAC	0.55 kW	CIMR-E7Z40P41	280	140	157	
	0.75 kW	CIMR-E7Z40P71				
	1.5 kW	CIMR-E7Z41P51				
	2.2 kW	CIMR-E7Z42P21			177	
	3.7 kW	CIMR-E7Z43P71				
	4.0 kW	CIMR-E7Z44P71				
	5.5 kW	CIMR-E7Z45P51				
	7.5 kW	CIMR-E7Z47P51	300	200	197	
	11 kW	CIMR-E7Z40111				
	15 kW	CIMR-E7Z40151	350	240	207	
	18.5 kW	CIMR-E7Z40181				
	22 kW	CIMR-E7Z40220	450	275	258	
	30 kW	CIMR-E7Z40300				
	37 kW	CIMR-E7Z40370	550	325	283	
	45 kW	CIMR-E7Z40450				
	55 kW	CIMR-E7Z40550				
	75 kW	CIMR-E7Z40750	725	450	348	
	90 kW	CIMR-E7Z40900				
	110 kW	CIMR-E7Z41100	850	500	358	
	132 kW	CIMR-E7Z41320				
	160 kW	CIMR-E7Z41600	916	575	378	
	185 kW	CIMR-E7Z41850	1305	710	413	
	220 kW	CIMR-E7Z42200				
	300 kW	CIMR-E7Z43000	1475	916	413	

Varispeed E7 IP54

Specifications		Drive model	H	W	D	
3 phase 400 VAC	7.5 kW	CIMR-E7Z47P52	600	350	240	
	11 kW	CIMR-E7Z40112				
	15 kW	CIMR-E7Z40152			260	
	18.5 kW	CIMR-E7Z40182				
	22 kW	CIMR-E7Z40222	650	410	300	
	30 kW	CIMR-E7Z40302				
	37 kW	CIMR-E7Z40372	750	580	330	
	45 kW	CIMR-E7Z40452				
	55 kW	CIMR-E7Z40552				

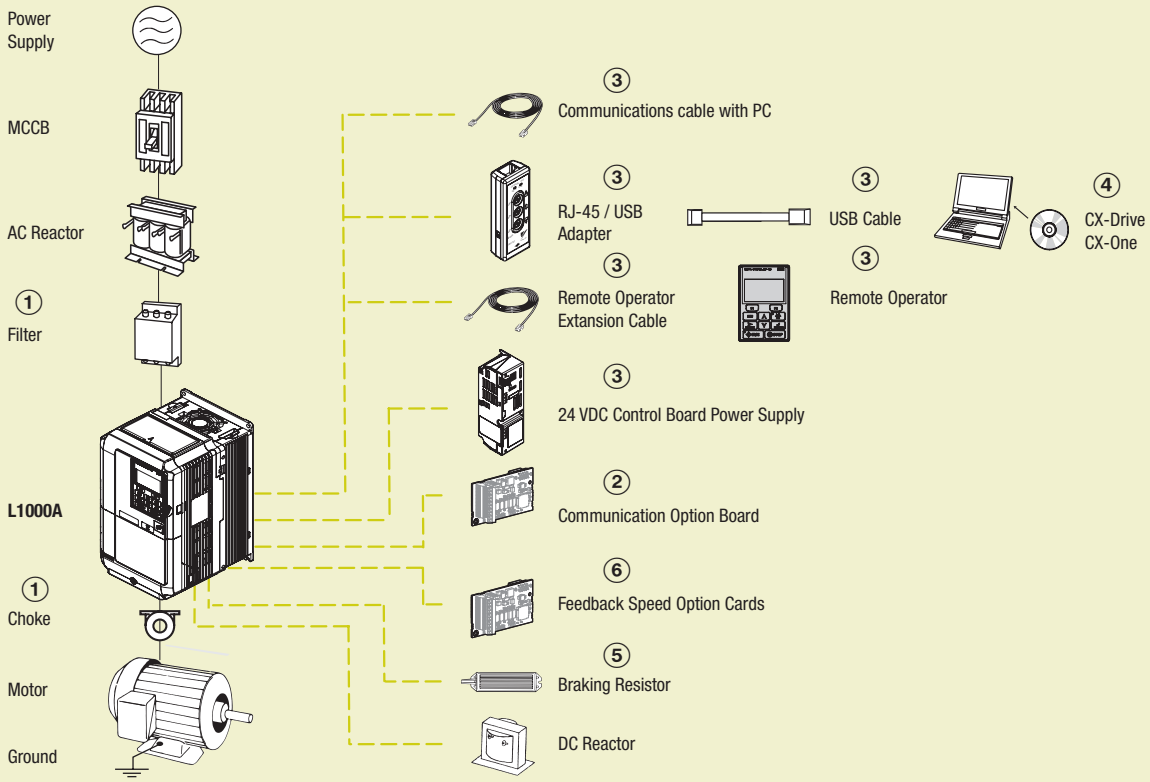


High performance Vector Control

The L1000A inverter provides advanced control functions for IM & PM motor control in lift applications. In addition, the L1000A is quickly installed and is capable of driving almost any lift.

- High starting torque (200% / 0.3Hz OLV, 200% / 0Hz CLV)
- Advanced Auto-Tuning for IM & PM Motors
- Lift language (Hz, m/s, rpm, levelling speed...)
- Rescue operation function
- Overshoot and anti-vibration control
- Fieldbus communications: CANopen
- Safety embedded: EN954-1 safety cat. 3, stop cat 0, ISO EN13849-1 PLd, IEC 61508 SIL 2 and EN81-1

Ordering information



L1000A

Specifications			Order code
	Heavy Duty		Standard
200 V	4.0 kW	17.5 A	CIMR-LC2A0018BAA
	5.5 kW	25 A	CIMR-LC2A0025BAA
	7.5 kW	33 A	CIMR-LC2A0033BAA
	11 kW	47 A	CIMR-LC2A0047BAA
	15 kW	60 A	CIMR-LC2A0060BAA
	18.5 kW	75 A	CIMR-LC2A0075BAA
	22 kW	85 A	CIMR-LC2A0085BAA
	30 kW	115 A	CIMR-LC2A0115BAA
	37 kW	145 A	CIMR-LC2A0145BAA
	45 kW	180 A	CIMR-LC2A0180BAA

Specifications			Order code
	Heavy Duty		Standard
400 V	4.0 kW	9.2 A	CIMR-LC4A0009BAA
	5.5 kW	14.8 A	CIMR-LC4A0015BAA
	7.5 kW	18 A	CIMR-LC4A0018BAA
	11 kW	24 A	CIMR-LC4A0024BAA
	15 kW	31 A	CIMR-LC4A0031BAA
	18.5 kW	39 A	CIMR-LC4A0039BAA
	22 kW	45 A	CIMR-LC4A0045BAA
	30 kW	60 A	CIMR-LC4A0060BAA
	37 kW	75 A	CIMR-LC4A0075BAA
	45 kW	91 A	CIMR-LC4A0091BAA
	55 kW	112 A	CIMR-LC4A0112BAA
	75 kW	150 A	CIMR-LC4A0150BAA

① Line filters

Inverter		Line filter Rasmi			Line filter Schaffner		
Voltage	**Model CIMR-LC_**	**Rated current (A)**	**Weight (kg)**	**Order code**	**Rated current (A)**	**Weight (kg)**	**Order code**
3-Phase 200 VAC	2A0018	24	2.0	A1000-FIA3024-RE	18	1.3	3G3RV-PFI3018-SE
	2A0025 / 2A0033	52	2.4	A1000-FIA2025-RE	35	1.4	3G3RV-PFI2035-SE
	2A0047	68	4.2	A1000-FIA2068-RE	35	1.4	3G3RV-PFI2035-SE
	2A0060 / 2A0075	96	4.4	A1000-FIA2096-RE	60	3	3G3RV-PFI2060-SE
	2A0085	105	6.5	A1000-FIA3105-RE	100	4.9	3G3RV-PFI2100-SE
	2A0115 / 2A0145 / 2A0180	170	9	A1000-FIA3170-RE	170	6.0	3G3RV-PFI3170-SE
3-Phase 400 VAC	4A0009 / 4A0015 / 4A0018	24	2.0	A1000-FIA3024-RE	18	1.3	3G3RV-PFI3018-SE
	4A0024 / 4A0031	44	2.8	A1000-FIA3044-RE	35	2.2	3G3RV-PFI3035-SE
	4A0039	52	-	A1000-FIA3052-RE	60	4.0	3G3RV-PFI3060-SE
	4A0045 / 4A0060	71	5.3	A1000-FIA3071-RE			
	4A0075				100	4.5	3G3RV-PFI3100-SE
	4A0091 / 4A0112	105	6.5	A1000-FIA3105-RE	170	6.0	3G3RV-FPI3170-SE
	4A0150	170	9	A1000-FIA3170-RE			

Chokes

Diameter	Description	Order code
21	Recommended for motors below 2.2 KW	A1000-FEV2102-RE
25	Recommended for motors below 15 KW	A1000-FEV2515-RE
50	Recommended for motors below 45 KW	A1000-FEV5045-RE
60	Recommended for motors above 45 KW	A1000-FEV6045-RE

② Communication cards

Type	Description	Function	Order code
Communication option board	CANopen option card	• Used for controlling the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI-S3

③ Accessories

Types	Description	Functions	Order code
Digital operator	LCD remote operator	LCD Display operator with language support	JVOP-180
	LED remote operator	LED Display operator	JVOP-182
	Remote operator cable	3 meters cable for connecting remote operator	3G3AX-CAJOP300-EE
Accessories	USB converter / USB cable	USB converter unit with copy and backup function	JVOP-181
	24 VDC option board	24V DC control board power supply 200V type	PS-A10L
		24V DC control board power supply 400V type	PS-A10H
	PC connection cable	RS232 PC tool connection cable	A1000-CAVPC232-EE

④ Computer software

Types	Description	Installation	Order code
Software	Computer software	Configuration and monitoring software tool	CX-drive
	Computer software	Configuration and monitoring software tool	CX-One

⑥ Feedback speed option card

Type	Description	Function	Order code
PG option card	Complementary PG	• For speed feedback input by connecting a motor encoder Input: 3 track (one or two tracks), for HTL encoder connection, 50 KHz max Output: 3 track open collector Encoder power supply: 12 V, 200 mA max	PG-B3
	Line Driver PG	• For speed feedback input by connecting a motor encoder Input: 3 track, line driver, 300 kHz max Output: 3 track, line driver Encoder power supply: 5 V or 12 V, 200 mA max	PG-X3
	Endat encoder PG	• For speed feedback input by connection a motor encoder Encoder type: EnDat 2.1/01, EnDat 2.2/01 (HEIDENHAIN) Maximum input frequency: 50KHz Pulse monitor: Matches RS-422 level Output voltage: 5 V +/-5%, 8 V +/-10% Maximum output current: 200mA Wiring lenght: 20m max. for the encoder, 30m max for the pulse monitor	PG-F3
	ERN1387 encoder PG	• For speed feedback input by connection a motor encoder Encoder type: ERN1387 (HEIDENHAIN) Maximum input frequency: 50KHz Pulse monitor: Matches RS-422 level Output voltage: 5 V +/-5% Maximum output current: 200mA Wiring lenght: 20m max. for the encoder, 30m max for the pulse monitor	PG-E3

Specifications

200 V class

Three-phase: CIMR-LC2A_		0018	0025	0033	0047	0060	0075	0085	0115	0145	0180
Motor kW*1	For HD setting	4.0	5.5	7.5	11	15	18.5	22	30	37	45
Output characteristics	Inverter capacity kVA*2	6.7	9.5	12.6	17.9	23	29	32	44	55	69
	Rated output current (A)	17.5*3	25*3	33*3	47*3	60*3	75*3	85*3	115*3	145*4	180*4
	Max. output voltage	Proportional to input voltage: 0..240 V									
	Max. output frequency	120 Hz									
Power supply	Rated input voltage and frequency	3-phase 200..240 V 50/60 Hz									
	Allowable voltage fluctuation	-15%..+10%									
	Allowable frequency fluctuation	+5%									
	Input Current (A)*5	18.9	28	37	52	68	80	82	111	136	164

*1 Based on a standard 4-pole motor for maximum applicable motor output.
*2 Rated Motor Capacity is calculated with a rated output voltage of 220 V.
*3 Carrier frequency can be increased up to 8 kHz while keeping this current rating. Higher carrier frequency settings require derating.
*4 Carrier frequency can be increased up to 5 kHz while keeping this current rating. Higher carrier frequency settings require derating.
*5 Assumes operation at rated output current. Input current rating varies depending on the power supply transformer, input reactor, Wiring conditions, and power supply impedance.

400 V class

Three-phase: CIMR-LC4A_		0009	0015	0018	0024	0031	0039	0045	0060	0075	0091	0112	0150
Motor kW*1	For HD setting	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75
Output characteristics	Inverter capacity kVA*2	7	11.3	13.7	18.3	24	30	34	48	57	69	85	114
	Rated output current (A)	9.2*3	14.8*3	18*3	24*3	31*3	39*3	45*3	60*3	75*3	91*3	112*4	150*4
	Max. output voltage	380..480V (proportional to input voltage)											
	Max. output frequency	120 Hz											
Power supply	Rated input voltage and frequency	3-phase 380..480 VAC, 50/60 Hz											
	Allowable voltage fluctuation	-15%..+10%											
	Allowable frequency fluctuation	+5%											
	Input Current (A)*5	10.4	15	20	29	39	44	49	58	71	86	105	142

*1 Based on a standard 4-pole motor for maximum applicable motor output.
*2 Rated Motor Capacity is calculated with a rated output voltage of 220 V.
*3 Carrier frequency can be increased up to 8 kHz while keeping this current rating. Higher carrier frequency settings require derating.
*4 Carrier frequency can be increased up to 5 kHz while keeping this current rating. Higher carrier frequency settings require derating.
*5 Assumes operation at rated output current. Input current rating varies depending on the power supply transformer, input reactor, Wiring conditions, and power supply impedance.

Dimensions

Enclosed Panel [IP20]

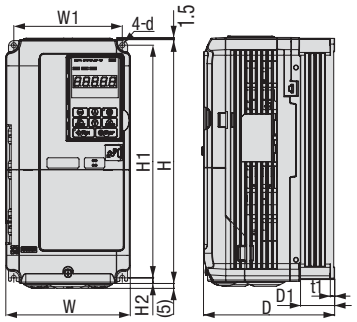


Figure 1

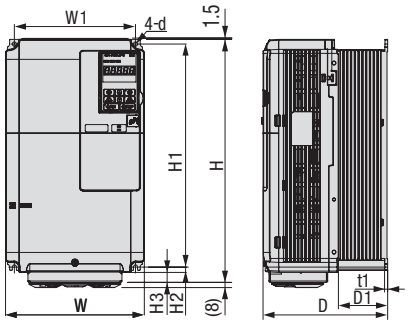


Figure 2

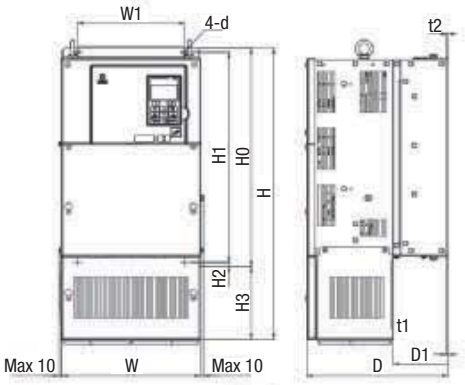


Figure 3

Voltage class	Max. applicable motor output kW	Inverter model CIMR-LC_	Figure	Dimensions in mm												
				W	H	D	W1	H0	H1	H2	H3	D1	t1	t2	d	Weight (kg)
Three-phase 200 V	4.0	2A0018	1	140	260	164	122	-	248	6	-	55	5	-	M5	3.5
	5.5	2A0025				167										4.0
	7.5	2A0033														4.0
	11	2A0047		180	300	187	160		284	8		75				5.6
	15	2A0060		220	350	197	192		335			78			M6	8.7
	18.5	2A0075	2		365			350			15					9.7
	22	2A0085	3	254	534	258	195	400	385	7.5	134	100	2.3	2.3		23
	30	2A0115		279	614		220	450	435		164					28
	37	2A0145		329	630	283	260	550	535		80	110				40
	45	2A0180														40
Three-phase 400 V	4.0	4A0009	1	140	260	164	122	-	248	6	-	55	5	-	M5	3.5
	5.5	4A0015				167										3.9
	7.5	4A0018														3.9
	11	4A0024		180	300		160		284	8						5.4
	15	4A0031				187						75				5.7
	18.5	4A0039		220	350	197	192		335			78			M6	8.3
	22	4A0045	3	254	465	258	195	400	385	7.5	65	100	2.3	2.3		23
	30	4A0060		279	515		220	450	435							27
	37	4A0075		329	630		260	510	495		120	105				39
	45	4A0091														39
	55	4A0112				283		550	535		80	110				43
	75	4A0150														45

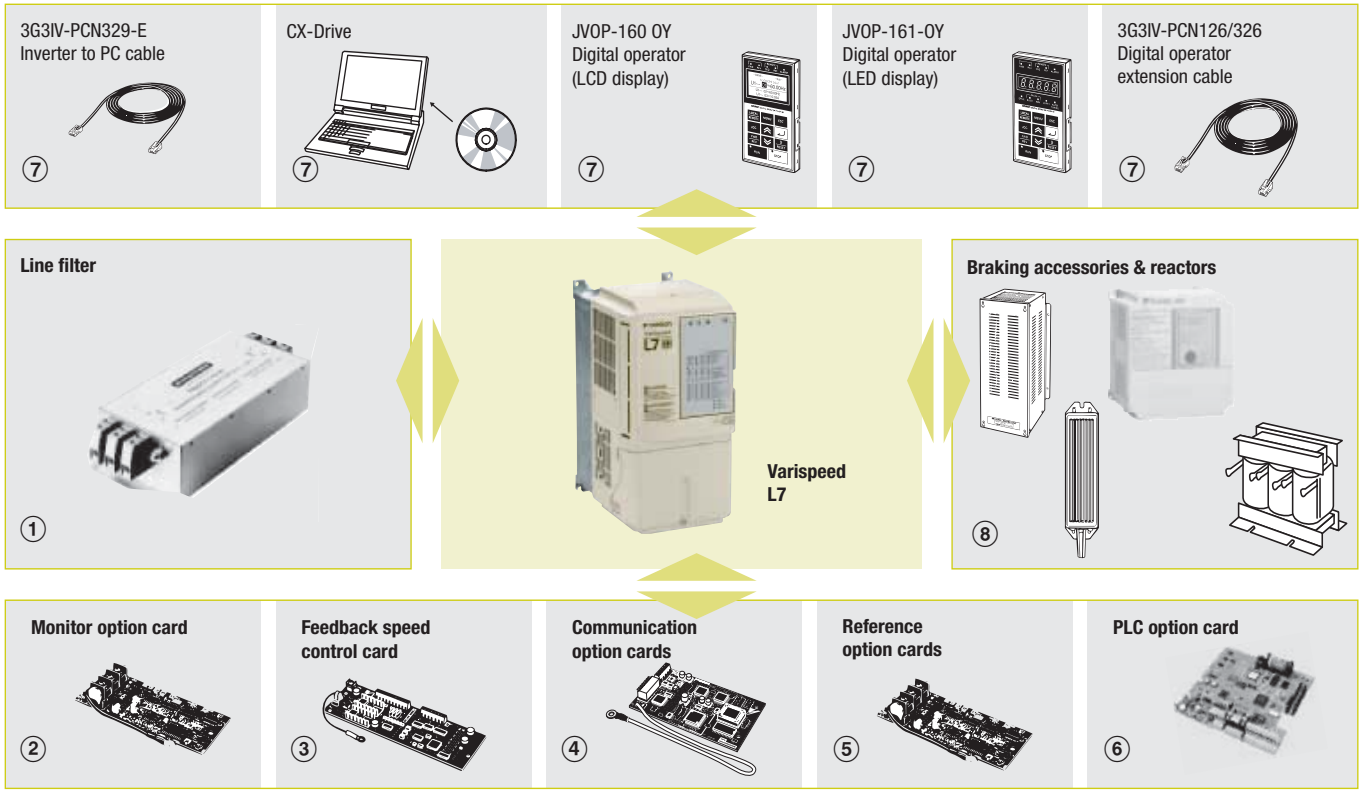


Made to drive lifts

The L7 is the ultimate drive for lift applications up to 3 m/s. High starting torque, silent operation, lift-specific operator interface and operation with both AC and PM motors are standard features of the L7 inverter.

- One model to control AC and PM motors
- Silent operation with no current de-rating
- Safety Cat 3 stop. Cat.0 embedded as standard.
- UPS or battery operation for emergency rescue.
- Motor auto-tuning at standstill and at RUN
- Meets Harmonic distortion normative EN12015 using AC Reactor accessory

Ordering information



Varispeed L7

200 V

Specifications			Order code
3 x 200 V	3.7 kW	17.5 A	CIMR-L7Z23P7
	5.5 kW	25 A	CIMR-L7Z25P5
	7.5 kW	33 A	CIMR-L7Z27P5
	11 kW	49 A	CIMR-L7Z2011
	15 kW	64 A	CIMR-L7Z2015
	18.5 kW	80 A	CIMR-L7Z2018
	22 kW	96 A	CIMR-L7Z2022
	30 kW	130 A	CIMR-L7Z2030
	37 kW	160 A	CIMR-L7Z2037
	45 kW	183 A	CIMR-L7Z2045
	55 kW	224 A	CIMR-L7Z2055

400 V

Specifications			Order code
3 x 400 V	4.0 kW	11 A	CIMR-L7Z44P0
	5.5 kW	14 A	CIMR-L7Z45P5
	7.5 kW	18 A	CIMR-L7Z47P5
	11 kW	27 A	CIMR-L7Z4011
	15 kW	34 A	CIMR-L7Z4015
	18.5 kW	41 A	CIMR-L7Z4018
	22 kW	48 A	CIMR-L7Z4022
	30 kW	65 A	CIMR-L7Z4030
	37 kW	80 A	CIMR-L7Z4037
	45 kW	96 A	CIMR-L7Z4045
	55 kW	128 A	CIMR-L7Z4055

① Line filters

200 V

Inverters	Line filters			
	EN55011 class	Current (A)	Weight (kg)	Order code
CIMR-L7Z23P7	B, 25 m A 100 m	35	1.4	3G3RV-PFI2035-SE
CIMR-L7Z25P5				
CIMR-L7Z27P5	B, 25 m A 100 m	60	3	3G3RV-PFI2060-SE
CIMR-L7Z2011				
CIMR-L7Z2015	B, 25 m A 100 m	100	4.9	3G3RV-PFI2100-SE
CIMR-L7Z2018				
CIMR-L7Z2022	A, 100 m	130	4.3	3G3RV-PFI2130-SE
CIMR-L7Z2030				
CIMR-L7Z2037	A, 100 m	160	6.0	3G3RV-PFI2160-SE
CIMR-L7Z2045	A, 100 m	200	11.0	3G3RV-PFI2200-SE
CIMR-L7Z2055				

400 V

Inverters	Line filters			
	EN55011 class	Current (A)	Weight (kg)	Order code
CIMR-L7Z44P0	B, 25 m A 100 m	18	1.3	3G3RV-PFI3018-SE
CIMR-L7Z45P5				
CIMR-L7Z47P5	B, 25 m A 100 m	21	1.8	3G3RV-PFI3021-SE
CIMR-L7Z4011	B, 25 m A 100 m	35	2.2	3G3RV-PFI3035-SE
CIMR-L7Z4015	B, 25 m A 100 m	60	4.0	3G3RV-PFI3060-SE
CIMR-L7Z4018				
CIMR-L7Z4022	A, 100 m	70	3.4	3G3RV-PFI3070-SE
CIMR-L7Z4030				
CIMR-L7Z4037	A, 100 m	100	4.5	3G3RV-PFI3100-SE
CIMR-L7Z4045				
CIMR-L7Z4055	A, 100 m	130	4.7	3G3RV-PFI3130-SE

① Line filters

Inverters	Line filters			
	EN55011 class	Current (A)	Weight (kg)	Order code
CIMR-L7Z44P0	B, 25 m A 100 m	18	1,0	3G3RV-PFI3018B-SE
CIMR-L7Z45P5				
CIMR-L7Z47P5	B, 25 m A 100 m	35	1,5	3G3RV-PFI3035B-SE
CIMR-L7Z4011				
CIMR-L7Z4015	B, 25 m A 100 m	60	2,2	3G3RV-PFI3060B-SE
CIMR-L7Z4018				



② Monitor option cards

Type	Description	Function	Order code
Monitor option card	Digital output card	Outputs isolated type digital signal for monitoring inverter run state (alarm signal, zero speed detection etc.) . Output channel: Photo coupler 6 channels (48 V, 50 mA or less) Relay contact output 2 channels (250 VAC, 1 A or less, 30 VDC, 1 A or less)	DO-08
	2C-relay output card	Two multi-function contact outputs (2C-relay) can be used other than those of the inverter proper unit.	DO-02C

③ Feedback speed control cards

Type	Description	Function	Order code
Feedback speed control card	PG speed controller card (Used for V/f control with PG or Flux Vector)	Phase A pulse (single pulse) inputs (voltage, complementary, open collector input) PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, max. current 200 mA] Pulse monitor output: +12 V, 20 mA	PG-A2
		Phase A and B pulse inputs (exclusively for complementary input) PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, Max. current 200 mA] Pulse monitor output: Open collector, +24 V, Max. current 30 mA	PG-B2
		Phase A pulse (differential pulse) input for V/f control (RS-422 input) PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] Pulse monitor output: RS-422	PG-D2
		Phase A, B and Z pulse (differential pulse) inputs (RS-422 input) PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] Pulse monitor output: RS-422	PG-X2
		Hyperface and endat encoder option.	PG-F2

④ Communication option cards

Type	Description	Function	Order code
Communication option card	DeviceNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.	SI-N1
	PROFIBUS-DP option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.	SI-P1
	CANopen option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller. It supports DSP402 CANOpen standard protocol for drives control in speed control.	SI-S1
	LONWORKS option card	Used for HVAC control, running or stopping the inverter, setting or referencing parameters, and monitoring output current, watt-hours, or similar items through LONWORKS communications with peripheral devices.	SI-J

⑤ Reference option cards

Description	Function	Order code
Analogue input card	2 channel high resolution analogue input card Channel 1: 0 to 10 V (20 kΩ) Channel 2: 4 to 20 mA (250 Ω) Resolution 14 bit	AI-14U
	3 channel high resolution analogue input card Signal level: -10 to +10 V (20 kΩ) 4 to 20 mA (250 Ω) Resolution: 13 bit + sign	AI-14B
Digital reference card	8 bit digital speed reference input card	DI-08
	16 bit digital speed reference input card	DI-16H2

⑥ PLC option boards

Description	Function	Order code
PLC option	Full PLC features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs. Embedded CompuBus/S fieldbus Standard Omron tools can be used for programming	3G3RV-P10ST8-E
PLC option with DeviceNet	Same features than standard models with DeviceNet support.	3G3RV-P10ST8-DRT-E

⑦ Accessories

Type	Description	Function	Order code
Digital operator	5 lines LCD digital operator 7 language support	Configuration and monitoring device.	JVOP-160-OY
	7 segment LED digital operator		JVOP-161-OY
Accessories	Digital operator extension cable 1 meter 3 meters	Cable to conncect the inverter and the digital operator when it's not plugged into the inverter.	3G3IV-PCN126 3G3IV-PCN326
	PC configuration cable	Cable to connect inverter and PC.	3G3IV-PCN329-E

⑦ Software

Description	Installation	Order code
Computer software	Configuration and monitoring software tool for Drives	CX-DRIVE
Computer software	Complete Omron automation software including CX-Drive	CX-ONE

For full specifications please refer to chapter software on page 582.

⑧ Braking unit, braking resistor unit & reactors

Note: For braking units specifications and models refer to the L7 datasheet Cat-No: I22E-EN-02

AC reactors

200 V

Inverter	Function	Description	Weight (kg)	Order Code
CIMR-L7Z23P7	AC reactor is needed to be according EN12015 harmonic distortion normative	Reactor III 3.7 kW (2.28 mH-21 A)	4.8	L7Z-PUZ23P7-CE
CIMR-L7Z25P5		Reactor III 5.5 kW (5.10 mH-17 A)	6.2	L7Z-PUZ25P5-CE
CIMR-L7Z27P5		Reactor III 7.5 kW (1.20 mH-40 A)	9	L7Z-PUZ27P5-CE
CIMR-L7Z2011		Reactor III 11 kW (0.92 mH-52 A)	14.5	L7Z-PUZ2011-CE
CIMR-L7Z2015		Reactor III 15 kW (0.70 mH-68 A)	17	L7Z-PUZ2015-CE
CIMR-L7Z2018		Reactor III 18.5 kW (0.50 mH-96 A)	22	L7Z-PUZ2018-CE
CIMR-L7Z2022		Reactor III 22 kW (0.31 mH-156 A)	28	L7Z-PUZ2022-CE
CIMR-L7Z2030		Reactor III 30 kW (1.23 mH-78 A)	38	L7Z-PUZ2030-CE
CIMR-L7Z2037		Reactor III 37 kW (0.27 mH-176 A)	47	L7Z-PUZ2037-CE
CIMR-L7Z2045		Reactor III 45 kW (0.22 mH-220 A)	58	L7Z-PUZ2045-CE
CIMR-L7Z2055		Reactor III 55 kW (0.18 mH-269 A)	72	L7Z-PUZ2055-CE

400 V

Inverter	Function	Description	Weight (kg)	Order Code
CIMR-L7Z44P0	AC reactor is needed to be according EN12015 harmonic distortion normative	Reactor III 3.7 kW (7 mH-13 A)	5	L7Z-PUZ44P0-CE
CIMR-L7Z45P5		Reactor III 5.5 kW (5.10 mH-17 A)	6.4	L7Z-PUZ45P5-CE
CIMR-L7Z47P5		Reactor III 7.5 kW (4.35 mH-22 A)	9.5	L7Z-PUZ47P5-CE
CIMR-L7Z4011		Reactor III 11 kW (3 mH-32 A)	15	L7Z-PUZ4011-CE
CIMR-L7Z4015		Reactor III 15 kW (2.34 mH-41 A)	17.5	L7Z-PUZ4015-CE
CIMR-L7Z4018		Reactor III 18.5 kW (1.95 mH-49 A)	22.5	L7Z-PUZ4018-CE
CIMR-L7Z4022		Reactor III 22 kW (1.65 mH-58 A)	28	L7Z-PUZ4022-CE
CIMR-L7Z4030		Reactor III 30 kW (1.23 mH-78 A)	38	L7Z-PUZ4030-CE
CIMR-L7Z4037		Reactor III 37 kW (1 mH-96 A)	47	L7Z-PUZ4037-CE
CIMR-L7Z4045		Reactor III 45 kW (0.83 mH-115 A)	58	L7Z-PUZ4045-CE
CIMR-L7Z4055		Reactor III 55 kW (0.62 mH-154 A)	72	L7Z-PUZ4055-CE

Specifications

200 V class

Order code CIMR-L7ZZ_			23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055
Max. applicable motor output*1		kW	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Output characteristics	Inverter capacity	kVA	7	10	14	20	27	33	40	54	67	76	93
	Rated current	A	17.5	25	33	49	64	80	96	130	160	183	224
	Max. voltage		3-phase; 200, 208, 220, 230, or 240 VAC (proportional to input voltage.)										
	Max. output frequency		Up to 120Hz available by programming.										
Power supply	Rated input voltage and frequency		3-phase, 200/208/220/230/240 VAC, 50/60 Hz										
	Rated input current A		21	25	40	52	68	96	115	156	176	220	269
	Allowable voltage fluctuation		+10%, -15%										
	Allowable frequency fluctuation		±5%										
Harmonic wave prevention	DC reactor		Optional						Built in				
	12-pulse input		Not possible						Possible				

*1 The maximum applicable motor output is given for a standard 4-pole Yaskawa motor. When selecting the actual motor and Inverter, be sure that the inverter rated current is applicable for the motor's rated current.

Note: A transformer with dual star-delta secondary is required on the power supply for 12-pulse rectification.

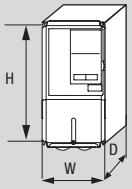
400 V class

Order code CIMR-L7ZZ_			44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055
Max. applicable motor output*1		kW	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55
Output characteristics	Inverter capacity	kVA	9	12	15	22	28	34	40	54	67	80	106
	Rated current	A	11	14	18	27	34	41	48	65	80	96	128
	Max. voltage		3-phase; 380, 400, 415, 440, 460, or 480 VAC (proportional to input voltage.)										
	Max. output frequency		120 Hz max.										
Power supply	Rated input voltage and frequency		3-phase, 380, 400, 415, 440, 460 or 480 VAC, 50/60 Hz										
	Rated input current A		13.2	17	22	32	41	49	58	78	96	115	154
	Allowable voltage fluctuation		+10%, -15%										
	Allowable frequency fluctuation		±5%										
Harmonic wave prevention	DC reactor		Optional						Built in				
	12-pulse input		Not possible						Possible				

*1 The maximum applicable motor output is given for a standard 4-pole Yaskawa motor. When selecting the actual motor and inverter, be sure that the inverter's rated current is applicable for the motor's rated current.

Note: A transformer with dual star-delta secondary is required on the power supply for 12-pulse rectification.

Dimensions

Specifications		Drive model	H	W	D	
3-phase 200 VAC	3.7 kW	CIMR-L7Z23P77	280	140	177	
	5.5 kW	CIMR-L7Z25P57				
	7.5 kW	CIMR-L7Z27P57	300	200	197	
	11 kW	CIMR-L7Z20117	310			
	15 kW	CIMR-L7Z20157	350	240	207	
	18.5 kW	CIMR-L7Z20187	380			
	22 kW	CIMR-L7Z20227	464	254	258	
	30 kW	CIMR-L7Z20300	450	275	258	
	37 kW	CIMR-L7Z20370	600	375	298	
	45 kW	CIMR-L7Z20450			328	
	55 kW	CIMR-L7Z20550	725	450	348	
3-phase 400 VAC	4.0 kW	CIMR-L7Z44P77	280	140	177	
	5.5 kW	CIMR-L7Z45P57				
	7.5 kW	CIMR-L7Z47P57	300	200	197	
	11 kW	CIMR-L7Z40117				
	15 kW	CIMR-L7Z40157	350	240	207	
	18.5 kW	CIMR-L7Z40187				
	22 kW	CIMR-L7Z40227	535	275	258	
	30 kW	CIMR-L7Z40307				
	37 kW	CIMR-L7Z40377	715	325	283	
	45 kW	CIMR-L7Z40457				
	55 kW	CIMR-L7Z40557				

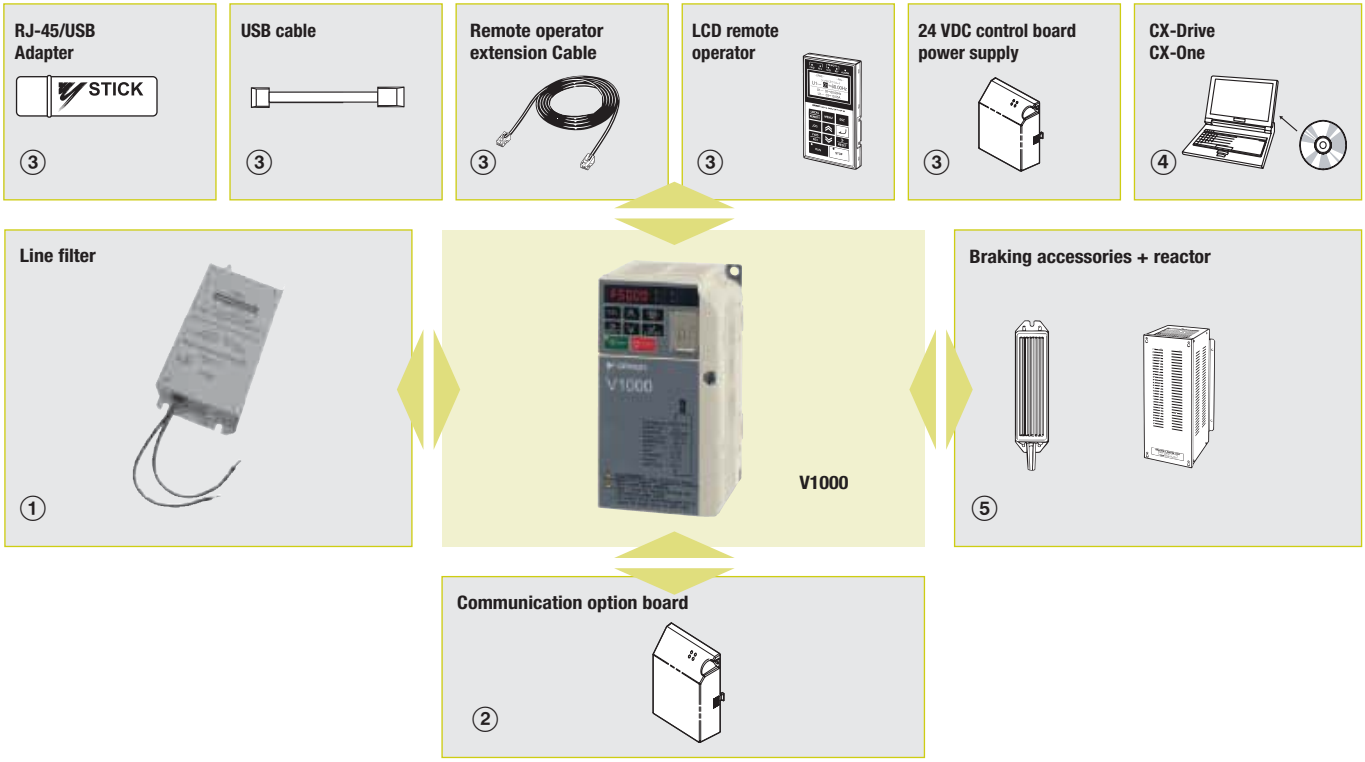


10 x 100 = 1 – Quality has a new formula

Thanks to the patented design of the V1000 series and modern manufacturing, it is built for a 10 year life-time without maintenance. The new features guarantee a 100% expectation match. And with a field failure rate of less than 1 in 10.000, the V1000 series inverter will outperform all other inverters long after it has been implemented.

- Up to 15 kW / 18.5 kW
- Built-in filter version
- Current vector control
- IM and PM motor control
- Embedded safety stop function Category 3 (EN954-1)

Ordering information



V1000

Specifications					Order code	
Voltage	Heavy Duty		Normal Duty		Standard	Built-in filter
1x200 V	0.12 kW	0.8 A	0.18 kW	0.8 A	VZAB0P1BAA	VZAB0P1HAA
	0.25 kW	1.6 A	0.37 kW	1.6 A	VZAB0P2BAA	VZAB0P2HAA
	0.55 kW	3.0 A	0.75 kW	3.5 A	VZAB0P4BAA	VZAB0P4HAA
	1.1 kW	5.0 A	1.1 kW	6.0 A	VZAB0P7BAA	VZAB0P7HAA
	1.5 kW	8.0 A	2.2 kW	9.6 A	VZAB1P5BAA	VZAB1P5HAA
	2.2 kW	11.0 A	3.0 kW	12.0 A	VZAB2P2BAA	VZAB2P2HAA
	4.0 kW	17.5 A	5.5 kW	21.0 A	VZAB4P0BAA	VZAB4P0HAA
3x200 V	0.12 kW	0.8 A	0.18 kW	0.8 A	VZA20P1BAA	VZA20P1HAA
	0.25 kW	1.6 A	0.37 kW	1.6 A	VZA20P2BAA	VZA20P2HAA
	0.55 kW	3.0 A	0.75 kW	3.5 A	VZA20P4BAA	VZA20P4HAA
	1.1 kW	5.0 A	1.1 kW	6.0 A	VZA20P7BAA	VZA20P7HAA
	1.5 kW	8.0 A	2.2 kW	9.6 A	VZA21P5BAA	VZA21P5HAA
	2.2 kW	11.0 A	3.0 kW	12.0 A	VZA22P2BAA	VZA22P2HAA
	4.0 kW	17.5 A	5.5 kW	21.0 A	VZA24P0BAA	VZA24P0HAA
	5.5 kW	25.0 A	7.5 kW	30.0 A	VZA25P5FAA	VZA25P5HAA
	7.5 kW	33.0 A	11.0 kW	40.0 A	VZA27P5FAA	VZA27P5HAA
	11 kW	47.0 A	15.0 kW	56.0 A	VZA2011FAA	VZA2011HAA
	15 kW	60.0 A	18.5 kW	69.0 A	VZA2015FAA	VZA2015HAA

Specifications					Order code	
Voltage	Heavy Duty		Normal Duty		Standard	Built-in filter
3x400 V	0.37 kW	1.2 A	0.18 kW	1.2 A	VZA40P2BAA	VZA40P2HAA
	0.55 kW	1.8 A	0.37 kW	2.1 A	VZA40P4BAA	VZA40P4HAA
	1.1 kW	3.4 A	0.75 kW	4.1 A	VZA40P7BAA	VZA40P7HAA
	1.5 kW	4.8 A	1.1 kW	5.4 A	VZA41P5BAA	VZA41P5HAA
	2.2 kW	5.5 A	2.2 kW	6.9 A	VZA42P2BAA	VZA42P2HAA
	3.0 kW	7.2 A	3.0 kW	8.8 A	VZA43P0BAA	VZA43P0HAA
	4.0 kW	9.2 A	5.5 kW	11.1 A	VZA44P0BAA	VZA44P0HAA
	5.5 kW	14.8 A	7.5 kW	17.5 A	VZA45P5FAA	VZA45P5HAA
	7.5 kW	18.0 A	11.0 kW	23.0 A	VZA47P5FAA	VZA47P5HAA
	11 kW	24.0 A	15.0 kW	31.0 A	VZA4011FAA	VZA4011HAA
	15 kW	31.0 A	18.5 kW	38.0 A	VZA4015FAA	VZA4015HAA

① Line filters

Specifications				Order code	
Power supply	Inverter V1000	Rated current (A)	Weight (kg)	Filter Rasmi	Filter Schaffner
1x200 V	VZAB0P1BAA	10	0,6	A1000-FIV1010-RE	A1000-FIV1010-SE
	VZAB0P2BAA				
	VZAB0P4BAA				
	VZAB0P7BAA	20	1	A1000-FIV1020-RE	A1000-FIV1020-SE
	VZAB1P5BAA				
	VZAB2P2BAA	30	1,1	A1000-FIV1030-RE	A1000-FIV1030-SE
	VZAB4P0BAA	40	1,2	A1000-FIV1040-RE	A1000-FIV1040-SE
3x400 V	VZA40P2BAA	5	1,1	A1000-FIV3005-RE	A1000-FIV3005-SE
	VZA40P4BAA				
	VZA40P7BAA	10	1,1	A1000-FIV3010-RE	A1000-FIV3010-SE
	VZA41P5BAA				
	VZA42P2BAA				
	VZA43P0BAA			A1000-FIV3020-RE	A1000-FIV3020-SE
	VZA44P0BAA	20	1,3		
	VZA45P5FAA	30	2,1	A1000-FIV3030-RE	A1000-FIV3030-SE
	VZA47P5FAA				
	VZAB011FAA	50	2,9	A1000-FIV1050-RE	Under Development
	VZAB015FAA			A1000-FIV10xx-RE	A1000-FIV10xx-RE
3x200 V	VZA20P1BAA	10	0,8	A1000-FIV2010-RE	A1000-FIV2010-SE
	VZA20P2BAA				
	VZA20P4BAA				
	VZA20P7BAA				
	VZA21P5BAA	20	1,1	A1000-FIV2020-RE	A1000-FIV2020-SE
	VZA22P2BAA				
	VZA24P0BAA	30	1,3	A1000-FIV2030-RE	A1000-FIV2030-SE
	VZA25P5FAA	50	2,4	A1000-FIV2060-RE	Under Development
	VZA27P5FAA				
	VZAB011FAA	100	4,2	A1000-FIV2100-RE	Under Development
	VZAB015FAA				

② Communication cards

Type	Description	Function	Order code
Communication option board	DeviceNet option card	Used for running or stopping the inverter, setting or referencing parameters, and ,monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.	SI-N3
	PROFIBUS-DP option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.	SI-P3
	Can open option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI-S3
	CompoNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CompoNet communication with the host controller.	A1000-CRT1

③ Accessories

Types	Description	Functions	Order code
Digital operator	LCD remote operator	LCD Display operator with language support	JVOP-180
Accessories	USB converter	USB converter unit with copy and backup function	JVOP-181
	Remote operator cable (1m)	Cable for connecting remote operator	72606-WV001
	Remote operator cable (3m)		72606-WV003
	24 VDC option board	24 VDC control board power supply	PS-UDC24

④ Computer software

Types	Description	Installation	Order code
Software	Computer software	Configuration and monitoring software tool	CX-drive
	Computer software	Configuration and monitoring software tool	CX-One

For full specifications please refer to chapter software on page 582.

⑤ Braking unit, braking resistor unit.

Specifications

200 V class

Single-phase: VZ-_		B0P1	B0P2	B0P4	B0P7	B1P5	B2P2	B4P0	–	–	–	–
Three-phase: VZ-_		20P1	20P2	20P4	20P7	21P5	22P2	24P0	25P5	27P5	2011	2015
Motor kW *1	For HD setting	0.12	0.25	0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15
	For ND setting	0.18	0.37	0.75	1.1	2.2	3.0	5.5	7.5	11	15	18.5
Output characteristics	Inverter capacity kVA	0.3	0.6	1.1	1.9	3.0	4.2	6.7	9.5	13	18	23
	Rated output current (A) at HD	0.8	1.6	3.0	5.0	8.0	11.0	17.5	25.0	33.0	47.0	60.0
	Rated output current (A) at ND	1.2	1.9	3.5	6.0	9.6	12.0	21.0	30.0	40.0	56.0	69.0
	Max. output voltage	Proportional to input voltage: 0 to 240 V										
	Max. output frequency	400 Hz										
Power supply	Rated input voltage and frequency	Single-phase 200 to 240 V 50/60 Hz 3-phase 200 to 240 V 50/60 Hz										
	Allowable voltage fluctuation	-15% to +10%										
	Allowable frequency fluctuation	+5%										

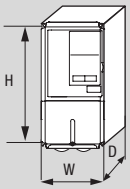
*1 Based on a standard 4-pole motor for maximum applicable motor output:
Constant Torque (CT) mode with a 150% overload capacity
Variable Torque (VT) mode with a 120% overload capacity

400 V class

Three-phase: VZ-_		40P2	40P4	40P7	41P5	42P2	43P0	44P0	45P5	47P5	4011	4015
Motor kW*1	For HD setting	0.2	0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15
	For ND setting	0.37	0.75	1.5	2.2	3.0	3.7	5.5	7.5	11	15	18.5
Output characteristics	Inverter capacity kVA	0.9	1.4	2.6	3.7	4.2	5.5	7.2	9.2	14.8	18	24
	Rated output current (A) at HD	1.2	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0	24	31
	Rated output current (A) at ND	1.2	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23	31	38
	Max. output voltage	0 to 480 V (proportional to input voltage)										
	Max. output frequency	400 Hz										
Power supply	Rated input voltage and frequency	3-phase 380 to 480 VAC, 50/60 Hz										
	Allowable voltage fluctuation	-15% to +10%										
	Allowable frequency fluctuation	+5%										

*1 Based on a standard 4-pole motor for maximum applicable motor output:
Constant Torque (CT) mode with a 150% overload capacity
Variable Torque (VT) mode with a 120% overload capacity

Dimensions

Specifications		Drive model	H	W	D	
1-phase 200 VAC	0,12 kW	VZAB0P1BAA	128	68	76	
	0,25 kW	VZAB0P2BAA				
	0,55 kW	VZAB0P4BAA			118	
	1,1 kW	VZAB0P7BAA		108	137.5	
	1,5 kW	VZAB1P5BAA			154	
	2,2 kW	VZAB2P2BAA		140	163	
	4,0 kW	VZAB4P0BAA	Under development			
3-phase 200 VAC	0,12 kW	VZA20P1BAA	128	68	76	
	0,25 kW	VZA20P2BAA				
	0,55 kW	VZA20P4BAA			108	
	1,1 kW	VZA20P7BAA			128	
	1,5 kW	VZA21P5BAA		108	129	
	2,2 kW	VZA22P2BAA			137.5	
	4,0 kW	VZA24P0BAA		140	143	
	5,5 kW	VZA25P5FAA	254		140	
	7,5 kW	VZA27P5FAA				
	11 kW	VZA2011FAA	290	180	163	
	15 kW	VZA2015FAA	358	220	187	
3-phase 400 VAC	0,37 kW	VZA40P2BAA	108	128	81	
	0,55 kW	VZA40P4BAA			99	
	1,1 kW	VZA40P7BAA			137.5	
	1,5 kW	VZA41P5BAA			154	
	2,2 kW	VZA42P2BAA				
	3,0 kW	VZA43P0BAA				
	4,0 kW	VZA44P0BAA	128	140	143	
	5,5 kW	VZA45P5FAA	254		140	
	7,5 kW	VZA47P5FAA				
	11 kW	VZA4011FAA	290	180	143	
	15 kW	VZA4015FAA			163	

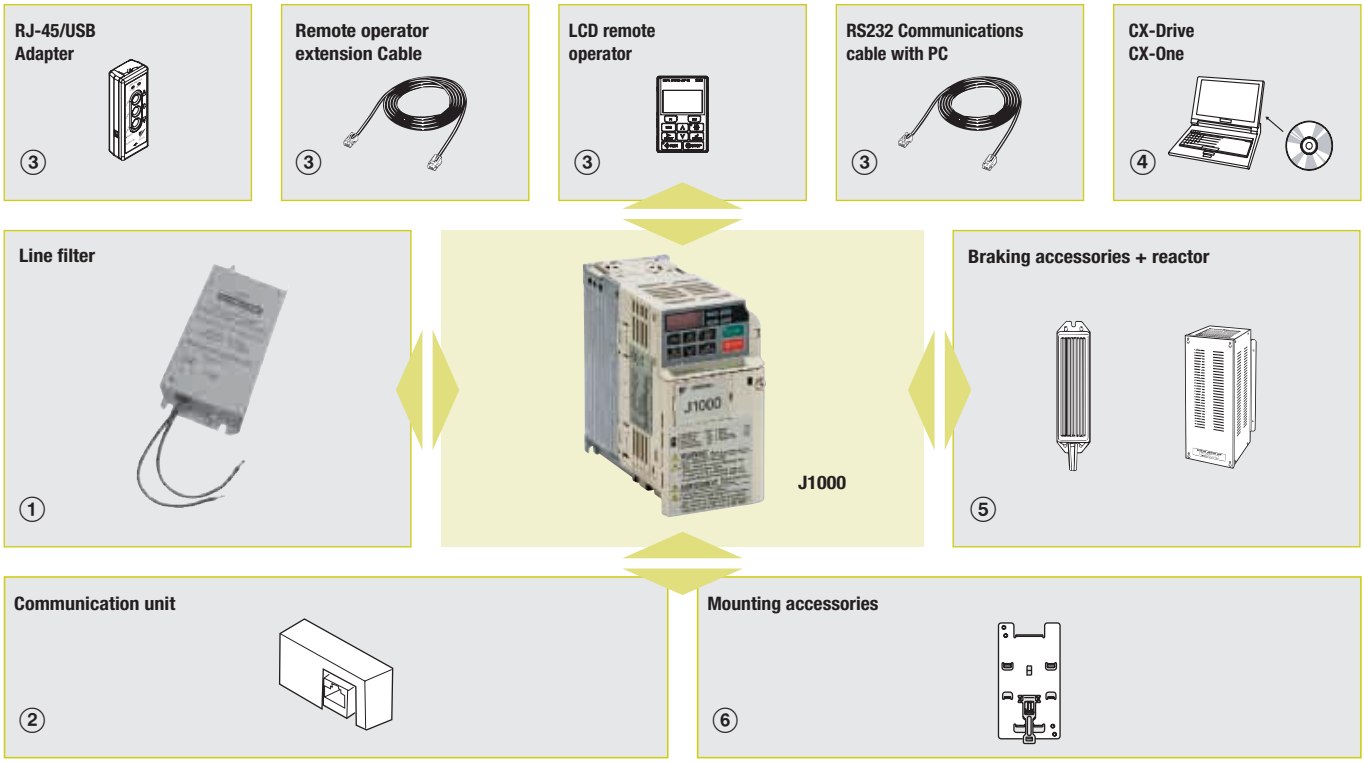


A compact and easy to use inverter series

The new J1000 inverter has been designed to become the basic inverter in applications like conveyors, fans and pumps with small power ratings. It's so easy to install, set-up, operate run but at same time covering all the needs for such a kinds of applications.

- V/f controlled inverter
- Torque performance (150% / 3 Hz)
- Double rating ND 120%/1 min and HD 150%/1 min
- Overload detection function (150% during 60 s)
- Motor thermal function
- Freely configurable V/f curve
- Optional RS-232C/485 communication - Modbus,

Ordering information



J1000

Specifications					Order code
Voltage	Heavy Duty		Normal Duty		
1x200 V	0.12 kW	0.8 A	0.18 kW	0.8 A	JZAB0P1BAA
	0.25 kW	1.6 A	0.37 kW	1.6 A	JZAB0P2BAA
	0.4 kW	3.0 A	0.75 kW	3.5 A	JZAB0P4BAA
	1.1 kW	5.0 A	1.1 kW	6.0 A	JZAB0P7BAA
	1.5 kW	8.0 A	2.2 kW	9.6 A	JZAB1P5BAA
3x200 V	0.12 kW	0.8 A	0.18 kW	0.8 A	JZA20P1BAA
	0.25 kW	1.6 A	0.37 kW	1.6 A	JZA20P2BAA
	0.4 kW	3.0 A	0.75 kW	3.5 A	JZA20P4BAA
	1.1 kW	5.0 A	1.1 kW	6.0 A	JZA20P7BAA
	1.5 kW	8.0 A	2.2 kW	9.6 A	JZA21P5BAA
	2.2 kW	11.0 A	3.0 kW	12.0 A	JZA22P2BAA
	4.0 kW	17.5 A	5.5 kW	21.0 A	JZA24P0BAA
3x400 V	0.2 kW	1.2 A	0.37 kW	1.2 A	JZA40P2BAA
	0.55 kW	1.8 A	0.75 kW	2.1 A	JZA40P4BAA
	1.1 kW	3.4 A	1.5 kW	4.1 A	JZA40P7BAA
	1.5 kW	4.8 A	2.2 kW	5.4 A	JZA41P5BAA
	2.2 kW	5.5 A	3.0 kW	6.9 A	JZA42P2BAA
	3.0 kW	7.2 A	4.0 kW	8.8 A	JZA43P0BAA
	4.0 kW	9.2 A	5.5 kW	11.1 A	JZA44P0BAA

① Line filters

Specifications		Line filter Schaffner			Line filter Rasmi		
Voltage	Inverter J1000	Rated current (A)	Weight (kg)	Order code	Rated current (A)	Weight (kg)	Order code
3-Phase 200 VAC	JZA20P1BAA	10	0.7	A1000-FIV2010-SE	10	0.8	A1000-FIV2010-RE
	JZA20P2BAA						
	JZA20P4BAA						
	JZA20P7BAA						
	JZA21P5BAA	20	0.9	A1000-FIV2020-SE	20	1.1	A1000-FIV2020-RE
	JZA22P2BAA						
	JZA24P0BAA	30	1.0	A1000-FIV2030-SE	30	1.3	A1000-FIV2030-RE
Single-Phase 200 VAC	JZAB0P1BAA	10	0.5	A1000-FIV1010-SE	10	0.6	A1000-FIV1010-RE
	JZAB0P2BAA						
	JZAB0P4BAA						
	JZAB0P7BAA	20	0.7	A1000-FIV1020-SE	20	1.0	A1000-FIV1020-RE
	JZAB1P5BAA						
3-Phase 400 VAC	JZA40P2BAA	5	0.5	A1000-FIV3005-SE	5	1.1	A1000-FIV3005-RE
	JZA40P4BAA						
	JZA40P7BAA	10	0.75	A1000-FIV3010-SE	10	1.1	A1000-FIV3010-RE
	JZA41P5BAA						
	JZA42P2BAA						
	JZA43P0BAA						
	JZA44P0BAA	15	1.0	A1000-FIV3020-SE	20	1.3	A1000-FIV3020-RE

① Chokes

Diameter	Description	Order code
21	Recommended for motors below 2.2 KW	A1000-FEV2102-RE
25	Recommended for motors below 15 KW	A1000-FEV2515-RE

② Communication units

Type	Description	Function	Order code
Option units	RS-232C serial communication interface	RS232C communications interface to connect the drive to a PC or the optional copy unit	SI-232/JC
	Remote operator interface	RS232C communication interface for usage with the external LED operator JVOP-182	SI-232/J
	RS-422/485 Serial communications interface	Interface for RS-422/485 communications using the MEMOBUS/Modbus RTU protocol	SI-485/J
	Potentiometer Option	Potentiometer option for setting the frequency reference directly at the drive	AI-V3/J

③ Accessories

Types	Description	Functions	Model
Digital operator	LED remote operator	Remote operator with LED display and copy function, cable length max. 3m.	JVOP-182
	Remote operator cable	3 meters cable for connecting remote operator	A1000-CAVOP300-EE
Accessories	USB converter / USB cable	Allows the user to copy and verify parameter settings between drives. Can also be used as adapter to connect the drive to a PC USB port. SI-232/JC option is required	JVOP-181
	PC connection cable	RS232 PC tool connection cable	A1000-CAVPC232-EE

④ Computer software

Types	Description	Installation	Order code
Software	Computer software	Configuration and monitoring software tool	CX-drive
	Computer software	Configuration and monitoring software tool	CX-One

For full specifications please refer to chapter software on page 582.

⑤ Braking unit, braking resistor unit

Inverter					Braking resistor unit			
Voltage	Max. applicable motor output kW	Inverter model JZA_		Connectable min. resistance Ω	Inverter-mounted type (3%ED, 10 sec max)			
		3-phase	1-phase		Resistance W	No. of used	Braking torque %	Order code
200 V (single-/three-phase)	0.12	20P1	B0P1	300	400	1	220	A1000-REJ0K15400-IE
	0.25	20P2	B0P2	300			220	
	0.55	20P4	B0P4	200	200	1	220	A1000-REJ0K15200-IE
	1.1	20P7	B0P7	120			125	
	1.5	21P5	B1P5	60	100	1	125	A1000-REJ0K15100-IE
	2.2	22P2	–	60	70	1	120	A1000-REJ0K15070-IE
	4.0	24P0	–	32	62	1	100	A1000-REJ0K15062-IE
400 V (three-phase)	0.37	40P2	–	750	750	1	230	A1000-REJ0K10750-IE
	0.55	40P4	–	750			230	
	1.1	40P7	–	510			130	
	1.5	41P5	–	240	400	1	125	A1000-REJ0K15400-IE
	2.2	42P2	–	200	300	1	115	A1000-REJ0K15300-IE
	3.0	43P0	–	100	400	2	105	A1000-REJ0K15400-IE
	4.0	44P0	–					

⑥ Mounting accessories

Types	Description	Applicable models JZA_	Order code
DIN Rail	Necessary to mount the inverter on a DIN rail	20P1/20P2/20P4/20P7 B0P1/B0P2/B0P4	EZZ08122A
		21P5/22P2 B0P7/B1P5 40P2/40P4/40P7/41P5/42P2	EZZ08122B
		24P0 B2P2 44P0	EZZ08122C
Heatsink external mounting attachment	Additional items to mount the inverter with the heatsink out of the panel.	20P1/20P2 B0P1/B0P2	100-034-075
		20P4 B0P4	100-034-076
		20P7	100-034-077
		40P2	100-034-078
		21P5/22P2 B1P5 41P5/42P2/43P0	100-034-79
		24P0 B2P2 44P0	100-034-80
		B4P0	100-036-357
		B0P7 40P4/40P7	100-036-418

Specifications

200 V class

Single-phase: JZA_		B0P1	B0P2	B0P4	B0P7	B1P5	-	-
Three-phase: JZA_		20P1	20P2	20P4	20P7	21P5	22P2	24P0
Motor kW*1	For HD setting	0.12	0.25	0.4	1.1	1.5	2.2	4.0
	For ND setting	0.18	0.37	0.75	1.1	2.2	3.0	5.5
Output characteristics	Inverter capacity kVA	0.3	0.6	1.1	1.9	3.0	4.2	6.7
	Rated output current (A) at HD	0.8	1.6	3.0	5.0	8.0	11.0	17.5
	Rated output current (A) at ND	1.2	1.9	3.5	6.0	9.6	12.0	21.0
	Max. output voltage	Proportional to input voltage: 0 to 240 V						
	Max. output frequency	400 Hz						
Power supply	Rated input voltage and frequency	Single-phase 200 to 240 V 50/60 Hz 3-phase 200 to 240 V 50/60 Hz						
	Allowable voltage fluctuation	-15% to +10%						
	Allowable frequency fluctuation	+5%						

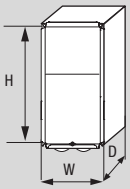
*1 Based on a standard 4-pole motor for maximum applicable motor output:
Heavy Duty (HD) mode with a 150% overload capacity
Normal Duty (ND) mode with a 120% overload capacity

400 V class

Three-phase: JZA_		40P2	40P4	40P7	41P5	42P2	43P0	44P0
Motor kW*1	For HD setting	0.2	0.4	1.1	1.5	2.2	3.0	4.0
	For ND setting	0.37	0.75	1.5	2.2	3.0	3.7	5.5
Output characteristics	Inverter capacity kVA	0.9	1.4	2.6	3.7	4.2	5.5	7.2
	Rated output current (A) at HD	1.2	1.8	3.4	4.8	5.5	7.2	9.2
	Rated output current (A) at ND	1.2	2.1	4.1	5.4	6.9	8.8	11.1
	Max. output voltage	0 to 480 V (proportional to input voltage)						
	Max. output frequency	400 Hz						
Power supply	Rated input voltage and frequency	3-phase 380 to 480 VAC, 50/60 Hz						
	Allowable voltage fluctuation	-15% to +10%						
	Allowable frequency fluctuation	+5%						

*1 Based on a standard 4-pole motor for maximum applicable motor output:
Heavy Duty (HD) mode with a 150% overload capacity
Normal Duty (ND) mode with a 120% overload capacity

Dimensions

Specifications		Drive model	H	W	D	
1 Phase 200 VAC	0,12 kW	JZAB0P1BAA	128	68	76	
	0,25 kW	JZAB0P2BAA				
	0,55 kW	JZAB0P4BAA			118	
	1,1 kW	JZAB0P7BAA		108	137,5	
	1,5 kW	JZAB1P5BAA			154	
3 Phase 200 VAC	0,12 kW	JZA20P1BAA	128	68	76	
	0,25 kW	JZA20P2BAA				
	0,55 kW	JZA20P4BAA			108	
	1,1 kW	JZA20P7BAA			128	
	1,5 kW	JZA21P5BAA		108	129	
	2,2 kW	JZA22P2BAA			137,5	
	4,0 kW	JZA24P0BAA		140	143	
3 Phase 400 VAC	0,37Kw	JZA40P2BAA	108	128	81	
	0,55 kW	JZA40P4BAA			99	
	1,1 kW	JZA40P7BAA			137,5	
	1,5 kW	JZA41P5BAA			154	
	2,2 kW	JZA42P2BAA				
	3,0 kW	JZA43P0BAA				
	4,0 kW	JZA44P0BAA	140		143	

G7/F7/L7/E7 Inverter PLC

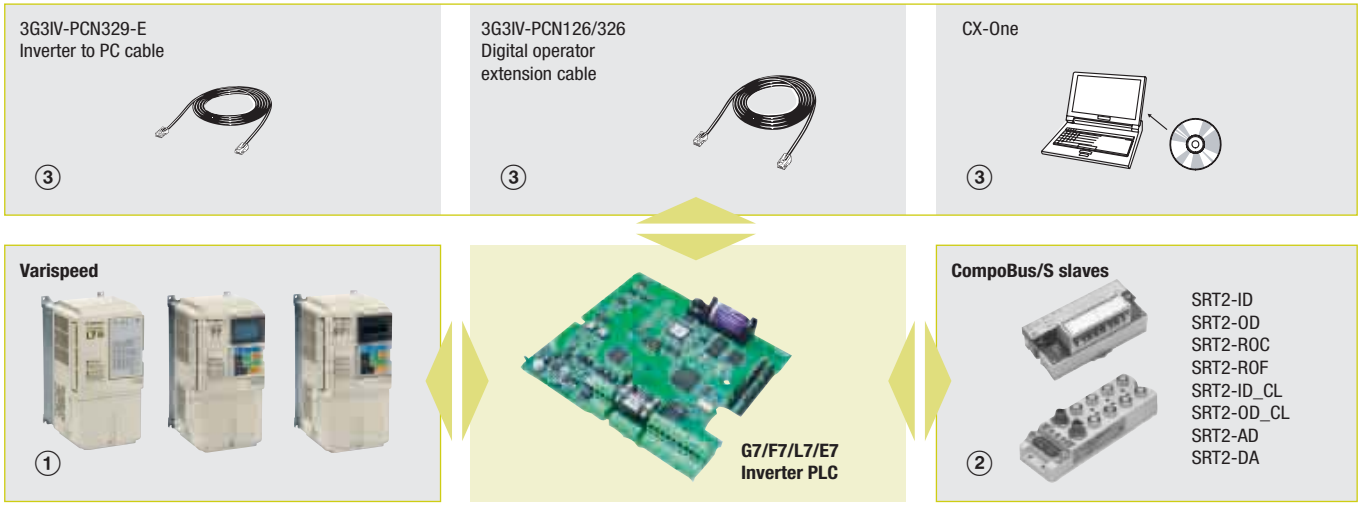


The Omron PLC embedded into the Omron-Yaskawa inverter family

Bringing PLC functionality to the drive. You will be able to access the inverter parameters, analogue/digital I/Os, control up to 256 I/Os and DeviceNet connectivity. Ideal for applications such as winding/unwinding, HVAC installations, smart lifts and water treatment.

- Fully featured Omron PLC embedded into the inverter
- Interrupt inputs, counter inputs, encoder inputs and pulse outputs
- Mechatronics functions (PWM, pulse and sync.)
- Memory backup
- Programmed using standard Omron PLC software

Ordering information



Inverter PLC

Specifications						Order code
Inputs	Outputs	RTC	CompoBus/S master	RS422 port	DeviceNet slave	
6	4	Yes	Yes	Yes	No	3G3RV-P10ST8-E
6	4	Yes	Yes	NO	Yes	3G3RV-P10ST8-DRT-E

① Inverters

Specifications	Order code
3 level control method inverter	Varispeed G7
Flux vector control inverter	Varispeed F7
Lift inverter	Varispeed L7
Pumps & fans inverter	Varispeed E7

Note: For detailed information please refer to inverter section.

② CompoBus/S slave

Specifications	Order code
CompoBus/S slaves	SRT2-XX*1

*1 For detailed information please refers to network I/O section

③ Cables

Specifications	Order code
Computer connecting cable	3G3IV-PCN329-E
Programmable console cable	3G3IV-PCN126/326

③ Computer software

Specifications	Order code
PLC programming software: CX-Programmer	CX-ONE
Inverter configurator software: CX-Drive	

For full specifications please refer to chapter software on page 582.

Specifications

Specifications by product

Item	3G3RV-P10ST8-E	3G3RV-P10ST8-DRT-E
PLC core	CPM2C-S	CPM2C-S
Inputs	6 24 VDC inputs	6 24 VDC inputs
Outputs	4 sourcing/PNP transistor outputs	4 sourcing/PNP transistor outputs
Peripheral port	Yes	Yes
RS-232C port	Yes	Yes
RS-422 port	No	Yes
Calendar/clock	Yes	Yes
Memory backup	Flash memory and battery	Flash memory and battery
CompoBus/S master interface	Yes	Yes
Encoder interface	Yes	Yes
DeviceNet slave interface	No	Yes

General specifications

Item		Specifications	
		3G3RV-P10ST8-E	3G3RV-P10ST8-DRT-E
Rated power supply voltage		24 VDC $^{+10\%}/_{-15\%}$ (external power supply for I/O)	
Communications power supply voltage		–	11 to 25 VDC (supplied by communications connector)
Vibration resistance		10 to 20 Hz, 9.8 m/s2 max. 20 to 50 Hz, 2 m/s2 max	
Ambient operating temperature		-10 to 45°C	
Ambient operating relative humidity		10 to 90% (no condensation)	
Ambient storage temperature		-20 to 70°C	
Atmosphere		Must be free from corrosive gas	
I/O control method		Cyclic scan method	
Programming language		Ladder chart method	
Processing speed	Basic instructions	0.64 µs (LD)	
	Special instructions	7.8 µs (MOV)	
Program capacity		4,096 words	
Inverter interface		Direct interface with inverter through IR-memory, DM-memory, Transfer command	
CompoBus/S master functions		Remote I/O devices can be allocated up to 256 I/O points (128 inputs and 128 outputs)	
DeviceNet slave functions		Up to 64 words (32 input words and 32 output words) can be allocated to the DeviceNet Master's I/O.	
Interrupts		Interrupt inputs: 2 inputs Response time: 50 µs	
		Interval timer interrupts: 1 input Set value: 0.5 to 319,968 ms Precision: 0.1 ms	Scheduled interrupts One-shot interrupt
High-speed counters	High-speed counter 1 input	No interrupt	
	Differential phase mode (5 kHz) Pulse plus direction input mode (20 kHz) Up/down input mode (20 kHz) Increment mode (20 kHz)	Count-check interrupt (an interrupt can be generated when the count equals the set value or the count lies within a preset range.)	
	Interrupt inputs (counter mode) 2 inputs Incrementing counter (2 kHz) Decrementing counter (2 kHz)	No interrupt	
		Count-up interrupt	
Encoder interface		3 input modes: Differential-phase (up/down) Pulse plus direction Up/down pulse Maximum input frequency 50 kHz Maximum counter range 4,294,967,295 (232-1) Two capture registers, 3 selectable registration inputs One comparison value Counter reset through software or Z-phase Interrupt function	
Pulse outputs		2 outputs: Single-phase pulse output without acceleration/deceleration 10 Hz to 10 kHz 2 outputs: Variable duty ratio pulse output 0.1 to 999.9 Hz, duty ratio 0 to 100% 1 output: Pulse output with trapezoidal acceleration/deceleration Pulse plus direction output, up/down pulse output, 10 Hz to 10 kHz	
Synchronized pulse control		1 point Input frequency range: 10 to 500 Hz, 20 Hz to 1 kHz, or 300 Hz to 20 kHz Output frequency range: 10 Hz to 10 kHz	
Pulse catch inputs		2 bits Minimum pulse input: 50 µs max. Used in common by input interrupts and input interrupt counter mode.	
Clock/calendar function		Shows the current year, month, day of the week, day of the month, hour, minute, and second.	
Communication function		Port 1 = Peripheral and RS-422: Host link, peripheral bus, no-protocol, programming console Port 2 = RS-232C port: Host link, no-protocol, 1:1 PLC link, 1:1 NT link	
Power-interruption hold function		Holds the contents of HR, AR, CNT, and DM Areas.	
Memory backup		Flash memory: Program, read-only DM area, and PC setup Memory backup: The read/write DM area, HR area, AR area, and counter values are backed up. (The battery has a 5-year lifetime at 25°C and it is replaceable.)	
Self-diagnostic function		CPU errors, memory errors, communications errors, setting errors, battery errors	

TURNING IDEAS INTO MACHINES THAT WORK...

This section will enable you to select the ideal motion controller, servo drive and inverter solution for your application. Especially created towards customer needs, our products are developed to help you build machines faster, with more flexibility and with total reliability. Because when we say it works, IT WORKS!

For more information on Omron automation solutions, please visit the Scalable Machine Automation mini-site at

www.scalablemachine.info



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trajexia TOTAL FREEDOM IN MOTION CONTROL

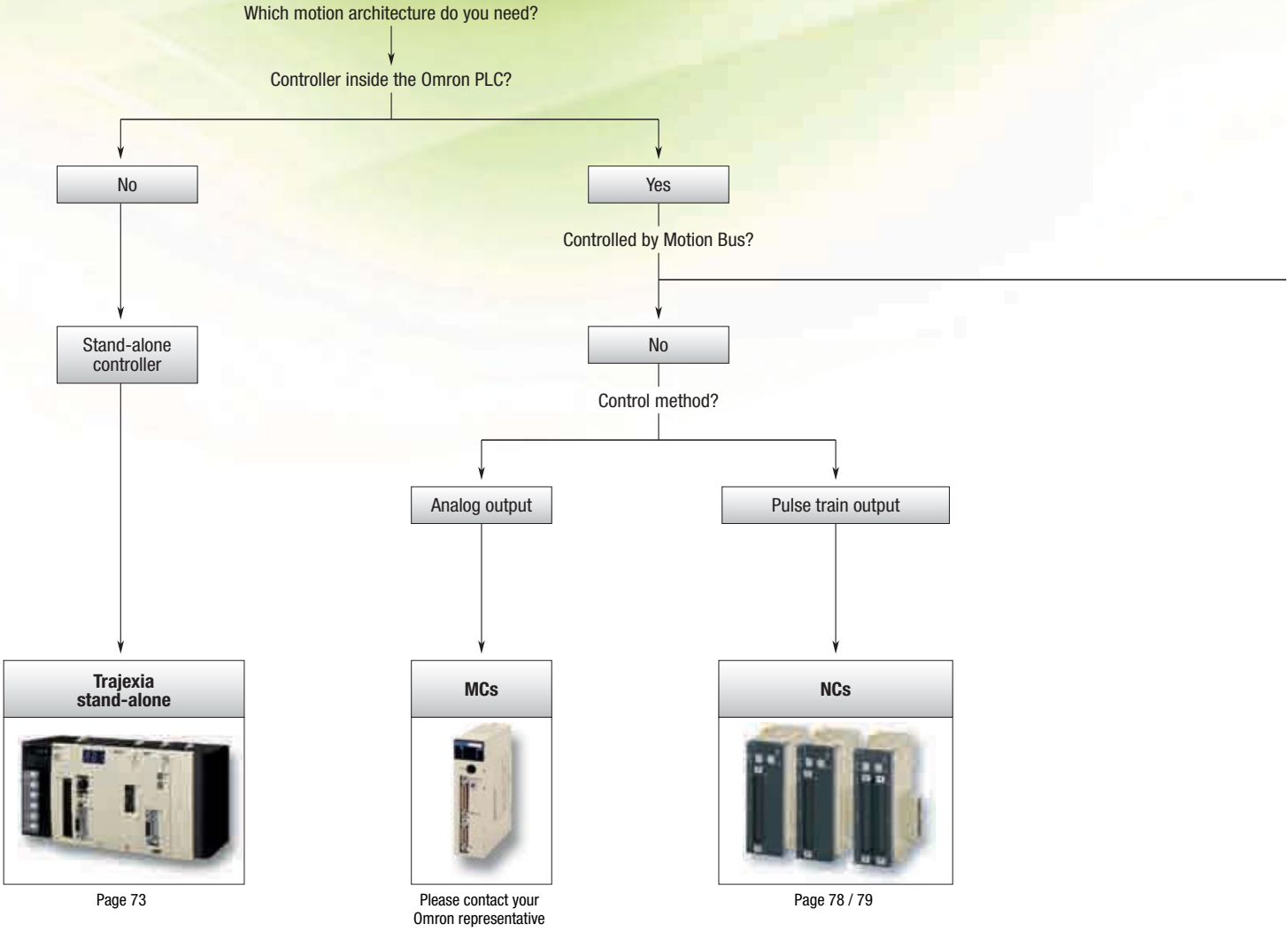
The advanced motion controller that puts you in control!

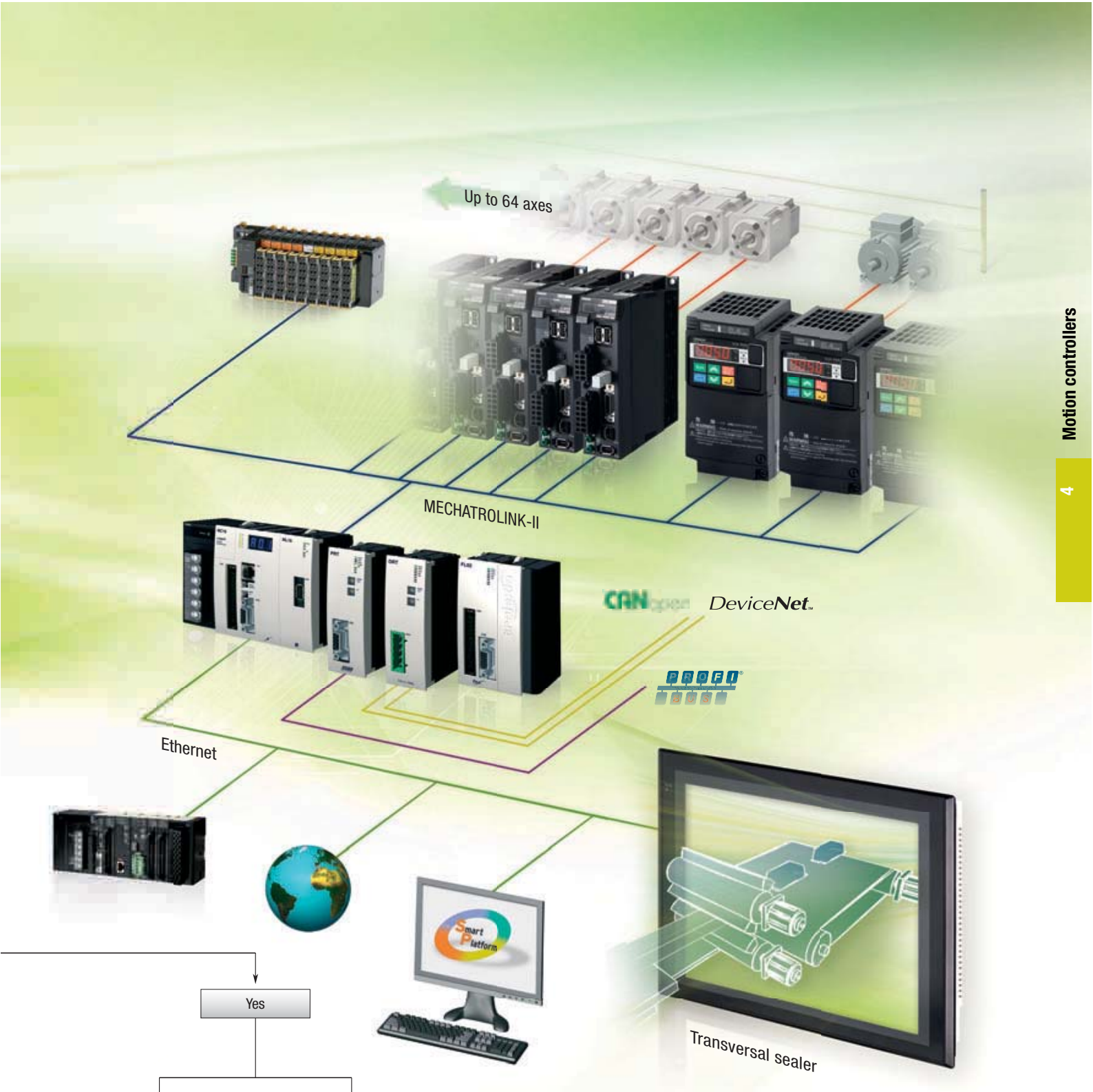
Trajexia motion platform puts you in control to create the best machines today and… tomorrow.

Trajexia stand-alone is a modular and dedicated motion controller over a motion bus and open communication.

The Trajexia-PLC motion controller unit has all the flexibility and modularity of Omron PLCs, plus the outstanding motion-control features of the Trajexia platform.

- Control of up to 64 axes over a robust and fast motion bus
- Advanced motion control such as CAM control, registration control, interpolation and axes synchronization
- Control of servos, inverters and I/Os over a single motion network
- Multi-tasking controller capable of running up to 22 tasks simultaneously





Yes

Single to multi-axes PTP applications	Advanced motion, e-cam, multi-axis synchronization
NC_71	**Trajexia MCH72**
	
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Motion controllers			
			
Model	**Trajexia stand-alone**	**Trajexia-PLC CJ1W-MCH72**	**CJ1W-NC_71**
	The advanced motion controller that puts you in control	Advanced multi-axes motion controller	16-axis point-to-point positioning controller
Axes control method	MECHATROLINK-II motion bus, analogue output and pulse-train output	MECHATROLINK-II motion bus	MECHATROLINK-II motion bus
Number of axes	4, 16, 64	30	2, 4, 16
Applicable servo drive	Accurax G5 and G-Series	Accurax G5 and G-Series	Accurax G5 and G-Series
Application	Advanced motion, e-cam, ELS, Phase shift, Registration	Advanced motion, e-cam, ELS, Phase shift, Registration	From simple PTP to multi axis PTP coordinated systems.
Servo control mode	Position, speed and torque	Position, speed and torque	Position, speed and torque
PLC series	Stand-alone motion controller: Serial, Ethernet, PROFIBUS, DeviceNet, CANopen, MECHATROLINK-II and HostLink connectivity	CJ	CJ
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Motion controllers		
		
Model	**NC_4**	**NC_3**
	4-axis point-to-point positioning controller with synchronization	4-axis point-to-point positioning controller
Axes control method	Pulse train output	Pulse train output
Number of axes	2, 4	1, 2, 4
Applicable servo drive	SmartStep 2 and Accurax G5	SmartStep 2 and Accurax G5
Application	Point-to-point with complex interpolations	Point to point applications
Servo control mode	Open loop position with linear and circular interpolation	Open loop position with linear interpolation
PLC series	CJ	CJ
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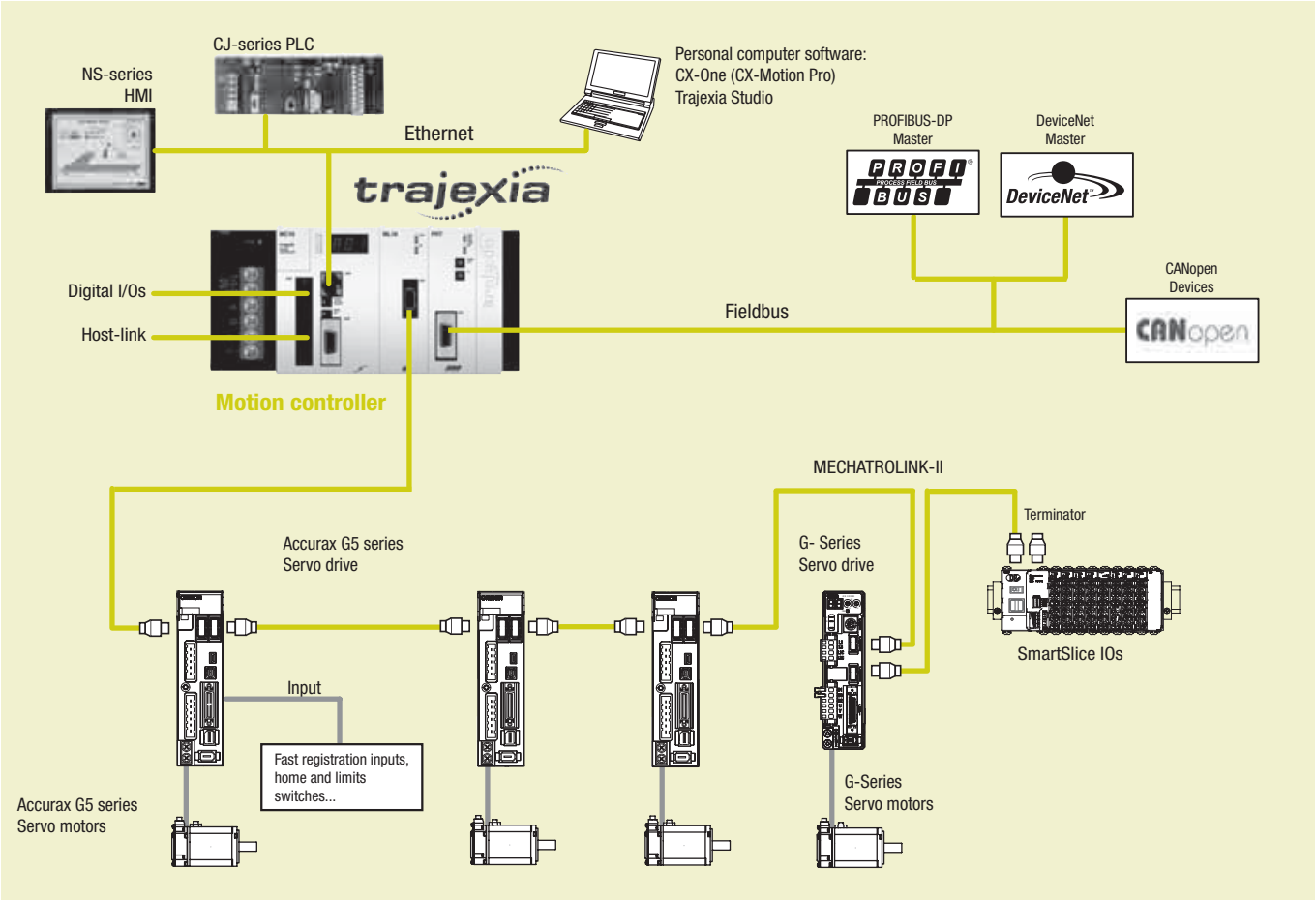
The advanced motion controller that puts you in control

Trajexia is Omron's new motion platform that offers you the performance of a dedicated motion system, the ease of use you get from an automation specialist and the peace of mind you have from a global player. Trajexia puts you in full control to create the best machines today and… tomorrow.

- Control of up to 64 axes over a robust and fast motion bus
- Advanced motion control such as CAM control, registration control, interpolation and axes synchronization via simple motion commands
- Control of servos, inverters and I/Os over a single motion network
- Multi-tasking controller capable of running up to 22 tasks simultaneously
- Open communication: serial, Ethernet built-in, PROFIBUS-DP, DeviceNet and CANopen

Ordering information



Trajexia motion controller

Name	Model
Trajexia motion controller unit, up to 4 axes. (Trajexia end cover unit TJ1-TER is included)	TJ1-MC04
Trajexia motion controller unit, up to 16 axes. (Trajexia end cover unit TJ1-TER is included)	TJ1-MC16
Trajexia motion controller unit, up to 64 axes. (Trajexia end cover unit TJ1-TER is included)	TJ2-MC64
Power supply for Trajexia system, 100-240 VAC	CJ1W-PA202
Power supply for Trajexia system, 24 VDC	CJ1W-PD022

Trajexia - axes control modules

Name	Model
Trajexia MECHATROLINK-II master unit (up to 4 stations)	TJ1-ML04
Trajexia MECHATROLINK-II master unit (up to 16 stations)	TJ1-ML16
Trajexia flexible axis unit (for 2 axes)	TJ1-FL02

Note: The TJ1-ML04 and TJ1-ML16 supported by the TJ2-MC64 motion controller are V2 (Version 2) and lot number equal or above Lot No.091019 (YYMMDD).

Trajexia - communication modules

Name	Model
Trajexia DeviceNet slave unit	TJ1-DRT
Trajexia PROFIBUS-DP slave unit	TJ1-PRT
Trajexia CANopen unit	TJ1-CORT

MECHATROLINK-II - related devices

Servo system

Name	Model
Accurax G5 servo drive ML-II built-in	R88D-KN___-ML2
G-Series servo drive ML-II built-in	R88D-GN__H-ML2

Note: Refer to servo systems section for detailed specs and ordering information

SmartSlice IOs system

Function	Specification	Model
SmartSlice Interface unit	SmartSlice MECHATROLINK-II interface unit	GRT1-ML2
End plate, one unit required per bus interface		GRT1-END
4 NPN inputs	24 VDC, 6 mA, 3-wire connection	GRT1-ID4
4 PNP inputs	24 VDC, 6 mA, 3-wire connection	GRT1-ID4-1
8 NPN inputs	24 VDC, 4 mA, 1-wire connection + 4xG	GRT1-ID8
8 PNP inputs	24 VDC, 4 mA, 1-wire connection + 4xV	GRT1-ID8-1
4 NPN outputs	24 VDC, 500 mA, 2-wire connection	GRT1-OD4
4 PNP outputs	24 VDC, 500 mA, 2-wire connection	GRT1-OD4-1
4 PNP outputs with short-circuit protection	24 VDC, 500 mA, 3-wire connection	GRT1-OD4G-1
8 NPN outputs	24 VDC, 500 mA, 1-wire connection + 4xV	GRT1-OD8
8 PNP outputs	24 VDC, 500 mA, 1-wire connection + 4xG	GRT1-OD8-1
8 PNP outputs with short-circuit protection	24 VDC, 500 mA, 1-wire connection + 4xG	GRT1-OD8G-1
2 relay outputs	240 VAC, 2 A, normally-open contacts	GRT1-ROS2
2 analogue inputs, current/voltage	±10 V, 0-10 V, 0-5 V, 1-5 V, 0-20 mA, 4-20 mA	GRT1-AD2
2 analogue outputs, voltage	± 10 V, 0-10 V, 0-5 V, 1-5 V	GRT1-DA2V
2 analogue outputs, current	0-20 mA, 4-20 mA	GRT1-DA2C

Note: Refer to Remote I/O section for detailed specs and ordering information

MECHATROLINK-II cables

Name	Remarks	Model
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II repeater	Network repeater	JEPMC-REP2000

Computer software

Specifications	Model
CX-Motion Pro V1.22 or higher	CX-One
Trajexia Studio[*1] V1.22 or higher	TJ1-Studio

[*1] When the Trajexia Studio software is included in CX-One, then it is called CX-Motion Pro.

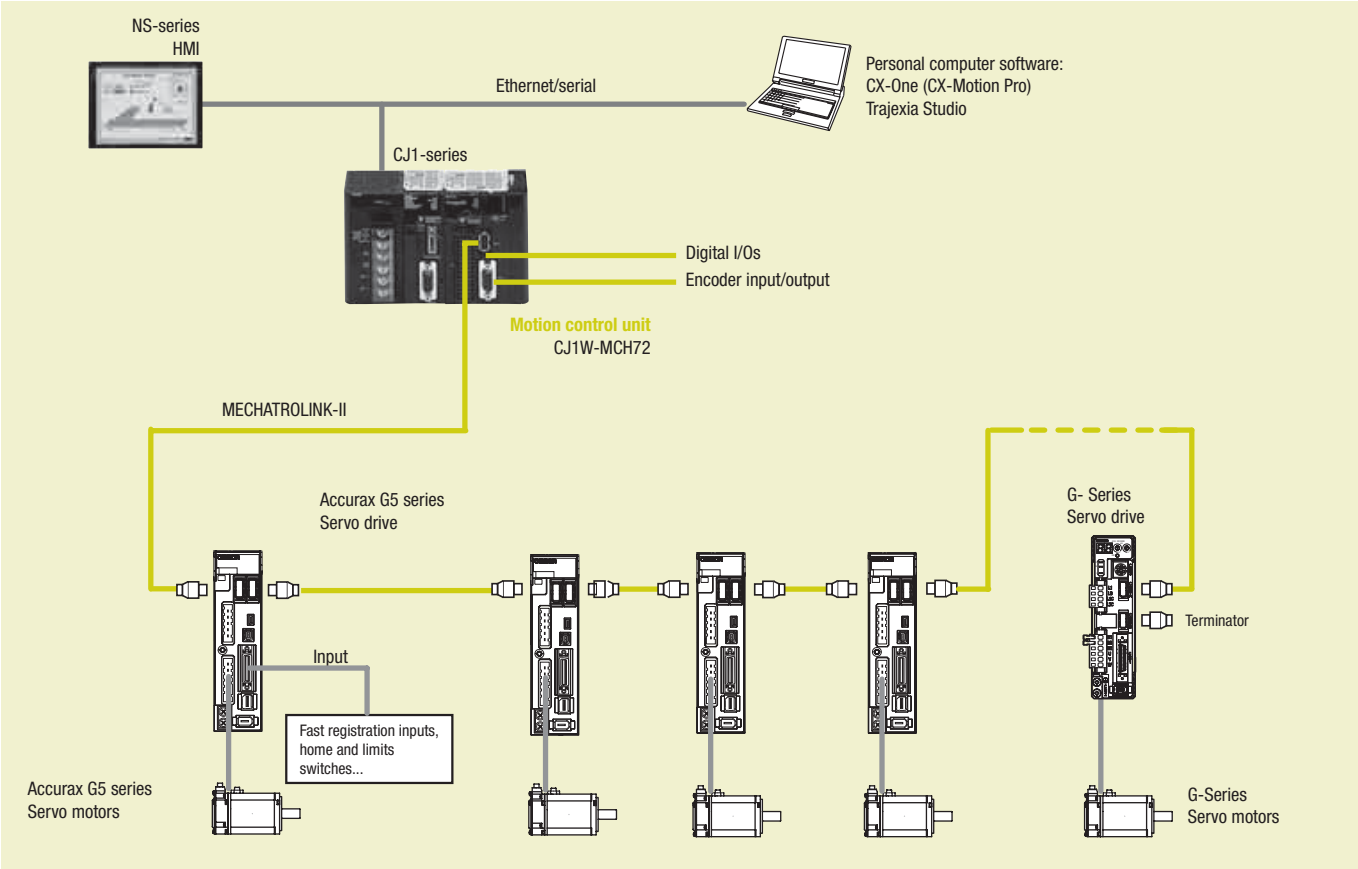


Trajexia motion controller integrated with your PLC

Trajexia, the family of advanced motion controllers that put you in control, now has a compact and integrated version. Meet Trajexia-PLC, the motion controller that has all the flexibility and modularity of Omron PLCs, plus the outstanding motion-control features of the Trajexia platform.

- Control of up to 30 physical axes
- Control of servos and inverters over a single motion network
- Advanced motion control such as CAM control, registration control, interpolation and axes synchronization via simple motion commands
- Serial port for external encoder
- Embedded digital I/Os
- I/O data exchange with the PLC CPU

Ordering information



Motion controller

Name	Model
Trajexia motion control unit - MECHATROLINK-II	CJ1W-MCH72

MECHATROLINK-II - related devices

Servo system

Name	Model
Accurax G5 servo drive ML-II built-in	R88D-KN___-ML2
G-Series servo drive ML-II built-in	R88D-GN__H-ML2

Note: Refer to servo systems section for detailed specs and ordering information

MECHATROLINK-II cables

Name	Remarks	Model
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30

Name	Remarks	Model
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II repeater	Network repeater	JEPMC-REP2000

Computer software

Specifications	Model
CX-Motion Pro V1.2 or higher	CX-One
Trajexia Studio*1 V1.2 or higher	TJ1-Studio

*1 When the Trajexia Studio software is included in CX-One, then it is called CX-Motion Pro.

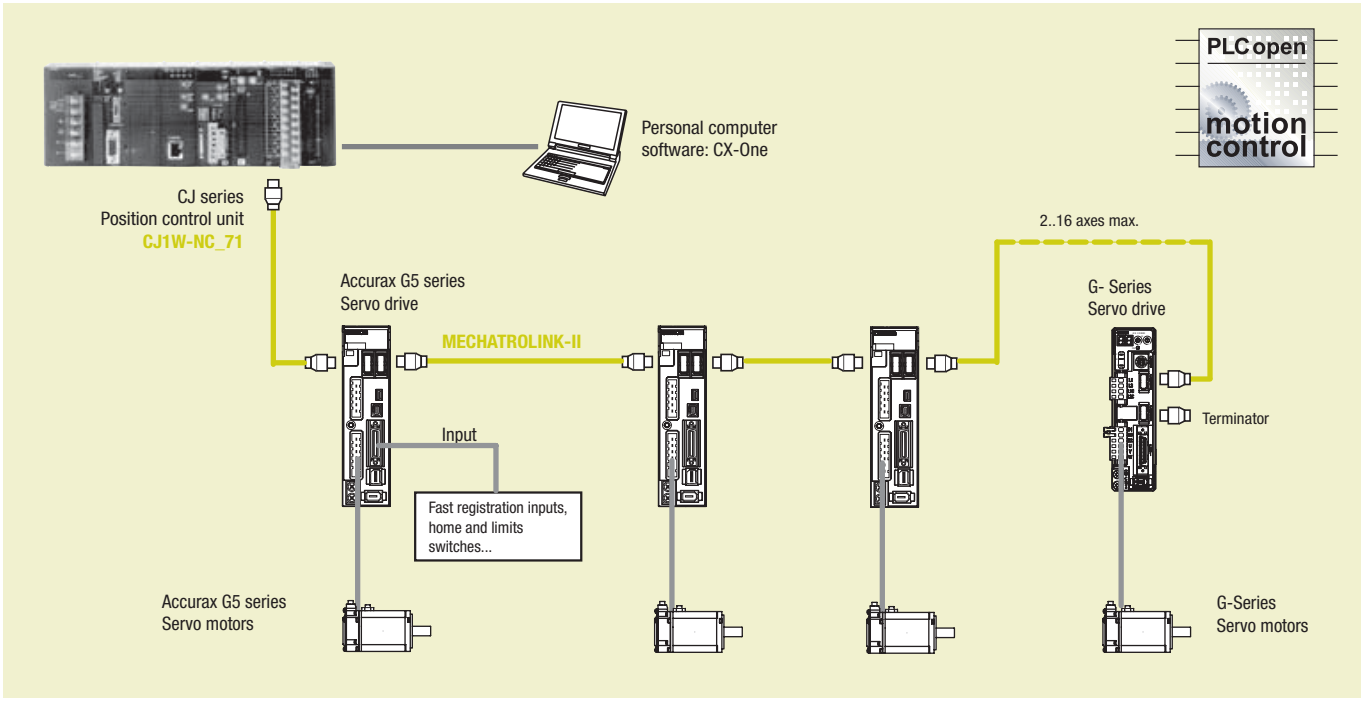


2, 4 and 16-axis point-to-point positioning controller over MECHATROLINK-II

NC_71 is a powerful controller for point-to-point applications. It is based on MECHATROLINK-II motion bus, which reduces programming and development and maintenance costs. Supports PLC open function blocks.

- Supports position, speed and torque control.
- Programming languages: ladder, function blocks. Supports PLC Open Function Blocks.
- Smart active parts for Omron HMIs terminals reduce engineering time.
- Access to the complete system from one point. Network setup, servo drives configuring and monitoring, and PLC programming.

Ordering information



Position controller unit

Name	Model
MECHATROLINK-II position controller unit - 16 axes	CJ1W-NCF71
MECHATROLINK-II position controller unit - 4 axes	CJ1W-NC471
MECHATROLINK-II position controller unit - 2 axes	CJ1W-NC271

Computer software

Specifications	Model
CX-One version 2.0 (CX-Motion NCF 1.70 or higher) CX-One version 3.0 (CX-Motion NCF 1.90 or higher) CX-One version 4.0 or higher	CX-One

MECHATROLINK-II related devices

Servo system

Name	Model
Accurax G5 servo drive ML-II built-in	R88D-KN___-ML2
G-Series servo drive ML-II built-in	R88D-GN__H-ML2

Note: Refer to servo systems section for detailed specs and ordering information

MECHATROLINK-II cables

Name	Remarks	Model
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30

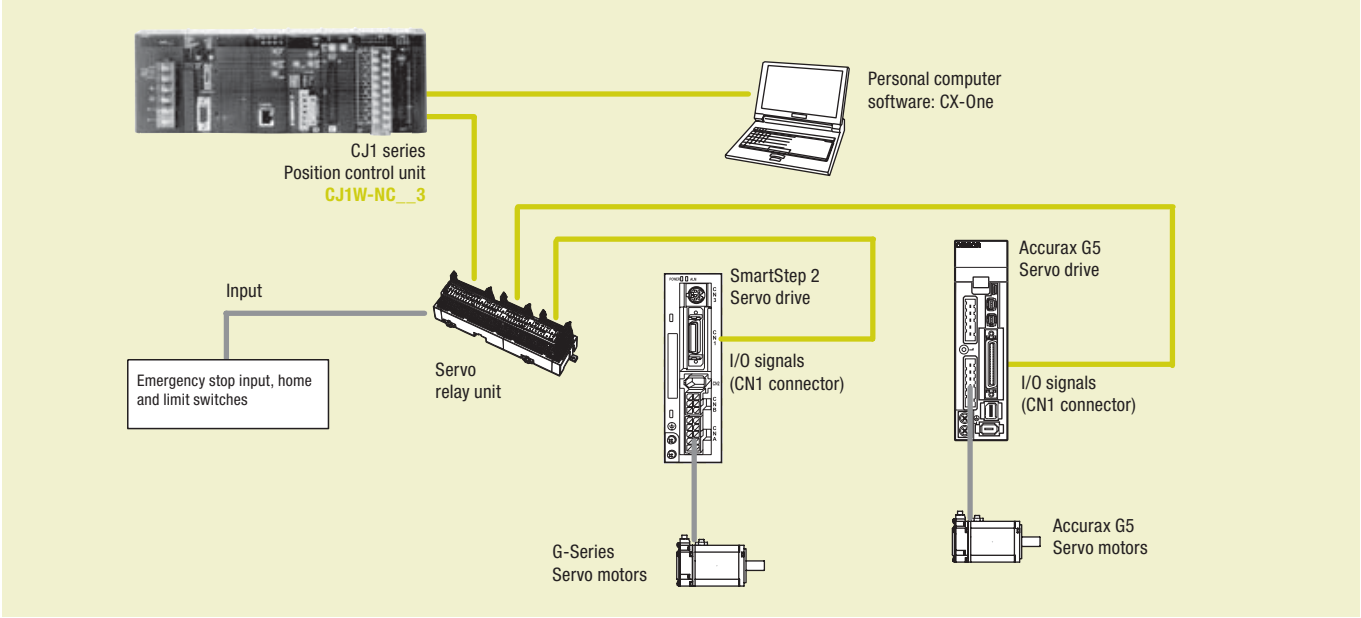


1, 2 or 4-axis point-to-point positioning controller with pulse train output

The NC motion controllers support positioning control via pulse-train outputs. Positioning is performed using trapezoidal or S-curve acceleration and deceleration. Ideal for controlling simple positioning in stepper motors and servos with pulse-train input.

- Positioning can be done by direct ladder commands
- Position and speed control
- Linear interpolation
- Interrupt feeding function
- Positioning of 100 points done from memory
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.

Ordering information



Position control unit

Name	Model
1 axis position control unit. Open-collector output.	CJ1W-NC113
2 axes position control unit. Open-collector output.	CJ1W-NC213
4 axes position control unit. Open-collector output.	CJ1W-NC413
1 axis position control unit. Line-driver output.	CJ1W-NC133
2 axes position control unit. Line-driver output.	CJ1W-NC233
4 axes position control unit. Line-driver output.	CJ1W-NC433

Servo drive cables

Note: Refer the selected servo systems section for cable and servo relay units information.

Computer software

Specifications	Model
CX-One	CX-One

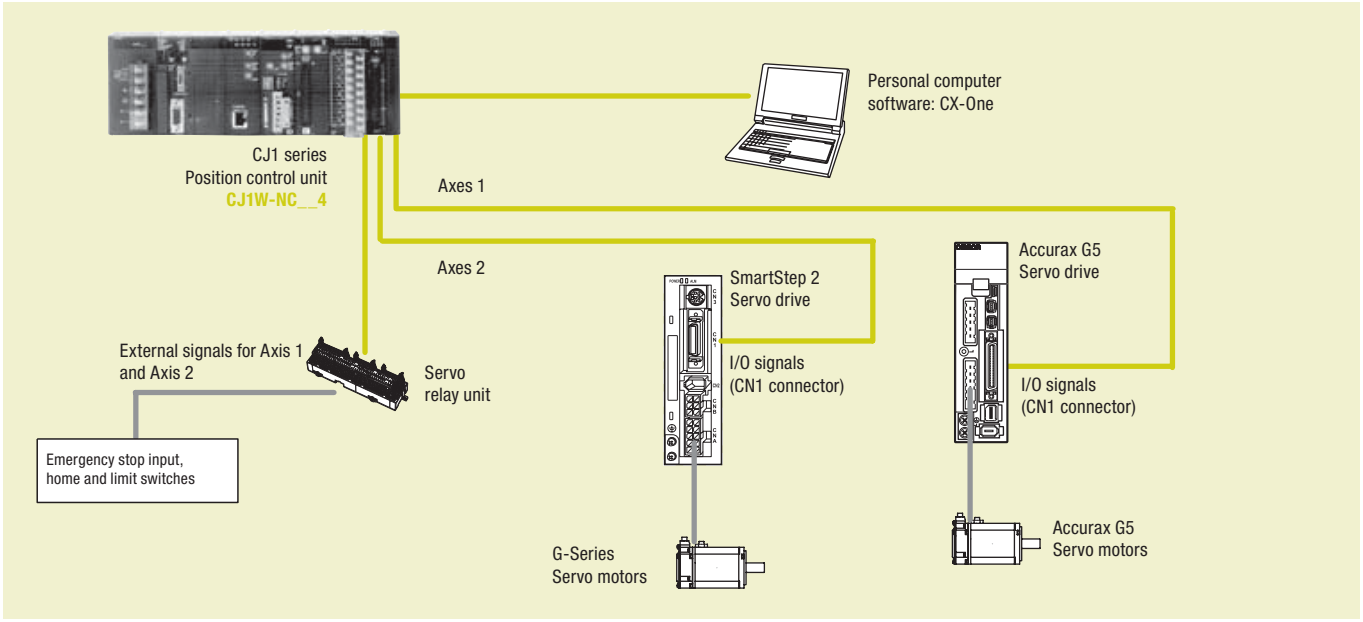


2 or 4-axis point-to-point positioning controller with pulse train output and motion control unit functionality

The NC motion controllers support positioning control via pulse-train outputs. Positioning is performed using trapezoidal or S-curve acceleration and deceleration. Ideal for controlling simple positioning in stepper motors and servos with pulse-train input. When the CJ1W-NC__4 unit is used in a CJ2 CPU, it can perform also synchronous operation by use of electronic CAMs and other function blocks.

- Position and speed control
- Linear interpolation and feeder control function
- Electronic CAM profiles and axes synchronization
- Positioning of 500 points done from memory
- Programming languages: ladder, function blocks.

Ordering information



Position control unit

Name	Model
2 axes position control unit. Open-collector output.	CJ1W-NC214
4 axes position control unit. Open-collector output.	CJ1W-NC414
2 axes position control unit. Line-driver output.	CJ1W-NC234
4 axes position control unit. Line-driver output.	CJ1W-NC434

Servo drive cables

Note: Refer to selected servo systems section for cable and servo relay units information.

Computer software

Specifications	Model
CX-One	CX-One

EXTREME MECHATRONICS MEETS X-STREAM AUTOMATION

At the heart of every great machine

Great machines are born from a perfect match between control and mechanics. Accurax G5 gives you the extra edge to build more accurate, faster, smaller and safer machines. You will benefit from an almost 25% reduction in motor weight, and gain 50% cabinet space. You will achieve sub micron precision and ms settling time. Some might call it perfection, we just call it tireless innovation to help you build great machines.

- Motion bus built-in and analogue/pulse models
- High response frequency of 2 kHz
- Safety built-in conforming ISO13849-1 PL-d
- High accuracy provided by 20 bit encoder

Which motion controller is used?

Trajexia stand-alone



Trajexia MCH72



NC_71



Accurax G5



G-Series



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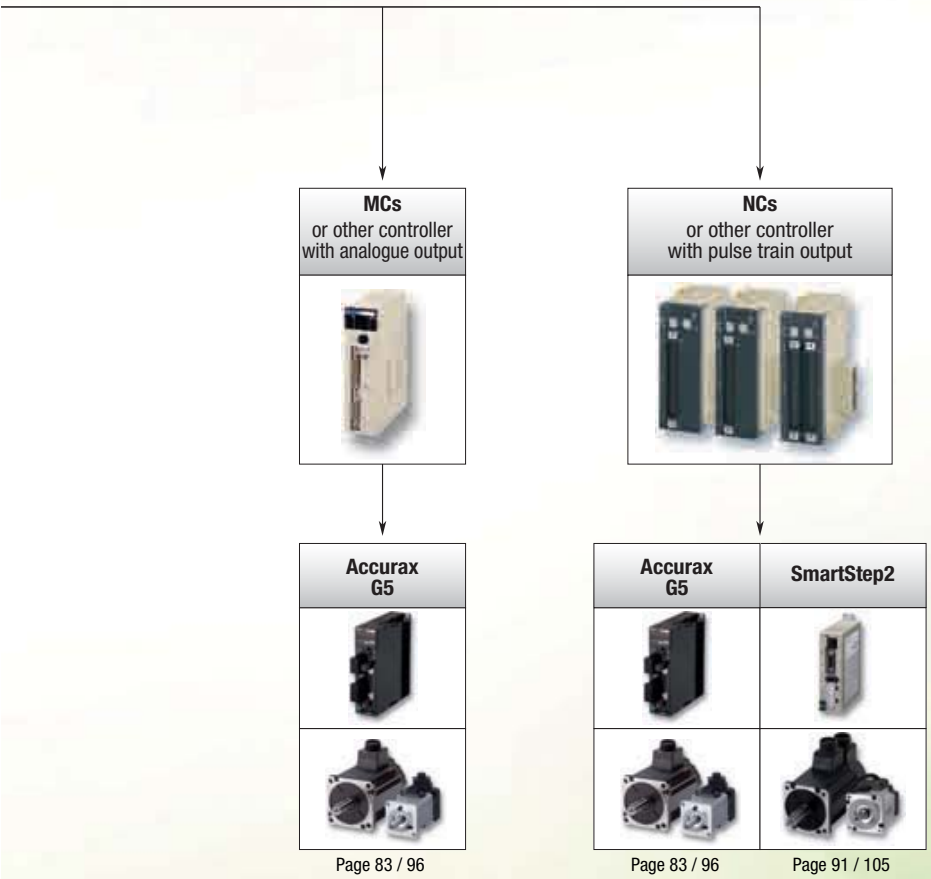
MCs
or other controller
with analogue output
NCs
or other controller
with pulse train output
Accurax
G5
Accurax
G5
SmartStep2
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Selection table

	Servo drives		
			
	Accurax G5	**G-Series**	**SmartStep 2**
	Extreme mechatronics meets X-Stream Automation	Compact in size big in features	The right step forward
Ratings 230 V single-phase	100 W to 1,500 W	100 W to 1,500 W	100 W to 750 W
Ratings 400 V three-phase	600 W to 5 kW	N/A	N/A
Applicable servomotor	Accurax G5 and G-Series motors	G-Series motors	G-Series motors
Position control	Pulse train input or via MECHATROLINK-II	MECHATROLINK-II	Pulse train input
Speed control	Analogue ±10 V or via MECHATROLINK-II	MECHATROLINK-II	N/A
Torque control	Analogue ±10 V or via MECHATROLINK-II	MECHATROLINK-II	N/A
Safety approvals	ISO13849-1:2008 (PL d), EN 954-1:1996 (Cat-3)	N/A	N/A
Full closed loop	Built-in	N/A	N/A
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	Accurax G5 servo motors		
			
	3000 r/min motor	**2000 r/min motor**	**1000 r/min motor**
Rated speed	3,000 rpm	2,000 rpm	1,000 rpm
Maximum speed	4,500 to 6,000 rpm	3,000 rpm	2,000 rpm
Rated torque	0.16 Nm to 15.9 Nm	1.91 Nm to 23.9 Nm	8.59 Nm to 28.7 Nm
Sizes	50 W to 5 kW	400 W to 5 kW	900 W to 3 kW
Applicable servo drive	Accurax G5 servo drive	Accurax G5 servo drive	Accurax G5 servo drive
Encoder resolution	20-bit incremental/ 17-bit absolute	20-bit incremental/ 17-bit absolute	20-bit incremental/ 17-bit absolute
IP rating	IP67	IP67	IP67
Page	96		

	G-Series servo motors -Cylindrical type-			G-Series servo motors -Flat type-
				
	3000 r/min motor	**2000 r/min motor**	**1000 r/min motor**	**3000 r/min motor**
Rated speed	3,000 rpm	2,000 rpm	1,000 rpm	3,000 rpm
Maximum speed	4,500 to 5,000 rpm	3,000 rpm	2,000 rpm	5,000 rpm
Rated torque	0.16 Nm to 4.77 Nm	4.8 Nm to 7.15 Nm	8.62 Nm	0.32 Nm to 1.3 Nm
Sizes	50 to 1,500 W	1 to 1.5 kW	900 W	100 to 400 W
Applicable servo drive	SmartStep 2 , G-Series and Accurax G5 servo drives	SmartStep 2 , G-Series and Accurax G5 servo drives	SmartStep 2 , G-Series and Accurax G5 servo drives	SmartStep 2 , G-Series and Accurax G5 servo drives
Encoder resolution	10,000 pulses/revolution or 17-bit absolute/incremental	10,000 pulses/revolution or 17-bit absolute/incremental	10,000 pulses/revolution or 17-bit absolute/incremental	10,000 pulses/revolution or 17-bit absolute/incremental
IP rating	IP65	IP65	IP65	IP65
Page	105			

Accurax G5 servo drive



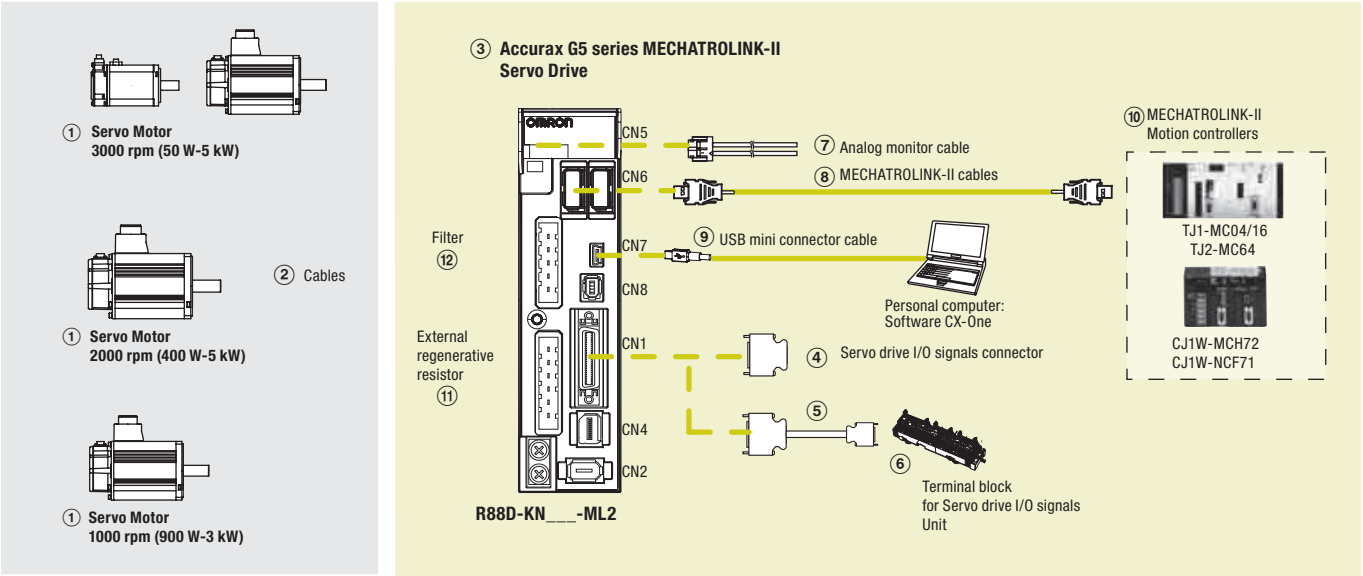
Accurate, fast and safe motion control in compact size

Accurax G5 gives you the extra edge to build accurate, faster, smaller and safer machines. You will benefit from an almost 25% reduction in motor weight, and gain 50% cabinet space. You will achieve sub micron precision and ms settling time.

- MECHATROLINK-II and Analogue/Pulse servo drive models
- Safety conforming ISO13849-1 Performance Level D
- High response frequency of 2 kHz
- High resolution serial encoder for greater accuracy provided by 20 bits encoder
- External encoder input for full close loop
- Real time auto-tuning
- Advanced tuning algorithms

Ordering information

Accurax G5 series MECHATROLINK-II reference configuration



Servo motors, power & encoder cables

Note: ①② Refer to the Accurax G5 servo motor section for servomotor, motor cables or connectors selection

Servo drives

Symbol	Specifications		Servo drive model	① Compatible G5 series rotary servo motors
③	1 phase 230 VAC	100 W	R88D-KN01H-ML2	R88M-K05030(H/T)-_
				R88M-K10030(H/T)-_
		200 W	R88D-KN02H-ML2	R88M-K20030(H/T)-_
		400 W	R88D-KN04H-ML2	R88M-K40030(H/T)-_
		750 W	R88D-KN08H-ML2	R88M-K75030(H/T)-_
		1.0 kW	R88D-KN10H-ML2	R88M-K1K020(H/T)-_
		1.5 kW	R88D-KN15H-ML2	R88M-K1K030(H/T)-_
				R88M-K1K530(H/T)-_
				R88M-K1K520(H/T)-_
				R88M-K90010(H/T)-_

Symbol	Specifications		Servo drive model	① Compatible G5 series rotary servo motors
③	3 phase 400 VAC	600 W	R88D-KN06F-ML2	R88M-K40020(F/C)-_
				R88M-K60020(F/C)-_
		1.0 kW	R88D-KN10F-ML2	R88M-K75030(F/C)-_
				R88M-K1K020(F/C)-_
		1.5 kW	R88D-KN15F-ML2	R88M-K1K030(F/C)-_
				R88M-K1K530(F/C)-_
				R88M-K1K520(F/C)-_
				R88M-K90010(F/C)-_
		2.0 kW	R88D-KN20F-ML2	R88M-K2K030(F/C)-_
				R88M-K2K020(F/C)-_
		3.0 kW	R88D-KN30F-ML2	R88M-K3K030(F/C)-_
				R88M-K3K020(F/C)-_
				R88M-K2K010(F/C)-_
		5.0 kW	R88D-KN50F-ML2	R88M-K4K030(F/C)-_
				R88M-K5K030(F/C)-_
				R88M-K4K020(F/C)-_
				R88M-K5K020(F/C)-_
				R88M-K3K010(F/C)-_

Control cables (for CN1)

Symbol	Description	Connect to	Length	Model
④	I/O connector kit (26 pins)	For I/O general purpose	-	R88A-CNW01C
⑤	Terminal block cable		1 m	XW2Z-100J-B34
			2 m	XW2Z-200J-B34
⑥	Terminal block (M3 screw and for pin terminals)		-	XW2B-20G4
	Terminal block (M3.5 screw and for fork/round terminals)		-	XW2B-20G5
	Terminal block (M3 screw and for fork/round terminals)		-	XW2D-20G6

Analogue monitor (for CN5)

Symbol	Name	Length	Model
⑦	Analogue monitor cable	1m	R88A-CMK001S

MECHATROLINK-II cables (for CN6)

Symbol	Specifications	Length	Model
⑧	MECHATROLINK-II Terminator resistor	-	JEPMC-W6022-E
	MECHATROLINK-II cables	0.5 m	JEPMC-W6003-A5-E
		1 m	JEPMC-W6003-01-E
		3 m	JEPMC-W6003-03-E
		5 m	JEPMC-W6003-05-E
		10 m	JEPMC-W6003-10-E
		20 m	JEPMC-W6003-20-E
		30 m	JEPMC-W6003-30-E

USB personal computer cable (for CN7)

Symbol	Name	Length	Model
⑨	USB mini-connector cable	2m	AX-CUSBM002-E

MECHATROLINK-II Motion controllers

Symbol	Name	Model
⑩	Trajexia stand-alone motion controller	TJ1-MC04 (4 axes)
		TJ1-MC16 (16 axes)
		TJ2-MC64 (64 axes)
	Trajexia-PLC motion controller	CJ1W-MCH72
	Position Controller Unit for CJ1 PLC	CJ1W-NCF71 (16 axes)
		CJ1W-NC471 (4 axes)
		CJ1W-NC271 (2 axes)
	Position Controller Unit for CS1 PLC	CS1W-NCF71 (16 axes)
		CS1W-NC471 (4 axes)
		CS1W-NC271 (2 axes)

External regenerative resistor

Symbol	Specifications	Model
⑪	50 Ω, 80 W	R88A-RR08050S
	100 Ω, 80 W	R88A-RR080100S
	47 Ω, 220 W	R88A-RR22047S
	20 Ω, 500 W	R88A-RR50020S

Filters

Symbol	Applicable servodrive	Rated current	Leakage current	Rated voltage	Model
⑫	R88D-KN01H-ML2, R88D-KN02H-ML2	2.4 A	3.5 mA	250 VAC single-phase	R88A-FIK102-RE
	R88D-KN04H-ML2	4.1 A	3.5 mA		R88A-FIK104-RE
	R88D-KN08H-ML2	6.6 A	3.5 mA		R88A-FIK107-RE
	R88D-KN10H-ML2, R88D-KN15H-ML2	14.2 A	3.5 mA		R88A-FIK114-RE
	R88D-KN06F-ML2, R88D-KN10F-ML2, R88D-KN15F-ML2	4 A	0.3 mA / 32 mA[*1]	400 VAC three-phase	R88A-FIK304-RE
	R88D-KN20F-ML2	6 A	0.3 mA / 32 mA[1]		R88A-FIK306-RE
	R88D-KN30F-ML2, R88D-KN50F-ML2	12.1 A	0.3 mA / 32 mA[1]		R88A-FIK312-RE

*1 Momentary peak leakage current for the filter at switch-on/off.

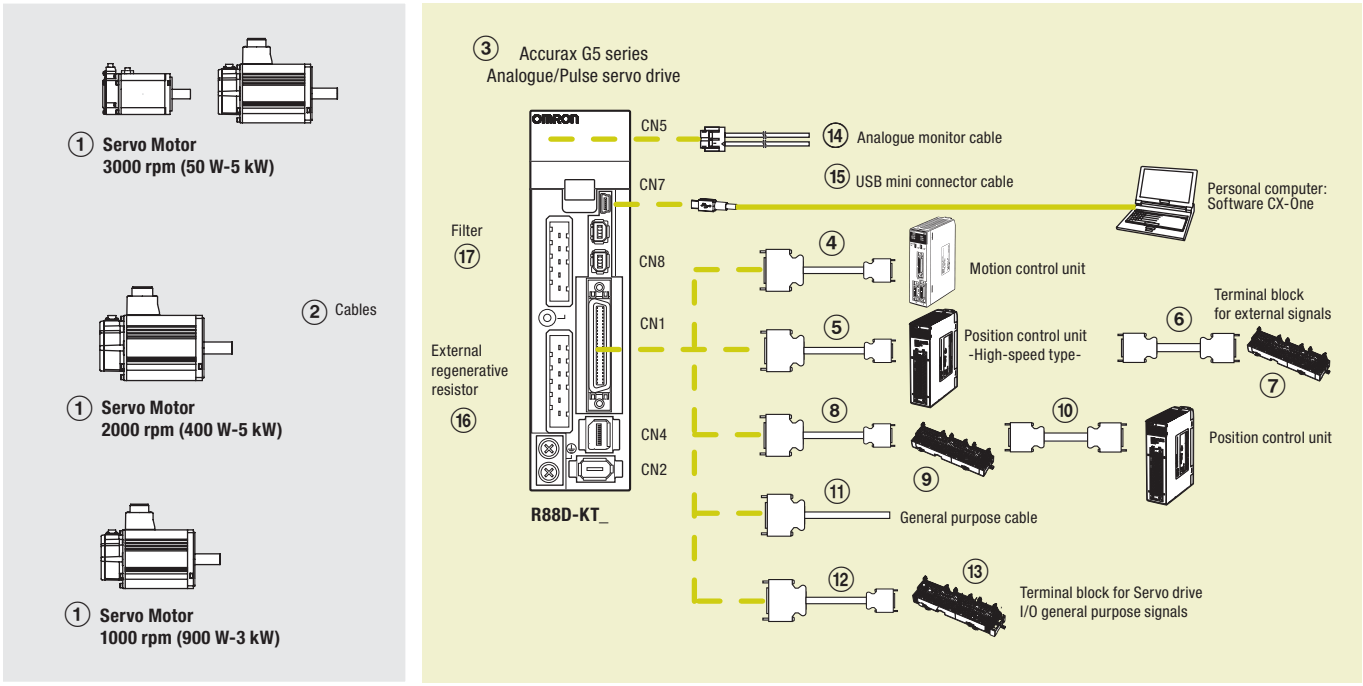
Connectors

Specifications	Model
External encoder connector (for CN4)	R88A-CNK41L
Safety I/O signal connector (for CN8)	R88A-CNK81S

Computer software

Specifications	Model
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.91 or higher)	CX-drive

Accurax G5 series Analogue/pulse Reference configuration



Servo motors, power & encoder cables

Note: ①② Refer to the Accurax G5 servo motor section for servomotor, motor cables or connectors selection

Servo drives

Symbol	Specifications		Servo drive model	① Compatible Accurax G5 series rotary servo motors
③	1 phase 230 VAC	100 W	R88D-KT01H	R88M-K05030(H/T)-_
				R88M-K10030(H/T)-_
		200 W	R88D-KT02H	R88M-K20030(H/T)-_
		400 W	R88D-KT04H	R88M-K40030(H/T)-_
		750 W	R88D-KT08H	R88M-K75030(H/T)-_
		1.0 kW	R88D-KT10H	R88M-K1K020(H/T)-_
		1.5 kW	R88D-KT15H	R88M-K1K030(H/T)-_
				R88M-K1K530(H/T)-_
				R88M-K1K520(H/T)-_
				R88M-K90010(H/T)-_
	3 phase 400 VAC	600 W	R88D-KT06F	R88M-K40020(F/C)-_
				R88M-K60020(F/C)-_
		1.0 kW	R88D-KT10F	R88M-K75030(F/C)-_
				R88M-K1K020(F/C)-_
		1.5 kW	R88D-KT15F	R88M-K1K030(F/C)-_
				R88M-K1K530(F/C)-_
				R88M-K1K520(F/C)-_
				R88M-K90010(F/C)-_
		2.0 kW	R88D-KT20F	R88M-K2K030(F/C)-_
				R88M-K2K020(F/C)-_
		3.0 kW	R88D-KT30F	R88M-K3K030(F/C)-_
				R88M-K3K020(F/C)-_
				R88M-K2K010(F/C)-_
		5.0 kW	R88D-KT50F	R88M-K4K030(F/C)-_
				R88M-K5K030(F/C)-_
				R88M-K4K020(F/C)-_
				R88M-K5K020(F/C)-_
				R88M-K3K010(F/C)-_

Control cables (for CN1)

Symbol	Description	Connect to	Length	Model
④	Control cable (1 axis)	Motion control units CS1W-MC221 CS1W-MC421	1 m	R88A-CPG001M1
			2 m	R88A-CPG002M1
			3 m	R88A-CPG003M1
			5 m	R88A-CPG005M1
	Control cable (2 axis)	Motion control units CS1W-MC221 CS1W-MC421	1 m	R88A-CPG001M2
			2 m	R88A-CPG002M2
			3 m	R88A-CPG003M2
			5 m	R88A-CPG005M2

Symbol	Description	Connect to	Length	Model
⑤	Control cable (line-driver output for 1 axis)	Position control units CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G9
			5 m	XW2Z-500J-G9
			10 m	XW2Z-10MJ-G9
	Control cable (open-collector output for 1 axis)	Position control units CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G13
			3 m	XW2Z-300J-G13
	Control cable (line-driver output for 2 axis)	Position control units CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G1
			5 m	XW2Z-500J-G1
			10 m	XW2Z-10MJ-G1
	Control cable (open-collector output for 2 axis)	Position control units CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G5
			3 m	XW2Z-300J-G5
⑥	Terminal block cable for external signals (for input common, forward/reverse run prohibited inputs, emergency stop input, origin proximity input and interrupt input)	Position control units CJ1W-NC234 CJ1W-NC434 CJ1W-NC214 CJ1W-NC414	0.5 m	XW2Z-C50X
			1 m	XW2Z-100X
			2 m	XW2Z-200X
			3 m	XW2Z-300X
			5 m	XW2Z-500X
			10 m	XW2Z-010X
⑦	Terminal block for external signals (M3 screw, pin terminals)		-	XW2B-20G4
	Terminal block for ext. signals (M3.5 screw, fork/round terminals)		-	XW2B-20G5
	Terminal block for ext. signals (M3 screw, fork/round terminals)		-	XW2D-20G6
⑧	Cable from servo relay unit to servo drive	CS1W-NC1_3, CJ1W-NC1_3, C200HW-NC113, CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3, C200HW-NC213/413, CQM1H-PLB21 or CQM1-CPU43	1 m	XW2Z-100J-B25
			2 m	XW2Z-200J-B25
		CJ1M-CPU21/22/23	1 m	XW2Z-100J-B31
			2 m	XW2Z-200J-B31
⑨	Servo relay unit	Position control units CS1W-NC1_3, CJ1W-NC1_3 or C200HW-NC113	-	XW2B-20J6-1B (1 axis)
		Position control units CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3 or C200HW-NC213/413	-	XW2B-40J6-2B (2 axes)
		CQM1H-PLB21 or CQM1-CPU43	-	XW2B-20J6-3B (1 axis)
		CJ1M-CPU21/22/23	-	XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes)
⑩	Position control unit connecting cable	CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 or C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 or C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU21/22/23	0.5 m	XW2Z-050J-A33
			1 m	XW2Z-100J-A33
⑪	General purpose cable	For general purpose controllers	1 m	R88A-CPG001S
			2 m	R88A-CPG002S
⑫	Terminal block cable	For general purpose controllers	1 m	XW2Z-100J-B24
			2 m	XW2Z-200J-B24
⑬	Terminal block (M3 screw and for pin terminals)		-	XW2B-50G4
	Terminal block (M3.5 screw and for fork/round terminals)		-	XW2B-50G5
	Terminal block (M3 screw and for fork/round terminals)		-	XW2D-50G6

Analogue monitor (for CN5)

Symbol	Name	Length	Model
⑭	Analogue monitor cable	1 m	R88A-CMK001S

USB personal computer cable (for CN7)

Symbol	Name	Length	Model
⑮	USB mini-connector cable	2 m	AX-CUSBM002-E

External regenerative resistor

Symbol	Specifications	Model
⑯	50 Ω, 80 W	R88A-RR08050S
	100 Ω, 80 W	R88A-RR080100S
	47 Ω, 220 W	R88A-RR22047S
	20 Ω, 500 W	R88A-RR50020S

Filters

Symbol	Applicable servodrive	Rated current	Leakage current	Rated voltage	Filter model
⑰	R88D-KT01H, R88D-KT02H	2.4 A	3.5 mA	250 VAC single-phase	R88A-FIK102-RE
	R88D-KT04H	4.1 A	3.5 mA		R88A-FIK104-RE
	R88D-KT08H	6.6 A	3.5 mA		R88A-FIK107-RE
	R88D-KT10H, R88D-KT15H	14.2 A	3.5 mA		R88A-FIK114-RE
	R88D-KT06F, R88D-KT10F, R88D-KT15F	4 A	0.3 mA / 32 mA*1	400 VAC three-phase	R88A-FIK304-RE
	R88D-KT20F	6 A	0.3 mA / 32 mA[1]		R88A-FIK306-RE
	R88D-KT30F, R88D-KT50F	12.1 A	0.3 mA / 32 mA[1]		R88A-FIK312-RE

*1 Momentary peak leakage current for the filter at switch-on/off.

Connectors

Specifications	Model
I/O connector kit -50 pins-(for CN1)	R88A-CNU11C
External encoder connector (for CN4)	R88A-CNK41L
Safety I/O signal connector (for CN8)	R88A-CNK81S

Computer software

Specifications	Model
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.90 or higher)	CX-drive

Specifications

Single-phase, 230 V

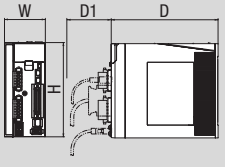
Servo drive type		R88D-K_	01H_	02H_	04H_	08H_	10H_	15H_
Applicable servo motor		R88M-K_	05030(H/T)_	20030(H/T)_	40030(H/T)_	75030(H/T)_	1K020(H/T)_	1K030(H/T)_
			10030(H/T)_	-	-	-	-	1K530(H/T)_
			-	-	-	-	-	1K520(H/T)_
			-	-	-	-	-	90010(H/T)_
Basic specifications	Max. applicable motor capacity	W	100	200	400	750	1000	1500
	Continuous output current	Arms	1.2	1.6	2.6	4.1	5.9	9.4
	Input power	Main circuit	Single-phase/3-phase, 200 to 240 VAC + 10 to -15% (50/60 Hz)					
	Supply	Control circuit	Single-phase, 200 to 240 VAC + 10 to -15% (50/60 Hz)					
	Control method		IGBT-driven PWM method, sinusoidal drive					
	Feedback		Serial encoder (incremental/absolute value)					
	Conditions: Usage/storage temperature		0 to +55°C / -20 to 65°C					
	Conditions: Usage/storage humidity		90% RH or less (non-condensing)					
	Conditions: Altitude		1000m or less above sea level					
	Conditions: Vibration/shock resistance	(max.)	5.88 m/s^2 10-60 Hz (Continuous operation at resonance point is not allowed) / 19.6 m/s^2					
	Configuration		Base mounted					
	Approx. weight	Kg	0.8		1.1	1.6	1.8	

Three-phase, 400 V

Servo drive type		R88D-K_	06F-_	10F-_	15F-_	20F-_	30F-_	50F-_
Applicable servo motor		R88M-K_	40020(F/C)-_	75030(F/C)-_	1K030(F/C)-_	2K030(F/C)-_	3K030(F/C)-_	4K030(F/C)-_
			60020(F/C)-_	1K020(F/C)-_	1K530(F/C)-_	2K020(F/C)-_	3K020(F/C)-_	5K030(F/C)-_
			-	-	1K520(F/C)-_	-	2K010(F/C)-_	4K020(F/C)-_
			-	-	90010(F/C)-_	-	-	5K020(F/C)-_
			-	-	-	-	-	3K010(F/C)-_
Basic specifications	Max. applicable motor capacity	W	0.6	1.0	1.5	2.0	3.0	5.0
	Continuous output current	Arms	2.9		4.7	6.7	9.4	16.5
	Input power	Main circuit	3-phase, 380 to 480 VAC + 10 to -15% (50/60Hz)					
	Supply	Control circuit	24 VDC ±15%					
	Control method		IGBT-driven PWM method, sinusoidal drive					
	Feedback		Serial encoder (incremental/absolute value)					
	Conditions: Usage/storage temperature		0 to +55°C / -20 to +65°C					
	Conditions: Usage/storage humidity		90% RH or less (non-condensing)					
	Conditions: Altitude		1000 m or less above sea level					
	Conditions: Vibration/shock resistance		5.88 m/s^2 10-60 Hz (Continuous operation at resonance point is not allowed) / 19.6 m/s^2					
	Configuration		Base mounted					
	Approx. weight	kg	1.9			2.7	4.7	

Dimensions

Drive model	Specification		Analogue/pulse model H	W	D	D1	ML2 model H	W	D	D1
R88D-KT01/02H, R88D-KN01/02H-ML2	230 V	100-200 W	150	40	130	70	150	40	132	70
R88D-KT04H, R88D-KN04H-ML2		400 W	150	55	130	70	150	55	132	70
R88D-KT08H, R88D-KN08H-ML2		750 W	150	65	170	70	150	65	172	70
R88D-KT10/15H, R88D-KN10/15H-ML2		1-1.5 kW	150	85	170	70	150	86	172	70
R88D-KT06/10/15F, R88D-KN06/10/15F-ML2	400 V	600 W-1.5 kW	150	91	170	70	150	92	172	70
R88D-KT20F, R88D-KN20F-ML2		2 kW	198	94	193.5	70	198	94	195	70
R88D-KT30/50F, R88D-KN30/50F-ML2		3-5 kW	250	130	212	70	250	130	213	70



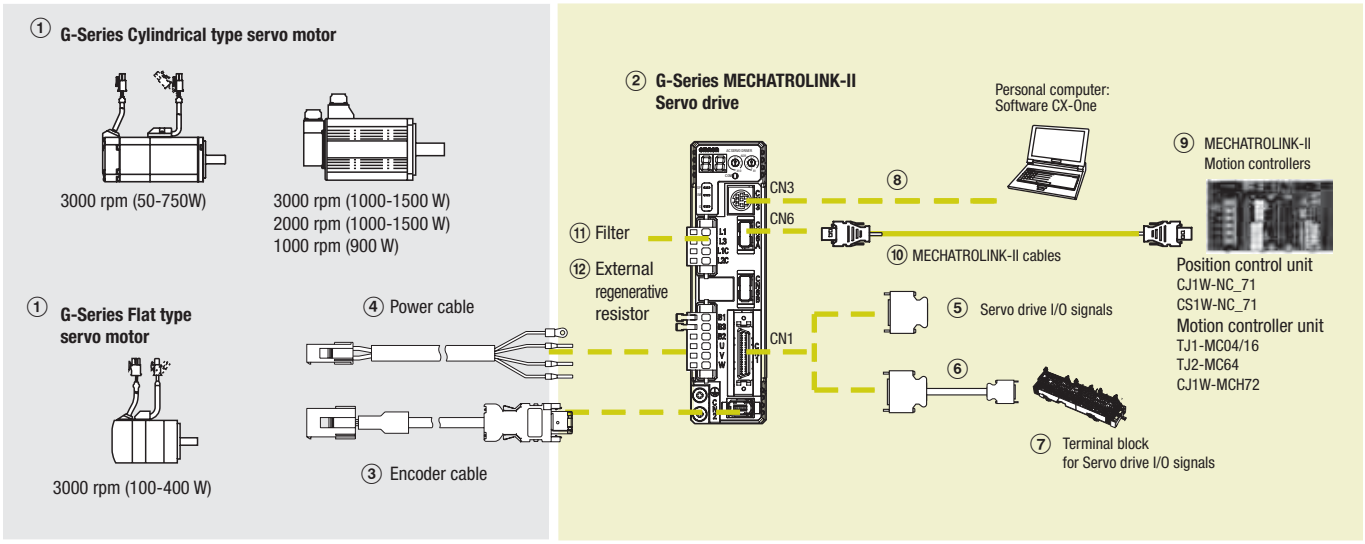


Compact in size, big in features. Save space, save wiring, save time

The G-series servo drive with built-in MECHATROLINK-II significantly reduces wiring and set-up time, while saving up to 30% of cabinet space. So you not only save on space, wiring and installation time, but also significantly reduce the chance of connection errors.

- High response frequency of 1 kHZ
- Auto-tuning for easy and quick start-up
- Vibration suppression and adaptive resonance suppression filter
- Positioning, speed and torque control modes
- Fast and accurate positioning
- Separated supply for main power and control power
- Incremental and absolute encoder available

Ordering information



Servo motors, power & encoder cables

Note: ①③④ Refer to the G-Series servo motor section for servomotor, motor cables or connectors selection

Servo drives

Symbol	Specifications		① Compatible rotary servo motors		Order code
			Cylindrical type	Flat type	Servo drive model
②	1 phase 200 VAC	100 W	R88M-G05030_	R88M-GP10030_	R88D-GN01H-ML2
			R88M-G10030_		
		200 W	R88M-G20030_	R88M-GP20030_	R88D-GN02H-ML2
		400 W	R88M-G40030_	R88M-GP40030_	R88D-GN04H-ML2
		750 W	R88M-G75030_	-	R88D-GN08H-ML2
		1.0 kW	R88M-G1K020T_	-	R88D-GN10H-ML2
		1.5 kW	R88M-G90010T_	-	R88D-GN15H-ML2
			R88M-G1K030T_	-	
			R88M-G1K520T_	-	
			R88M-G1K530T_	-	

Control cables (for CN1)

Symbol	Name	Connect to	Length	Model
⑤	I/O connector kit	Servo drive I/O signals	-	R88A-CNU01C
⑥	Terminal block cable		1 m	XW2Z-100J-B33
			2 m	XW2Z-200J-B33
⑦	Terminal block		-	XW2B-20G4
				XW2B-20G5
				XW2D-20G6

Computer cable (for CN3)

Symbol	Name	Length	Model
⑧	Computer cable RS232	2 m	R88A-CCG002P2

MECHATROLINK-II Motion controllers

Symbol	Name	Model
⑨	Trajexia stand-alone motion controller	TJ1-MC04 (4 axes)
		TJ1-MC16 (16 axes)
		TJ2-MC64 (64 axes)
	Trajexia-PLC motion controller	CJ1W-MCH72
	Position Controller Unit for CJ1 PLC	CJ1W-NCF71 (16 axes)
		CJ1W-NC471 (4 axes)
		CJ1W-NC271 (2 axes)
	Position Controller Unit for CS1 PLC	CS1W-NCF71 (16 axes)
		CS1W-NC471 (4 axes)
		CS1W-NC271 (2 axes)

Computer software

Specifications	Order code
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.70 or higher)	CX-drive
Complete Omron software package including CX-drive. (CX-One version 3.10 or higher)	CX-One

MECHATROLINK-II cables (for CN6)

Symbol	Specifications	Length	Order code
⑩	MECHATROLINK-II Terminator resistor	-	JEPMC-W6022-E
	MECHATROLINK-II cables	0.5 m	JEPMC-W6003-A5-E
		1 m	JEPMC-W6003-01-E
		3 m	JEPMC-W6003-03-E
		5 m	JEPMC-W6003-05-E
		10 m	JEPMC-W6003-10-E
		20 m	JEPMC-W6003-20-E
		30 m	JEPMC-W6003-30-E

Filters

Symbol	Applicable servodrive	Rated current	Leakage current	Rated voltage	Order code
⑪	R88D-GN01H_ R88D-GN02H_	2.4 A	3.5 mA	250 VAC single-phase	R88A-FIK102-RE
	R88D-GN04H_	4.1 A	3.5 mA		R88A-FIK104-RE
	R88D-GN08H_	6.6 A	3.5 mA		R88A-FIK107-RE
	R88D-GN10H_ R88D-GN15H_	14.2 A	3.5 mA		R88A-FIK114-RE

External regenerative resistor

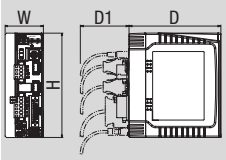
Symbol	Specifications	Order code
⑫	50 Ω, 80 W	R88A-RR08050S
	100 Ω, 80 W	R88A-RR080100S
	47 Ω, 220 W	R88A-RR22047S
	20 Ω, 500 W	R88A-RR50020S

Specifications

Servo drive type			R88D-GN_	01H-ML2	02H-ML2	04H-ML2	08H-ML2	10H-ML2	15H-ML2
Applicable servomotor			R88M-G_	05030_/10030_	20030_	40030_	75030_	G1K020T_	90010T_ /1K030T_ / 1K5_0T_
			R88M-GP_	10030_	20030_	40030_	-	-	-
Basic specifications	Max. applicable motor capacity		W	100	200	400	750	1000	1500
	Continuous output current		Arms	1.16	1.6	2.7	4.0	5.9	9.8
	Max. output current		Arms	3.5	5.3	7.1	14.1	21.2	28.3
	Input power	Main circuit		For single-phase, 200 to 240 VAC +10 to -15% (50/60 Hz)			For single-phase/ three-phase, 200 to 240 VAC +10 to -15% (50/60 Hz)		
	Supply	Control circuit		For single-phase, 200 to 240 VAC + 10 to -15% (50/60 Hz)					
	Control method			IGBT-driven PWM method					
	Feedback			Serial encoder (incremental/absolute)					
	Conditions	Usage/storage temperature		0 to +55 °C / -20 to 65 °C					
		Usage/storage humidity		90% RH or less (non-condensing)					
		Altitude		1000m or less above sea level					
		Vibration/shock resistance		5.88 m/s^2 / 19.6 m/s^2					
	Configuration			Base mounted					
	Approx. weightkg			0.8		1.1	1.5	1.7	
Position/Speed/torque control mode	Performance	Speed control range		1:5000					
		Speed variance	Load variance	During 0 to 100% load ±0.01 max. (at rated speed)					
			Voltage variance	0% at ±10% of rated voltage (at rated speed)					
			Temperature variance	0 to 50ºC ±0.1% max. (at rated speed)					
		Frequency characteristics		1 kHz					
		Torque control accuracy (reproducibility)		±3% (at 20% to 100% of rated torque)					
		Soft start time setting		0 to 10 s (acceleration time and deceleration time can be set)					
	Command Input	MECHATROLINK Communication		MECHATROLINK-II commands (for sequence, motion, data setting/reference, monitor, adjustment and other commands)					
I/O signal	Sequence input signal			Emergency stop, 3 external latch signals, forward/reverse torque limit, forward/reverse run prohibit, origin proximity, 3 general-purpose inputs					
	Sequence output signal			It is possible to output three types of signals: positioning completed, speed coincidence, rotation speed detection, servo ready, current limit, speed limit, brake release and warning signal					

Servo drive type				01H-ML2	02H-ML2	04H-ML2	08H-ML2	10H-ML2	15H-ML2
Applicable servomotor			R88M-G_	05030_/10030_	20030_	40030_	75030_	G1K020T_	90010T_ /1K030T_ / 1K5_0T_
			R88M-GP_	10030_	20030_	40030_	-	-	-
Integrated functions	Communications	RS-232 communications	Interface	Personal computer					
			Transmission rate	From 2400 to 57600 bps					
			Functions	Parameter setting, status display, alarm display (monitor, clear, history), servo drive data tracing function, test run/auto-tuning operations, real time trace, absolute encoder setting, default values function					
		MECHATROLINK communications	Communications protocol	MECHATROLINK-II					
			Transmission rate	10 Mbps					
			Functions	Parameter setting, status display, alarm display (monitor, clear, history), default values function					
	Automatic load inertia detection			Horizontal and vertical axis mode. One parameter rigidity setting.					
	Dynamic brake (DB)			Operates when main power OFF, servo alarm, overtravel or servo OFF					
	Regenerative processing			Built-in regeneration resistor in models from 750 W to 1.5 kW. External regeneration resistor optionally.					
	Overtravel (OT) prevention function			Dynamic brake, disables torque or emergency stop torque during POT and NOT operation					
	Emergency stop (STOP)			Emergency stop input					
	Encoder divider function			Optional division pulses possible					
	Electronic gearing			0,01<Numerator/Denominator<100					
	Internal speed setting function			8 internal speeds					
	Protective functions			Overvoltage, undervoltage, overcurrent, overload, regeneration overload, servo drive overheat					
	Analogue monitor Output			The actual servomotor speed, command speed, torque and number of accumulated pulses can be measured using an oscilloscope or other device.					
	Panel operator		Display functions	A 2-digit 7-segment LED display shows the servo drive status, alarm codes, parameters, etc.					
				MECHATROLINK-II communications status LED indicator (COM)					
			Switches	Rotary switch for setting the MECHATROLINK-II node address					

Dimensions

Drive model	Specification		H	W	D	D1	
R88D-GN01H-ML2	200 V	100-200 W	150 mm	40 mm	132 mm	70 mm	
R88D-GN02H-ML2							
R88D-GN04H-ML2		400 W	150 mm	55 mm	132 mm	70 mm	
R88D-GN08H-ML2		750 W	150 mm	65 mm	172 mm	70 mm	
R88D-GN10H-ML2		1 kW-1.5 kW	150 mm	85 mm	172 mm	70 mm	
R88D-GN15H-ML2							



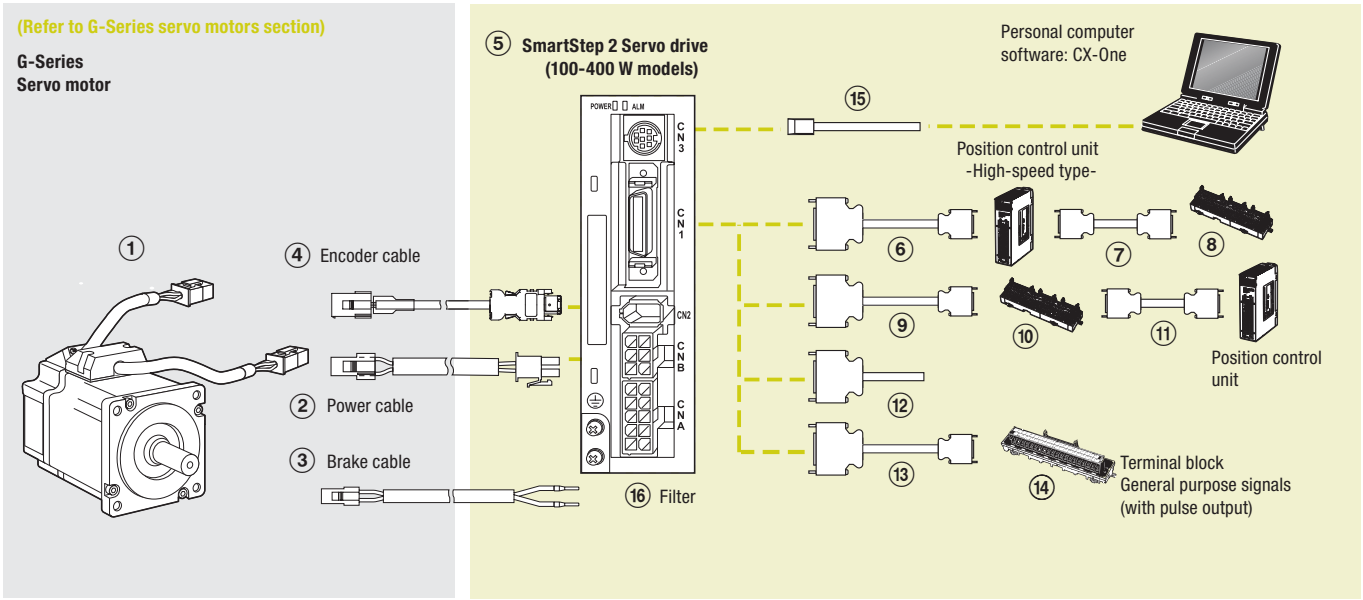
Another step forward in drive simplicity

The new SmartStep offers an ideal solution for point-to-point motion applications where simplicity is essential. SmartStep 2 keeps things simple whilst combining high performance and advanced features in a cost effective solution.

- On-line Auto-tuning and Easy set up
- Ultra-compact size. The footprint is only 48% compared to the previous SmartStep
- Two torque limits
- Electronic gear, four internal speed settings and wide range of pulse settings
- Adaptive resonance suppression filter
- Position control via pulse input 500 kpps
- Configuration and commissioning using CX Drive-software

Ordering information

SmartStep2 Servo Drive Configuration (100-400 W)



Servo motor

Note: ①②③④ refer to G-Series motor section for detailed motor specifications and selection.

Servo drives

Symbol	Specifications		Compatible servo motors ①		Order code
			Cylindrical type	Flat type	SmartStep 2 drive model
⑤	200 VAC	100 W	R88M-G05030H-_	-	R7D-BP01H
			R88M-G10030H-_	R88M-GP10030H-_	
		200 W	R88M-G20030H-_	R88M-GP20030H-_	R7D-BP02HH
		400 W	R88M-G40030H-_	R88M-GP40030H-_	R7D-BP04H

Power Supply cables (for CNA)

Symbol	Specifications	Appearance	Order code
⑤	Power Supply Input Cable for Single-Phase Power (connectors attached)		R7A-CLB002S2

Control cables (for CN1)

Symbol	Description	Connect to	Length	Order code
⑥	Control cable (line-driver output for 1 axis)	Position control unit CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G12
			5 m	XW2Z-500J-G12
			10 m	XW2Z-10MJ-G12
	Control cable (open-collector output for 1 axis)	Position control unit CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G16
			3 m	XW2Z-300J-G16
	Control cable (line-driver output for 2 axis)	Position control unit CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G4
			5 m	XW2Z-500J-G4
			10 m	XW2Z-10MJ-G4
	Control cable (open-collector output for 2 axis)	Position control unit CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G8
			3 m	XW2Z-300J-G8

Symbol	Description	Connect to	Length	Order code
⑦	Terminal block cable for external signals (for input common, forward/reverse run prohibited inputs, emergency stop input, origin proximity input and interrupt input)	Position control units CJ1W-NC234 CJ1W-NC434 CJ1W-NC214 CJ1W-NC414	0.5 m	XW2Z-C50X
			1 m	XW2Z-100X
			2 m	XW2Z-200X
			3 m	XW2Z-300X
			5 m	XW2Z-500X
			10 m	XW2Z-010X
⑧	Terminal block for external signals (with M3 screw and for pin terminals)		-	XW2B-20G4
	Terminal block ext. signals (with M3.5 screw and for fork/round terminals)		-	XW2B-20G5
	Terminal block ext. signals (with M3 screw and fork/round pin terminals)		-	XW2D-20G6
⑨	Cable from servo relay unit to servo drive	CS1W-NC1_3, CJ1W-NC1_3, C200HW-NC113, CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3, C200HW-NC213/413, CQM1H-PLB21 or CQM1-CPU43-V1	1 m	XW2Z-100J-B29
			2 m	XW2Z-200J-B29
		CJ1M-CPU21/22/23	1 m	XW2Z-100J-B32
			2 m	XW2Z-200J-B32
⑩	Servo relay unit	CS1W-NC1_3, CJ1W-NC1_3 or C200HW-NC113 position control unit	-	XW2B-20J6-1B (1 axis)
		CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3 or C200HW-NC213/413 position control unit	-	XW2B-40J6-2B (2 axes)
		CQM1H-PLB21 or CQM1-CPU43-V1	-	XW2B-20J6-3B (1 axis)
		CJ1M-CPU21/22/23	-	XW2B-20J6-8A (1 axis)
				XW2B-40J6-9A (2 axes)
⑪	Position control unit connecting cable	CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CS1W-NC113 C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CJ1M-CPU21/22/23	0.5 m	XW2Z-050J-A33
			1 m	XW2Z-100J-A33
		CQM1H-PLB21 CQM1-CPU43-V1	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
⑫	General purpose cable	For general purpose controllers	1 m	R7A-CPB001S
			2 m	R7A-CPB002S
⑬	Terminal block cable	For general purpose controllers	1 m	XW2Z-100J-B28
			2 m	XW2Z-200J-B28
⑭	Terminal block (with M3 screw and for pin terminals)		-	XW2B-34G4
	Terminal block (with M3.5 screw and for fork/round terminals)		-	XW2B-34G5
	Terminal block (with M3 screw and fork/round pin terminals)		-	XW2D-34G6

Cable for CN3

Symbol	Name	Length	Order code
⑮	Personal Computer Monitor Cable	2 m	R88A-CCG002P2

Filters

Symbol	Applicable servo drive	Rated current	Rated voltage	Order code
⑯	R7D-BP01H/ 02HH/ 04H	4 A	1 pH, 230 V	R7A-FIB104-RE

Connectors

Specifications	Order code
Main Circuit Connector (CNA)	R7A-CNB01P
Servomotor Connector (CNB)	R7A-CNB01A
Control I/O Connector (CN1)	R88A-CNW01C
Encoder Input Connector (CN2)	R88A-CNW01R
Servomotor Connector for Encoder Cable	R88A-CNG02R
Servomotor Connector for Servomotor Power Cable	R88A-CNG01A
Brake Cable Connector	R88A-CNG01B

External regeneration resistor

Specification	Order code
80 W, 50 Ω	R88A-RR08050S
80 W, 100 Ω	R88A-RR080100S
220 W, 47 Ω	R88A-RR22047S

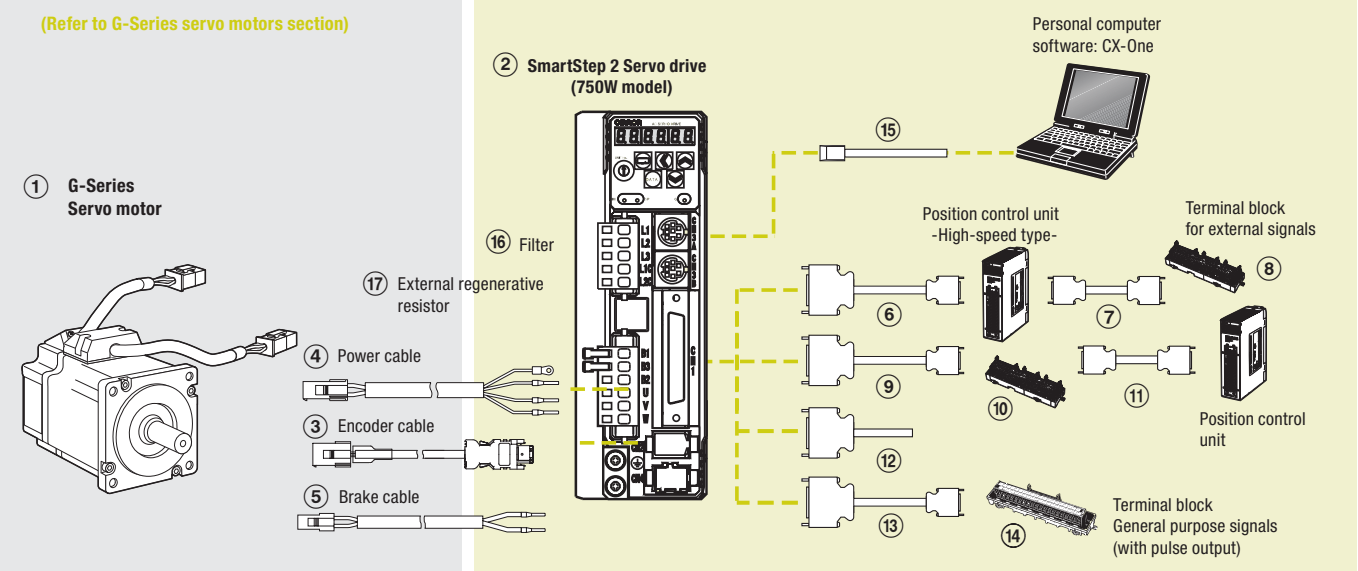
External regeneration resistor cable

Specifications	Order code
External Regenerative Resistor Connection Cable, 2 meters	R7A-CLB002RG

Parameter unit & computer software

Specifications	Order code
Parameter copy unit (with cable)	R88A-PR02G
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.8 or higher)	CX-drive

SmartStep2 Servo Drive Configuration (750 W)



Servo motor

Note: ①③④⑤ refer to G-Series motor section for detailed motor specifications and selection.

Servo drives

Symbol	Specifications		① Compatible rotary servo motors	Order code
			Cylindrical type	Servo drive model
②	1 phase 200 VAC	750 W	R88M-G75030H-_	R88D-GP08H

Control cables (for CN1)

Symbol	Description	Connect to	Length	Order code
⑥	Control cable (line-driver output for 1 axis	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G9
			5 m	XW2Z-500J-G9
			10 m	XW2Z-10MJ-G9
	Control cable (open-collector output for 1 axis	Position control units (high-speed type) CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G13
			3 m	XW2Z-300J-G13
	Control cable (line-driver output for 2 axis	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G1
			5 m	XW2Z-500J-G1
			10 m	XW2Z-10MJ-G1
	Control cable (open-collector output for 2 axis	Position control units (high-speed type) CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G5
			3 m	XW2Z-300J-G5
⑦	Terminal block cable for external signals (for input common, forward/reverse run prohibited inputs, emergency stop input, origin proximity input and interrupt input)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434 CJ1W-NC214 CJ1W-NC414	0.5 m	XW2Z-C50X
			1 m	XW2Z-100X
			2 m	XW2Z-200X
			3 m	XW2Z-300X
			5 m	XW2Z-500X
			10 m	XW2Z-010X
⑧	Terminal block for external signals (M3 screw, pin terminals)		-	XW2B-20G4
	Terminal block ext. signals (M3.5 screw, fork/round terminals)		-	XW2B-20G5
	Terminal block ext. signals (M3 screw, fork/round terminals)		-	XW2D-20G6
⑨	Cable from servo relay unit to servo drive	CS1W-NC1_3, CJ1W-NC1_3, C200HW-NC113/213/413, CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3 or CQM1H-PLB21	1 m	XW2Z-100J-B25
			2 m	XW2Z-200J-B25
		CJ1M-CPU21/22/23	1 m	XW2Z-100J-B31
			2 m	XW2Z-200J-B31
⑩	Servo relay unit	CS1W-NC1_3, CJ1W-NC1_3 or C200HW-NC113 position control unit	-	XW2B-20J6-1B (1 axis)
		CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3 or C200HW-NC213/413 position control unit	-	XW2B-40J6-2B (2 axes)
		CQM1H-PLB21	-	XW2B-20J6-3B (1 axis)
		CJ1M-CPU21/22/23	-	XW2B-20J6-8A (1 axis)
				XW2B-40J6-9A (2 axes)

Symbol	Description	Connect to	Length	Order code
⑪	Position control unit connecting cable	CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 or C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 or C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU21/22/23	0.5 m	XW2Z-050J-A33
			1 m	XW2Z-100J-A33
⑫	General purpose cable	For general purpose controllers	1 m	R88A-CPG001S
			2 m	R88A-CPG002S
⑬	Terminal block cable	For general purpose controllers	1 m	XW2Z-100J-B24
			2 m	XW2Z-200J-B24
⑭	Terminal block (M3 screw and for pin terminals)		-	XW2B-50G4
	Terminal block (M3.5 screw and for fork/round terminals)		-	XW2B-50G5
	Terminal block (M3 screw and for fork/found terminals)		-	XW2D-50G6

Computer cable (for CN3)

Symbol	Name	Length	Order code
⑮	Computer cable RS232	2 m	R88A-CCG002P2

Filter

Symbol	Rated current	Leakage current	Rated voltage	Applicable servodrive	Order code
⑯	6.6 A	3.5 mA	250 VAC single-phase	R88D-GP08H	R88A-FIK107-RE

External regenerative resistor

Symbol	Specifications	Order code
⑰	50 Ω, 80 W	R88A-RR08050S
	100 Ω, 80 W	R88A-RR080100S
	47 Ω, 220 W	R88A-RR22047S
	20 Ω, 500 W	R88A-RR50020S

Connectors

Specifications	Order code
I/O connector kit -50 pins- (for CN1)	R88A-CNU11C
Power cable connector (motor side)	R88A-CNG01A
Encoder connector (Servo drive side CN2)	R88A-CNW01R
Incremental encoder cable connector (motor side)	R88A-CNG02R

Computer software

Specifications	Order code
Configuration and monitoring software tool for servo drives and inverters (CX-drive version 1.91 or higher).	CX-Drive

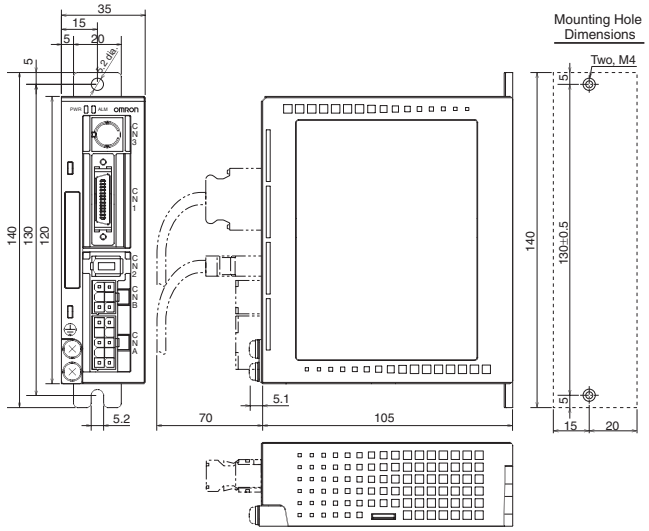
Specifications

Performance specifications

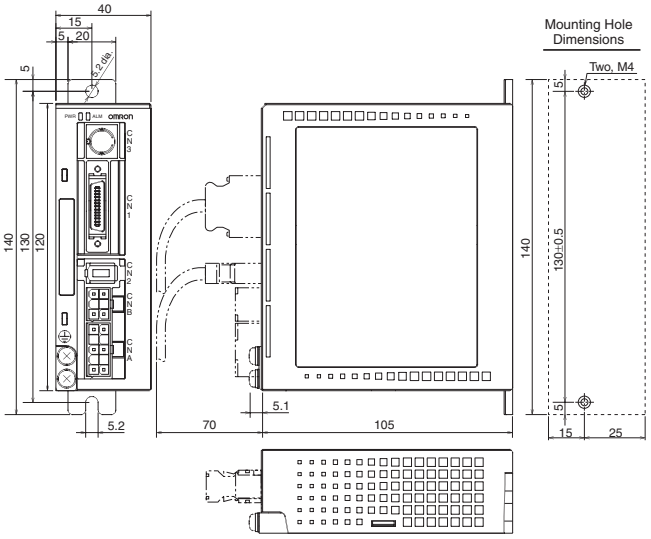
Item	200 VAC input type			
	100 W	200 W	400 W	750 W
	R7D-BP01H	R7D-BP02HH	R7D-BP04H	R88D-GP08H
Continuous output current (rms)	1.0 A	1.6 A	2.5 A	4 A
Momentary maximum output current (rms)	3.3 A	4.9 A	7.8 A	14.1 A
Main-circuit power supply	Single-phase 200 to 240 VAC (170 to 264 V), 50/60 Hz			Single-phase/three-phase 200 to 240 VAC (170 to 264 V), 50/60 Hz
Control circuit input power	-			Single-phase 200 to 240 VAC (170 to 264 V)
Control method	All-digital method			
Feedback	10,000 pulses/revolution incremental encoder			
Inverter method	PWM method based on IGBT			
PWM frequency	12 kHz		6 kHz	
Weight	0.35 kg	0.42 kg	0.42 kg	1.5 kg
Compatible motor voltage	200 V			
Command pulse response	Line drive: 500 kpps			
Compatible motor capacity	50 W 100 W	200 W	400 W	750 W
Applicable servo motor (R88M-)	G05030H G10030H GP10030H	G020030H GP20030H	G40030H GP40030H	G75030H

Dimensions

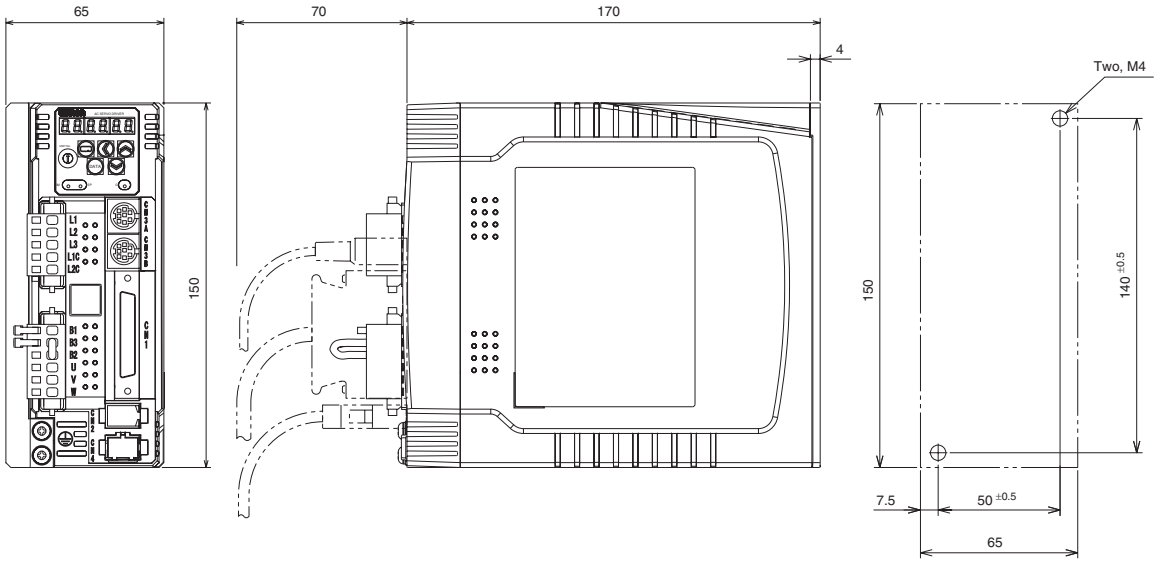
R7D-BP01H (230 V, 100 W)



R7D-BP02HH/04H (230 V, 200-400 W)



R88D-GP08H (230 V, 750 W)



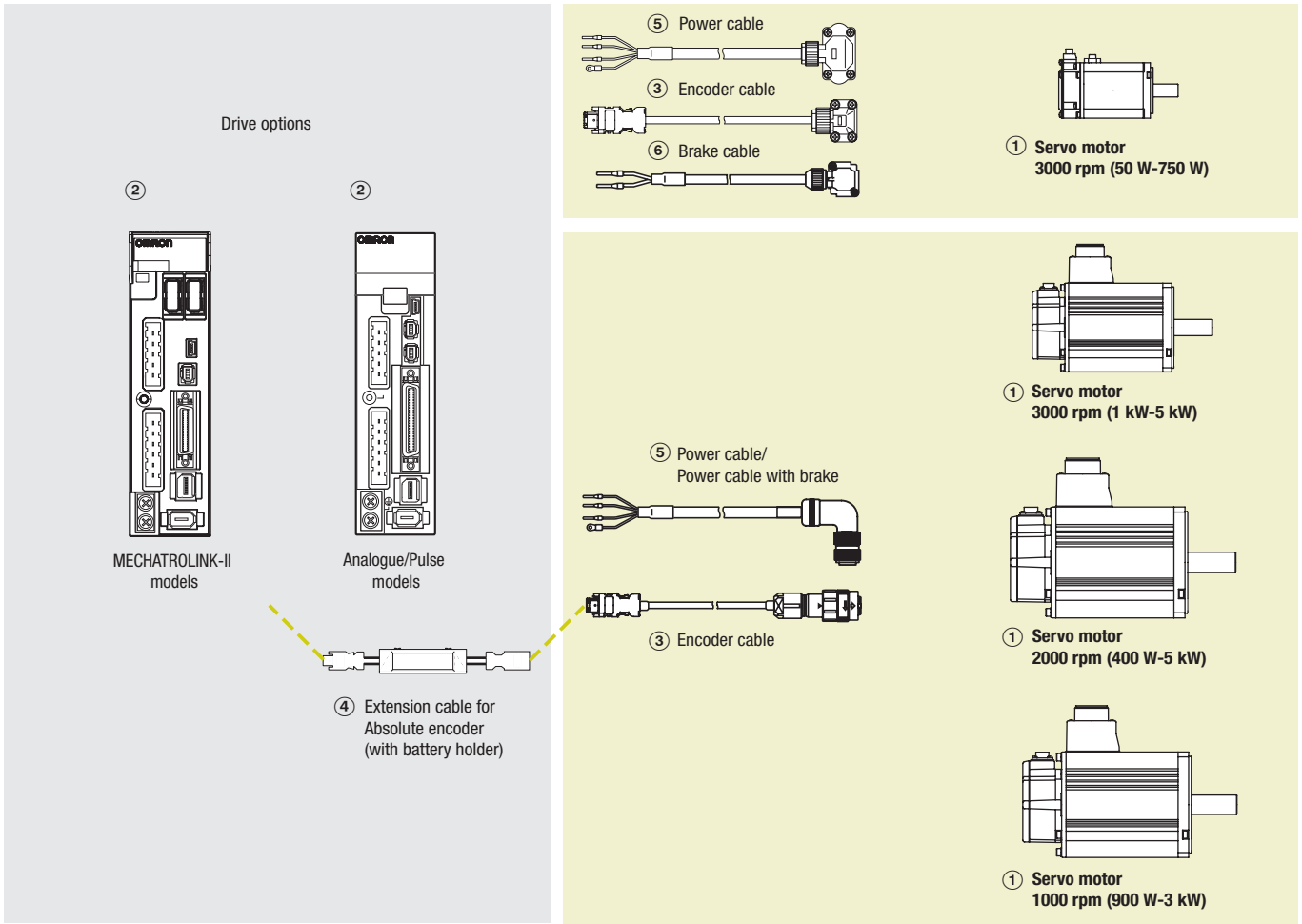


Servo motor family for accurate motion control.

Accurax G5 servo motors include IP67 protection and connectors on the motor body. Use of 10 pole motors and 20 bit encoder results in 40% reduction in motor cogging. The servomotors are 25% lighter and 15% smaller due to patented new stator design PACK&CLAMP technology, 40% iron loss reduction and 15% smaller encoder.

- Peak torque 300% of rated torque during 3 seconds or more depending on model
- High accuracy provided by a 20 bit resolution encoder, ABS encoder as an option
- IP67 protection in all models
- Ultra-light and compact size motor
- Low speed ripple and low torque ripple due to low torque cogging
- Various shaft, brake and seal options

Ordering information



Servo drive

② Refer to Accurax G5 servo drive section for detailed drive specifications and selection of drive accessories.

Accurax G5 servo motors

Servo motors 3000 r/min (50 - 5000 W)

Symbol	Specifications					Compatible servo drives ②		Order code
	Voltage	Encoder and design		Rated torque	Capacity	G5 MECHATROLINK-II	G5 Analogue/Pulse	
①  230 V (50 - 750 W)  230 V (1000 - 1500 W) 400 V (750 - 5000 W)	230 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	0.16 Nm	50 W	R88D-KN01H-ML2	R88D-KT01H	R88M-K05030H-S2
				0.32 Nm	100 W	R88D-KN01H-ML2	R88D-KT01H	R88M-K10030H-S2
				0.64 Nm	200 W	R88D-KN02H-ML2	R88D-KT02H	R88M-K20030H-S2
				1.3 Nm	400 W	R88D-KN04H-ML2	R88D-KT04H	R88M-K40030H-S2
				2.4 Nm	750 W	R88D-KN08H-ML2	R88D-KT08H	R88M-K75030H-S2
				3.18 Nm	1000 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K030H-S2
				4.77 Nm	1500 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K530H-S2
			With brake	0.16 Nm	50 W	R88D-KN01H-ML2	R88D-KT01H	R88M-K05030H-BS2
				0.32 Nm	100 W	R88D-KN01H-ML2	R88D-KT01H	R88M-K10030H-BS2
				0.64 Nm	200 W	R88D-KN02H-ML2	R88D-KT02H	R88M-K20030H-BS2
				1.3 Nm	400 W	R88D-KN04H-ML2	R88D-KT04H	R88M-K40030H-BS2
				2.4 Nm	750 W	R88D-KN08H-ML2	R88D-KT08H	R88M-K75030H-BS2
				3.18 Nm	1000 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K030H-BS2
				4.77 Nm	1500 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K530H-BS2
		Absolute encoder (17 bit) Straight shaft with key and tap	Without brake	0.16 Nm	50 W	R88D-KN01H-ML2	R88D-KT01H	R88M-K05030T-S2
				0.32 Nm	100 W	R88D-KN01H-ML2	R88D-KT01H	R88M-K10030T-S2
				0.64 Nm	200 W	R88D-KN02H-ML2	R88D-KT02H	R88M-K20030T-S2
				1.3 Nm	400 W	R88D-KN04H-ML2	R88D-KT04H	R88M-K40030T-S2
				2.4 Nm	750 W	R88D-KN08H-ML2	R88D-KT08H	R88M-K75030T-S2
				3.18 Nm	1000 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K030T-S2
				4.77 Nm	1500 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K530T-S2
			With brake	0.16 Nm	50 W	R88D-KN01H-ML2	R88D-KT01H	R88M-K05030T-BS2
				0.32 Nm	100 W	R88D-KN01H-ML2	R88D-KT01H	R88M-K10030T-BS2
				0.64 Nm	200 W	R88D-KN02H-ML2	R88D-KT02H	R88M-K20030T-BS2
				1.3 Nm	400 W	R88D-KN04H-ML2	R88D-KT04H	R88M-K40030T-BS2
				2.4 Nm	750 W	R88D-KN08H-ML2	R88D-KT08H	R88M-K75030T-BS2
				3.18 Nm	1000 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K030T-BS2
				4.77 Nm	1500 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K530T-BS2
	400 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	2.39 Nm	750 W	R88D-KN10F-ML2	R88D-KT10F	R88M-K75030F-S2
				3.18 Nm	1000 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K030F-S2
				4.77 Nm	1500 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K530F-S2
				6.37 Nm	2000 W	R88D-KN20F-ML2	R88D-KT20F	R88M-K2K030F-S2
				9.55 Nm	3000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K3K030F-S2
				12.7 Nm	4000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K4K030F-S2
				15.9 Nm	5000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K5K030F-S2
			With brake	2.39 Nm	750 W	R88D-KN10F-ML2	R88D-KT10F	R88M-K75030F-BS2
				3.18 Nm	1000 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K030F-BS2
				4.77 Nm	1500 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K530F-BS2
				6.37 Nm	2000 W	R88D-KN20F-ML2	R88D-KT20F	R88M-K2K030F-BS2
				9.55 Nm	3000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K3K030F-BS2
				12.7 Nm	4000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K4K030F-BS2
				15.9 Nm	5000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K5K030F-BS2
		Absolute encoder (17 bit) Straight shaft with key and tap	Without brake	2.39 Nm	750 W	R88D-KN10F-ML2	R88D-KT10F	R88M-K75030C-S2
				3.18 Nm	1000 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K030C-S2
				4.77 Nm	1500 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K530C-S2
				6.37 Nm	2000 W	R88D-KN20F-ML2	R88D-KT20F	R88M-K2K030C-S2
				9.55 Nm	3000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K3K030C-S2
				12.7 Nm	4000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K4K030C-S2
				15.9 Nm	5000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K5K030C-S2
			With brake	2.39 Nm	750 W	R88D-KN10F-ML2	R88D-KT10F	R88M-K75030C-BS2
				3.18 Nm	1000 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K030C-BS2
				4.77 Nm	1500 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K530C-BS2
				6.37 Nm	2000 W	R88D-KN20F-ML2	R88D-KT20F	R88M-K2K030C-BS2
				9.55 Nm	3000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K3K030C-BS2
				12.7 Nm	4000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K4K030C-BS2
				15.9 Nm	5000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K5K030C-BS2

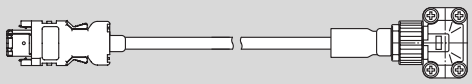
Servo motors 2000 r/min (1 - 5 kW)

Symbol	Specifications					Compatible servo drives ②		Order code
	Voltage	Encoder and design		Rated torque	Capacity	G5 MECHATROLINK-II	G5 Analogue/Pulse	
① 	230 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	4.77 Nm	1000 W	R88D-KN10H-ML2	R88D-KT10H	R88M-K1K020H-S2
				7.16 Nm	1500 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K520H-S2
			With brake	4.77 Nm	1000 W	R88D-KN10H-ML2	R88D-KT10H	R88M-K1K020H-BS2
				7.16 Nm	1500 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K520H-BS2
		Absolute encoder (17 bit) Straight shaft with key and tap	Without brake	4.77 Nm	1000 W	R88D-KN10H-ML2	R88D-KT10H	R88M-K1K020T-S2
				7.16 Nm	1500 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K520T-S2
			With brake	4.77 Nm	1000 W	R88D-KN10H-ML2	R88D-KT10H	R88M-K1K020T-BS2
				7.16 Nm	1500 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K1K520T-BS2
	400 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	1.91 Nm	400 W	R88D-KN06F-ML2	R88D-KT06F	R88M-K40020F-S2
				2.86 Nm	600 W	R88D-KN06F-ML2	R88D-KT06F	R88M-K60020F-S2
				4.77 Nm	1000 W	R88D-KN10F-ML2	R88D-KT10F	R88M-K1K020F-S2
				7.16 Nm	1500 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K520F-S2
				9.55 Nm	2000 W	R88D-KN20F-ML2	R88D-KT20F	R88M-K2K020F-S2
				14.3 Nm	3000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K3K020F-S2
				19.1 Nm	4000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K4K020F-S2
				23.9 Nm	5000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K5K020F-S2
			With brake	1.91 Nm	400 W	R88D-KN06F-ML2	R88D-KT06F	R88M-K40020F-BS2
				2.86 Nm	600 W	R88D-KN06F-ML2	R88D-KT06F	R88M-K60020F-BS2
				4.77 Nm	1000 W	R88D-KN10F-ML2	R88D-KT10F	R88M-K1K020F-BS2
				7.16 Nm	1500 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K520F-BS2
				9.55 Nm	2000 W	R88D-KN20F-ML2	R88D-KT20F	R88M-K2K020F-BS2
				14.3 Nm	3000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K3K020F-BS2
				19.1 Nm	4000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K4K020F-BS2
				23.9 Nm	5000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K5K020F-BS2
		Absolute encoder (17 bit) Straight shaft with key and tap	Without brake	1.91 Nm	400 W	R88D-KN06F-ML2	R88D-KT06F	R88M-K40020C-S2
				2.86 Nm	600 W	R88D-KN06F-ML2	R88D-KT06F	R88M-K60020C-S2
				4.77 Nm	1000 W	R88D-KN10F-ML2	R88D-KT10F	R88M-K1K020C-S2
				7.16 Nm	1500 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K520C-S2
				9.55 Nm	2000 W	R88D-KN20F-ML2	R88D-KT20F	R88M-K2K020C-S2
				14.3 Nm	3000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K3K020C-S2
				19.1 Nm	4000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K4K020C-S2
				23.9 Nm	5000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K5K020C-S2
			With brake	1.91 Nm	400 W	R88D-KN06F-ML2	R88D-KT06F	R88M-K40020C-BS2
				2.86 Nm	600 W	R88D-KN06F-ML2	R88D-KT06F	R88M-K60020C-BS2
				4.77 Nm	1000 W	R88D-KN10F-ML2	R88D-KT10F	R88M-K1K020C-BS2
				7.16 Nm	1500 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K1K520C-BS2
				9.55 Nm	2000 W	R88D-KN20F-ML2	R88D-KT20F	R88M-K2K020C-BS2
				14.3 Nm	3000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K3K020C-BS2
				19.1 Nm	4000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K4K020C-BS2
				23.9 Nm	5000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K5K020C-BS2

Servo motors 1000 r/min (900 - 3000 W)

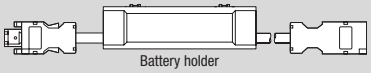
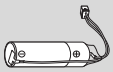
Symbol	Specifications					Compatible servo drives ②		Order code
	Voltage	Encoder and design		Rated torque	Capacity	G5 MECHATROLINK-II	G5 Analogue/Pulse	
① 	230 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	8.59 Nm	900 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K90010H-S2
			With brake	8.59 Nm	900 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K90010H-BS2
		Absolute encoder (17 bit) Straight shaft with key and tap	Without brake	8.59 Nm	900 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K90010T-S2
			With brake	8.59 Nm	900 W	R88D-KN15H-ML2	R88D-KT15H	R88M-K90010T-BS2
	400 V	Incremental encoder (20 bit) Straight shaft with key and tap	Without brake	8.59 Nm	900 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K90010F-S2
				19.1 Nm	2000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K2K010F-S2
				28.7 Nm	3000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K3K010F-S2
			With brake	8.59 Nm	900 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K90010F-BS2
				19.1 Nm	2000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K2K010F-BS2
				28.7 Nm	3000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K3K010F-BS2
		Absolute encoder (17 bit) Straight shaft with key and tap	Without brake	8.59 Nm	900 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K90010C-S2
				19.1 Nm	2000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K2K010C-S2
				28.7 Nm	3000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K3K010C-S2
			With brake	8.59 Nm	900 W	R88D-KN15F-ML2	R88D-KT15F	R88M-K90010C-BS2
				19.1 Nm	2000 W	R88D-KN30F-ML2	R88D-KT30F	R88M-K2K010C-S2
				28.7 Nm	3000 W	R88D-KN50F-ML2	R88D-KT50F	R88M-K3K010C-S2

Encoder cables for absolute and incremental encoders

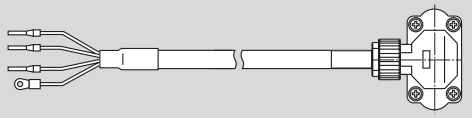
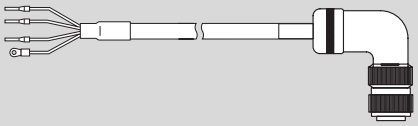
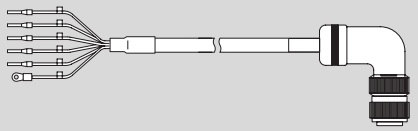
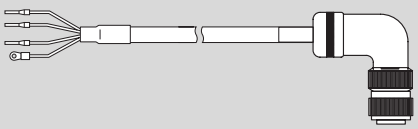
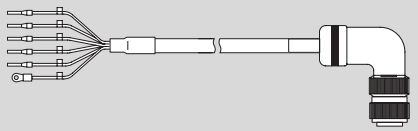
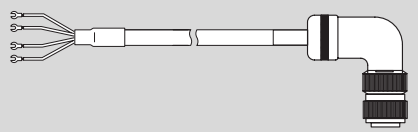
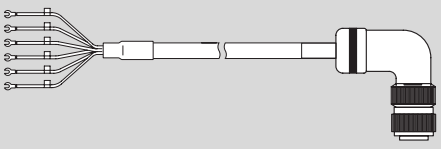
Symbol	Appearance	Specifications		Order code
③		Encoder cable for servomotors R88M-K(050/100/200/400/750)30(H/T)_	1.5 m	R88A-CRKA001-5CR-E
			3 m	R88A-CRKA003CR-E
			5 m	R88A-CRKA005CR-E
			10 m	R88A-CRKA010CR-E
			15 m	R88A-CRKA015CR-E
			20 m	R88A-CRKA020CR-E
		Encoder cable for servomotors R88M-K(1K0/1K5)30(H/T)_ R88M-K(750/1K0/1K5/2K0/3K0/4K0/5K0)30(F/C)_ R88M-K(400/600/1K0/1K5/2K0/3K0/4K0/5K0)20_ R88M-K(900/2K0/3K0)10_	1.5 m	R88A-CRKC001-5NR-E
			3 m	R88A-CRKC003NR-E
			5 m	R88A-CRKC005NR-E
			10 m	R88A-CRKC010NR-E
			15 m	R88A-CRKC015NR-E
			20 m	R88A-CRKC020NR-E

Note: For servomotors fitted with an absolute encoder you have to add the extension battery cable R88A-CRGD0R3C_ (see below) or connect a backup battery in the CN1 I/O connector.

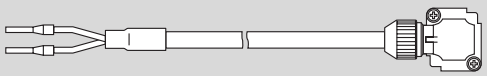
Absolute encoder battery cable (encoder extension cable only)

Symbol	Appearance	Specifications			Order code
④	 Battery holder	Absolute encoder battery cable	Battery not included	0.3 m	R88A-CRGD0R3C
			Battery included (R88A-BAT01G)	0.3 m	R88A-CRGD0R3C-BS
		Absolute encoder backup battery	2,000 mA.h 3.6V	-	R88A-BAT01G

Power cables

Symbol	Appearance	Specifications			Order code
⑤		For 200 V servomotors R88M-K(050/100/200/400/750)30(H/T)_ Note: for servomotors with brake R88M-K(050/100/200/400/750)30(H/T)-BS2, the separate brake cable R88A-CAKA___BR-E is needed	Power cable only (without brake)	1.5 m	R88A-CAKA001-5SR-E
				3 m	R88A-CAKA003SR-E
				5 m	R88A-CAKA005SR-E
				10 m	R88A-CAKA010SR-E
				15 m	R88A-CAKA015SR-E
				20 m	R88A-CAKA020SR-E
		For 200 V servomotors R88M-K(1K0/1K5)30(H/T)_ R88M-K(1K0/1K5)20(H/T)_ R88M-K90010(H/T)_	without brake _-S2	1.5 m	R88A-CAGB001-5SR-E
				3 m	R88A-CAGB003SR-E
				5 m	R88A-CAGB005SR-E
				10 m	R88A-CAGB010SR-E
				15 m	R88A-CAGB015SR-E
				20 m	R88A-CAGB020SR-E
			with brake _-BS2	1.5 m	R88A-CAGB001-5BR-E
				3 m	R88A-CAGB003BR-E
				5 m	R88A-CAGB005BR-E
				10 m	R88A-CAGB010BR-E
				15 m	R88A-CAGB015BR-E
				20 m	R88A-CAGB020BR-E
		For 400 V servomotors R88M-K(750/1K0/1K5/2K)30(F/C)_ R88M-K(400/600/1K0/1K5/2K0)20(F/C)_ R88M-K90010(F/C)_	without brake _-S2	1.5 m	R88A-CAGB001-5SR-E
				3 m	R88A-CAGB003SR-E
				5 m	R88A-CAGB005SR-E
				10 m	R88A-CAGB010SR-E
				15 m	R88A-CAGB015SR-E
				20 m	R88A-CAGB020SR-E
			with brake _-BS2	1.5 m	R88A-CAKF001-5BR-E
				3 m	R88A-CAKF003BR-E
				5 m	R88A-CAKF005BR-E
				10 m	R88A-CAKF010BR-E
				15 m	R88A-CAKF015BR-E
				20 m	R88A-CAKF020BR-E
		For 400 V servomotors R88M-K(3K0/4K0/5K0)30(F/C)_ R88M-K(3K0/4K0/5K0)20(F/C)_ R88M-K(2K0/3K0)10(F/C)_	without brake _-S2	1.5 m	R88A-CAGD001-5SR-E
				3 m	R88A-CAGD003SR-E
				5 m	R88A-CAGD005SR-E
				10 m	R88A-CAGD010SR-E
				15 m	R88A-CAGD015SR-E
				20 m	R88A-CAGD020SR-E
			with brake _-BS2	1.5 m	R88A-CAGD001-5BR-E
				3 m	R88A-CAGD003BR-E
				5 m	R88A-CAGD005BR-E
				10 m	R88A-CAGD010BR-E
				15 m	R88A-CAGD015BR-E
				20 m	R88A-CAGD020BR-E

Brake cable (for 3000 r/min 50-750 W Motors)

Symbol	Appearance	Specifications		Order code
⑥		Brake cable only. For 200 V servo motors with brake R88M-K(050/100/200/400/750)30(H/T)-BS2	1.5 m	R88A-CAKA001-5BR-E
			3 m	R88A-CAKA003BR-E
			5 m	R88A-CAKA005BR-E
			10 m	R88A-CAKA010BR-E
			15 m	R88A-CAKA015BR-E
			20 m	R88A-CAKA020BR-E

Connectors for encoder, power and brake cables

Specifications		Applicable Servomotor	Order code
Connectors for making encoder cables	Drive side (CN2)	All models	R88A-CNW01R
	Motor side	R88M-K(050/100/200/400/750)30(H/T)_	R88A-CNK02R
	Motor side	R88M-K(1K0/1K5)30(H/T)_ R88M-K(750/1K0/1K5/2K0/3K0/4K0/5K0)30(F/C)_ R88M-K(400/600/1K0/1K5/2K0/3K0/4K0/5K0)20_ R88M-K(900/2K0/3K0)10_	R88A-CNK04R
Connectors for making power cables	Motor side	R88M-K(050/100/200/400/750)30(H/T)_	R88A-CNK11A
	Motor side	R88M-K(1K0/1K5)30(H/T)-S2 R88M-K(1K0/1K5)20(H/T)-S2 R88M-K90010(H/T)-S2 R88M-K(750/1K0/1K5/2K0)30(F/C)-S2, R88M-K(400/600/1K0/1K5/2K0)20(F/C)-S2 R88M-K90010(F/C)-S2	MS3108E20-4S
	Motor side	R88M-K(1K0/1K5)30(H/T)-BS2 R88M-K(1K0/1K5)20(H/T)-BS2 R88M-K90010(H/T)-BS2	MS3108E20-18S
	Motor side	R88M-K(750/1K0/1K5/2K0/3K0/4K0/5K0)30(F/C)-BS2 R88M-K(400/600/1K0/1K5/2K0/3K0/4K0/5K0)20(F/C)-BS2 R88M-K(900/2K0/3K0)10(F/C)-BS2	MS3108E24-11S
	Motor side	R88M-K(3K0/4K0/5K0)30(F/C)-S2 R88M-K(3K0/4K0/5K0)20(F/C)-S2 R88M-K(2K0/3K0)10(F/C)-S2	MS3108E22-22S
Connector for brake cable	Motor side	R88M-K(050/100/200/400/750)30(H/T)-BS2	R88A-CNK11B

Note: 1. All cables listed are flexible and shielded (except the R88A-CAKA___-BR-E which is only a flexible cable).
2. All connectors and cables listed have IP67 class (except R88A-CNW01R connector and R88A-CRGD0R3C cable).

Specifications

Servo motors 3000 r/min, 230 V

Voltage			230 V						
Servo motor model R88M-K_		20-bit incremental encoder	05030H-_	10030H-_	20030H-_	40030H-_	75030H-_	1K030H-_	1K530H-_
		17-bit absolute encoder	05030T-_	10030T-_	20030T-_	40030T-_	75030T-_	1K030T-_	1K530T-_
Rated output		W	50	100	200	400	750	1000	1500
Rated torque		N·m	0.16	0.32	0.64	1.3	2.4	3.18	4.77
Instantaneous peak torque		N·m	0.48	0.95	1.91	3.8	7.1	9.55	14.3
Rated current		A (rms)	1.2	1.1	1.5	2.4	4.1	6.6	8.2
Instantaneous max. current		A (rms)	5.1	4.7	6.5	10.2	17.4	28	35
Rated speed		min^{-1}	3000						
Max. speed		min^{-1}	6000					5000	
Torque constant		N·m/A (rms)	0.11±10%	0.21±10%	0.31±10%	0.39±10%	0.42±10%	0.37	0.45
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$ (without brake)	0.025	0.051	0.14	0.26	0.87	2.03	2.84
		$kg·m^2x10^{-4}$ (with brake)	0.027	0.054	0.16	0.28	0.97	2.35	3.17
Allowable load moment of inertia (JL)		Multiple of (JM)	30				20	15	
Rated power rate		kW/s (without brake)	10.1	19.9	29.0	62.4	65.6	49.8	80.1
		kW/s (with brake)	9.4	18.8	25.4	58	58.8	43	71.8
Allowable radial load		N	68		245		490		
Allowable thrust load		N	58		98		196		
Approx. mass		Kg (without brake)	0.32	0.47	0.82	1.2	2.3	3.5	4.4
		Kg (with brake)	0.53	0.68	1.3	1.7	3.1	4.5	5.4
Brake specifications	Rated voltage		24VDC ±10%						
	Holding brake moment of inertia J	$kg·m^2x10^{-4}$	0.002		0.0018		0.33		
	Power consumption (at 20°C)	W	7		9		17	19	
	Current consumption (at 20°C)	A	0.3		0.36		0.70±10%	0.81±10%	
	Static friction torque	N.m (minimum)	0.29		1.27		2.5	7.8	
	Rise time for holding torque	ms (max.)	35		50				
	Release time	ms (max)	20		15				

Voltage			230 V						
Servo motor model R88M-K_		20-bit incremental encoder	05030H-_	10030H-_	20030H-_	40030H-_	75030H-_	1K030H-_	1K530H-_
		17-bit absolute encoder	05030T-_	10030T-_	20030T-_	40030T-_	75030T-_	1K030T-_	1K530T-_
Basic specifications	Time Rating		Continuous						
	Insulation class		Type B					Type F	
	Ambient operating/ storage temperature		0 to +40°C/ -20 to 65°C						
	Ambient operating/ storage humidity		20 to 80% (non-condensing)					20 to 85% (non-condensing)	
	Vibration class		V-15						
	Insulation resistance		20 MΩ min. at 500 VDC between the power terminals and FG terminal						
	Enclosure		Totally-enclosed, self-cooling, IP67 (excluding shaft opening)						
	Vibration resistance		Vibration acceleration 49 m/s2						
	Mounting		Flange-mounted						

Servo motors 3000 r/min, 400 V

Voltage			400 V						
Servo motor model R88M-K_		20-bit incremental encoder	75030F-_	1K030F-_	1K530F-_	2K030F-_	3K030F-_	4K030F-_	5K030F-_
		17-bit absolute encoder	75030C-_	1K030C-_	1K530C-_	2K030C-_	3K030C-_	4K030C-_	5K030C-_
Rated output		W	750	1000	1500	2000	3000	4000	5000
Rated torque		N·m	2.39	3.18	4.77	6.37	9.55	12.7	15.9
Instantaneous peak torque		N·m	7.16	9.55	14.3	19.1	28.6	38.2	47.7
Rated current		A (rms)	2.4	3.3	4.2	5.7	9.2	9.9	12
Instantaneous max. current		A (rms)	10	14	18	24	39	42	51
Rated speed		min^{-1}	3000						
Max. speed		min^{-1}	5000					4500	
Torque constant		N·m/A (rms)	0.78	0.75	0.89	0.87	0.81	0.98	
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$ (without brake)	1.61	2.03	2.84	3.68	6.5	12.9	17.4
		$kg·m^2x10^{-4}$ (with brake)	1.93	2.35	3.17	4.01	7.85	14.2	18.6
Allowable load moment of inertia (JL)		Multiple of (JM)	30						
Rated power rate		kW/s (without brake)	35.5	49.8	80.1	110	140	126	146
		kW/s (with brake)	29.6	43	71.8	101	116	114	136
Allowable radial load		N	490					784	
Allowable thrust load		N	196					343	
Approx. mass		Kg (without brake)	3.1	3.5	4.4	5.3	8.3	11	14
		Kg (with brake)	4.1	4.5	5.4	6.3	9.4	12.6	16
Brake specifications	Rated voltage		24VDC±10%						
	Holding brake moment of inertia J	$kg·m^2x10^{-4}$	0.33						1.35
	Power consumption (at 20°C)	W	17	19				22	
	Current consumption (at 20°C)	A	0.70±10%	0.81±10%				0.90±10%	
	Static friction torque	N.m (minimum)	2.5	7.8			11.8	16.1	
	Rise time for holding torque	ms (max.)	50					110	
	Release time	ms (max)	15					50	
Basic specifications	Time Rating		Continuous						
	Insulation class		Type F						
	Ambient operating/ storage temperature		0 to +40°C/ -20 to 65°C						
	Ambient operating/ storage humidity		20% to 85% (non-condensing)						
	Vibration class		V-15						
	Insulation resistance		20 MΩ min. at 500 VDC between the power terminals and FG terminal						
	Enclosure		Totally-enclosed, self-cooling, IP67(excluding shaft opening)						
	Vibration resistance		Vibration acceleration 49 m/s²						
	Mounting		Flange-mounted						

Servo motors 2000 r/min, 230V/ 400 V

Voltage		230 V		400 V							
Servo motor model R88M-K_	20-bit incremental encoder	1K020H-_	1K520H-_	40020F-_	60020F-_	1K020F-_	1K520F-_	2K020F-_	3K020F-_	4K020F-_	5K020F-_
	17-bit absolute encoder	1K020T-_	1K520T-_	40020C-_	60020C-_	1K020C-_	1K520C-_	2K020C-_	3K020C-_	4K020C-_	5K020C-_
Rated output	W	1000	1500	400	600	1000	1500	2000	3000	4000	5000
Rated torque	N·m	4.77	7.16	1.91	2.86	4.77	7.16	9.55	14.3	19.1	23.9
Instantaneous peak torque	N·m	14.3	21.5	5.73	8.59	14.3	21.5	28.7	43	57.3	71.6
Rated current	A (rms)	5.7	9.4	1.2	1.5	2.8	4.7	5.9	8.7	10.6	13
Instantaneous max. current	A (rms)	24	40	4.9	6.5	12	20	25	37	45	55
Rated speed	min^{-1}	2000									
Max. speed	min^{-1}	3000									
Torque constant	N·m/A (rms)	0.63	0.58	1.27	1.38	1.27	1.16	1.27	1.18	1.40	1.46
Rotor moment of inertia (JM)	$kg·m^2x10^{-4}$ (without brake)	4.60	6.70	1.61	2.03	4.60	6.70	8.72	12.9	37.6	48
	$kg·m^2x10^{-4}$ (with brake)	5.90	7.99	1.90	2.35	5.90	7.99	10	14.2	38.6	48.8
Max. load moment of inertia (JL)	Multiple of (JM)	10									
Rated power rate	kW/s (without brake)	49.5	76.5	22.7	40.3	49.5	76.5	105	159	97.1	119
	kW/s (with brake)	38.6	64.2	19.2	34.8	38.6	64.2	91.2	144	94.5	117
Allowable radial load	N	490							784		
Allowable thrust load	N	196							343		

Voltage			230 V		400 V							
Servo motor model R88M-K_		20-bit incremental encoder	1K020H-_	1K520H-_	40020F-_	60020F-_	1K020F-_	1K520F-_	2K020F-_	3K020F-_	4K020F-_	5K020F-_
		17-bit absolute encoder	1K020T-_	1K520T-_	40020C-_	60020C-_	1K020C-_	1K520C-_	2K020C-_	3K020C-_	4K020C-_	5K020C-_
Approx. mass		kg (without brake)	5.2	6.7	3.1	3.5	5.2	6.7	8	11	15.5	18.6
		kg (with brake)	6.7	8.2	4.1	4.5	6.7	8.2	9.5	12.6	18.7	21.8
Brake specifications	Rated voltage		24VDC ±10%									
	Holding brake moment inertia	(J) kg·m^{2}x10^{-4}	1.35								4.7	
	Power consumption (20°C)	W	14	19	17		14	19		22	31	
	Current consumption (20°C)	A	0.59±10%	0.79±10%	0.70 ±10%		0.59±10%	0.79 ±10%		0.90±10%	1.3±10%	1.3 ±-10%
	Static friction torque	N.m (minimum)	4.9	13.7	2.5		4.9	13.7		16.2	24.5	
	Rise time for holding torque	ms (max.)	80	100	50		80	100		110	80	
	Release time	ms (max)	70	50	15		70	50			25	
Basic specifications	Time Rating		Continuous									
	Insulation class		TypeF									
	Ambient operating/ storage temperature		0 to +40 °C/ -20 to 85°C									
	Ambient operating/ storage humidity		20% to 85% (non-condensing)									
	Vibration class		V-15									
	Insulation resistance		20 MΩ min. at 500 VDC between the power terminals and FG terminal									
	Enclosure		Totally-enclosed, self-cooling, IP67 (excluding shaft opening)									
	Vibration resistance		Vibration acceleration 49 m/s²									
	Mounting		Flange-mounted									

Servo motors 1000 r/min, 230 V/400 V

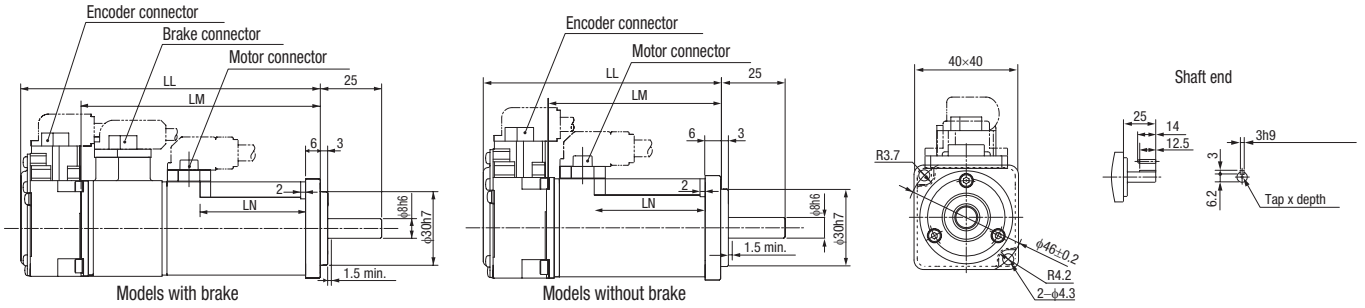
Applied voltage			230 V	400 V		
Servo motor model R88M-K_		20-bit incremental encoder	90010H-_	90010F-_	2K010F-_	3K010F-_
		17-bit absolute encoder	90010T-_	90010C-_	2K010C-_	3K010C-_
Rated output		W	900	900	2000	3000
Rated torque		N·m	8.59		19.1	28.7
Instantaneous peak torque		N·m	19.3		47.7	71.7
Rated current		A (rms)	7.6	3.8	8.5	11.3
Instantaneous max. current		A (rms)	24	12	30	40
Rated speed		min^{-1}	1000			
Max. speed		min^{-1}	2000			
Torque constant		N·m/A (rms)	0.86	1.72	1.76	1.92
Rotor moment of inertia (JM)		kg·m^{2}x10^{-4} (without brake)	6.70		30.3	48.4
		kg·m^{2}x10^{-4} (with brake)	7.99		31.4	49.2
Allowable load moment of inertia (JL)		Multiple of (JM)	10			
Rated power rate		kW/s (without brake)	110		120	170
		kW/s (with brake)	92.4		116	167
Allowable radial load		N	686		1176	1470
Allowable thrust load		N	196		490	
Approx. mass		kg (without brake)	6.7		14	20
		kg (with brake)	8.2		17.5	23.5
Brake specifications	Rated voltage		24VDC ±10%			
	Holding brake moment of inertia J	kg·m^{2}x10^{-4}	1.35		4.7	
	Power consumption (at 20°C)	W	19		31	34
	Current consumption (at 20°C)	A	0.79±10%		1.3±10%	1.4±10%
	Static friction torque	N.m (minimum)	13.7		24.5	58.8
	Rise time for holding torque	ms (max.)	100		80	150
	Release time	ms (max)	50		25	50
Basic specifications	Time Rating		Continuous			
	Insulation class		Type F			
	Ambient operating/ storage temperature		0 to +40 °C/ -20 to 65°C			
	Ambient operating/ storage humidity		20% to 85% RH (non-condensing)			
	Vibration class		V-15			
	Insulation resistance		20 MΩ min. at 500 VDC between the power terminals and FG terminal			
	Enclosure		Totally-enclosed, self-cooling, IP67 (excluding shaft opening)			
	Vibration resistance		Vibration acceleration 49 m/s2			
	Mounting		Flange-mounted			

Dimensions

Servo motors

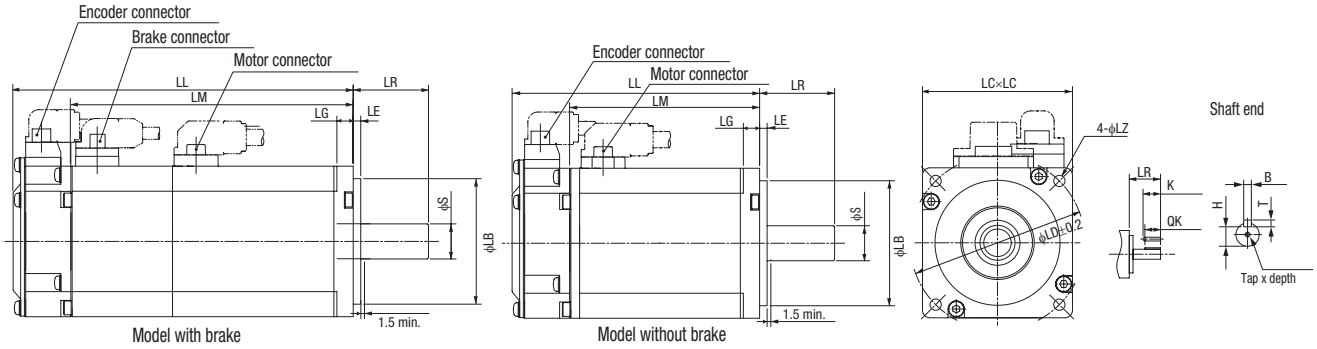
Type 3000 r/min motors (230 V, 50 - 100 W)

Dimensions (mm)	Without brake		With brake		LN	Shaft End Dimensions	Approx. Mass (Kg)	
Model	LL	LM	LL	LM		Tap × Depth	Without brake	With brake
R88M-K05030(H/T)-_S2	72	48	102	78	23	M3 x 6L	0.32	0.53
R88M-K10030(H/T)-_S2	92	68	122	98	43		0.47	0.68



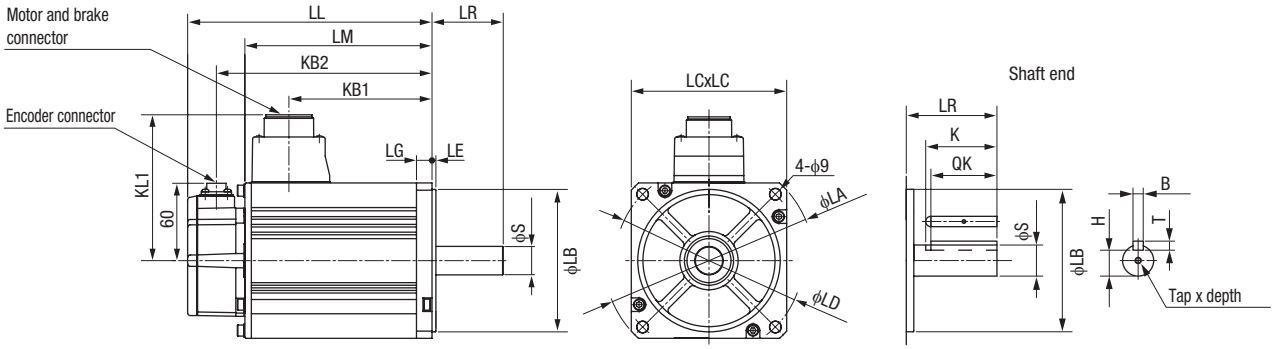
Type 3000 r/min motors (230 V, 200 - 750 W)

Dimensions (mm)	Without brake		With brake		LR	Flange surface						Shaft End Dimensions							Approx. Mass Kg	
Model	LL	LM	LL	LM		LB	LC	LD	LE	LG	LZ	S	K	QK	H	B	T	Tap × Depth	Without brake	With brake
R88M-K20030(H/T)-_S2	79.5	56.5	116	93	30	50^{h7}	60	70	3	6.5	4.5	11^{h6}	20	18	8.5	4^{h9}	4	M4x8L	0.82	1.3
R88M-K40030(H/T)-_S2	99	76	135.5	112.5								14^{h6}	25	22.5	11	5^{h9}	5	M5x10L	1.2	1.7
R88M-K75030(H/T)-_S2	112.2	86.2	148.2	122.2	35	70^{h7}	80	90		8	6	19^{h6}		22	15.5	6^{h9}	6		2.3	3.1



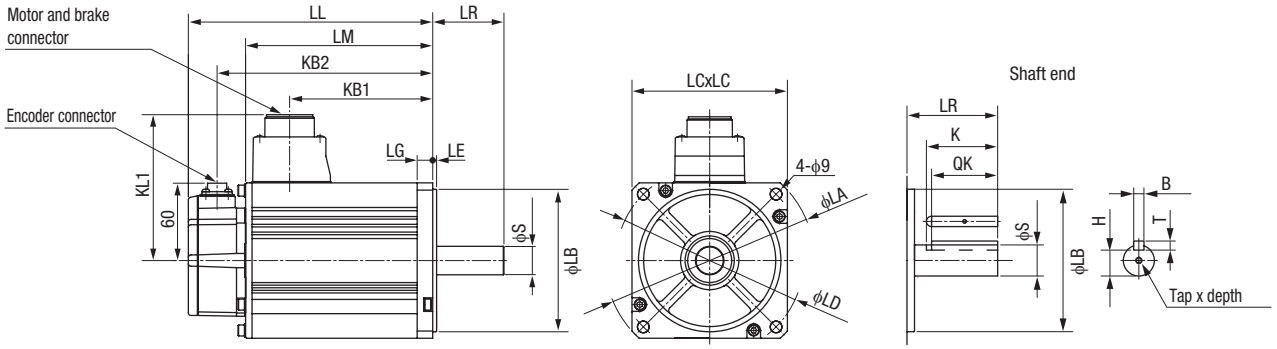
Type 3000 r/min motors (230 V, 1 - 1.5 kW/ 400V, 750 W - 5 kW)

Dimensions (mm)		Without brake					With brake					LR	Flange surface						Shaft End Dimensions							Approx. Mass (Kg)	
Voltage	Model R88M-K_	LL	LM	KB1	KB2	KL1	LL	LM	KB1	KB2	KL1		LA	LB	LC	LD	LE	LG	S	Tap × Depth	K	QK	H	B	T	Without brake	With brake
230	1K030(H/T)-_S2	141	97	66	119	101	168	124	66	146	101	55	135	95^{h7}	100	115	3	10	19^{h6}	M5x 12L	45	42	15.5	6^{h9}	6	3.5	4.5
	1K530(H/T)-_S2	159.5	115.5	84.5	137.5		186.5	142.5	84.5	164.5																4.4	5.4
400	75030(F/C)-_S2	131.5	87.5	56.5	109.5		158.5	114.5	53.5	136.5	103															3.1	4.1
	1K030(F/C)-_S2	141	97	66	119		168	124	63	146																3.5	4.5
	1K530(F/C)-_S2	159.5	115.5	84.5	137.5		186.5	142.5	81.5	164.5																4.4	5.4
	2K030(F/C)-_S2	178.5	134.5	103.5	156.5		205.5	161.5	100.5	183.5																5.3	6.3
	3K030(F/C)-_S2	190	146	112	168	113	215	171	112	193	113		162	110^{h7}	120	145		12	22^{h6}			41	18	8^{h9}	7	8.3	9.4
	4K030(F/C)-_S2	208	164	127	186	118	233	189	127	211	118	65	165		130		6		24^{h6}	M8x 20L	55	51	20			11	12.6
	5K030(F/C)-_S2	243	199	162	221		268	224	162	246																14	16



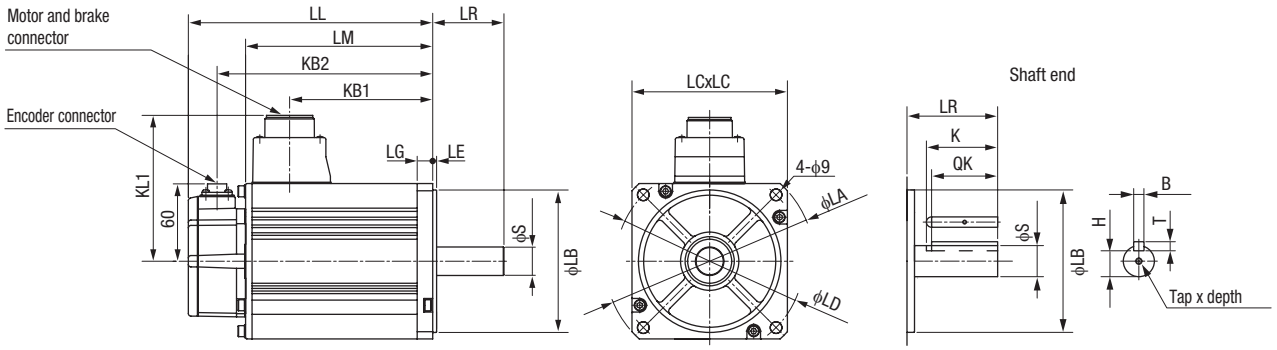
Type 2000 r/min motors (230 V, 1-1.5 kW/400 V, 400 W-5 kW)

Dimensions (mm)		Without brake					With brake					LR	Flange surface							Shaft End Dimensions							Approx. Mass (Kg)	
Voltage	Model R88M-K_	LL	LM	KB1	KB2	KL1	LL	LM	KB1	KB2	KL1		LA	LB	LC	LD	LE	LG	LZ	S	Tap × Depth	K	QK	H	B	T	Without brake	With brake
230	1K020(H/T)-_S2	138	94	60	116	116	163	119	60	141	116	55	165	110^{h7}	130	145	6	12	9	22^{h6}	M5x 12L	45	41	18	8^{h9}	7	5.2	6.7
	1K520(H/T)-_S2	155.5	111.5	77.5	133.5		180.5	136.5	77.5	158.5																	6.7	8.2
400	40020(F/C)-_S2	131.5	87.5	56.5	109.5	101	158.5	114.5	53.5	136.5	103		135	95^{h7}	100	115	3	10		19^{h6}			42	15.5	6^{h9}	6	3.1	4.1
	60020(F/C)-_S2	141	97	66	119		168	124	63	146																	3.5	4.5
	1K020(F/C)-_S2	138	94	60	116	116	163	119	57	141	118		165	110^{h7}	130	145	6	12		22^{h6}			41	18	8^{h9}	7	5.2	6.7
	1K520(F/C)-_S2	155.5	111.5	77.5	133.5		180.5	136.5	74.5	158.5																	6.7	8.2
	2K020(F/C)-_S2	173	129	95	151		198	154	92	176																	8	9.5
	3K020(F/C)-_S2	208	164	127	186	118	233	189	127	211		65								24^{h6}	M8x 20L	55	51	20			11	12.6
	4K020(F/C)-_S2	177	133	96	155	140	202	158	96	180	140	70	233	114.3^{h7}	176	200	3.2	18	13.5	35^{h6}	M12x 25L		50	30	10^{h9}	8	15.5	18.7
	5K020(F/C)-_S2	196	152	115	174		221	177	115	199																	18.6	21.8



Type 1000 r/min motors (230 V, 900W / 400 V, 900W - 3 kW)

Dimensions (mm)		Without brake					With brake					LR	Flange surface							Shaft End Dimensions							Approx. Mass (Kg)	
Voltage	Model R88M-K_	LL	LM	KB1	KB2	KL1	LL	LM	KB1	KB2	KL1		LA	LB	LC	LD	LE	LG	LZ	S	Tap × Depth	K	QK	H	B	T	Without brake	With brake
230	90010(H/T)-_S2	155.5	111.5	77.5	133.5	116	180.5	136.5	77.5	158.5	116	70	165	110^{h7}	130	145	6	12	9	22^{h6}	M5x12L	45	41	18	8^{h9}	7	6.7	8.2
400	90010(F/C)-_S2								74.5		118										M5x10L							
	2K010(F/C)-_S2	163.5	119.5	82.5	141.5	140	188.5	144.5	82.5	166.5	140	80	233	114.3^{h7}	176	200	3.2	18	13.5	35^{h6}	M12x 25L	55	50	30	10^{h9}	8	14	17.5
	3K010(F/C)-_S2	209.5	165.5	128.5	187.5		234.5	190.5	128.5	212.5																	20	23.5



G-Series servo motors



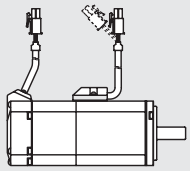
Compact in size, big in features

A wide range of compact servo motors to meet all application needs. When used with a SmartStep 2 drive, the G-series servo motors offer the simplicity and cost-effectiveness of a stepper with the added advantages of a servo system.

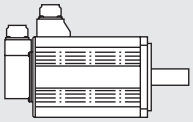
- Peak torque 300% of continuous torque during 3 seconds or more depending on model
- Servo motors supported by SmartStep2, G-Series and Accurax G5 servo drives
- Cylindrical and Flat servo motors types are available
- Encoder accuracy of 10,000 step/rev as standard and 17-bit INC/ABS encoder as optional
- IP65 as standard and shaft oil seal available
- Motors with brake as option

Ordering information

① **G-Series Cylindrical type Servo motor**

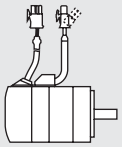


3000 rpm (50-750W)



3000 rpm (1000-1500 W)
2000 rpm (1000-1500 W)
1000 rpm (900 W)

① **G-Series Flat type Servo motor**



3000 rpm (100-400 W)



③ Encoder cable

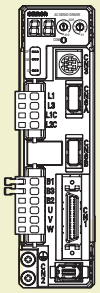
④ Absolute Encoder Battery cable



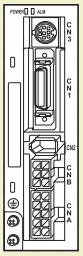
⑤ Power cable

⑥ Brake cable

② **G-Series Servo drive**



② **SmartStep 2 Servo drive**
Servo Drive controlled by pulses



Servo drive

② Refer to G-Series and SmartStep2 servo drive section for detailed drive specifications and selection of drive accessories.

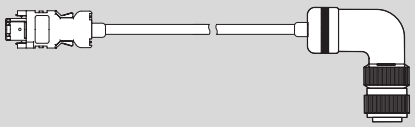
Cylindrical servo motors 3000/2000/1000 r/min (50 - 1.5 kW)

Symbol	Specifications						Compatible servo drives ②		Order code
	Voltage	Encoder and design	Speed	Design	Rated torque	Capacity	SmartStep2	G-Series	
①  (50-750 W)  (900-1500 W)	230 V	Incremental encoder (10000 pulses) Straight shaft with key & tap	3000 min^{-1}	Without brake	0.16 Nm	50 W	R7D-BP01H	R88D-GN01H-ML2	R88M-G05030H-S2
					0.32 Nm	100 W	R7D-BP01H	R88D-GN01H-ML2	R88M-G10030H-S2
					0.64 Nm	200 W	R7D-BP02HH	R88D-GN02H-ML2	R88M-G20030H-S2
					1.3 Nm	400 W	R7D-BP04H	R88D-GN04H-ML2	R88M-G40030H-S2
					2.4 Nm	750 W	R88D-GP08H	R88D-GN08H-ML2	R88M-G75030H-S2
				With brake	0.16 Nm	50 W	R7D-BP01H	R88D-GN01H-ML2	R88M-G05030H-BS2
					0.32 Nm	100 W	R7D-BP01H	R88D-GN01H-ML2	R88M-G10030H-BS2
					0.64 Nm	200 W	R7D-BP02HH	R88D-GN02H-ML2	R88M-G20030H-BS2
					1.3 Nm	400 W	R7D-BP04H	R88D-GN04H-ML2	R88M-G40030H-BS2
					2.4 Nm	750 W	R88D-GP08H	R88D-GN08H-ML2	R88M-G75030H-BS2
		Absolute/ incremental encoder (17 bits) Straight shaft with key & tap		Without brake	0.16 Nm	50 W	-	R88D-GN01H-ML2	R88M-G05030T-S2
					0.32 Nm	100 W	-	R88D-GN01H-ML2	R88M-G10030T-S2
					0.64 Nm	200 W	-	R88D-GN02H-ML2	R88M-G20030T-S2
					1.3 Nm	400 W	-	R88D-GN04H-ML2	R88M-G40030T-S2
					2.4 Nm	750 W	-	R88D-GN08H-ML2	R88M-G75030T-S2
					3.18 Nm	1 kW	-	R88D-GN15H-ML2	R88M-G1K030T-S2
					4.77 Nm	1.5 kW	-	R88D-GN15H-ML2	R88M-G1K530T-S2
				With brake	0.16 Nm	50 W	-	R88D-GN01H-ML2	R88M-G05030T-BS2
					0.32 Nm	100 W	-	R88D-GN01H-ML2	R88M-G10030T-BS2
					0.64 Nm	200 W	-	R88D-GN02H-ML2	R88M-G20030T-BS2
					1.3 Nm	400 W	-	R88D-GN04H-ML2	R88M-G40030T-BS2
					2.4 Nm	750 W	-	R88D-GN08H-ML2	R88M-G75030T-BS2
					3.18 Nm	1 kW	-	R88D-GN15H-ML2	R88M-G1K030T-BS2
					4.77 Nm	1.5 kW	-	R88D-GN15H-ML2	R88M-G1K530T-BS2
			2000 min^{-1}	Without brake	4.8 Nm	1 kW	-	R88D-GN10H-ML2	R88M-G1K020T-S2
					7.15 Nm	1.5 kW	-	R88D-GN15H-ML2	R88M-G1K520T-S2
				With brake	4.8 N m	1 kW	-	R88D-GN10H-ML2	R88M-G1K020T-BS2
					7.15 Nm	1.5 kW	-	R88D-GN15H-ML2	R88M-G1K520T-BS2
			1000 min^{-1}	Without brake	8.62 Nm	900 W	-	R88D-GN15H-ML2	R88M-G90010T-S2
				With brake			-	R88D-GN15H-ML2	R88M-G90010T-BS2

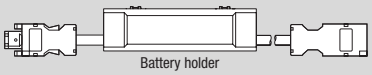
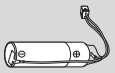
Flat type servo motors 3000 r/min (100 - 400 W)

Symbol	Specifications					Compatible servo drives ②		Order code
	Voltage	Encoder and design		Rated torque	Capacity	SmartStep2	G-Series	
① 	230 V	Incremental encoder (10000 pulses) Straight shaft with key & tap	Without brake	0.32 Nm	100 W	R7D-BP01H	R88D-GN01H-ML2	R88M-GP10030H-S2
				0.64 Nm	200 W	R7D-BP02HH	R88D-GN02H-ML2	R88M-GP20030H-S2
				1.3 Nm	400 W	R7D-BP04H	R88D-GN04H-ML2	R88M-GP40030H-S2
			With brake	0.32 Nm	100 W	R7D-BP01H	R88D-GN01H-ML2	R88M-GP10030H-BS2
				0.64 Nm	200 W	R7D-BP02HH	R88D-GN02H-ML2	R88M-GP20030H-BS2
				1.3 Nm	400 W	R7D-BP04H	R88D-GN04H-ML2	R88M-GP40030H-BS2
		Absolute/ incremental encoder (17 bits) Straight shaft with key & tap	Without brake	0.32 Nm	100 W	-	R88D-GN01H-ML2	R88M-GP10030T-S2
				0.64 Nm	200 W	-	R88D-GN02H-ML2	R88M-GP20030T-S2
				1.3 Nm	400 W	-	R88D-GN04H-ML2	R88M-GP40030T-S2
			With brake	0.32 Nm	100 W	-	R88D-GN01H-ML2	R88M-GP10030T-BS2
				0.64 Nm	200 W	-	R88D-GN02H-ML2	R88M-GP20030T-BS2
				1.3 Nm	400 W	-	R88D-GN04H-ML2	R88M-GP40030T-BS2

Encoder cables

Symbol	Appearance	Specifications		Order code
③		Encoder cable for absolute encoder (50-750 W) R88M-G(50/100/200/400/750)30T-_ R88M-GP(100/200/400)30T-_	1.5 m	R88A-CRGA001-5CR-E
			3 m	R88A-CRGA003CR-E
			5 m	R88A-CRGA005CR-E
			10 m	R88A-CRGA010CR-E
			15 m	R88A-CRGA015CR-E
			20 m	R88A-CRGA020CR-E
		Encoder cable for Incremental encoder (50-750 W) R88M-G(50/100/200/400/750)30H-_ R88M-GP(100/200/400)30H-_	1.5 m	R88A-CRGB001-5CR-E
			3 m	R88A-CRGB003CR-E
			5 m	R88A-CRGB005CR-E
			10 m	R88A-CRGB010CR-E
			15 m	R88A-CRGB015CR-E
			20 m	R88A-CRGB020CR-E
		Encoder cable for Absolute encoder (900-1500 W) R88M-G(1K0/1K5)30T-_ R88M-G(1K0/1K5)20T-_ R88M-G90010T-_	1.5 m	R88A-CRGC001-5NR-E
			3 m	R88A-CRGC003NR-E
			5 m	R88A-CRGC005NR-E
			10 m	R88A-CRGC010NR-E
			15 m	R88A-CRGC015NR-E
			20 m	R88A-CRGC020NR-E

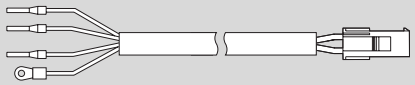
Absolute encoder battery cable

Symbol	Appearance	Specifications			Order code
④		Absolute Encoder battery cable	Battery not included	0.3 m	R88A-CRGD0R3C
			One R88A-BAT01G Battery included	0.3 m	R88A-CRGD0R3C-BS
		Absolute Encoder backup battery 2,000 mA.h 3.6 V		-	R88A-BAT01G

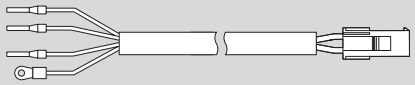
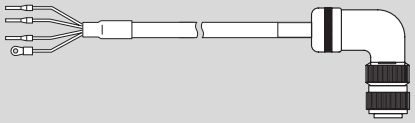
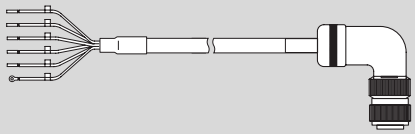
Note: The absolute encoder battery cable is only an extension and must be used with an absolute encoder cable.

Power cables

for SmartStep2 servo drive

Symbol	Appearance	Specifications		Order code
⑤		For servomotors from 50 to 400 W R88M-G(50/100/200/400)30_ R88M-GP(100/200/400)30_ For servomotors with brake, a separate cable (R88A-CAGA_BR-E) is needed	1.5 m	R7A-CAB001-5SR-E
			3 m	R7A-CAB003SR-E
			5 m	R7A-CAB005SR-E
			10 m	R7A-CAB010SR-E
			15 m	R7A-CAB015SR-E
			20 m	R7A-CAB020SR-E
		For servomotors 750W R88M-G75030_ For servomotors with brake, a separate cable (R88A-CAGA_BR-E) is needed	1.5 m	R88A-CAGA001-5SR-E
			3 m	R88A-CAGA003SR-E
			5 m	R88A-CAGA005SR-E
			10 m	R88A-CAGA010SR-E
			15 m	R88A-CAGA015SR-E
			20 m	R88A-CAGA020SR-E

for G-Series servo drive

Symbol	Appearance	Specifications		Order code
⑤		For servomotors from 50 to 750W R88M-G(50/100/200/400/750)30_ R88M-GP(100/200/400)30_ For servomotors with brake, a separate cable (R88A-CAGA_BR-E) is needed	1.5 m	R88A-CAGA001-5SR-E
			3 m	R88A-CAGA003SR-E
			5 m	R88A-CAGA005SR-E
			10 m	R88A-CAGA010SR-E
			15 m	R88A-CAGA015SR-E
			20 m	R88A-CAGA020SR-E
		For servomotors from 900 to 1.5 kW without brake R88M-G(1K0/1K5)30T-S2 R88M-G(1K0/1K5)20T-S2 R88M-G90010T-S2	1.5 m	R88A-CAGB001-5SR-E
			3 m	R88A-CAGB003SR-E
			5 m	R88A-CAGB005SR-E
			10 m	R88A-CAGB010SR-E
			15 m	R88A-CAGB015SR-E
			20 m	R88A-CAGB020SR-E
		For servomotors from 900 to 1.5 kW with brake R88M-G(1K0/1K5)30T-BS2 R88M-G(1K0/1K5)20T-BS2 R88M-G90010T-BS2	1.5 m	R88A-CAGB001-5BR-E
			3 m	R88A-CAGB003BR-E
			5 m	R88A-CAGB005BR-E
			10 m	R88A-CAGB010BR-E
			15 m	R88A-CAGB015BR-E
			20 m	R88A-CAGB020BR-E

Brake cable (for 50-750 W servo motors)

Symbol	Appearance	Specifications		Order code
⑥		Brake cable only. For servomotors from 50 to 750W with brake R88M-G(050/100/200/400/750)30_-BS2, R88M-GP(100/200/400)30_-BS2	1.5 m	R88A-CAGA001-5BR-E
			3 m	R88A-CAGA003BR-E
			5 m	R88A-CAGA005BR-E
			10 m	R88A-CAGA010BR-E
			15 m	R88A-CAGA015BR-E
			20 m	R88A-CAGA020BR-E

Connectors for power, encoder and brake cables

Specifications		Applicable Servomotor	Order code
Connectors for power cables	Drive side (CNB)	R88M-G(050/100/200/400)30H_, R88M-GP(100/200/400)30H_ (SmartStep2 Servo drives only)	R7A-CNB01A
	Motor side	R88M-G(050/100/200/400/750)30_, R88M-GP(100/200/400)30_	R88A-CNG01A
	Motor side	R88M-G(1K0/1K5)30_-S2, R88M-G(1K0/1K5)20_-S2, R88M-G90010_-S2 (without brake)	MS3108E20-4S
	Motor side	R88M-G(1K0/1K5)30_-BS2, R88M-G(1K0/1K5)20_-BS2, R88M-G90010_-BS2 (with brake)	MS3108E20-18S
Connectors for encoder cables	Drive side (CN2)	-	R88A-CNW01R
	Motor side	R88M-G(050/100/200/400/750)30T-_, R88M-GP(100/200/400)30T-_ (Absolute encoder)	R88A-CNG01R
	Motor side	R88M-G(050/100/200/400/750)30H-_, R88M-GP(100/200/400)30H-_ (Incremental encoder)	R88A-CNG02R
	Motor side	R88M-G(1K0/1K5)30T-_, R88M-G(1K0/1K5)20T-_, R88M-G90010T-_	MS3108E20-29S
Connector for brake cable	Motor side	R88M-G(050/100/200/400/750)30_-BS2, R88M-GP(100/200/400)30_-BS2	R88A-CNG01B

Note: 1. All cables listed are flexible and shielded (except the R88A-CAGA___BR-E which is only a flexible cable)
2. The R88A-CRGC___NR-E, R88A-CAGB___SR-E and R88A-CAGB___BR-E cables have IP67 class (including connector)

Specifications

Cylindrical servo motors 3000/2000/1000 r/min

Applied voltage			230 V									
Servo motor model R88M-_			G05030_	G10030_	G20030_	G40030_	G75030_	G1K030T	G1K530T	G1K020T	G1K520T	G90010T
Rated output		W	50	100	200	400	750	1000	1500	1000	1500	900
Rated torque		N·m	0.16	0.32	0.64	1.3	2.4	3.18	4.77	4.8	7.15	8.62
Instantaneous peak torque		N·m	0.45	0.90	1.78	3.67	7.05	9.1	12.8	13.5	19.6	18.4
Rated current		A (rms)	1.1		1.6	2.6	4	7.2	9.4	5.6	9.4	7.6
Instantaneous max. current		A (rms)	3.4		4.9	7.9	12.1	21.4	28.5	17.1	28.5	17.1
Rated speed		min^{-1}	3000							2000		1000
Max. speed		min^{-1}	5000				4500	5000		3000		2000
Torque constant		N·m/A (rms)	0.14	0.19	0.41	0.51	0.64	0.44	0.51	0.88	0.76	1.13
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$	0.025	0.051	0.14	0.26	0.87	1.69	2.59	6.17	11.2	
Allowable load moment of inertia (JL)		Multiple of (JM)	30				20	15		10		
Rated power rate		kW/s	10.4	20.1	30.3	62.5	66	60	88	37.3	45.8	66.3
Applicable Encoder			Incremental encoder (10000 pulses)					-				
			Incremental /Absolute encoder(17 bits)									
Allowable radial load		N	68		245		392		490			686
Allowable thrust load		N	58		98		147		196			
Approx. mass		kg (without brake)	0.3	0.5	0.8	1.2	2.3	4.5	5.1	6.8	8.5	
		kg (with brake)	0.5	0.7	1.3	1.7	3.1	5.1	6.5	8.7	10.1	10
Brake specifications	Rated voltage		24 VDC +/-5%					24 VDC +/-10%				
	Holding brake moment of inertia J	$kg·m^2x10^{-4}$	0.002		0.018		0.075	0.25	0.33	1.35		
	Power consumption (at 20°C)	W	7		9		10	18	19	14	19	
	Current consumption (at 20°C)	A	0.3		0.36		0.42	0.74	0.81	0.59	0.79	
	Static friction torque	N.m (minimum)	0.29		1.27		2.45	4.9	7.8	4.9	13.7	
	Rise time for holding torque	ms (max.)	35		50		70	50		80	100	
	Release time	ms (max)	20		15		20	15		70	50	
Basic specifications	Rating		Continuous									
	Insulation grade		Type B					Type F				
	Ambient operating/ storage temperature		0 to +40°C/ -20 to 65°C					0 to +40°C/ -20 to 80°C				
	Ambient operating/ storage humidity		85% RH max. (non-condensing)									
	Vibration class		V-15									
	Insulation resistance		20 MΩ min. at 500 VDC between the power terminals and FG terminal									
	Enclosure		Totally-enclosed, self-cooling, IP65 (excluding shaft opening and lead wire ends)									
	Vibration resistance		Vibration acceleration 49 m/s²					Vibration acceleration 24.5 m/s²				
	Mounting		Flange-mounted									

Flat servo motors 3000 r/min

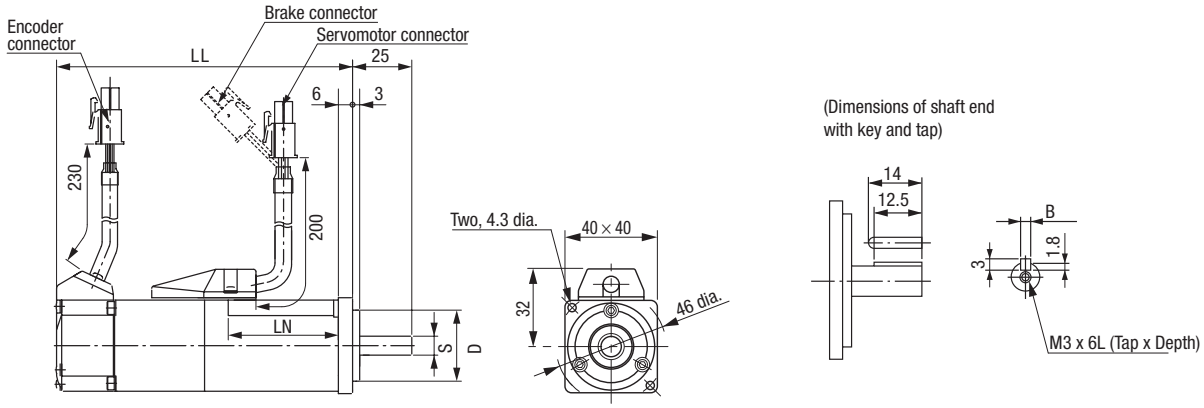
Applied voltage		230 V		
Servo motor model R88M-_		GP10030_	GP20030_	GP40030_
Rated output	W	100	200	400
Rated torque	N·m	0.32	0.64	1.3
Instantaneous peak torque	N·m	0.86	1.8	3.65
Rated current	A (rms)	1	1.6	2.5
Instantaneous max. current	A (rms)	3.1	4.9	7.5
Rated speed	min^{-1}	3000		

Applied voltage			**230 V**		
Servo motor model R88M-_			**GP10030_**	**GP20030_**	**GP40030_**
Max. speed		min^{-1}	5000		
Torque constant		N·m/A (rms)	0.34	0.42	0.54
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$	0.1	0.35	0.64
Allowable load moment of inertia (JL)		Multiple of (JM)	20		
Rated power rate		kW/s	10.2	11.5	25.5
Applicable encoder			Incremental (10000 pulses)		
			Incremental /Absolute encoder(17 bits)		
Allowable radial load		N	68	245	
Allowable thrust load		N	58	98	
Approx. mass		kg (without brake)	0.7	1.3	1.8
		kg (with brake)	0.9	2	2.5
Brake specifications	**Rated voltage**		24VDC +/-10%		
	Holding brake moment of inertia J	$kg·m^2x10^{-4}$	0.03	0.09	
	Power consumption (at 20°C)	W	7	10	
	Current consumption (at 20°C)	A	0.29	0.41	
	Static friction torque	N.m (minimum)	0.29	1.27	
	Rise time for holding torque	ms (max.)	50	60	
	Release time	ms (max)	15		
Basic specifications	**Rating**		Continuous		
	Insulation grade		Type B		
	Ambient operating/ storage temperature		0 to +40 °C/ -20 to 80°C		
	Ambient operating/ storage humidity		85% RH max. (non-condensing)		
	Vibration class		V-15		
	Insulation resistance		20 MΩ min. at 500 VDC between the power terminals and FG terminal		
	Enclosure		Totally-enclosed, self-cooling, IP65 (excluding shaft opening and lead wire ends)		
	Vibration resistance		Vibration acceleration 49 m/s2		
	Mounting		Flange-mounted		

Dimensions

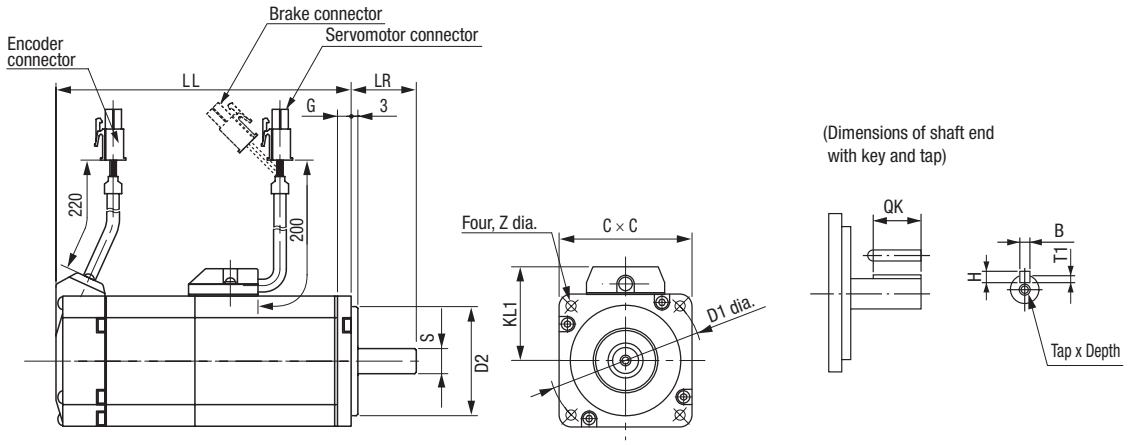
Cylindrical type 3000 r/min (230 V, 50-100 W)

Dimensions (mm)	**Without brake**	**With brake**	**LN**	**Flange surface**	**Shaft end**		**Approx. mass (kg)**	
Model	**LL**	**LL**		**D**	**S**	**B**	**Without brake**	**With brake**
R88M-G05030_-_S2	72	102	26.5	30^{h7}	8^{h6}	3^{h9}	0.3	0.5
R88M-G10030_-_S2	92	122	46.5				0.5	0.7



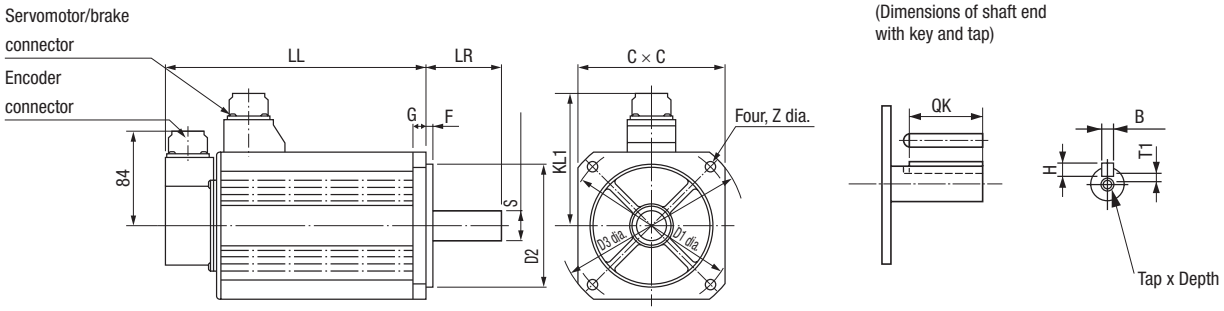
Cylindrical type 3000 r/min (230 V, 200-750 W)

Dimensions (mm)	Without brake	With brake	LR	KL1	Flange surface					Shaft end						Approx. mass (kg)	
Model	LL	LL			D1	D2	C	G	Z	S	QK	B	H	T1	Tap x depth	Without brake	With brake
R88M-G20030_-_S2	79.5	116	30	43	70	50^{h7}	60	6.5	4.5	11^{h6}	18	4^{h9}	4	2.5	M4x8L	0.8	1.3
R88M-G40030_-_S2	99	135.5								14^{h6}	22.5	5^{h9}	5	3	M5x10L	1.2	1.7
R88M-G75030_-_S2	112.2	149.2	35	53	90	70^{h7}	80	8	6	19^{h6}	22	6^{h9}	6	3.5		2.3	3.1



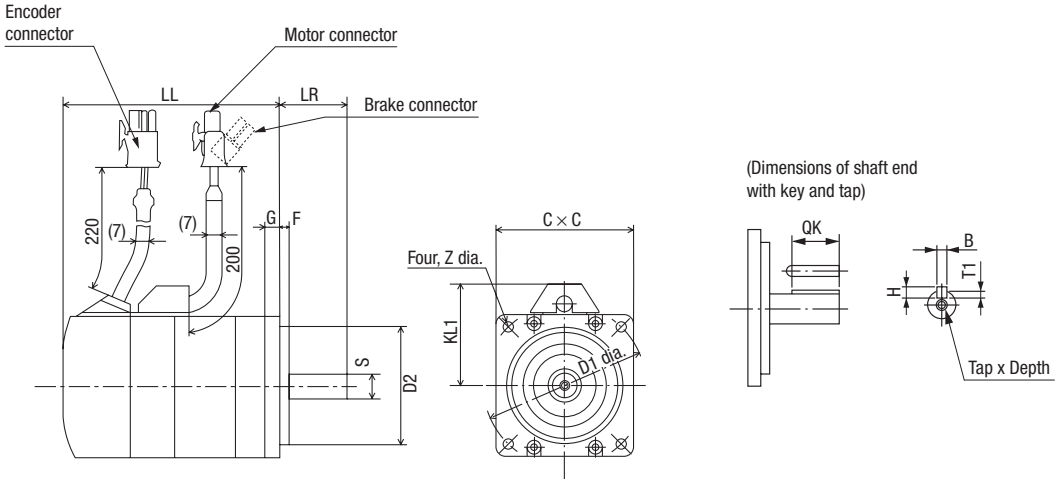
Cylindrical type 3000, 2000 and 1000 r/min (230 V, 900 kW - 1.5 kW)

Dimensions (mm)	Without brake	With brake	LR	KL1	Flange surface							Shaft end						Approx. mass (kg)	
Model	LL	LL			D1	D2	D3	C	G	F	Z	S	QK	B	H	T1	Tap x depth	Without brake	With brake
R88M-G1K030T-_S2	175	200	55	98	100	80^{h7}	120	90	7	3	6.6	19^{h6}	42	6^{h9}	6	3.5	M5x12L	4.5	5.1
R88M-G1K530T-_S2	180	205		103	115	95^{h7}	135	100	10		9							5.1	6.5
R88M-G1K020T-_S2	150	175		118	145	110^{h7}	165	130	12	6		22^{h6}	41	8^{h9}	7	4		6.8	8.7
R88M-G1K520T-_S2	175	200																8.5	10.1
R88M-G90010T-_S2	175	200	70																10



Flat type 3000 r/min (230 V, 100 W - 400 W)

Dimensions (mm)	Without brake	With brake	LR	KL1	Flange surface						Shaft end						Approx. mass (kg)	
Model	LL	LL			D1	D2	C	F	G	Z	S	QK	B	H	T1	Tap x depth	Without brake	With brake
R88M-GP10030H-_S2	60.5	84.5	25	43	70	50^{h7}	60	3	7	4.5	8^{h6}	12.5	3^{h9}	3	1.8	M3x6L	0.7	0.9
R88M-GP10030T-_S2	87.5	111.5																
R88M-GP20030H-_S2	67.5	100	30	53	90	70^{h7}	80	5	8	5.5	11^{h6}	18	4^{h9}	4	2.5	M4x8L	1.3	2
R88M-GP20030T-_S2	94.5	127																
R88M-GP40030H-_S2	82.5	115									14^{h6}	22.5	5^{h9}	5	3.0	M5x10L	1.8	2.5
R88M-GP40030T-_S2	109.5	142																



BORN TO DRIVE MACHINES

200% starting torque

Torque control in open loop

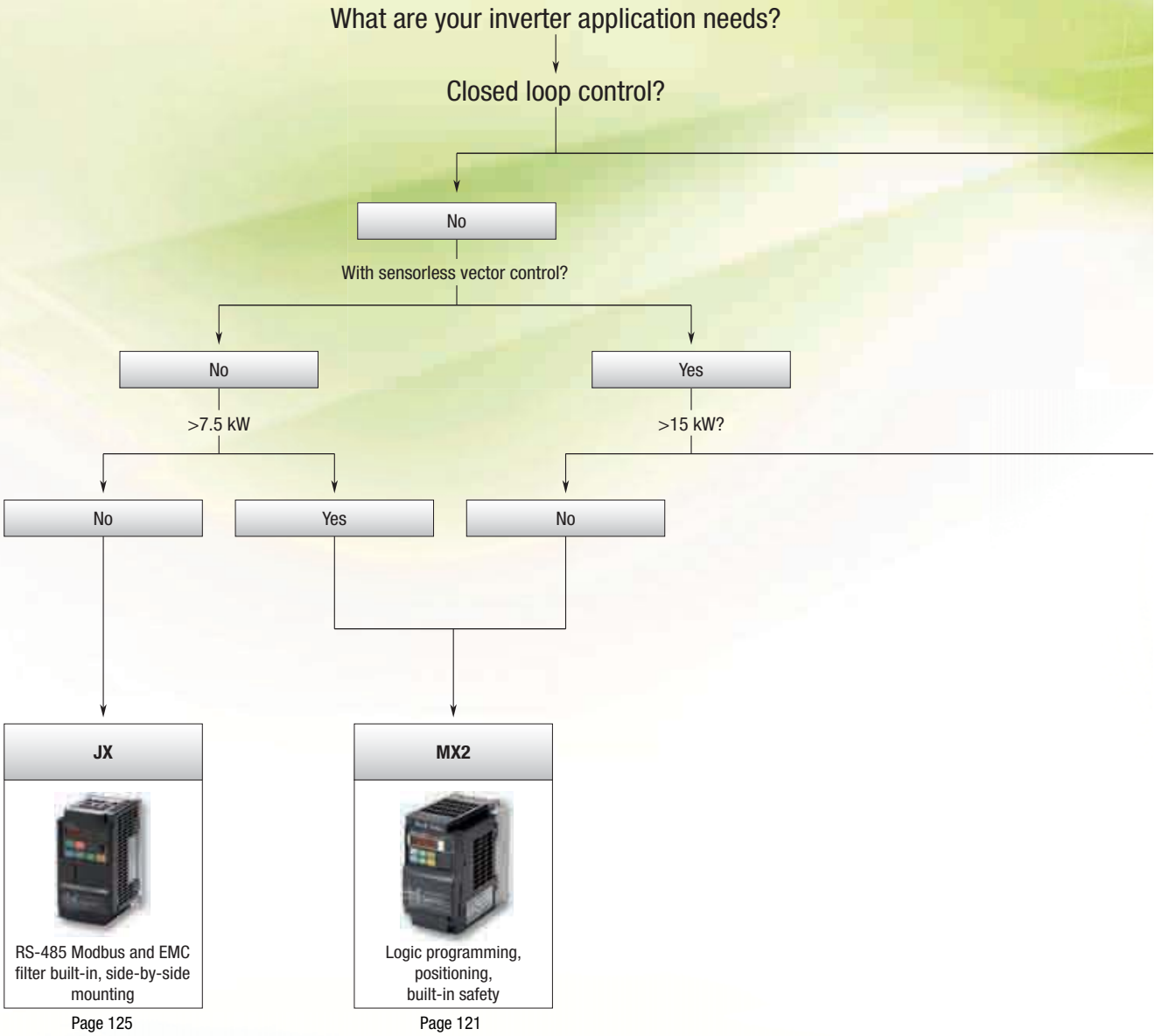
Special motors

One parameter auto-tuning

Harmonised motor and machine control

Specifically created for your application, the MX2 was developed to harmonise advanced motor and machine control. Thanks to its advanced design and algorithms the MX2 provides smooth control down to zero speed, plus precise operation for fast cyclic operations and torque control capability in open loop.

The MX2 also gives you comprehensive functionality for machine control such as positioning, speed synchronisation and logic programming. The MX2 is fully integrated within the Omron smart automation platform.
The MX2 is the child of a true leader in machine automation.



MOTOR CONTROL

- Near stand-still operation (0.5 Hz)
- Smooth control of high inertia loads
- Control of fast cyclic loads

- Ideal for low to medium torque applications
- Can replace a flux vector or servo drive in suitable systems

- Permanent magnet motors
- High speed motors up to 1000 Hz

- Just by entering the kW rating of the motor the MX2 gives you smooth and safe operation



MACHINE CONTROL

Safety inside	• Conforms to safety norm ISO-13849 CAT3 performance level PLD • 2 Safety inputs • External device monitoring (EDM)
Logic programming	• Flow chart programming • Intuitive – up to 5 tasks in parallel
Positioning	• Up to 8 pre-set positions with "Homing" • Speed synchronisation
Integrated in the Omron Smart Automation	• CX-Drive programming tool connected via integrated USB port on MX2. • Modbus RS485 built-in • Option units for EtherCAT, Profibus, DeviceNet, ML-II and more…

NO MAINTENANCE 10 YEARS

RoHS Compliant

WARRANTY 3 YEARS

Yes

Yes

690 V power supply?

No

Yes

RX



Logic programming, positioning, application oriented

Page 116

SX



Logic programming, Application oriented, hardware customization

Page 129

Model	RX	MX2	JX
			
	Customised to your machine	**Born to drive machines**	**Compact and complete**
400 V three-phase	**0.4 kW to 132 kW**	**0.4 kW to 15 kW**	**0.4 kW to 7.5 kW**
200 V three-phase	**0.4 kW to 55 kW**	**0.1 kW to 15 kW**	**0.2 kW to 7.5 kW**
200 V single-phase	**N/A**	**0.1 kW to 2.2 kW**	**0.2 kW to 2.2 kW**
Application	High Performance, built-in know-how functionality	Harmonized motor and machine control	General purpose built-in communications
Control method	Open and Closed loop for Vector and V/F control	Open loop speed and torque control for vector and speed for V/F control	V/F control
Torque features	200% at 0.0 Hz (CLV) 150% at 0.3 Hz (OLV)	200% at 0.5 Hz	150% at 3 Hz
Connectivity	Modbus, DeviceNet, PROFIBUS	Modbus, DeviceNet, PROFIBUS, MECHATROLINK-II EtherCAT, CompoNet	Modbus
Logic Programming	Standard Firmware	Standard Firmware	N/A
Page	116	121	125

Model	SX
	
	High Performance Vector Control
400 V three-phase	**90 kW to 800 kW**
690 V three-phase	**90 kW to 1,000 kW**
Application	High Power Flux vector and variable torque applications
Control method	Flux vector and V/F control
Torque features	120% at 0,0 Hz (CLV) 120% at 0,5 Hz (OLV)
Connectivity	Modbus, DeviceNet, PROFIBUS
Logic Programming	Standard Firmware
Customisation options	Hardware customisation (Main switch, Liquid cooling, 12-pulse rectifier, …)
Page	129

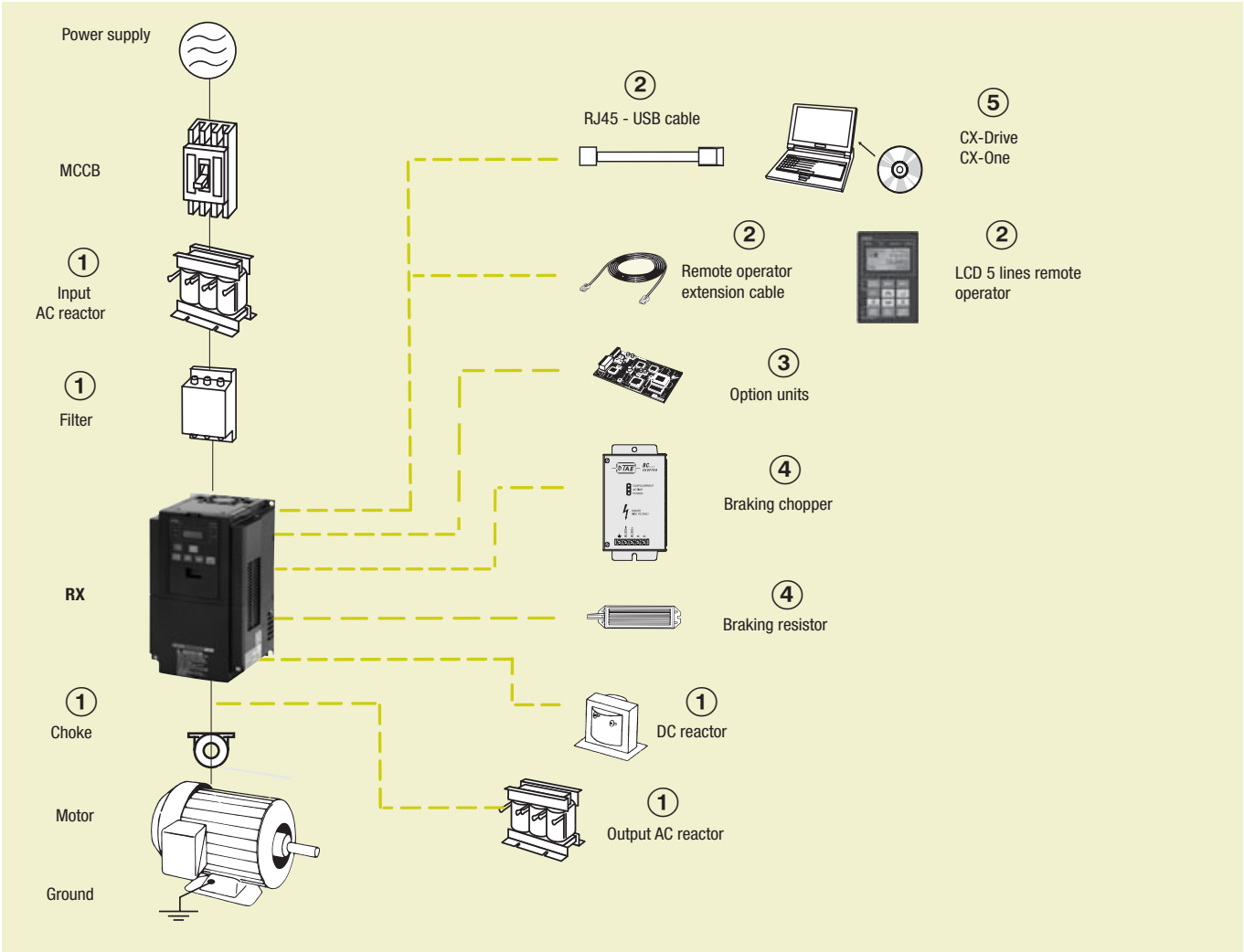


Customised to your machine

Omron realises that you need quality and reliability, plus the ability to easily and quickly customise your inverter to the application in hand. And with the RX, you have the perfect tool for the job. Naturally it combines the same high level of quality and performance for which Omron is renowned. It also has abundant application functionality on board and you can customise it yourself to match your precise requirements.

- Ratings up to 132 kW
- Sensor-less vector control at 0 Hz domain
- Sensor-less and vector closed-loop control
- Built-in EMC filter
- Built-in logic programmability
- Built-in application oriented functionality
- Positioning functionality
- Fieldbus communications: Modbus, DeviceNet and PROFIBUS

Ordering information



RX

Specifications			Order code	Specifications			Order code
Voltage class	Max motor kW	Rated current A	Standard	Voltage class	Max motor kW	Rated current A	Standard
Three-phase 200 V	0.4	3.0	RX-A2004-EF	Three-phase 400 V	0.4	1.5	RX-A4004-EF
	0.75	5.0	RX-A2007-EF		0.75	2.5	RX-A4007-EF
	1.5	7.5	RX-A2015-EF		1.5	3.8	RX-A4015-EF
	2.2	10.5	RX-A2022-EF		2.2	5.3	RX-A4022-EF
	4.0	16.5	RX-A2037-EF		4.0	9.0	RX-A4040-EF
	5.5	24	RX-A2055-EF		5.5	14	RX-A4055-EF
	7.5	32	RX-A2075-EF		7.5	19	RX-A4075-EF
	11	46	RX-A2110-EF		11	25	RX-A4110-EF
	15	64	RX-A2150-EF		15	32	RX-A4150-EF
	18.5	76	RX-A2185-EF		18.5	38	RX-A4185-EF
	22	95	RX-A2220-EF		22	48	RX-A4220-EF
	30	121	RX-A2300-EF		30	58	RX-A4300-EF
	37	145	RX-A2370-EF		37	75	RX-A4370-EF
	45	182	RX-A2450-EF		45	91	RX-A4450-EF
	55	220	RX-A2550-EF		55	112	RX-A4550-EF
	-	-	-		75	149	RX-B4750-EF
	-	-	-		90	176	RX-B4900-EF
	-	-	-		110	217	RX-B411K-EF
	-	-	-		132	260	RX-B413K-EF

① Rasmi line filters

200 V					400 V				
Model RX-_	Rated current (A)	Leakage Nom / Max	Kg	Order code	Model RX-_	Rated current (A)	Leakage Nom / Max	Kg	Order code
A2004 / A2007/ A2015/ A2022 / A2037	18	0.7/40 mA	2.0	AX-FIR2018-RE	A4004/ A4007/ A4015/ A4022/ A4040	10	0.3/40 mA	1.9	AX-FIR3010-RE
A2055 / A2075 / A2110	53	0.7/40 mA	2.5	AX-FIR2053-RE	A4055 / A4075 / A4110	30	0.3/40 mA	2.2	AX-FIR3030-RE
A2150/ A2185/ A2220	110	1.2/70 mA	8.0	AX-FIR2110-RE	A4150/ A4185/ A4220	53	0.8/70 mA	4.5	AX-FIR3053-RE
A2300	145	1.2/70 mA	8.6	AX-FIR2145-RE	A4300	64	3/160 mA	7.0	AX-FIR3064-RE
A2370/ A2450	250	6/300 mA	13.0	AX-FIR3250-RE	A4370	100	2/130 mA	8.0	AX-FIR3100-RE
A2550	320	6/300 mA	13.2	AX-FIR3320-RE	A4450 / A4550	130	2/130 mA	8.6	AX-FIR3130-RE
-					A4750 / A4900	250	10/500 mA	13.0	AX-FIR3250-RE
					A411K / A413K	320	10/500 mA	13.2	AX-FIR3320-RE

① Input AC Reactors

3-Phase 200 VAC		3-Phase 400 VAC	
Inverter Model RX-_	Order code	Inverter Model RX-_	Order code
A2004 / A2007 / A2015	AX-RAI02800100-DE	A4004 / A4007 / A4015	AX-RAI07700050-DE
A2022 / A2037	AX-RAI00880200-DE	A4022 / A4040	AX-RAI03500100-DE
A2055 / A2075	AX-RAI00350335-DE	A4055 / A4075	AX-RAI01300170-DE
A2110 / A2150	AX-RAI00180670-DE	A4110 / A4150	AX-RAI00740335-DE
A2185 / A2220	AX-RAI00091000-DE	A4185 / A4220	AX-RAI00360500-DE
A2300 / A2370	AX-RAI00071550-DE	A4300 / A4370	AX-RAI00290780-DE
A2450 / A2550	AX-RAI00042300-DE	A4450 / A4550	AX-RAI00191150-DE

① DC Reactors

3-Phase 200 VAC		3-Phase 400 VAC	
Inverter Model RX-_	Order code	Inverter Model RX-_	Order code
A2004	AX-RC10700032-DE	A4004	AX-RC43000020-DE
A2007	AX-RC06750061-DE	A4007	AX-RC27000030-DE
A2015	AX-RC03510093-DE	A4015	AX-RC14000047-DE
A2022	AX-RC02510138-DE	A4022	AX-RC10100069-DE
A2037	AX-RC01600223-DE	A4040	AX-RC06400116-DE
A2055	AX-RC01110309-DE	A4055	AX-RC04410167-DE
A2075	AX-RC00840437-DE	A4075	AX-RC03350219-DE
A2110	AX-RC00590614-DE	A4110	AX-RC02330307-DE
A2150	AX-RC00440859-DE	A4150	AX-RC01750430-DE
A2185 / A2220	AX-RC00301275-DE	A4185 / A4220	AX-RC01200644-DE
A2300	AX-RC00231662-DE	A4300	AX-RC00920797-DE
A2370	AX-RC00192015-DE	A4370	AX-RC00741042-DE
A2450	AX-RC00162500-DE	A4450	AX-RC00611236-DE
A2550	AX-RC00133057-DE	A4550	AX-RC00501529-DE

① Chokes

Diameter	Description	Order code
21	For 2.2 kW motors or below	AX-FER2102-RE
25	For 15 kW motors or below	AX-FER2515-RE
50	For 45 kW motors or below	AX-FER5045-RE
60	For 55 kW motors or above	AX-FER6055-RE

① Output AC Reactor

200 V		400 V	
Model RX-_	**Order code**	**Model RX-_**	**Order code**
A2004	AX-RA011500026-DE	A4004 / A4007 / A4015	AX-RA016300038-DE
A2007	AX-RA007600042-DE		
A2015	AX-RA004100075-DE		
A2022	AX-RA003000105-DE	A4022	AX-RA011800053-DE
A2037	AX-RA001830160-DE	A4040	AX-RA007300080-DE
A2055	AX-RA001150220-DE	A4055	AX-RA004600110-DE
A2075	AX-RA000950320-DE	A4075	AX-RA003600160-DE
A2110	AX-RA000630430-DE	A4110	AX-RA002500220-DE
A2150	AX-RA000490640-DE	A4150	AX-RA002000320-DE

② Accessories

Types	Description	Functions	Order code
Digital operator	LCD remote operator	5 Line LCD remote operator with copy function, cable length max. 3 m*1	AX-OP05-E
	Remote operator cable	3 meters cable for connecting remote operator	3G3AX-CAJOP300-EE
	LED remote operator	LED remote operator, cable length max. 3 m	3G3AX-OP01
	Mounting kit for LED operator	Mounting kit for LED operator on panel	4X-KITMINI
Accessories	USB converter / USB cable	RJ45 to USB connection cable	3G3AX-PCACN2

*1 Please note, models with firmware 4287 and 4288, the operator will only display 2 lines of text.

③ Option boards

Types	Description	Functions	Order code
Encoder feedback	PG speed controller option card	Phase A,B and Z pulse (differential pulse) inputs (RS-422) Pulse train position command input (RS-422) Pulse monitor output (RS-422) PG frequency range: 100 kHz max	3G3AX-PG
Communication option board	DeviceNet option card	Used for running or stopping the inverter or give frequency reference through DeviceNet	SJ-DN
	PROFIBUS option card	Used for running or stopping the inverter or give frequency reference through PROFIBUS	SJ-PB
Digital input	Digital input option card	Allows to set frequency reference from a digital selection	SJ-DG

④ Braking unit, braking resistor unit

Inverter					Braking resistor unit					
Voltage	**Max. motor kW**	**Inverter RX-_**	**Braking Unit AX-BCR_**	**Connectable min. resistance Ω**	**Inverter mounted type (3%ED, 10 sec max)**		**Braking torque %**	**External resistor 10%ED 10 sec max for built-in 5 sec max for Braking Unit**		**Braking torque %**
		3-phase			**Order code**	**Resist Ω**		**Order code**	**Resist Ω**	
200 V (single-/ three-phase)	0.55	2004	Built-in	50	AX-REM00K1200-IE	200	180	AX-REM00K1200-IE	200	180
	1.1	2007					100	AX-REM00K2070-IE	70	200
	1.5	2015		35	AX-REM00K2070-IE	70	140	AX-REM00K4075-IE	75	130
	2.2	2022					90	AX-REM00K4035-IE	35	180
	4.0	2037			AX-REM00K4075-IE	75	50	AX-REM00K6035-IE	35	100
	5.5	2055		16	AX-REM00K4035-IE	35	75	AX-REM00K9020-IE	20	150
	7.5	2075		10			55	AX-REM01K9017-IE	17	110
	11.0	2110			AX-REM00K6035-IE	35	40	AX-REM02K1017-IE	17	75
	15.0	2150		7.5	AX-REM00K9017-IE	17	55	AX-REM03K5010-IE	10	95
	18.5	2185			AX-REM03K5010-IE	10	75	AX-REM19K0008-IE	8	95
	22.0	2220		5			65			80
	30.0	2300	2035090-TE	4				AX-REM19K0006-IE	6	80
	37.0	2370							6	60
	45.0	2450	2070130-TE	2.8				2 x AX-REM19K0006-IE	3	105
	55.0	2550							3	85
400 V (three-phase)	0.55	4004	Built-in	100	AX-REM00K1400-IE	400	200	AX-REM00K1400-IE	400	200
	1.1	4007					200			200
	1.5	4015			AX-REM00K1200-IE	200	190	AX-REM00K2200-IE	200	190
	2.2	4022			AX-REM00K2200-IE	200	130	AX-REM00K5120-IE	120	200
	4.0	4040		70	AX-REM00K2120-IE	120	120	AX-REM00K6100-IE	100	140
	5.5	4055			AX-REM00K4075-IE	75	140	AX-REM00K9070-IE	70	150
	7.5	4075		35			100	AX-REM01K9070-IE	70	110
	11.0	4110			AX-REM00K6100-IE	100	50	AX-REM02K1070-IE	70	75
	15.0	4150		24	AX-REM00K9070-IE	70	55	AX-REM03K5035-IE	35	110
	18.5	4185			AX-REM03K5035-IE	35	90	AX-REM19K0030-IE	30	100
	22.0	4220		20			75			85
	30.0	4300	4015045-TE	16				AX-REM19K0020-IE	20	95
	37.0	4370	4017068-TE	11				AX-REM38K0012-IE	15	125
	45.0	4450								100
	55.0	4550	4035090-TE	8.5				2 x AX-REM19K0020-IE	10	100
	75.0	4750						3 x AX-REM19K0030-IE	10	75
	90.0	4900	4070130-TE	5.5				2 x AX-REM38K0012-IE	6	105
	110.0	411K	4090240-TE	3.2				3 x AX-REM38K0012-IE	4	125
	132.0	413K								105

⑤ Computer software

Description	Installation	Order code
Computer software	Configuration and monitoring software tool	CX-drive
Computer software	Configuration and monitoring software tool	CX-One

Specifications

200 V class

Three-phase: RX-_			A2004	A2007	A2015	A2022	A2037	A2055	A2075	A2110	A2150	A2185	A2220	A2300	A2370	A2450	A2550
Motor kW*1			0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55
Output characteristics	Inverter capacity kVA	200 V	1.0	1.7	2.5	3.6	5.7	8.3	11.0	15.9	22.1	26.3	32.9	41.9	50.2	63.0	76.2
		240 V	1.2	2.0	3.1	4.3	6.8	9.9	13.3	19.1	26.6	31.5	39.4	50.2	60.2	75.6	91.4
	Rated output current (A)		3.0	5.0	7.5	10.5	16.5	24	32	46	64	76	95	121	145	182	220
	Max. output voltage		Proportional to input voltage: 0..240 V														
	Max. output frequency		400 Hz														
Power supply	Rated input voltage and frequency		3-phase 200..240 V 50/60 Hz														
	Allowable voltage fluctuation		-15%..+10%														
	Allowable frequency fluctuation		5%														
Braking	Regenerative braking		Internal BRD circuit (external discharge resistor)											External regenerative braking unit			
	Minimum connectable resistance		50	50	35	35	35	16	10	10	7.5	7.5	5				
Protective structure			IP20														
Cooling method			Forced air cooling														

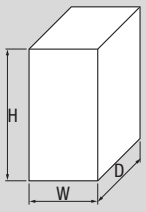
*1 Based on a standard 3-Phase standard motor.

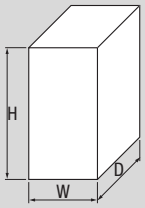
400 V class

Three-phase: RX-_			A4004	A4007	A4015	A4022	A4040	A4055	A4075	A4110	A4150	A4185	A4220	A4300	A4370	A4450	A4550	B4750	B4900	B411K	B413K
Motor kW*1			0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132
Output characteristics	Inverter capacity kVA	400 V	1.0	1.7	2.5	3.6	6.2	9.7	13.1	17.3	22.1	26.3	33.2	40.1	51.9	63.0	77.6	103.2	121.9	150.3	180.1
		480 V	1.2	2.0	3.1	4.3	7.4	11.6	15.8	20.7	26.6	31.5	39.9	48.2	62.3	75.6	93.1	123.8	146.3	180.4	216.1
	Rated output current (A)		1.5	2.5	3.8	5.3	9.0	14	19	25	32	38	48	58	75	91	112	149	176	217	260
	Max. output voltage		Proportional to input voltage: 0..480 V																		
	Max. output frequency		400 Hz																		
Power supply	Rated input voltage and frequency		3-phase 380..480 V 50/60 Hz																		
	Allowable voltage fluctuation		-15%..+10%																		
	Allowable frequency fluctuation		5%																		
Braking	Regenerative braking		Internal BRD circuit (external discharge resistor)											External regenerative braking unit							
	Minimum connectable resistance		100	100	100	100	70	70	35	35	24	24	20								
Protective structure			IP20															IP00			
Cooling method			Forced air cooling																		

*1 Based on a standard 3-Phase standard motor.

Dimensions

Voltage class	Inverter model	Dimensions in mm				
		H	W	D	Weight (KG)	
Three-phase 200 V	RX-A2004	255	150	140	3.5	
	RX-A2007					
	RX-A2015					
	RX-A2022					
	RX-A2037					
	RX-A2055	260	210	170	6	
	RX-A2075					
	RX-A2110					
	RX-A2150	390	250	190	14	
	RX-A2185					
	RX-A2220					
	RX-A2300	540	310	195	20	
	RX-A2370	550	390	250	30	
	RX-A2450					
	RX-A2550	700	480	250	43	

Voltage class	Inverter model	Dimensions in mm				
		H	W	D	Weight (KG)	
Three-phase 400 V	RX-A4004	255	150	140	3.5	
	RX-A4007					
	RX-A4015					
	RX-A4022					
	RX-A4040					
	RX-A4055	260	210	170	6	
	RX-A4075					
	RX-A4110					
	RX-A4150	390	250	190	14	
	RX-A4185					
	RX-A4220					
	RX-A4300	540	310	195	22	
	RX-A4370	550	390	250	30	
	RX-A4450					
	RX-A4550					
	RX-B4750	700	390	268	60	
	RX-B4900					
	RX-B411K	740	480	270	80	
	RX-B413K					

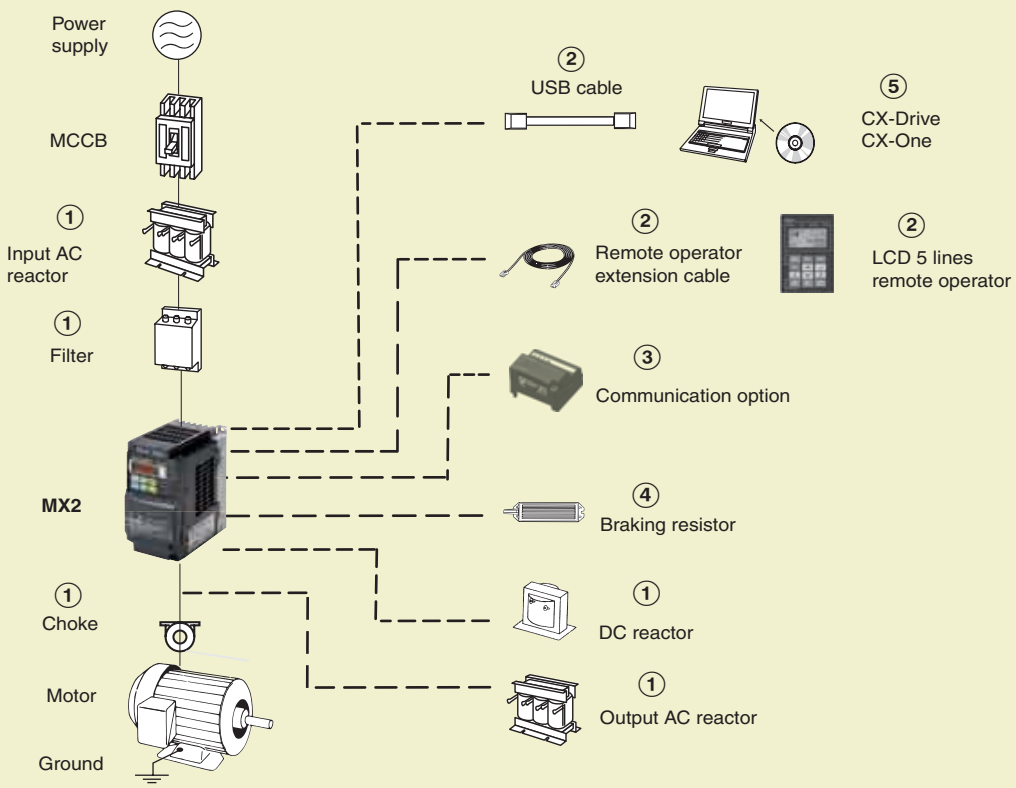


Born to drive machines

MX2 has been developed to harmonise advanced motor and machine control. Thanks to its advanced design algorithms the MX2 provides smooth control down to zero speed, plus precise operation for fast cyclic operations and torque control capability in open loop. The MX2 also gives you comprehensive functionality for machine control such as positioning, speed synchronisation and logic programming.

- Current vector control
- Double rating VT 120%/1 min and CT 150%/1 min
- High speed motors up to 1000 Hz and IM & PM motor control
- Torque control in open loop vector
- Positioning functionality
- Built-in application functionality (i.e. Brake control)
- Fieldbus comms: Modbus, DeviceNet, PROFIBUS, MECHATROLINK-II, EtherCAT, CompoNet

Ordering information



MX2

Voltage class	Constant torque		Variable torque		Order code
	Max motor kW	Rated current A	Max motor kW	Rated current A	Standard
Single-phase 200 V	0.1	1.0	0.2	1.2	MX2-AB001-E
	0.2	1.6	0.4	1.9	MX2-AB002-E
	0.4	3.0	0.55	3.5	MX2-AB004-E
	0.75	5.0	1.1	6.0	MX2-AB007-E
	1.5	8.0	2.2	9.6	MX2-AB015-E
	2.2	11.0	3.0	12.0	MX2-AB022-E
Three-phase 200 V	0.1	1.0	0.2	1.2	MX2-A2001-E
	0.2	1.6	0.4	1.9	MX2-A2002-E
	0.4	3.0	0.55	3.5	MX2-A2004-E
	0.75	5.0	1.1	6.0	MX2-A2007-E
	1.5	8.0	2.2	9.6	MX2-A2015-E
	2.2	11.0	3.0	12.0	MX2-A2022-E
	3.7	17.5	5.5	19.6	MX2-A2037-E
	5.5	25.0	7.5	30.0	MX2-A2055-E
	7.5	33.0	11	40.0	MX2-A2075-E
	11	47.0	15	56.0	MX2-A2110-E
	15	60.0	18.5	69.0	MX2-A2150-E

Voltage class	Constant torque		Variable torque		Order code
	Max motor kW	Rated current A	Max motor kW	Rated current A	Standard
Three-phase 400 V	0.4	1.8	0.75	2.1	MX2-A4004-E
	0.75	3.4	1.5	4.1	MX2-A4007-E
	1.5	4.8	2.2	5.4	MX2-A4015-E
	2.2	5.5	3.0	6.9	MX2-A4022-E
	3.0	7.2	4.0	8.8	MX2-A4030-E
	4.0	9.2	5.5	11.1	MX2-A4040-E
	5.5	14.8	7.5	17.5	MX2-A4055-E
	7.5	18.0	11	23.0	MX2-A4075-E
	11	24.0	15	31.0	MX2-A4110-E
	15	31.0	18.5	38.0	MX2-A4150-E

① Line filters

Inverter		Line filter Rasmi	
Voltage	Model MX2-_	Rated current (A)	Reference
1-Phase 200 VAC	AB001/AB002/AB004	10	AX-FIM1010-RE
	AB007	14	AX-FIM1014-RE
	AB015/AB022	24	AX-FIM1024-RE
3-Phase 200 VAC	A2001/A2002/ A2004/A2007	10	AX-FIM2010-RE
	A2015/A2022	20	AX-FIM2020-RE
	A2037	30	AX-FIM2030-RE
	A2055/A2075	60	AX-FIM2060-RE
	A2110	80	AX-FIM2080-RE
	A2150	100	AX-FIM2100-RE
3-Phase 400 VAC	A4004/A4007	5	AX-FIM3005-RE
	A4015/A4022/A4030	10	AX-FIM3010-RE
	A4040	14	AX-FIM3014-RE
	A4055/A4075	23	AX-FIM3030-RE
	A4110/A4150	50	AX-FIM3050-RE

① Input AC reactors

Inverter		AC Reactor
Voltage	Model MX2-_	Order code
3-Phase 200 VAC	A2002/A2004/A2007	AX-RAI02800080-DE
	A2015/A2022/A2037	AX-RAI00880200-DE
	A2055/A2075	AX-RAI00350335-DE
	A2110/A2150	AX-RAI00180670-DE
1-Phase 200 VAC	AB002/AB004	Under development
	AB007	
	AB015/AB022	
3-Phase 400 VAC	A4004/A4007/A4015	AX-RAI07700050-DE
	A4022/A4030/A4040	AX-RAI03500100-DE
	A4055/A4075	AX-RAI01300170-DE
	A4110/A4150	AX-RAI00740335-DE

① DC reactors

200V single phase		200V 3-phase		400V 3-phase	
Inverter	Order code	Inverter	Order code	Inverter	Order code
MX2-AB001	AX-RC10700032-DE	MX2-A2001	AX-RC21400016-DE	MX2-A4004	AX-RC43000020-DE
MX2-AB002		MX2-A2002		MX2-A4007	AX-RC27000030-DE
MX2-AB004	AX-RC06750061-DE	MX2-A2004	AX-RC10700032-DE	MX2-A4015	AX-RC14000047-DE
MX2-AB007	AX-RC03510093-DE	MX2-A2007	AX-RC06750061-DE	MX2-A4022	AX-RC10100069-DE
MX2-AB015	AX-RC02510138-DE	MX2-A2015	AX-RC03510093-DE	MX2-A4030	AX-RC08250093-DE
MX2-AB022	AX-RC01600223-DE	MX2-A2022	AX-RC02510138-DE	MX2-A4040	AX-RC06400116-DE
-		MX2-A2037	AX-RC01600223-DE	MX2-A4055	AX-RC04410167-DE
		MX2-A2055	AX-RC01110309-DE	MX2-A4075	AX-RC03350219-DE
		MX2-A2075	AX-RC00840437-DE	MX2-A4011	AX-RC02330307-DE
		MX2-A2011	AX-RC00590614-DE	MX2-A4015	AX-RC01750430-DE
		MX2-A2015	AX-RC00440859-DE	-	

① Chokes

Diameter	Description	Model
21	For 2.2 KW motors or below	AX-FER2102-RE
25	For 15 KW motors or below	AX-FER2515-RE
50	For 45 KW motors or below	AX-FER5045-RE

① Output AC reactor

Inverter		AC Reactor
Voltage	Model MX2-_	Order code
200 VAC	A2001/A2002/A2004/ AB001/AB002/AB004	AX-RA011500026-DE
	A2007/AB007	AX-RA007600042-DE
	A2015/AB015	AX-RA004100075-DE
	A2022/AB022	AX-RA003000105-DE
	A2037	AX-RA001830160-DE
	A2055	AX-RA001150220-DE
	A2075	AX-RA000950320-DE
400 VAC	A4004/A4007/A4015	AX-RA016300038-DE
	A4022	AX-RA011800053-DE
	A4030/A4040	AX-RA007300080-DE
	A4055	AX-RA004600110-DE
	A4075	AX-RA003600160-DE

② Accessories

Types	Description	Functions	Order code
Digital operator	LCD remote operator	5 Line LCD remote operator with copy function, cable length max. 3 m	AX-OP05-E
	Remote operator cable	3 meters cable for connecting remote operator	3G3AX-CAJOP300-EE
	LED remote operator	LED remote operator, cable length max. 3 m	3G3AX-OP01
	Mounting kit for LED operator	Mounting kit for LED operator on panel	4X-KITMINI
Accessories	PC configuration cable	Mini USB to USB connector cable	AX-CUSBM002-E

③ Communication option boards

Description	Functions	Model
PROFIBUS option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS communications with the host controller.	3G3AX-MX2-PRT
DeviceNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communications with the host controller.	3G3AX-MX2-DRT
Ethercat option card	Under development	3G3AX-MX2-ERT
CompoNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CompoNet communications with the host controller.	3G3AX-MX2-CRT
Mechatrolink II option card	Under development	3G3AX-MX2-ML2
CanOpen option card		3G3AX-MX2-CORT

④ Braking unit, braking resistor unit

Inverter					Braking resistor unit					
Voltage	Max. motor kW	Inverter MX2-_		Connectable min. resistance Ω	Inverter mounted type (3 %ED, 10 sec max)		Braking torque %	Inverter mounted type (10%ED, 10 sec max)		Braking torque %
		3-phase	1-phase		Type AX-	Resist Ω		Type AX-	Resist Ω	
200 V (single-/three-phase)	0.12	2001	B001	100	AX-REM00K1400-IE	400	200	AX-REM00K1400-IE	400	200
	0.25	2002	B002				180			180
	0.55	2004	B004		AX-REM00K1200-IE	200	180	AX-REM00K1200-IE	200	180
	1.1	2007	B007	50			100	AX-REM00K2070-IE	70	200
	1.5	2015	B015		AX-REM00K2070-IE	70	140	AX-REM00K4075-IE	75	130
	2.2	2022	B022	35			90	AX-REM00K4035-IE	35	180
	4.0	2040	-		AX-REM00K4075-IE	75	50	AX-REM00K6035-IE	35	100
	5.5	2055	–	20	AX-REM00K4035-IE	35	75	AX-REM00K9020-IE	20	150
	7.5	2075	–	17			55	AX-REM01K9017-IE	17	110
	11	2110	-		AX-REM00K6035-IE	35	40	AX-REM02K1017-IE	17	75
	15	2150	-	10	AX-REM00K9017-IE	17	55	AX-REM03K5010-IE	10	95
400 V (three-phase)	0.55	4004	–	180	AX-REM00K1400-IE	400	200	AX-REM00K1400-IE	400	200
	1.1	4007	–				200			200
	1.5	4015	–		AX-REM00K1200-IE	200	190	AX-REM00K2200-IE	200	190
	2.2	4022	–	100	AX-REM00K2200-IE	200	130	AX-REM00K5120-IE	120	200
	3.0	4030	–		AX-REM00K2120-IE	120	160			160
	4.0	4040	–				120	AX-REM00K6100-IE	100	140
	5.5	4055	–	70	AX-REM00K4075-IE	75	140	AX-REM00K9070-IE	70	150
	7.5	4075	–				100	AX-REM01K9070-IE	70	110
	11	4110	-		AX-REM00K6100-IE	100	50	AX-REM02K1070-IE	70	75
	15	4150	-	35	AX-REM00K9070-IE	70	55	AX-REM03K5035-IE	35	110

⑤ Computer software

Description	Installation	Model
Computer software	Configuration and monitoring software tool	CX-drive
Computer software	Configuration and monitoring software tool	CX-One

Specifications

200 V class

Single-phase: MX2-_			AB001	AB002	AB004	AB007*1	AB015	AB022	-	-	-	-	-
Three-phase: MX2-_			A2001	A2002	A2004	A2007	A2015	A2022	A2037	A2055	A2075	A2110	A2150
Motor kW*2	For VT setting		0.2	0.4	0.55	1.1	2.2	3.0	5.5	7.5	11	15	18.5
	For CT setting		0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
Output characteristics	Inverter capacity kVA	200 VT	0.4	0.6	1.2	2.0	3.3	4.1	6.7	10.3	13.8	19.3	23.9
		200 CT	0.2	0.5	1.0	1.7	2.7	3.8	6.0	8.6	11.4	16.2	20.7
		240 VT	0.4	0.7	1.4	2.4	3.9	4.9	8.1	12.4	16.6	23.2	28.6
		240 CT	0.3	0.6	1.2	2.0	3.3	4.5	7.2	10.3	13.7	19.5	24.9
	Rated output current (A) at VT		1.2	1.9	3.5	6.0	9.6	12.0	19.6	30.0	40.0	56.0	69.0
	Rated output current (A) at CT		1.0	1.6	3.0	5.0	8.0	11.0	17.5	25.0	33.0	47.0	60.0
	Max. output voltage		Proportional to input voltage: 0-240 V										
	Max. output frequency		1000 Hz*3										
Power supply	Rated input voltage and frequency		Single-phase 200..240 V 50/60 Hz 3-phase 200..240 V 50/60 Hz										
	Allowable voltage fluctuation		-15%..+10%										
	Allowable frequency fluctuation		5%										
Braking torque	At short-time deceleration		100%: <50 Hz				70%: <50 Hz	Approx 20%	-				
	At capacitor feedback		50%: <60 Hz				50%: <60 Hz						
Cooling method			Self cooling				Forced-air-cooling						

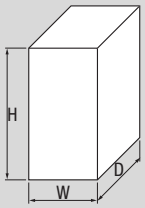
*1 Three phase model use forced-air-cooling but single phase model is self cooling.
*2 Based on a standard 3-Phase standard motor.
*3 Above 400 Hz with some function limitation.

400 V class

Three-phase: MX2-_			A4004	A4007	A4015	A4022	A4030	A4040	A4055	A4075	A4110	A4150
Motor kW*1	For VT setting		0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5
	For CT setting		0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15
Output characteristics	Inverter capacity kVA	380 VT	1.3	2.6	3.5	4.5	5.7	7.3	11.5	15.1	20.4	25.0
		380 CT	1.1	2.2	3.1	3.6	4.7	6.0	9.7	11.8	15.7	20.4
		480 VT	1.7	3.4	4.4	5.7	7.3	9.2	14.5	19.1	25.7	31.5
		480 CT	1.4	2.8	3.9	4.5	5.9	7.6	12.3	14.9	19.9	25.7
	Rated output current (A) at VT		2.1	4.1	5.4	6.9	8.8	11.1	17.5	23.0	31.0	38.0
	Rated output current (A) at CT		1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0	24.0	31.0
	Max. output voltage		Proportional to input voltage: 0-480 V									
	Max. output frequency		1000 Hz*2									
Power supply	Rated input voltage and frequency		3-phase 380-480 V 50/60 Hz									
	Allowable voltage fluctuation		-15%..+10%									
	Allowable frequency fluctuation		5%									
Braking torque	At short-time deceleration At capacitor feedback		100%: <50Hz 50%: <60Hz				70%: <50Hz 50%: <60Hz	-				
Cooling method			Self cooling		Forced-air-cooling							

*1 Based on a standard 3-Phase standard motor.
*2 Above 400 Hz with some function limitation.

Dimensions

Voltage class	Inverter model	Dimensions in mm				
		H	W	D	Weight (KG)	
Single-phase 200 V	MX2-AB001	128	68	109	1.0	
	MX2-AB002				1.0	
	MX2-AB004			123	1.1	
	MX2-AB007	128	108	170.5	1.4	
	MX2-AB015				1.8	
	MX2-AB022				1.8	
Three-phase 200 V	MX2-A2001	128	68	109	1.0	
	MX2-A2002				1.0	
	MX2-A2004			113	1.1	
	MX2-A2007			146	1.2	
	MX2-A2015	128	108	170.5	1.6	
	MX2-A2022				1.8	
	MX2-A2037	128	140	170.5	2.0	
	MX2-A2055	260	140	155	3.0	
	MX2-A2075				3.4	
	MX2-A2110	296	180	175	5.1	
	MX2-A2150	350	220	175	7.4	
Three-phase 400 V	MX2-A4004	128	108	144	1.5	
	MX2-A4007			171	1.6	
	MX2-A4015				1.8	
	MX2-A4022				1.9	
	MX2-A4030				1.9	
	MX2-A4040	128	140	171	2.1	
	MX2-A4055	260		155	3.5	
	MX2-A4075				3.5	
	MX2-A4110	296	180	175	4.7	
	MX2-A4150				5.2	

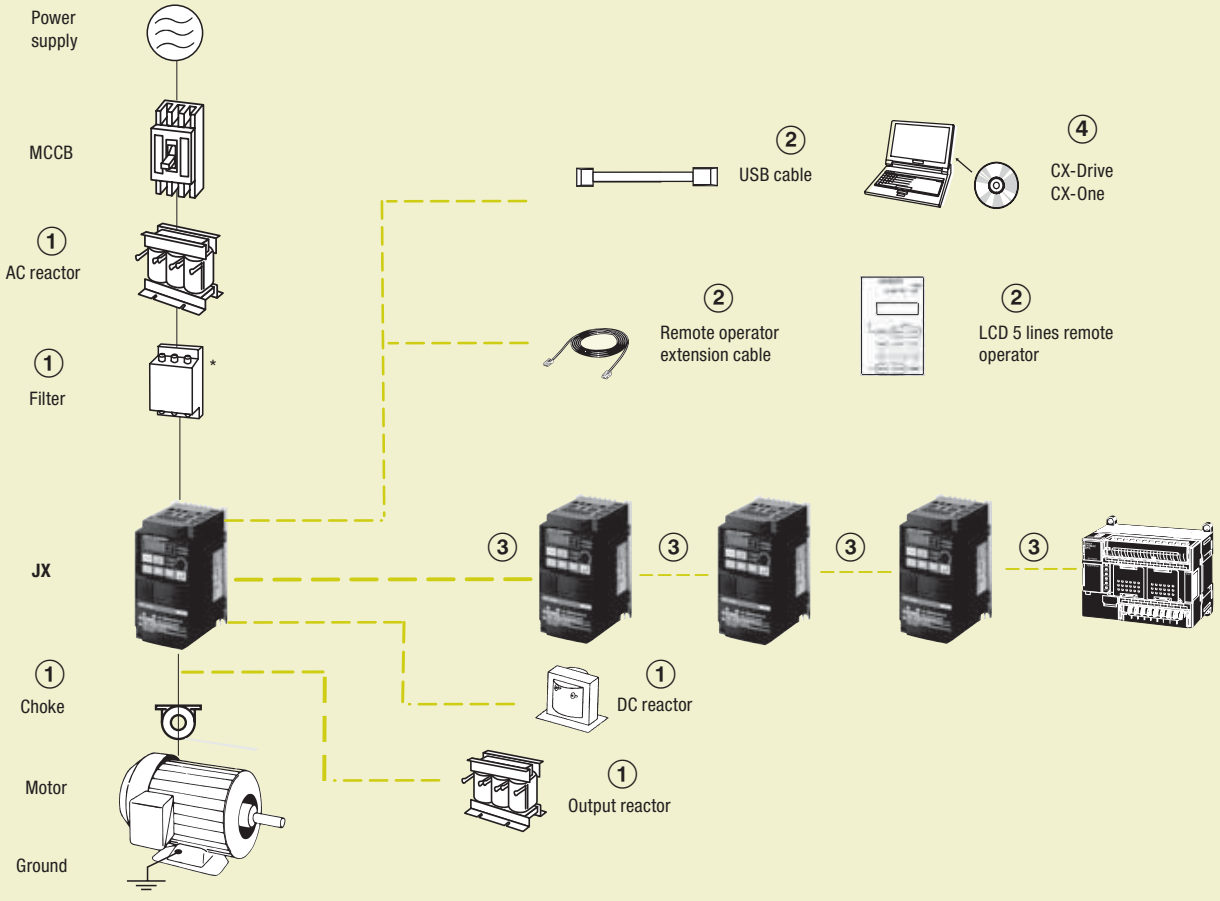


Compact and complete

With the RFI filter built-in, and the communications integrated as standard, the JX provides a compact and complete solution to a whole range of simple applications, such as conveyor control. The RS485 Modbus is built into the RJ45 port of the inverter front, making it very easy to add inverters into the network without any extra option boards. Therefore, saving costs and space.

- V/f controlled inverter
- Side by side mounting
- EMC filter built-in
- RS485 Modbus built-in
- Overload detection function (150% during 60 s)
- PID
- Micro-surge voltage suppression
- Automatic energy saving

Ordering information



* Only needed for 3 phase 200 V or to comply C1 on 3 phase 400 V models

JX

Specifications			Order code
Voltage class	Max. applicable motor output kW	Rated output current (A)	Standard
Single-phase 200 V	0.2	1.4	JX-AB002-EF
	0.4	2.6	JX-AB004-EF
	0.75	4	JX-AB007-EF
	1.5	7.1	JX-AB015-EF
	2.2	10	JX-AB022-EF
Three-phase 200 V	0.2	1.4	JX-A2002-E
	0.4	2.6	JX-A2004-E
	0.75	4	JX-A2007-E
	1.5	7.1	JX-A2015-E
	2.2	10	JX-A2022-E
	3.7	15.9	JX-A2037-E
	5.5	24	JX-A2055-E
	7.5	32	JX-A2075-E
Three-phase 400 V	0.4	1.5	JX-A4004-EF
	0.75	2.5	JX-A4007-EF
	1.5	3.8	JX-A4015-EF
	2.2	5.5	JX-A4022-EF
	4.0	8.6	JX-A4040-EF
	5.5	13	JX-A4055-EF
	7.5	16	JX-A4075-EF

① Line filters

Inverter		Line filter Rasmi		
Voltage	Model JX-_	Rated current (A)	Weight (kg)	Order code
1-Phase 200 VAC	AB002/AB004	6	0.5	AX-FIJ1006-RE
	AB007	10	0.6	AX-FIJ1010-RE
	AB015/AB022	26	0.8	AX-FIJ1026-RE
3-Phase 200 VAC	A2002/A2004/A2007	6	1.0	AX-FIJ2006-RE
	A2015/A2022/A2037	20	1.3	AX-FIJ2020-RE
	A2055/A2075	40	2.3	AX-FIJ2040-RE
3-Phase 400 VAC	A4004/A4007/A4015	5	0.9	AX-FIJ3005-RE
	A4022/A4040	11	1.1	AX-FIJ3011-RE
	A4055/A4075	20	1.7	AX-FIJ3020-RE

① Input AC Reactors

Inverter		AC Reactor
Voltage	Model JX-_	Order code
3-Phase 200 VAC	A2002/A2004/A2007	AX-RAI02800080-DE
	A2015/A2022/A2037	AX-RAI00880175-DE
	A2055/A2075	AX-RAI00350335-DE
1-Phase 200 VAC	AB002/AB004	Under development
	AB007	
	AB015/AB022	
3-Phase 400 VAC	A4004/A4007/A4015	AX-RAI07700042-DE
	A4022/A4040	AX-RAI03500090-DE
	A4055/A4075	AX-RAI01300170-DE

① DC Reactors

200 V single phase		200 V 3-phase		400 V 3-phase	
Inverter	Order code	Inverter	Order code	Inverter	Order code
JX-AB002	AX-RC10700032-DE	JX-A2002	AX-RC21400016-DE	-	
JX-AB004	AX-RC06750061-DE	JX-A2004	AX-RC10700032-DE	JX-A4004	AX-RC43000020-DE
JX-AB007	AX-RC03510093-DE	JX-A2007	AX-RC06750061-DE	JX-A4007	AX-RC27000030-DE
JX-AB015	AX-RC02510138-DE	JX-A2015	AX-RC03510093-DE	JX-A4015	AX-RC14000047-DE
JX-AB022	AX-RC01600223-DE	JX-A2022	AX-RC02510138-DE	JX-A4022	AX-RC10100069-DE
-		JX-A2037	AX-RC01600223-DE	JX-A4040	AX-RC06400116-DE
		JX-A2055	AX-RC01110309-DE	JX-A4055	AX-RC04410167-DE
		JX-A2075	AX-RC00840437-DE	JX-A4075	AX-RC03350219-DE

① Chokes

Diameter	Description	Order code
21	For 2.2 KW motors or below	AX-FER2102-RE
25	For 7.5 KW motors or below	AX-FER2515-RE

① Output AC Reactors

Inverter		AC Reactor
Voltage	Model JX-_	Order code
200 VAC	A2001/A2002/A2004/ AB001/AB002/AB004	AX-RA011500026-DE
	A2007/AB007	AX-RA007600042-DE
	A2015/AB015	AX-RA004100075-DE
	A2022/AB022	AX-RA003000105-DE
	A2037	AX-RA001830160-DE
	A2055	AX-RA001150220-DE
	A2075	AX-RA000950320-DE
400 VAC	A4004/A4007/A4015	AX-RA016300038-DE
	A4022	AX-RA011800053-DE
	A4040	AX-RA007300080-DE
	A4055	AX-RA004600110-DE
	A4075	AX-RA003600160-DE

② Accessories

Types	Description	Functions	Order code
Digital operator	LCD remote operator	5 Line LCD*1 remote operator with copy function, cable length max. 3 m	AX-OP05-E
	Remote operator cable	3 meters cable for connecting remote operator	3G3AX-CAJOP300-EE
	LED remote operator	LED remote operator, cable length max. 3 m	3G3AX-OP01
	Mounting kit for LED operator	Mounting kit for LED operator on panel	4X-KITMINI
Accessories	USB converter/ USB cable	RJ45 to USB connection cable	3G3AX-PCACN2
	RJ45 T-Branch cable	T cable for RS-422 connection	3G3AX-CTB020-EE
	RJ45 Terminator resistor	Terminator resistor for RS-422 connection	3G3AX-CTR150-EE

*1 Please note, for JX inverters models, the operator will only display 2 lines of text.

④ Computer software

Description	Installation	Order code
Computer software	Configuration and monitoring software tool	CX-drive
Computer software	Configuration and monitoring software tool	CX-One

Specifications

200 V class

Single-phase: JX_			AB002	AB004	AB007	AB015	AB022	–	–	–
Three-phase: JX_			A2002	A2004	A2007	A2015	A2022	A2037	A2055	A2075
Motor kW*1	Applicable motor capacity		0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5
Output characteristics	Inverter capacity kVA	200 V	0.4	0.9	1.3	2.4	3.4	5.5	8.3	11.0
		240 V	0.5	1.0	1.6	2.9	4.1	6.6	9.9	13.3
	Rated output current (A)		1.4	2.6	4.0	7.1	10.0	15.9	24.0	32.0
	Max. output voltage		Proportional to input voltage: 0…240 V							
	Max. output frequency		400 Hz							
Power supply	Rated input voltage and frequency		Single-phase 200…240 V 50/60 Hz 3-phase 200…240 V 50/60 Hz							
	Rated input current (A)	Single-phase 200 V	3.1	5.8	9.0	16.0	22.5	–	–	–
		Three-phase 200 V	1.8	3.4	5.2	9.3	13.0	20.0	30.0	40.0
	Allowable voltage fluctuation		-15%…+10%							
	Allowable frequency fluctuation		+5%							
Built-in filter			EMC filter (C1 single phase)							
Braking torque	At short-time deceleration At capacitor feedback		Approx. 50%			50% for 3-phase 20 to 40% for 1-phase	Approx 20% to 40%		Approx 20%	
Cooling method			Self cooling			Forced-air-cooling				

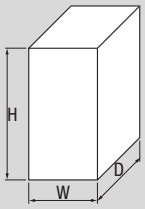
*1 Based on a standard 3-Phase standard motor.

400 V class

Three-phase: JX_			A4004	A4007	A4015	A4022	A4040	A4055	A4075
Motor kW*1	Applicable motor capacity		0.4	0.75	1.5	2.2	4.0	5.5	7.5
Output characteristics	Inverter capacity kVA	380 V	0.9	1.6	2.5	3.6	5.6	8.5	10.5
		480 V	1.2	2.0	3.1	4.5	7.1	10.8	13.3
	Rated output current (A)		1.5	2.5	3.8	5.5	8.6	13.0	16.0
	Max. output voltage		Proportional to input voltage: 0…480 V						
	Max. output frequency		400 Hz						
Power supply	Rated input voltage and frequency		3-phase 380…480 V 50/60 Hz						
	Rated input current (A)		2.0	3.3	5.0	7.0	11.0	16.5	20.0
	Allowable voltage fluctuation		-15%…+10%						
	Allowable frequency fluctuation		+5%						
Built-in filter			EMC filter C2 class						
Braking torque	At short-time deceleration At capacitor feedback		Approx. 50%		Approx. 20% to 40%			Approx. 20%	
Cooling method			Self cooling		Forced-air-cooling				

*1 Based on a standard 3-Phase standard motor.

Dimensions

Voltage class	Max. applicable motor output kW	Inverter model JX_	Dimensions in mm				
			H	W	D	Weight	
Single-phase 200 V	0.2	AB002	155	80	95.5	0.8	
	0.4	AB004			109.5	0.9	
	0.75	AB007	189	110	130.5	1.5	
	1.5	AB015			157.5	2.3	
	2.2	AB022				2.4	
Three-phase 200 V	0.2	A2002	155	80	95.5	0.8	
	0.4	A2004			109.5	0.9	
	0.75	A2007			132.5	1.1	
	1.5	A2015	189	110	157.5	2.2	
	2.2	A2022				2.4	
	3.7	A2037					
	5.5	A2055	250	180	167.5	4.2	
	7.5	A2075					
Three-phase 400 V	0.4	A4004	189	110	130.5	1.5	
	0.75	A4007			157.5	2.3	
	1.5	A4015				2.4	
	2.2	A4022					
	4.0	A4040					
	5.5	A4055	250	180	167.5	4.2	
	7.5	A4075					

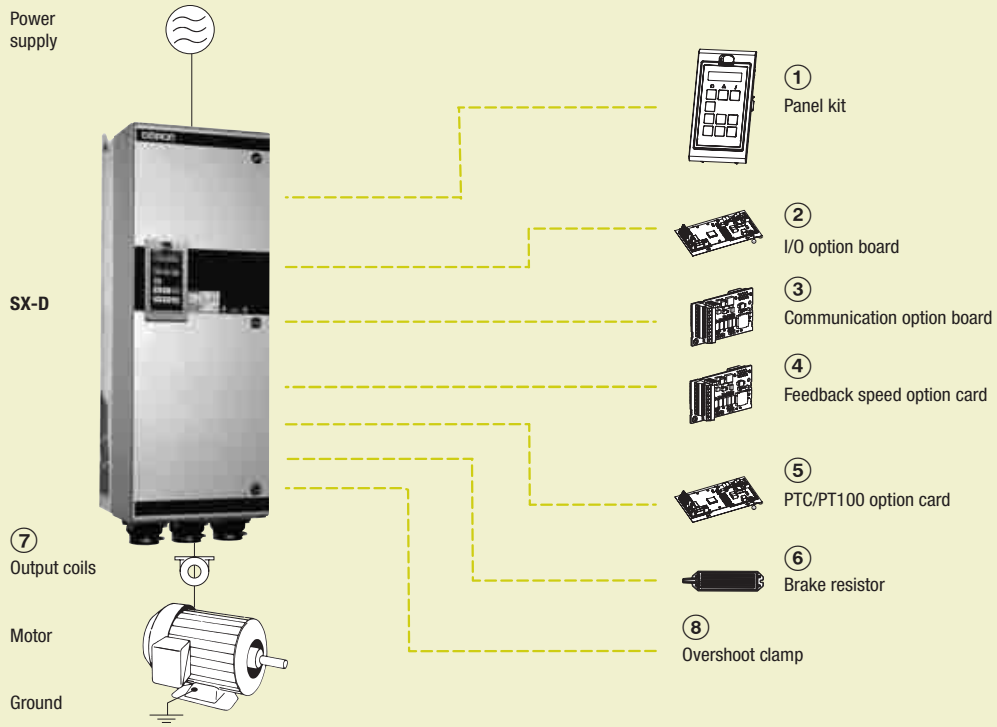


Force & flow in harmony

Designed to drive any high power application from 90 kW up to 1 MW, the new SX series of compact inverters features embedded application dedicated functionality plus logic programming and customizable LCD information to give you all the control flexibility required for applications ranging from high torque to smooth flow and pressure control.

- 500 V-690 V power supply from 90 kW up to 1 MW
- IP54 full range.
- Compact design & Robustness
- Built-in EMC filter for complete family and fuses from 200 kW
- Safety according EN13849-1 and EN62061 standards
- Logic programmability
- Hardware customization
- Fieldbus communications: Modbus, DeviceNet and PROFIBUS

Ordering information



SX-D

Specifications					Order code	
Voltage	Heavy Duty		Normal Duty		Direct torque control	V/F
400 V	75 kW	140 A	90 kW	175 A	SX-D4090-EF	SX-D4090-EV
	90 kW	168 A	110 kW	210 A	SX-D4110-EF	SX-D4110-EV
	110 kW	200 A	132 kW	250 A	SX-D4132-EF	SX-D4132-EV
	132 kW	240 A	160 kW	300 A	SX-D4160-EF	SX-D4160-EV
	160 kW	300 A	200 kW	375 A	SX-D4200-EF	SX-D4200-EV
	200 kW	344 A	220 kW	430 A	SX-D4220-EF	SX-D4220-EV
	220 kW	400 A	250 kW	500 A	SX-D4250-EF	SX-D4250-EV
	250 kW	480 A	315 kW	600 A	SX-D4315-EF	SX-D4315-EV
	315 kW	520 A	355 kW	650 A	SX-D4355-EF	SX-D4355-EV
	355 kW	600 A	400 kW	750 A	SX-D4400-EF	SX-D4400-EV
	400 kW	688 A	450 kW	680 A	SX-D4450-EF	SX-D4450-EV
	450 kW	800 A	500 kW	1000 A	SX-D4500-EF	SX-D4500-EV
	500 kW	960 A	630 kW	1200 A	SX-D4630-EF	SX-D4630-EV
	630 kW	1200 A	800 kW	1500 A	SX-D4800-EF	SX-D4800-EV

Specifications					Order code	
Voltage	Heavy Duty		Normal Duty		Direct torque control	V/F
690 V	75 kW	72 A	90 kW	90 A	SX-D6090-EF	SX-D6090-EV
	90 kW	87 A	110 kW	109 A	SX-D6110-EF	SX-D6110-EV
	110 kW	117 A	132 kW	146 A	SX-D6132-EF	SX-D6132-EV
	132 kW	140 A	160 kW	175 A	SX-D6160-EF	SX-D6160-EV
	160 kW	168 A	200 kW	210 A	SX-D6200-EF	SX-D6200-EV
	200 kW	200 A	250 kW	250 A	SX-D6250-EF	SX-D6250-EV
	250 kW	240 A	315 kW	300 A	SX-D6315-EF	SX-D6315-EV
	315 kW	300 A	355 kW	375 A	SX-D6355-EF	SX-D6355-EV
	315 kW	344 A	450 kW	430 A	SX-D6450-EF	SX-D6450-EV
	355 kW	400 A	500 kW	500 A	SX-D6500-EF	SX-D6500-EV
	450 kW	480 A	600 kW	600 A	SX-D6600-EF	SX-D6600-EV
	500 kW	520 A	630 kW	650 A	SX-D6630-EF	SX-D6630-EV
	600 kW	600 A	710 kW	750 A	SX-D6710-EF	SX-D6710-EV
	650 kW	688 A	800 kW	860 A	SX-D6800-EF	SX-D6800-EV
	710 kW	720 A	900 kW	900 A	SX-D6900-EF	SX-D6900-EV
	800 kW	800 A	1000 kW	1000 A	SX-D61K0-EF	SX-D61K0-EV

① Panel Kit

Description	Function	Order code
Panel kit	Panel kit complete including panel	01-3957-00
Blank panel kit	Panel kit complete including blank panel	01-3957-01

② I/O option board

Description	Function	Order code
Additional I/O option	Provides 3 extra relay outputs and 3 additional digital inputs	01-3876-01
Crane option	Dedicated option board for crane application, including additional I/O and functions	01-3876-07

③ Communication option board

Description	Function	Order code
RS232/485	MODBUS RTU serial communication by RS232 or RS485 interface with galvanic isolation	01-3876-04
PROFIBUS-DP option card	Used for operating the inverter through PROFIBUS-DP communication with the host controller.	01-3876-05
DeviceNet option card	Used for operating the inverter through DeviceNet communication with the host controller.	01-3876-06
Modbus/TCP, Ethernet	Used for operating the inverter through Modbus/TCP communication with the host controller.	01-3876-09

④ Encoder feedback option card

Description	Function	Order code
Encoder option	Used for connection of the actual motor speed via encoder. Up to 100 kHz with TTL and HTL incremental encoders with 5/24 V power supply	01-3876-03

⑤ PTC/PT100 option card

Description	Function	Order code
Thermal protection	Allows to connect a motor thermistor to the inverter	01-3876-08

⑥ Braking chopper and braking resistor

All inverter sizes could be fitted with an optional built-in brake chopper from factory but is not possible to install it later. The choice of the resistor depends on the application switch-on duration and duty-cycle Following tables describes the activation level of the built-in braking chopper and the minimum resistor that could be used depending on the input voltage.

400 V				600 V			
R for different input voltage (Ω)			Order code	R for different input voltage (Ω)			Order code
220-240 VAC	380-415 VAC	440-480 VAC		500-525 VAC	550-600 VAC	660-690 VAC	
3.8	3.8	4.4	SX-D4090-EF	4.9	5.7	6.5	SX-D6090-EF
2.7	2.7	3.1	SX-D4110-EF	4.9	5.7	6.5	SX-D6110-EF
2.7	2.7	3.1	SX-D4132-EF	4.9	5.7	6.5	SX-D6132-EF
2 x 3.8	2 x 3.8	2 x 4.4	SX-D4160-EF	4.9	5.7	6.5	SX-D6160-EF
2 x 3.8	2 x 3.8	2 x 4.4	SX-D4200-EF	2 x 4.9	2 x 5.7	2 x 6.5	SX-D6200-EF
2 x 2.7	2 x 2.7	2 x 3.1	SX-D4220-EF	2 x 4.9	2 x 5.7	2 x 6.5	SX-D6250-EF
2 x 2.7	2 x 2.7	2 x 3.1	SX-D4250-EF	2 x 4.9	2 x 5.7	2 x 6.5	SX-D6315-EF
3 x 2.7	3 x 2.7	3 x 3.1	SX-D4315-EF	2 x 4.9	2 x 5.7	2 x 6.5	SX-D6355-EF
3 x 2.7	3 x 2.7	3 x 3.1	SX-D4355-EF	3 x 4.9	3 x 5.7	3 x 5.7	SX-D6450-EF
3 x 2.7	3 x 2.7	3 x 3.1	SX-D4400-EF	3 x 4.9	3 x 5.7	3 x 5.7	SX-D6500-EF
4 x 2.7	4 x 2.7	4 x 3.1	SX-D4450-EF	4 x 4.9	4 x 5.7	4 x 5.7	SX-D6600-EF
4 x 2.7	4 x 2.7	4 x 3.1	SX-D4500-EF	4 x 4.9	4 x 5.7	4 x 5.7	SX-D6630-EF
6 x 2.7	6 x 2.7	6 x 3.1	SX-D4630-EF	6 x 4.9	6 x 5.7	6 x 5.7	SX-D6710-EF
6 x 2.7	6 x 2.7	6 x 3.1	SX-D4800-EF	6 x 4.9	6 x 5.7	6 x 5.7	SX-D6800-EF
				6 x 4.9	6 x 5.7	6 x 5.7	SX-D6900-EF
				6 x 4.9	6 x 5.7	6 x 5.7	SX-D61K0-EF

Supply voltage (VAC)I	Built-in brake chopper trigger level (VDC)
220-240	380
380-415	660
440-480	780

Supply voltage (VAC)I	Built-in brake chopper trigger level (VDC)
500-525	860
550-600	1000
660-690	1150

⑦ Output coils

Output coils above SX-D4132-EF for the 400V and SX-D6160-EF should be order from factory as they should be installed inside of the cabinet

Voltage	Inverter model	Rated current	Inductance	Rated Voltage	Max carrier	Max output frequency	Max temp	Order code
400V	SX-D4090-EF	175A	0.05 mH	800V	6 KHz	200 Hz	40ºC	473171 00
	SX-D4110-EF	275A	0.032 mH		1.5 kHz	100 Hz		473172 00
	SX-D4132-EF							
690V	SX-D6090-EF	90A	0.1 mH		6 kHz	200 Hz		473169 00
	SX-D6110-EF	146A	0.05 mH		6 kHz	200 Hz		473170 00
	SX-D6132-EF							
	SX-D6160-EF	175A	0.05 mH		6 kHz	200 Hz		473171 00

⑧ Overshoot clamp

Note: Only two types of overshoot clamps could be order for after mounting

Inverter	Function	Order code
SX-D4090 to SX-D4132 SX-D6090 to SX-D6160	Together with the output coils, the overshoot clamp restricts the voltage and the dV/dt on the motor winding. Inverters must be ordered including the option DC+/DC- connectors.	52163
SX-D4160 to SX-D4800 SX-D6200 to SX-D61K0	Together with the output coils, the overshoot clamp restricts the voltage and the dV/dt on the motor winding. Doesn´t require the "DC+/DC-" option.	52220

Specifications

400 V class

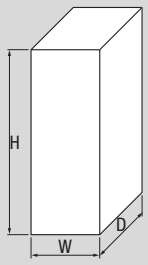
Three-phase: SX-D4___-EF		090	110	132	160	200	220	250	315	355	400	450	500	630	800
Motor kW*1	For HD setting	75	90	110	132	160	200	220	250	315	355	400	450	500	630
	For ND setting	90	110	132	160	200	220	250	315	355	400	450	500	630	800
Output characteristics	Max output current (A)	210	252	300	360	450	516	600	720	780	900	1032	1200	1440	1800
	Rated output current (A) at HD	140	168	200	240	300	344	400	480	520	600	688	800	960	1200
	Rated output current (A) at ND	175	210	250	300	375	430	500	600	650	750	860	1000	1200	1500
	Output voltage	0 to Mains supply voltage													
	Max. output frequency	400 Hz													
Power supply	Rated input voltage and frequency	3-phase 230..480 V 50/60 Hz													
	Allowable voltage fluctuation	+10%..-15% (-10% at 230V)													
	Allowable frequency fluctuation	45 to 65 Hz													

*1 Based on a standard 4-pole motor for maximum applicable motor output

600 V class

Three-phase: SX-D6___-EF		090	110	132	160	200	250	315	355	450	500	600	630	710	800	900	1K0
Motor kW	For HD setting	75	90	110	132	160	200	250	315	315	355	450	500	600	650	710	800
	For ND setting	90	110	132	160	200	250	315	355	450	500	600	630	710	800	900	1000
Output characteristics	Max output current (A)	108	131	175	210	252	300	360	450	516	600	720	780	900	1032	1080	1200
	Rated output current (A) at HD	72	87	117	140	168	200	240	300	344	400	480	520	600	688	720	800
	Rated output current (A) at ND	90	109	146	175	210	250	300	375	430	500	600	650	750	860	900	1000
	Output voltage	0 to Mains supply voltage															
	Max. output frequency	400 Hz															
Power supply	Rated input voltage and frequency	3-phase 500..690V, 50/60 Hz															
	Allowable voltage fluctuation	+10%..-15%															
	Allowable frequency fluctuation	45 to 65 Hz															

Dimensions (IP54)

Voltage	Drive model	H	W	D	
400 V	SX-D4090-EF	952.50	285	314	
	SX-D4110-EF to SX-D4132-EF	952.50	345	314	
	SX-D4160-EF to SX-D4250-EF	2330	600	600	
	SX-D4315-EF to SX-D4400-EF	2330	1000	600	
	SX-D4450-EF to SX-D4500-EF	2330	1200	600	
	SX-D4630-EF to SX-D4800-EF	2330	2000	600	
600 V	SX-D6090-EF to SX-D6160-EF	952.50	344.50	314	
	SX-D6200-EF to SX-D6355-EF	2330	600	600	
	SX-D6450-EF to SX-D6500-EF	2330	1000	600	
	SX-D6600-EF to SX-D6630-EF	2330	1200	600	
	SX-D6710-EF to SX-D61K0-EF	2330	2000	600	

NEVER-FAIL

“It’s not about our products, it’s about your production”

Our "Never-fail" concept looks beyond device reliability. The whole chain of machine control and management should be able to diagnose a potential malfunction and alert the operator while production continues.

Learn how to benefit from the never-fail principle at:
www.never-fail.info

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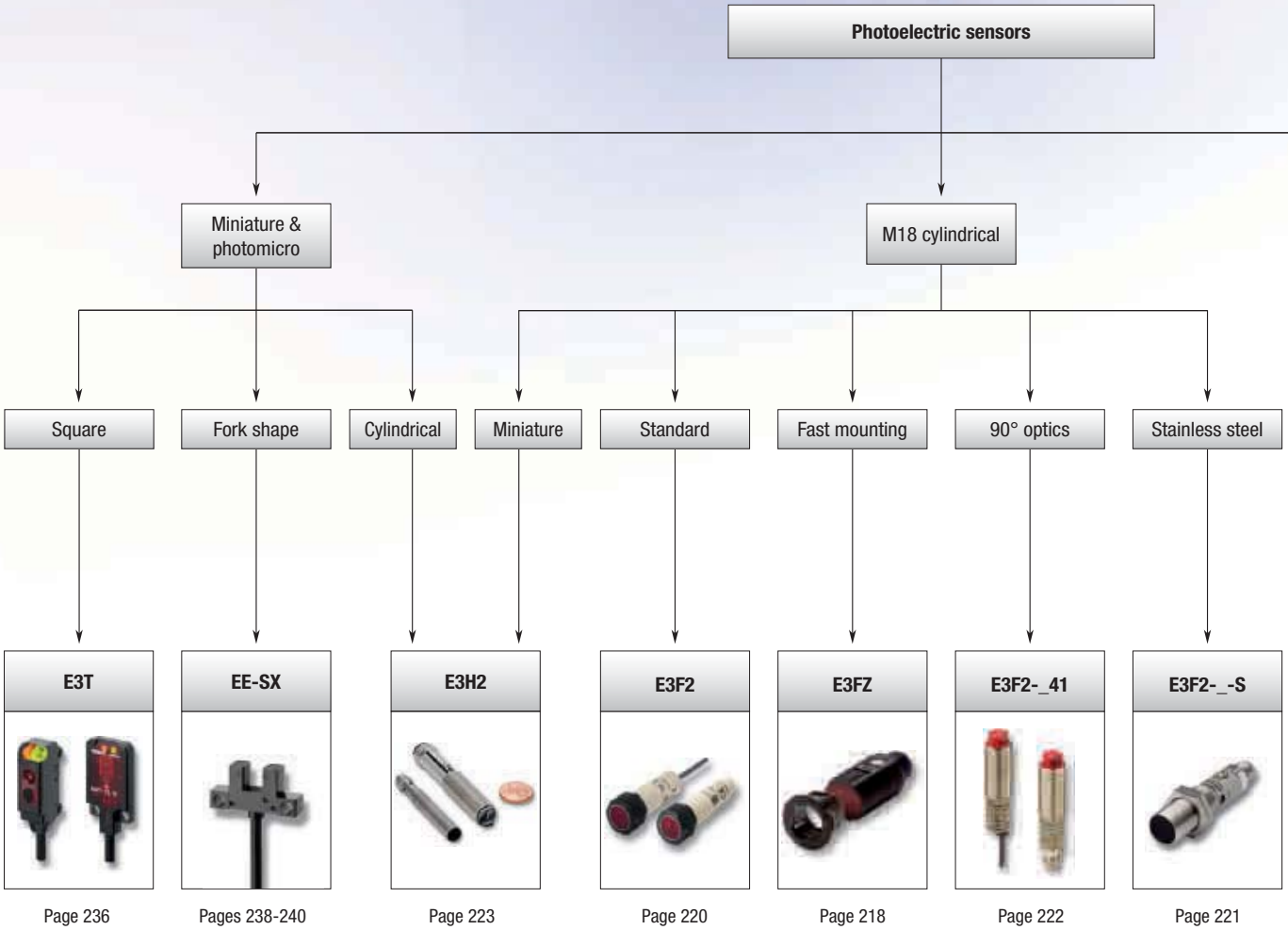
FOR MACHINES BUILT TO LAST

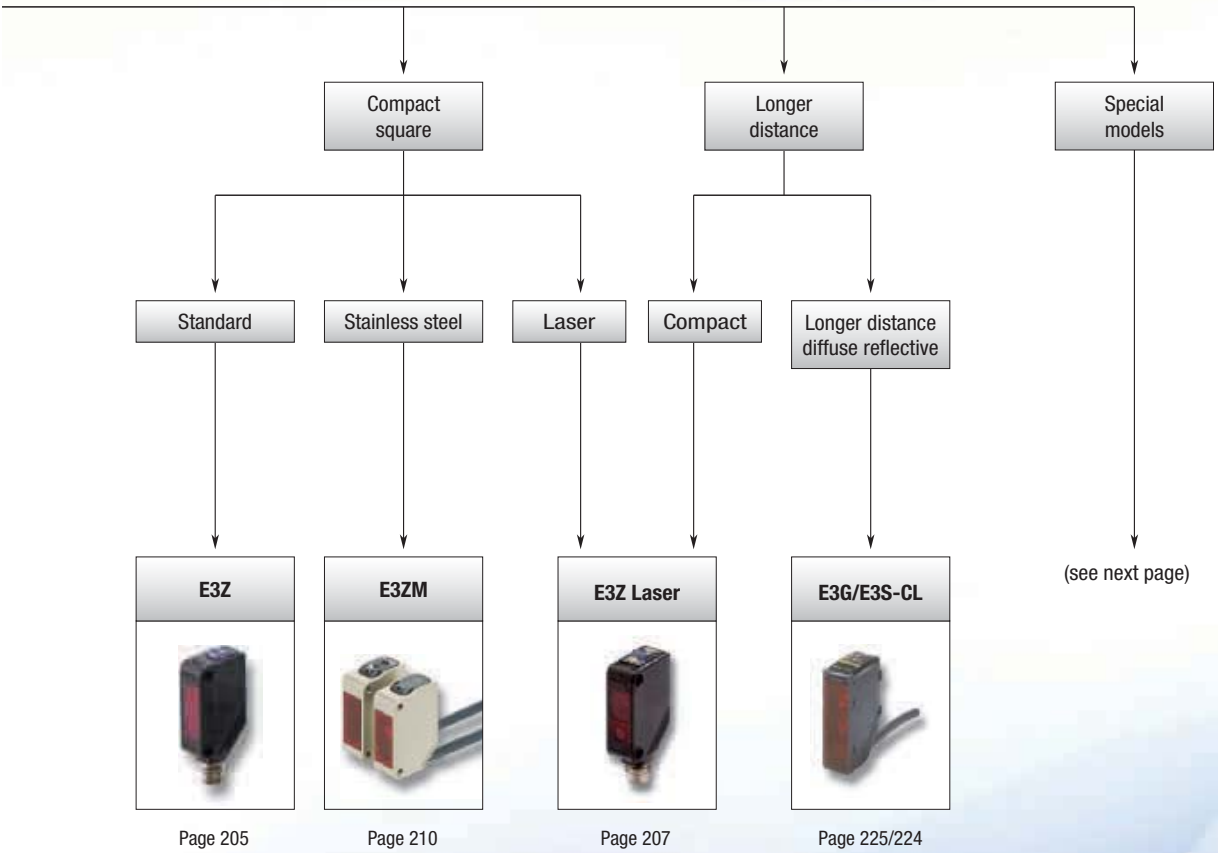
Reliability and accuracy confirmed by millions… every day

With more than one million units sold, the E3Z is among the world's most popular and successful photoelectric sensors.
Manufactured to exceptionally high engineering standards, you can take the performance reliability for granted.

- Optimal sensing performance tuned to your application
- Various housing designs fitting your application concept
- Proven performance and unmatched reliability






Compact square
Longer distance
Special models
Standard
Stainless steel
Laser
Compact
Longer distance diffuse reflective
E3Z
E3ZM
E3Z Laser
E3G/E3S-CL
(see next page)
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Selection table

Type	Compact Square			Longer distance	
					
Model	**E3Z**	**E3ZM**	**E3Z Laser**	**E3S-CL**	**E3G**
Housing	PBT	Stainless steel	PBT	Zinc diecast	PBT
Through-beam	15 m, 30 m	15 m	60 m	–	–
Retro-reflective with M.S.R.	5 m	4 m	15 m	–	(10 m)
Diffuse-reflective (energetic)	1 m	1 m	–	–	2 m
Diffuse-reflective (background suppression)	200 mm	200 mm	300 mm	500 mm	1.2 m
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Type	Oil resistant	Mark detection	Transparent detection		
					
Model	**E3ZM-C**	**E3ZM-V**	**E3ZM-B**	**E3Z-B**	**E3FZ-B**
Key features	Oil and lubricant resistant stainless steel housing	White LED for optimal contrast	Optimised optical system for all transparent objects	Optical system for standard transparent objects	Optimised optical system for all transparent objects
Housing	Stainless steel	Stainless steel	Stainless steel	PBT	M18 PBT
Through-beam	20 m	–	–	–	–
Retro-reflective with M.S.R.	4 m		500 mm	500 mm, 2 m	700 mm
Diffuse-reflective	1 m	12mm±2mm	–	–	–
Diffuse-reflective (background suppression)	200 mm	–	–	–	–
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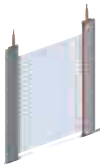
Cylindrical				Miniature	
					
E3F2	**E3F2-_-S**	**E3FZ**	**E3H2**	**E3T**	**EE-SX**
M18 PBT, brass	M18 stainless steel	M18 PBT	M12 brass, M8 stainless steel	PBT	PBT
7 m	7 m	15 m	4 m, 2 m	1 m	5 mm (slot width)
4 m	4 m	4 m	2 m	200 mm	–
1 m	1 m	1 m	300 mm	30 mm	–
100 mm	100 mm	200 mm	–	30 mm	–
220	221	218	223	236	238

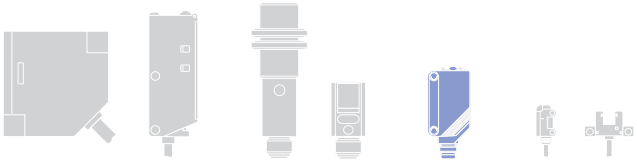
90° optics	High precision positioning	Fork shape	Structured object detection	Multi voltage power supply	Light curtains	
						
E3F2-_41, E3FR	**E3C-LDA**	**E3Z-G**	**E3S-LS3**	**E3JK, E3JM, E3G-_M**	**F3E, F3ET**	**F3EM**
Radial (90°) optics	Up to 10 µm accuracy	Slot width 25 mm	Wide beam	AC/DC power supply and relay output	Area monitoring up to 2100 mm	Height measurement up to 2100 mm
M18 PBT, Brass	PBT	PBT	PBT	ABS, ABS, PBT	Aluminium	Aluminium
–,15 m	–	25 mm	–	5 m, 10 m, -	5 m, 3 m/ 15 m	3 m , 15 m
2 m, 4 m	7 m	–	–	4 m, 4 m, 10 m	–	–
300 mm, 1 m	1 m	–	60 mm	300 mm, 700 mm, 2 m	–	–
–, 200 mm	–	–	–	-, -, 1.2 m	–	–
222/218	231	229	230	226/227/228	234/233	235



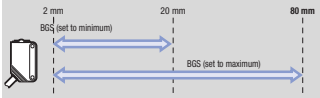
General purpose sensor in compact plastic housing

Compact housing size and high-power LED for excellent performance-size ratio and best value-performance ratio for standard applications.

- Minimal optical axis deviation for easy alignment
- IP67 and IP69K for highest water resistance
- Intensive shielding for highest noise immunity (EMC)
- Multiple moulding housing for high mechanical resistance



Ordering information

Sensor type		Sensing distance	Connection method				Order code	
							NPN output	PNP output
Through-beam		30 m (Infrared light)	–	–	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-T62 2M	E3Z-T82 2M
			■	–	–		E3Z-T67	E3Z-T87
		10 m (Red light)	–	–	2 m		E3Z-T61A 2M	E3Z-T81A 2M
			■	–	–		E3Z-T66A	E3Z-T86A
Retro-reflective with M.S.R.		0.1 to 4 m*1 (Red light)	–	–	2 m		E3Z-R61 2M	E3Z-R81 2M
			■	–	–		E3Z-R66	E3Z-R86
Retro-reflective without M.S.R.		0.1 to 5 m*1 (Infrared light)	–	–	2 m		E3Z-R61-4 2M	E3Z-R81-4 2M
			■	–	–		E3Z-R66-4	E3Z-R86-4
Diffuse-reflective		1 m (adjustable) (Infrared light)	–	–	2 m		E3Z-D62 2M	E3Z-D82 2M
			■	–	–		E3Z-D67	E3Z-D87
Diffuse-reflective wide beam		100 mm (adjustable) (Infrared light)	–	–	2 m		E3Z-D61 2M	E3Z-D81 2M
			■	–	–		E3Z-D66	E3Z-D86
Distance-settable (back-ground suppression)*2	Small spot (Red light)		–	–	2 m		E3Z-LS63 2M	E3Z-LS83 2M
			■	–	–		E3Z-LS68	E3Z-LS88
	Standard (Red light)		–	–	2 m		E3Z-LS61 2M*2	E3Z-LS81 2M*2
			■	–	–		E3Z-LS66*2	E3Z-LS86*2

*1 Measured with E39-R1S
*2 For infrared LED models contact your Omron representative

Specifications

Item		Through-beam		Retro-reflective without M.S.R		Diffuse-reflective	Diffuse-reflective (wide beam)	Distance-settable (background suppression)	
				Red LED	Infrared LED			Standard	Small spot
	NPN	E3Z-T62/T67	E3Z-T61A/T66A	E3Z-R61/R66	E3Z-R6_-4	E3Z-D62/D67	E3Z-D61/D66	E3Z-LS61/66	E3Z-LS63/68
	PNP	E3Z-T82/T87	E3Z-T81A/T86A	E3Z-R81/R86	E3Z-R8_-4	E3Z-D82/D87	E3Z-D81/D86	E3Z-LS81/86	E3Z-LS83/88
Sensing distance		30 m	10 m	0.1 to 4 m (with E39-R1S)	0.1 to 5m (with E39-R1S)	1 m (adjustable)	100 mm (adjustable)	200 mm max.	80 mm max.
Directional angle		Both emitter and receiver: 3° to 15°		2° to 10°		–			
Black/white error		–						10% of set distance max.	5% of set distance max.
Light source (wave length)		Infrared LED (870 nm)	RED LED (700 nm)	Red LED (680 nm)	Infrared LED (870 nm)	Infrared LED (860 nm)		Red LED (680 nm)	Red LED (650 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.							
Control output		Load power supply voltage 26.4 VDC max., load current 100 mA max. (residual voltage 2 V max.) Open collector output type (depends on the NPN/PNP output format) Light-ON/Dark-ON switch selectable							
Protective circuits		Reverse polarity protection, short-circuit protection, output reverse polarity protection	Output short-circuit protection, power supply, reverse polarity protection	Reverse polarity protection, output short-circuit protection, mutual interference prevention, output reverse polarity protection				Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation or reset: 2 ms max.	Operation or reset: 1 ms max.						
Ambient temperature		Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)							
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9							
Material	Case	PBT (polybutylene terephthalate)							
	Lens	Denatured polyacrylate resin		Methacrylate resin		Denatured polyacrylate resin			



High ambient light immunity



High electromagnetic noise immunity



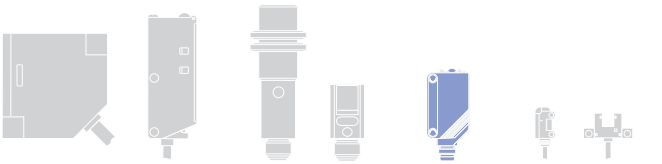
Robust and tight housing construction



LASER sensor in compact plastic housing

The E3Z LASER sensor in compact plastic housing features visible LASER light for precision positioning and detection applications.

- Visible LASER light for precision positioning and small object detection
- High power LD for long range precision
- Class 1 LASER
- Precise background suppression and low black/white error for accurate detection



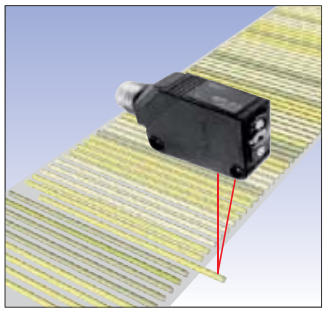
Ordering information

Sensor type	Sensing distance	Response time	Connection method				Order code	
			●	●			NPN output	PNP output
Through-beam	60 m	1 ms	–	–	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-LT61 2M	E3Z-LT81 2M
			■	–	–		E3Z-LT66	E3Z-LT86
Retro-reflective with M.S.R.	0.3 to 15 m*1		–	–	2 m		E3Z-LR61 2M	E3Z-LR81 2M
			■	–	–		E3Z-LR66	E3Z-LR86
Distance-settable (background suppression)	20 to 300 mm		–	–	2 m		E3Z-LL61 2M	E3Z-LL81 2M
			■	–	–		E3Z-LL66	E3Z-LL86
	25 to 300 mm	0.5 ms	–	–	2 m		E3Z-LL63 2M	E3Z-LL83 2M
			■	–	–		E3Z-LL68	E3Z-LL88

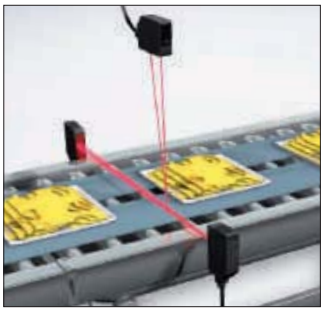
*1 Measured with E39-R1

Specifications

Item		Through-beam	Retro-reflective with M.S.R.	Distance settable (background suppression)	
		Standard model			High-speed model
	NPN output	E3Z-LT61/-LT66	E3Z-LR61/-LR66	E3Z-LL61/-LL66	E3Z-LL63/-LL68
	PNP output	E3Z-LT81/-LT86	E3Z-LR81/-LR86	E3Z-LL81/-LL86	E3Z-LL83/-LL88
Sensing distance		60 m	0.3 to 15 m (with E39-R1S)	20 to 300 mm	25 to 300 mm
Black/white error		–		5% (at 160 mm)	5% (at 100 mm)
Light source (wave length)		Red LD (655 nm), JIS Class 1, IEC Class 1, FDA Class II			
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.			
Protective circuits		Power supply reverse polarity, protection, short circuit protection, output reverse polarity protection	Power supply reverse polarity protection, short circuit protection, output reverse polarity protection, mutual interference prevention		
Response time		Operation or reset: 1 ms max.			Operation or reset 0.5 ms max.
Ambient temperature range		Operating: -10 to 55°C, Storage: -25 to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9			
Material	Case	PBT (polybutylene terephthalate)			
	Lens	Modified polyacrylate resin	Methacrylate	Modified polyacrylate resin	



Low black/white error for precise detection



Visible laser light for precision positioning



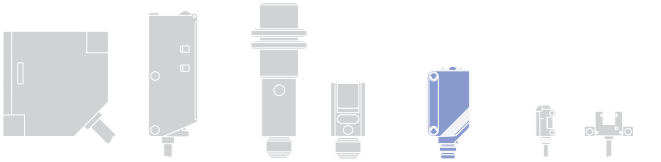
Class 1 laser



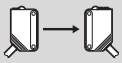
Photoelectric sensor with anti-tampering protection in compact plastic housing

The E3Z-_H line is part of the compact size E3Z family and features sensors without sensitivity adjusters for maximum tampering protection.

- Compact housing size and high-power LED for excellent performance-size ratio
- IP67 and IP69K for highest water resistance
- Intensive shielding for highest noise immunity (EMC)
- Tough PBT housing for high mechanical resistance



Ordering information

Sensor type	Sensing distance	Output configuration	Connection method				Order code
							Anti-tampering
Through-beam 	15 m	NPN	–	–	■	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-T61H 2M
			■	–	–		E3Z-T66H
		PNP	–	–	■		E3Z-T81H 2M
			■	–	–		E3Z-T86H
Retro-reflective with M.S.R. 	0.1 to 4 m*1	NPN	–	–	■		E3Z-R61H 2M
			■	–	–		E3Z-R66H
		PNP	–	–	■		E3Z-R81H 2M
			■	–	–		E3Z-R86H

*1 Measured with E39-R1S

Specifications

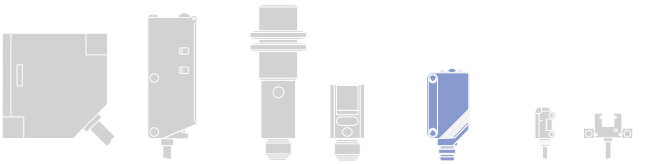
Item		Through-beam	Retro-reflective with M.S.R.
		E3Z-T_	E3Z-R_
Sensing distance		15 m	0.1 to 4m (with E39-R1S)
Light source (wave length)		Infrared LED (870 nm)	Red LED (660 nm)
Power supply voltage		12 to 24 VDC ±10%	
Ambient temperature		Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	PBT	
	Lens	Denatured polyacrylate resin	Methacrylate resin



Photoelectric sensor for condition monitoring in compact plastic housing

The E3Z 'condition monitoring' family features active or passive sensor function checking capabilities detecting misalignments, dirt covers, defective sensors, etc.

- E3Z-_-J0: Self-diagnostic alarm output on unstable signal
- E3Z-_-G2: Detection of dirt cover by power reduction
- E3Z-_-G0: Active sensor functionality check by test input forcing state change at receiver (emission stop)



Ordering information

Sensor type	Sensing distance	Output configuration	Connection method	Order code*1		
				Self diagnosis	Emission stop	Light intensity switching
Through-beam	15 m	NPN	2 m	E3Z-T61-J0SHW-P2	E3Z-T61-G0SHW-P2	E3Z-T61-G2SHW-P2
		PNP	2 m	E3Z-T81-J0SHW-P2	E3Z-T81-G0SHW-P2	E3Z-T81-G2SHW-P2
Retro-reflective with M.S.R.	0.1 to 4 m	NPN	2 m	E3Z-R61-J0SRW-P2	E3Z-R61-G0SRW-P2	E3Z-R61-G2SRW-P2
		PNP	2 m	E3Z-R81-J0SRW-P2	E3Z-R81-G0SRW-P2	E3Z-R81-G2SRW-P2
Diffuse-reflective	1 m (adjustable)	NPN	2 m	E3Z-D62-J0SHW-P2	E3Z-D62-G0SHW-P2	E3Z-D62-G2SHW-P2
		PNP	2 m	E3Z-D82-J0SHW-P2	E3Z-D82-G0SHW-P2	E3Z-D82-G2SHW-P2

*1 For ordering M8 4-pin connector versions replace '-P2' by '-CN'.

Specifications

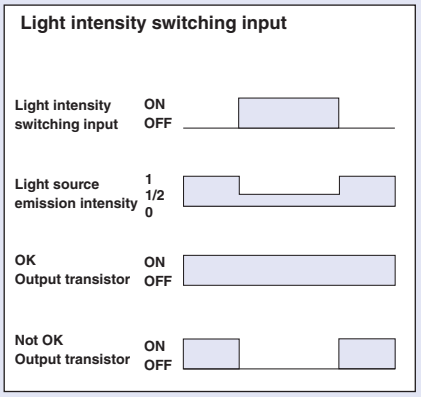
Item	Through-beam	Retro-reflective with M.S.R.	Diffuse-reflective
	E3Z-T_	E3Z-R_	E3Z-D_
Sensing distance	15 m	0.1 to 4m (with E39-R1S)	1 m (adjustable)
Light source	Infrared LED (870 nm)	Red LED (660 nm)	Infrared LED (860 nm)
Power supply voltage	12 to 24 VDC ±10%		
Ambient temperature	Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)		
Degree of protection	IEC 60529 IP67, IP69K after DIN 40050 part 9		
Material	PBT		

Light intensity switching/self diagnostic output

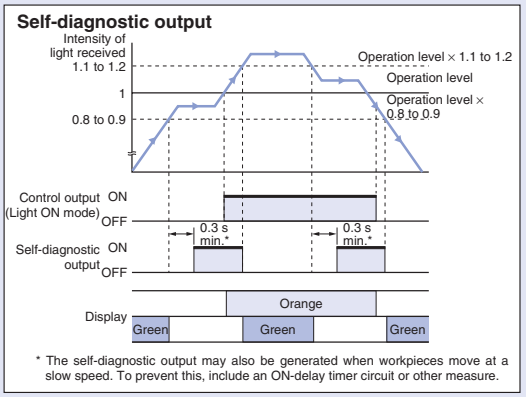
Errors might be caused by a dusty or dirty lens.

The E3Z with light intensity switching can prevent malfunctions by ensuring that sufficient functional reserve is available. At startup the light intensity is reduced by 50% and continued operation in this state indicates sufficient reserve when power is switched back to 100%.

Also, when light reception becomes unstable during operation, the E3Z with self-diagnostic output function outputs an alert to enable early maintenance.



Note: for light ON mode with workpiece



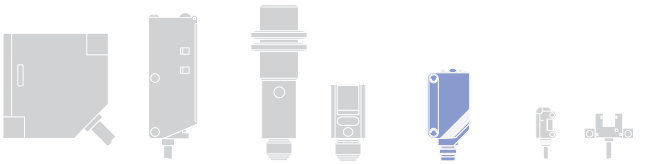
* The self-diagnostic output may also be generated when workpieces move at a slow speed. To prevent this, include an ON-delay timer circuit or other measure.



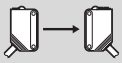
Photoelectric sensor in compact stainless steel housing

Compact housing size and high power LED for excellent performance-size ratio in a rugged, detergent-resistant stainless steel housing for demanding environments.

- High grade stainless steel housing (SUS316L)
- IP67 and IP69k for highest water resistance
- ECOLAB tested and certified detergent resistance



Ordering information

Sensor type	Sensing distance	Connection method				Order code	
		○	○			NPN output	PNP output
Through-beam 	15 m	–	–	2 m	*1	E3ZM-T61 2M	E3ZM-T81 2M
		■	–	–		E3ZM-T66	E3ZM-T86
	0.8 m with built-in slit	–	–	2 m		E3ZM-T63 2M	E3ZM-T83 2M
		■	–	–		E3ZM-T68	E3ZM-T88
Retro-reflective with M.S.R. 	0.1 to 4 m	–	–	2 m		E3ZM-R61 2M	E3ZM-R81 2M
		■	–	–		E3ZM-R66	E3ZM-R86
Diffuse-reflective 	1 m (adjustable)	–	–	2 m		E3ZM-D62 2M	E3ZM-D82 2M
		■	–	–		E3ZM-D67	E3ZM-D87
Diffuse-reflective (background suppression) 	10 to 100 mm (fixed)	–	–	2 m		E3ZM-LS61X 2M*2	E3ZM-LS81X 2M*2
		■	–	–		E3ZM-LS66X*2	E3ZM-LS86X*2
	10 to 200 mm (fixed)	–	–	2 m		E3ZM-LS64X 2M*2	E3ZM-LS84X 2M*2
		■	–	–		E3ZM-LS69X*2	E3ZM-LS89X*2

*1 For ordering pigtail versions replace '2M' of the cable types with:
- S1J: for M12 stainless steel plug with 30 cm cable
- S3J: for M8 4-pin stainless steel plug with 30cm cable
- S5J: for M8 3-pin stainless steel plug with 30cm cable (except for background suppression types)
- M1J: for M12 brass plug with 30cm cable
- M3J: for M8 4-pin brass plug with 30cm cable
- M5J: for M8 3-pin brass plug with 30cm cable (except for background suppression types)

*2 E3ZM-LS_X are fixed LIGHT-ON models. For fixed DARK-ON models please order E3ZM-LS_Y and for L-ON/D-ON selectable by wire please order E3ZM-LS_H.

Specifications

Item		Through-beam		Retro-reflective with M.S.R.	Diffuse-reflective
	NPN	E3ZM-T61 E3ZM-T66	E3ZM-T63 E3ZM-T68	E3ZM-R61 E3ZM-R66	E3ZM-D62 E3ZM-D67
	PNP	E3ZM-T81 E3ZM-T86	E3ZM-T83 E3ZM-T88	E3ZM-R81 E3ZM-R86	E3ZM-D82 E3ZM-D87
Sensing distance		15 m	0.8 m	0.1 to 4m (with E39-R1S)	1 m (adjustable)
Light source (wave length)		Infrared LED (870 nm)		Red LED (660 nm)	Infrared LED (860 nm)
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p)			
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention, output reverse polarity protection	
Ambient temperature range		Operating: -25°C to 55°C, storage: -40°C to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9			
Materials	Case	SUS316L			
	Lens	Methacrylic resin			
	Display	PES (polyether sulfone)			
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)			
	Seals	Fluoro rubber			

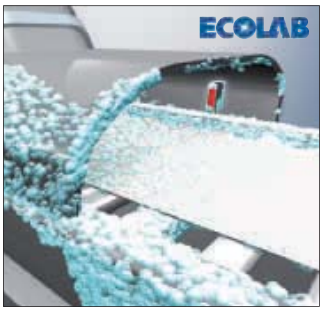
Item		Diffuse-reflective with background suppression (fixed distance)	
	NPN	E3ZM-LS61X E3ZM-LS66X	E3ZM-LS64X E3ZM-LS69X
	PNP	E3ZM-LS81X E3ZM-LS86X	E3ZM-LS84X E3ZM-LS89X
Sensing distance		10 to 100 mm (fixed)	10 to 200 mm (fixed)
Light source (adjustable)		Red LED (650 nm)	Red LED (660 nm)
Black/white error		5% of sensing distance max.	20% of sensing distance max.
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.	
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection, mutual interference protection	
Ambient temperature range		Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Materials	Case	SUS316L	
	Lens	Methacrylic resin	
	Display	PES (polyether sulfone)	
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)	
	Seals	Fluoro rubber	



Robust construction



Tight housing



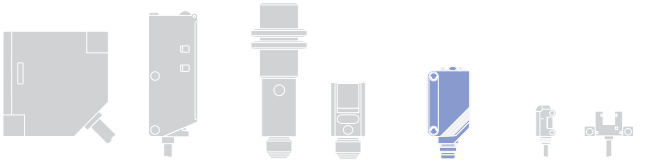
Detergent resistant



Oil-resistant photoelectric sensor in compact stainless steel housing

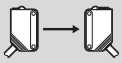
The oil-resistant compact photoelectric sensor in a robust stainless steel housing features an enhanced functional reserve for reliable object detection in dirty and mechanically demanding environments such as automotive assembly lines.

- Oil-resistant stainless steel housing
- IP67 and IP69k for highest water resistance
- High visibility orange LED in through-beam model for easy alignment



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Through-beam 	15 m (Infrared light)	–	–	2 m	–	E3ZM-CT61 2M	E3ZM-CT81 2M
		–	–	–	■*1	E3ZM-CT61-M1TJ	E3ZM-CT81-M1TJ
		■	–	–	–	E3ZM-CT66	E3ZM-CT86
	20 m (Orange light)	–	–	2 m	–	E3ZM-CT62B 2M	E3ZM-CT82B 2M
		–	–	–	■*1	E3ZM-CT62B-M1TJ	E3ZM-CT82B-M1TJ
		■	–	–	–	E3ZM-CT67B	E3ZM-CT87B
Retro-reflective with M.S.R. 	0.1 to 4m*2	–	–	2 m	–	E3ZM-CR61 2M	E3ZM-CR81 2M
		–	–	–	■*1	E3ZM-CR61-M1TJ	E3ZM-CR81-M1TJ
		■	–	–	–	E3ZM-CR66	E3ZM-CR86
Diffuse-reflective 	1 m (adjustable)	–	–	2 m	–	E3ZM-CD62 2M	E3ZM-CD82 2M
		–	–	–	■*1	E3ZM-CD62-M1TJ	E3ZM-CD82-M1TJ
		■	–	–	–	E3ZM-CD67	E3ZM-CD87
Diffuse-reflective (background suppression) 	10 to 100 mm (fixed)	–	–	2 m	–	E3ZM-CL61H 2M	E3ZM-CL81H 2M
		–	–	–	■*1	E3ZM-CL61H-M1TJ	E3ZM-CL81H-M1TJ
		■	–	–	–	E3ZM-CL66H	E3ZM-CL86H
	10 to 200 mm (fixed)	–	–	2 m	–	E3ZM-CL64H 2M	E3ZM-CL84H 2M
		–	–	–	■*1	E3ZM-CL64H-M1TJ	E3ZM-CL84H-M1TJ
		■	–	–	–	E3ZM-CL69H	E3ZM-CL89H

*1 uses Omron's Twist & Click M12 connector XS5.
*2 Measured with E39-R1S

Specifications

Item		Through-beam		Retro-reflective with M.S.R.	Diffuse-reflective
	NPN	E3ZM-CT61 (-M1TJ) E3ZM-CT66	E3ZM-CT62B (-M1TJ) E3ZM-CT67B	E3ZM-CR61 (-M1TJ) E3ZM-CR66	E3ZM-CD62 (-M1TJ) E3ZM-CD67
	PNP	E3ZM-CT81 (-M1TJ) E3ZM-CT86	E3ZM-CT82B (-M1TJ) E3ZM-CT87B	E3ZM-CR81 (-M1TJ) E3ZM-CR86	E3ZM-CD82 (-M1TJ) E3ZM-CD87
Sensing distance		15 m	20 m	0.1 to 4 m (with E39-R1S)	1 m (adjustable)
Light source (wave length)		Infrared LED (870 nm)	Orange LED (615 nm)	Red LED (660 nm)	Infrared LED (860 nm)
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)			
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection, and mutual interference prevention	
Ambient temperature range		Operating: -25°C to 55°C, storage: -40°C to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9			
Materials	Case	SUS316L			
	Lens	PMMA (polymethylmethacrylate)			
	Display	PES (polyether sulfone)			
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)			
	Seals	Fluoro rubber			

Item		Diffuse-reflective with background suppression (fixed distance)	
	NPN	E3ZM-CL61H (-M1TJ) E3ZM-CL66H	E3ZM-CL64H (-M1TJ) E3ZM-CL69H
	PNP	E3ZM-CL81H (-M1TJ) E3ZM-CL86H	E3ZM-CL84H (-M1TJ) E3ZM-CL89H
Sensing distance		10 to 100 mm (fixed)	10 to 200 mm (fixed)
Light source (wave length)		Red LED (650 nm)	Red LED (660 nm)
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.	
Protective circuits		Reversed power supply polarity protection, output short-circuit protection, reversed output polarity protection, mutual interference protection	
Ambient temperature range		Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Materials	Case	SUS316L	
	Cable	Oil-resistant vinyl cable	
	Lens	PMMA (polymethylmethacrylate)	
	Display	PES (polyethersulfone)	
	Seals	Fluoro rubber	

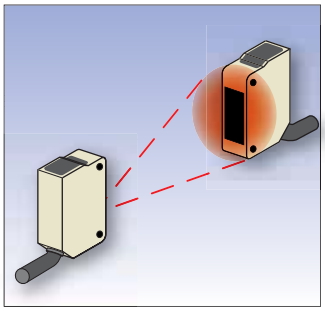


Tested oil and lubricant resistance

Oil Resistance

Test oil type	Product name	Kinetic viscosity at 40°C (mm²/s)	pH (dilution rate)
Lubricants	Velocity Oil No. 3	2.02	–
Non-water-soluble cutting oils	Yushiron Oil No.2 AC	Less than 10	–
Water-soluble cutting oils	Yushiroken EC50T3	–	10.1 (×30)
	Yushiroken EC50T5		9.9 (×30)
	Yushiroken S46D		9.9 (×50)
	Yushiroken S50N		8.6 (×50)
	Yushiron Lubic HWC68		9.1 (×30)
	Yushiroken Synthetic #770TG		9.9 (×20)
	Emulcut FA-900ST		9.7 (×30)
	Multicool CSF-9000		9.7 (×20)
	Sugicut CS-68JS-1		9.6 (×20)
	Toyocool 3A-666		9.6 (×20)
	Gryton 1700		9.1 (×10)
	Gryton 1700D		9.3 (×3)

1. The Sensor was immersed in the above oils for 240 h at 55°C and then passed an insulation resistance test at 100 MΩ.
2. Use the kinetic viscosities and pHs in the above table as a guide when using the Sensor in environments containing oils not listed in the table. Additives in the oil may also affect performance. Always test applicability in advance.



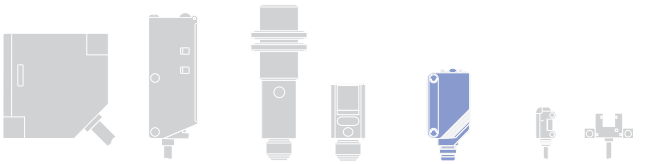
Highly visible orange LED



Print mark detection photoelectric sensor in compact stainless steel housing

The detergent resistant photoelectric sensor in a robust stainless steel housing provides reliable detection of all common print marks in food packaging applications.

- White LED for stable detection of differently coloured or black print marks
- SUS 316L stainless steel housing
- Easy-to-use teach-in button or remote teach
- Fast response time of 50 µs



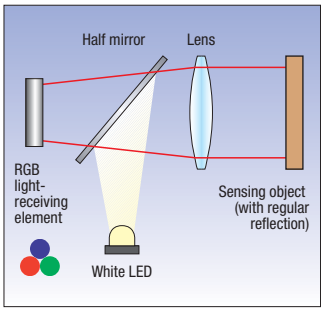
Special models M18 cylindrical Compact Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Mark sensor 	12±2 mm	–	–	2 m	–	E3ZM-V61 2M	E3ZM-V81 2M
		■	–	–	–	E3ZM-V66	E3ZM-V86

Specifications

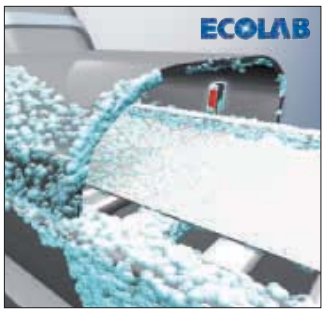
Item		NPN	E3ZM-V6_
		PNP	E3ZM-V8_
Sensing distance			12±2 mm
Light source (wave length)			White LED (450 to 700 nm)
Power supply voltage			10 to 30 VDC ±10%, ripple (p-p) 10% max.
Protective circuits			Reversed power supply polarity protection, output short-circuit protection, Reversed output polarity protection, and mutual interference prevention
Ambient temperature range			Operating: -25°C to 55°C, storage: -40°C to 70°C (with no icing or condensation)
Response time			50 µs
Degree of protection			IEC: IP67, DIN 40050-9: IP69K
Materials	Case		SUS316L
	Lens		PMMA (polymethylmethacrylate)
	Display		PES (polyether sulfone)
	Sensitivity adjustment and operation switch		PEEK (polyether ether ketone)
	Seals		Fluoro rubber



Coaxial optical system with white LED



Remote teaching



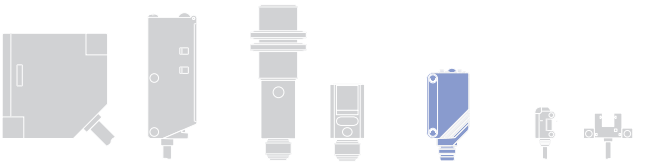
Detergent resistant



Transparent object detection sensor in compact stainless steel housing

The E3ZM-B family provides models for the general transparent material detection and specialized models providing highest stability for the detection of PET bottles.

- Stable PET detection using double refraction and AC[3] power control technology
- Detergent resistant compact SUS316L housing



Ordering information

Sensor type		Sensing distance	Special reflector	Connection method				Order code	
								NPN output	PNP output
Retro-reflective with M.S.R.	Optimised for PET bottles and trays	100 to 500 mm (teachable)	Order separately*1	–	–	2 m	–	E3ZM-B61 2M	E3ZM-B81 2M
				■	–	–	–	E3ZM-B66	E3ZM-B86
			E39-RP1 included	–	–	2 m	–	E3ZM-B61-C 2M	E3ZM-B81-C 2M
				■	–	–	–	E3ZM-B66-C	E3ZM-B86-C
Retro-reflective with M.S.R.	For all transparent media (glass, PET, foils)	100 to 500 mm (potentiometer adjustment)*2	Order separately*3	–	–	2 m	–	E3ZM-B61T 2M	E3ZM-B81T 2M
				■	–	–	–	E3ZM-B66T	E3ZM-B86T

*1 For higher signal stability using circular polarisation functionality for PET bottles, order special reflector E39-RP1 separately
*2 Teachable all-transparent-media types are available. Contact your OMRON representative
*3 Order reflector separately

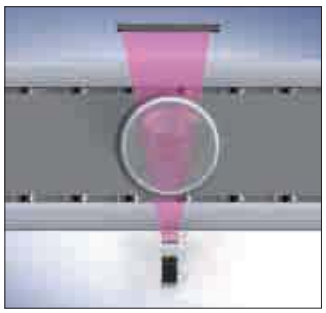
Specifications

Item		PET optimised	all-transparent-media*1
	NPN	E3ZM-B61(-C)/-B66(-C)	E3ZM-B6_T
	PNP	E3ZM-B81(-C)/-B86(-C)	E3ZM-B8_T
Sensing distance		100 to 500 mm (with E39-RP1)	
Light source (wave length)		Red LED (650 nm)	
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.	
Protective circuits		Reversed power supply polarity protection, output short-circuit protection, mutual interference prevention, and reversed output polarity protection	
Response time		Operation or reset: 1 ms max.	
Ambient temperature range		Operating: -40°C to 60°C, storage: -40°C to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Materials	Case	SUS316L	
	Lens	PMMA (polymethylmethacrylate)	
	Display	PES (polyether sulfone)	
	Seals	Fluoro rubber	
	Cable	PVC (polyvinyl chloride)	

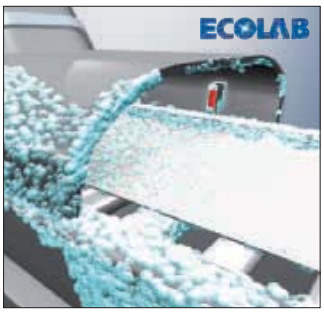
*1 Contact your Omron representative for details on all-transparent-media types (potentiometer adjustment or teachable)



Utilisation of double reflection effect in PET for higher detection stability (PET optimised models)



Automatic LED power adjustment (AC[3]) to compensate for soiling and temperature fluctuations



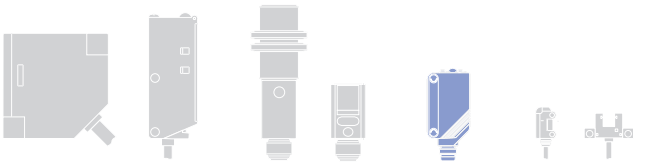
Detergent resistant



Transparent bottle detection photoelectric sensor in compact plastic housing

The E3Z-B provides easy adjustment for the detection of a large variety of standard transparent objects.

- Detects a wide range of bottles from single bottles to sets of stocked bottles
- IP67/IP69K tested for highest water resistance



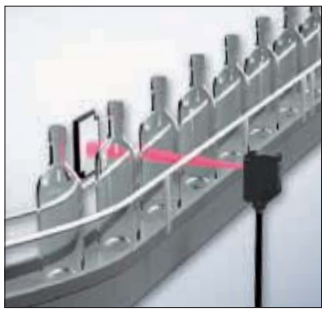
Ordering information

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Retro-reflective without M.S.R. 	80 to 500 mm*1 (adjustable)	–	–	2 m	–	E3Z-B61 2M	E3Z-B81 2M
		■	–	–	–	E3Z-B66	E3Z-B86
	0.5 to 2 m*1 (adjustable)	–	–	2 m	–	E3Z-B62 2M	E3Z-B82 2M
		■	–	–	–	E3Z-B67	E3Z-B87

*1 Measured with E39-R1S

Specifications

Item		Retro-reflective without M.S.R.	
	NPN output	E3Z-B61/E3Z-B66	E3Z-B62/E3Z-B67
	PNP output	E3Z-B81/E3Z-B86	E3Z-B82/E3Z-B87
Sensing distance		80 to 500 mm (with E39-R1) (adjustable)	0.1 to 2 m (with E39-R1S) (adjustable)
Light source (wave length)		Red LED (680 nm)	
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) : 10% max.	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation or reset: 1 ms max.	
Ambient temperature		Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	PBT (polybutylene terephthalate)	
	Lens	Methacrylate resin	



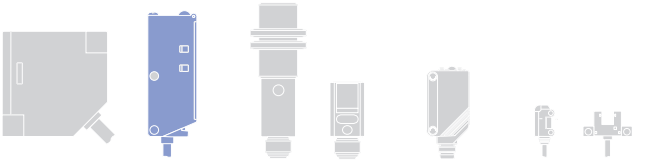
Easy adjustment for the detection of a large variety of transparent objects



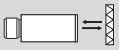
Transparent object detection sensor in compact M18 housing

The E3FZ-B provides enhanced detection stability for the detection of transparent objects. It allows an easy and intuitive adjustment by potentiometer to adjust to individual requirements.

- Easy adjustment to individual requirements for all transparent materials
- Easy mounting due to short M18 housing
- Coaxial optics for stable, distance-independent detection



Ordering Information

Sensor type	Sensing distance	Connection method				Order code	
					*1	NPN output	PNP output
Retro-reflective with M.S.R. 	0 to 700 mm *2	–	–	2 m	–	E3FZ-B61 2M	E3FZ-B81 2M
		–	■	–	–	E3FZ-B66	E3FZ-B86

*1 For ordering pigtail versions contact your OMRON representative. Available options on request are:
- M3J:for M8 4-pin pigtail connector with 30 cm cable
- M5J:for M8 3-pin pigtail connector with 30 cm cable
- M1TJ: for M12 4-pin XS5 smart-click connector with 30 cm cable.

*2 Sensing distance is rated on reflector E39-R1S. Reflector is sold separately.

Mounting Brackets

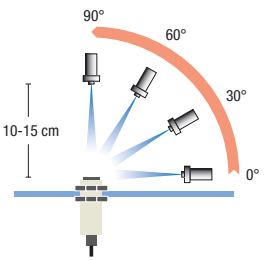
Type	Material	Order code
90° Mounting Bracket *1	Stainless Steel	E39-EL12

*1 Bracket fitting to M18 screw mounting.

Ratings and Specifications

Item		E3FZ-B_
Sensing distance		0 to 700 mm (Using E39-R1S, other reflectors see diagram operating range)
Light source (wavelength)		Red LED (650 nm)
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)
Protective circuits		Reversed power supply polarity, load short-circuit protection, mutual interference prevention, reversed output polarity protection
Response time		Operation or reset: 1 ms max.
Ambient temperature range		Operating: –25 to 55°C, Storage: –40 to 70°C (with no icing or condensation)
Degree of protection		IEC 60529: IP67, DIN 40050-9: IP69K *1
Materials	Housing	ABS
	Lens	PMMA (polymethylmethacrylate)
	Cable	PVC (polyvinyl chloride)

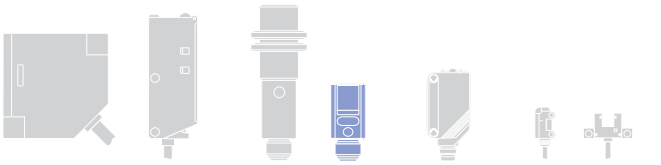
*1 IP69K is a protection standard against high temperature and high-pressure water defined in the German standard DIN 40050, Part 9. The test piece is sprayed with water at 80°C at a water pressure of 80 to 100 BAR using a specified nozzle shape at a rate of 14 to 16 liters/min.
The distance between the test piece and nozzle is 10 to 15 cm, and water is sprayed horizontally for 30 seconds each at 0°, 30°, 60°, and 90° while rotating the test piece on a horizontal plane.





Easy Mounting photoelectric sensor in short plastic M18 housing

- High power LED for enhanced sensing distance
- SecureClick snap mounting for fast installation



Ordering information

Snap mounting - E3FZ[*1]

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Through-beam	15 m	–	–	2 m	–[*2]	E3FZ-T61H 2M	E3FZ-T81H 2M
		–	■	–	–[*2]	E3FZ-T66H	E3FZ-T86H
Retro-reflective with M.S.R.	0.1 to 4 m[*3]	–	–	2 m	–[*2]	E3FZ-R61H 2M	E3FZ-R81H 2M
		–	■	–	–[*2]	E3FZ-R66H	E3FZ-R86H
Diffuse-reflective	1 m (adjustable)	–	–	2 m	–[*2]	E3FZ-D62 2M	E3FZ-D82 2M
		–	■	–	–[*2]	E3FZ-D67	E3FZ-D87
Diffuse-reflective (background suppression)	100 mm (fixed)	–	–	2 m	–[*2]	E3FZ-LS61H 2M	E3FZ-LS81H 2M
		–	■	–	–[*2]	E3FZ-LS66H	E3FZ-LS86H
	200 mm (fixed)	–	–	2 m	–[*2]	E3FZ-LS64H 2M	E3FZ-LS84H 2M
		–	■	–	–[*2]	E3FZ-LS69H	E3FZ-LS89H

Radial mounting - E3FR

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Through-beam	15 m	–	–	2 m	–[*2]	E3FR-T61H 2M	E3FR-T81H 2M
		–	■	–	–[*2]	E3FR-T66H	E3FR-T86H
Retro-reflective with M.S.R.	0.1 to 4 m[*3]	–	–	2 m	–[*2]	E3FR-R61H 2M	E3FR-R81H 2M
		–	■	–	–[*2]	E3FR-R66H	E3FR-R86H
Diffuse-reflective	1 m (adjustable)	–	–	2 m	–[*2]	E3FR-D62 2M	E3FR-D82 2M
		–	■	–	–[*2]	E3FR-D67	E3FR-D87
Diffuse-reflective (background suppression)	100 mm (fixed)	–	–	2 m	–[*2]	E3FR-LS61H 2M	E3FR-LS81H 2M
		–	■	–	–[*2]	E3FR-LS66H	E3FR-LS86H
	200 mm (fixed)	–	–	2 m	–[*2]	E3FR-LS64H 2M	E3FR-LS84H 2M
		–	■	–	–[*2]	E3FR-LS69H	E3FR-LS89H

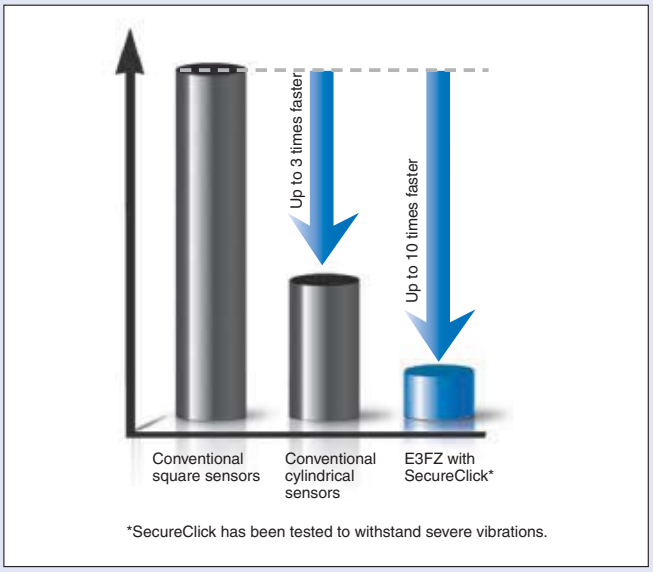
*1. Mounting with snap holder (provided with product) or M18 nuts (provided with product) possible.
*2. Pigtail connectors are available on request
*3. Measured with reflector E39-R1S

Specifications

	Through-beam	Retro-reflective with M.S.R.	Diffuse-reflective	Diffuse-reflective with background suppression	
Item	**E3FZ-T/E3FR-T**	**E3FZ-R/E3FR-R**	**E3FZ-D/E3FR-D**	**E3F_-LS_1H/E3F_-LS_6H**	**E3F_-LS_4H/E3F_-LS_9H**
Light source (wave length)	Infrared LED (870 nm)	Red LED (660 nm)	Infrared LED (860 nm)	Red LED (650 nm)	Red LED (660 nm)
Power supply voltage	10 to 30 VDC ±10% ripple (p-p): 10% max.				
Protective circuits	Output short-circuit and power supply reverse polarity protection				
Ambient temperature	Operating: -25 to 55°C/Storage: -40 to +70°C (with no icing or condensation)				
Degree of protection	IEC 60529 IP67, IP69K after DIN 40050 part 9				
Material	Plastic (case: ABS; lens: PMMA)				

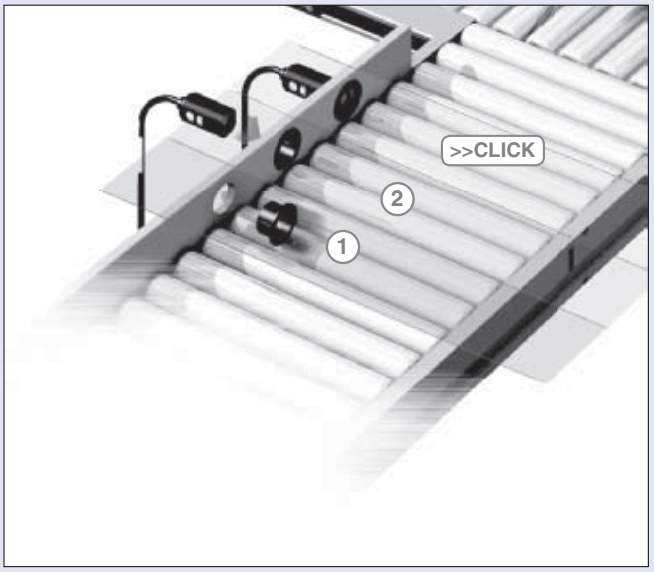
Easy and fast installation

Installation time can be reduced by up to 10 times compared to conventional sensors.



*SecureClick has been tested to withstand severe vibrations.

The **SecureClick** snap mounting mechanism provides easy installation in 2 steps and enhanced protection against vibration.

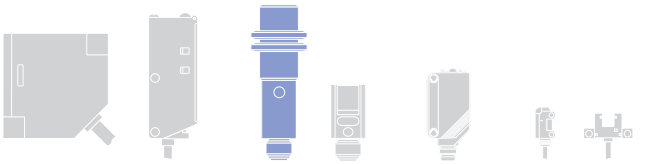




Photoelectric sensor in plastic or brass M18 housing

The E3F2 sensors in cylindrical M18 plastic or brass housings are ideally suited for a wide range of standard applications providing high reliability and long sensor lifetime with excellent price-performance ratio.

- Plastic or metal (brass) housings
- IP67, IP69K for highest water resistance
- Special beam models available (see complete datasheet)



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Housing material	Connection method				Order code	
							NPN output	PNP output
Through-beam	7 m	Plastic	–	–	2 m	–	E3F2-7C4 2M	E3F2-7B4 2M
		Brass					E3F2-7C4-M 2M	E3F2-7B4-M 2M
		Plastic	–	■	–	–	E3F2-7C4-P1	E3F2-7B4-P1
		Brass					E3F2-7C4-M1-M	E3F2-7B4-M1-M
Retro-reflective with M.S.R.	0.1 to 4 m*1 (adjustable)	Plastic	–	–	2 m	–	E3F2-R4C4-E 2M	E4F2-R4B4-E 2M
		Brass					E3F2-R4C4-M-E 2M	E3F2-R4B4-M-E 2M
		Plastic	–	■	–	–	E3F2-R4C4-P1-E	E3F2-R4B4-P1-E
		Brass					E3F2-R4C4-M1-M-E	E3F2-R4B4-M1-M-E
Diffuse-reflective	0.3 m (adjustable)	Plastic	–	–	2 m	–	E3F2-DS30C4 2M	E3F2-DS30B4 2M
		Brass					E3F2-DS30C4-M 2M	E3F2-DS30B4-M 2M
		Plastic	–	■	–	–	E3F2-DS30C4-P1	E3F2-DS30B4-P1
		Brass					E3F2-DS30C4-M1-M	E3F2-DS30B4-M1-M
	1 m (adjustable)	Plastic	–	–	2 m	–	E3F2-D1C4 2M	E3FR-D1B4 2M
		Brass					E3F2-D1C4-M 2M	E3F2-D1B4-M 2M
		Plastic	–	■	–	–	E3F2-D1C4-P1	E3F2-D1B4-P1
		Brass					E3F2-D1C4-M1-M	E3F2-D1B4-M1-M
Diffuse-reflective (background suppression)	100 mm (fixed)	Plastic	–	–	2 m	–	E3F2-LS10C4 2M	E3F2-LS10B4 2M
		Brass					E3F2-LS10C4-M 2M	E3F2-LS10B4-M 2M
		Plastic	–	■	–	–	E3F2-LS10C4-P1	E3F2-LS10B4-P1
		Brass					E3F2-LS10C4-M1-M	E3F2-LS10B4-M1-M

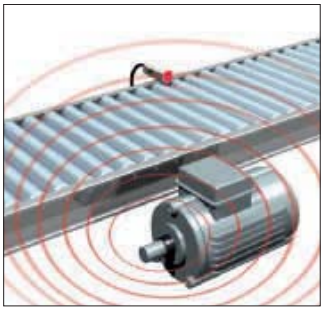
*1 Measured using E39-R1S

Specifications

Item		Through-beam	Retro-reflective with M.S.R.	Diffuse-reflective		Diffuse-reflective (background suppression)
		E3F2-7_	E3F2-R4_	E3F2-D1_	E3F2-DS30_	E3F2-LS10_4-_
Light source (wave length)		Infrared LED (950 nm)	Red LED (660 nm)	Infrared LED (880 nm)		Red LED (660 nm)
Power supply voltage		10 to 30 VDC				
Protective circuits		Output short-circuit protection and power supply reverse polarity protection				
Ambient temperature		Operating: -25 to 55°C/Storage: -30 to 70°C (with no icing or condensation)				
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9				
Material	Case	Plastic ABS Nickel plated brass				
	Lens	PMMA				



High ambient light immunity



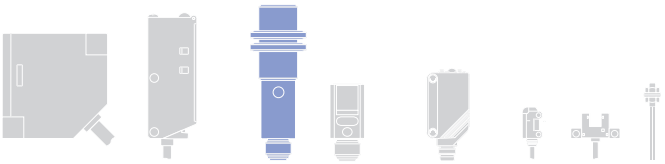
High electromagnetic noise immunity



Photoelectric sensor in stainless steel M18 housing

For areas that undergo frequent cleaning the stainless steel housing of the E3F2-_-S provides enhanced detergent resistance and longer sensor lifetime.

- IP67, IP69K for highest water resistance
- Enhanced detergent resistance certified by ECOLAB



Ordering information

Sensor type	Sensing distance	Housing material	Connection method				Order code	
							NPN output	PNP output
Through-beam	7 m	Stainless steel	–	–	2 m	–	E3F2-7C4-S 2M	E3F2-7B4-S 2M
			–	■	–	–	E3F2-7C4-M1-S	E3F2-7B4-M1-S
Retro-reflective with M.S.R.	0.1 to 4 m*1 (adjustable)	Stainless steel	–	–	2 m	–	E3F2-R4C4-S-E 2M	E3F2-R4B4-S-E 2M
			–	■	–	–	E3F2-R4C4-M1-S-E	E3F2-R4B4-M1-S-E
Diffuse-reflective	0.3 m (adjustable)	Stainless steel	–	–	2 m	–	E3F2-DS30C4-S 2M	E3F2-DS30B4-S 2M
			–	■	–	–	E3F2-DS30C4-M1-S	E3F2-DS30B4-M1-S
	1 m (adjustable)	Stainless steel	–	–	2 m	–	E3F2-D1C4-S 2M	E3F2-D1B4-S 2M
			–	■	–	–	E3F2-D1C4-M1-S	E3F2-D1B4-M1-S
Diffuse-reflective (background suppression)	100 mm (fixed)	Stainless steel	–	–	2 m	–	E3F2-LS10C4-S 2M	E3F2-LS10B4-S 2M
			–	■	–	–	E3F2-LS10C4-M1-S	E3F2-LS10B4-M1-S

*1 Measured using E39-R1S

Specifications

Item		Through-beam	Retro-reflective with M.S.R.	Diffuse-reflective		Diffuse-reflective (background suppression)
		E3F2-7_	E3F2-R4_	E3F2-D1_	E3F2-DS30_	E3F2-LS10_4-_
Light source (wave length)		Infrared LED (950 nm)	Red LED (660 nm)	Infrared LED (880 nm)		Red LED (660 nm)
Power supply voltage		10 to 30 VDC				
Protective circuits		Output short-circuit protection and power supply reverse polarity protection				
Ambient temperature		Operating: -25 to 55°C/Storage: -30 to 70°C (with no icing or condensation)				
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9				
Material	Case	Stainless steel				
	Lens	PMMA				



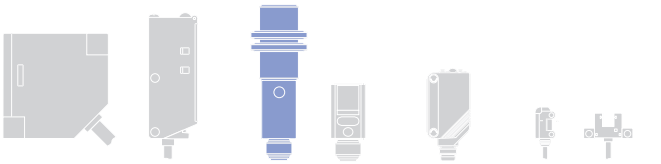
High water and detergent resistance



Photoelectric sensor in plastic or brass radial M18 housing

Radial (angled) optics for easy mounting, installation and adjustment

- Diffuse-reflective and retro-reflective models
- IP67 and IP69K



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Housing material	Connection method				Order code	
							NPN output	PNP output
Retro-reflective with M.S.R.	0.1 to 2 m*1	Plastic	–	–	2 m	–	E3F2-R2RC41-E 2M	E3F2-R2RB41-E 2M
		Brass					E3F2-R2RC41-M-E 2M	E3F2-R2RB41-M-E 2M
		Plastic	–	■	–	–	E3F2-R2RC41-P1-E	E3F2-R2RB41-P1-E
		Brass					E3F2-R2RC41-M1-M-E	E3F2-R2RB41-M1-M-E
Diffuse-reflective	300 mm (adjustable)	Plastic	–	–	2 m	–	E3F2-DS30C41 2M	E3F2-DS30B41 2M
		Brass					E3F2-DS30C41-M 2M	E3F2-DS30B41-M 2M
		Plastic	–	■	–	–	E3F2-DS30C41-P1	E3F2-DS30B41-P1
		Brass					E3F2-DS30C41-M1-M	E3F2-DS30B41-M1-M

*1 Measured with E39-R1S.

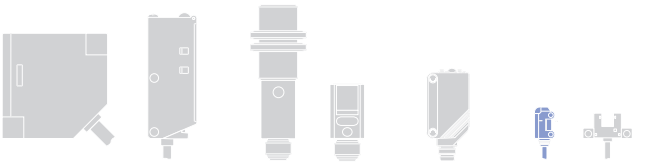
Specifications

Item		Retro-reflective with M.S.R.	Diffuse-reflective
		E3F2-R2R_41-_	E3F2-DS30_41-_
Light source (wave length)		Red LED (660 nm)	Infrared LED (880 nm)
Power supply voltage		10 to 30 VDC	
Protective circuits		Output short-circuit protection and power supply reverse polarity protection	
Response time		Operation or reset: 2.5 ms max.	
Ambient temperature		Operating: -25 to 55°C/Storage: -30 to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	Nickel plated brass	
		Plastic (ABS)	
	Lens	PMMA	



Miniature photoelectric sensors in cylindrical M8 and M12 housing

- M8 or M12 sized cylindrical housings when mounting space is crucial
- Retro-reflective models with two teaching modes for standard and semi-transparent objects
- pre-wired and connector models



Ordering information

M12 cylindrical housing

Sensor type	Sensing distance	Operation mode	Connection method				Order code	
							NPN output	PNP output
Through-beam	4 m (adjustable)	light on / dark on selectable	–	–	2 m	–	E3H2-T4C4M 2M	E3H2-T4B4M 2M
			–	■	–	–	E3H2-T4C4M-M1	E3H2-T4B4M-M1
Retro-reflective with M.S.R.	2 m (teachable*1)		–	–	2 m	–	E3H2-R2C4M 2M*2	E3H2-R2B4M 2M*2
			–	■	–	–	E3H2-R2C4M-M1*2	E3H2-R2B4M-M1*2
Diffuse-reflective	300 mm (teachable)		–	–	2 m	–	E3H2-DS30C4M 2M	E3H2-DS30B4M 2M
			–	■	–	–	E3H2-DS30C4M-M1	E3H2-DS30B4M-M1
	100 mm (fixed)		–	–	2 m	–	E3H2-DS10C4M 2M	E3H2-DS10B4M 2M
			–	■	–	–	E3H2-DS10C4M-M1	E3H2-DS10B4M-M1

*1 Models without teach-button are available. Contact your OMRON representative.
*2 Without reflector; order reflector separately

M8 cylindrical housing

Sensor type	Sensing distance	Operation mode	Connection method				Order code	
							NPN output	PNP output
Through-beam	2 m	dark on	–	–	2 m	–	E3H2-T2C2S 2M	E3H2-T2B2S 2M
			■	–	–	–	E3H2-T2C2S-M5	E3H2-T2B2S-M5
		light on	–	–	2 m	–	E3H2-T2C1S 2M	E3H2-T2B1S 2M
			■	–	–	–	E3H2-T2C1S-M5	E3H2-T2B1S-M5

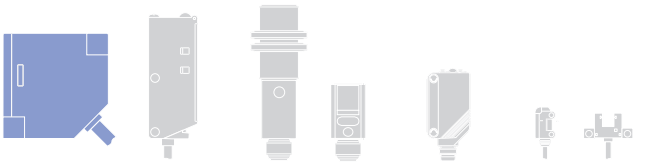
Specifications

Item	Through-beam		Retro-reflective with M.S.R.	Diffuse-reflective	
	E3H2-T4	E3H2-T2	E3H2-R	E3H2-DS30	E3H2-DS10
Sensing distance	4 m (adjustable)	2 m	2 m (teachable) (when using E39-R1S)	300 mm (teachable)	100 mm (fixed)
Light source (wave length)	Infrared LED (880 nm)		Red LED (660 nm)	Infrared LED (880 nm)	
Power supply voltage	10 to 30 VDC, 10% ripple				
Control output	Load current: 100 mA max. (residual voltage 2 V max.); E3H2-_C_: NPN E3H2-_B_: PNP				
	Light-on/dark-on selectable by wire	E3H2-T2_2_: dark on E3H2-T2_1_: light on	Light-on/dark-on selectable by wire		
Protective circuits	Power supply reverse polarity protection, output short circuit protection				
Response time	Operation or reset: 2.5 ms max	Operation or reset: 1 ms max.	Operation or reset: 1.1 ms max		
Sensitivity adjustment	Potentiometer adjuster	–	Teach-in		–
Ambient temperature	Operating: -25 to +55°C	Operating: -25 to +50°C	Operating: -25 to +55°C		
Degree of protection	EN 60529: IP67				
Material case lens	nickel-plated brass plastic	stainless steel plastic	nickel-plated brass plastic		



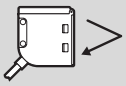
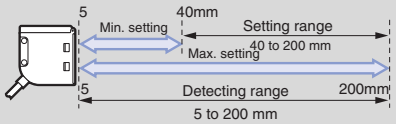
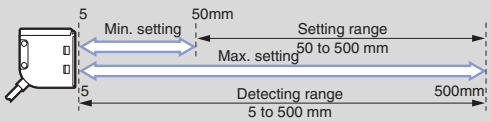
Distance-settable photoelectric sensor in metal housing

- Minimal black/white error for highest reliability detecting differently coloured objects (E3S-CL1)
- Setting distance up to 500 mm with reliable background suppression



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensortype	Sensing distance	Connection method				Order code
Distance-settable (background suppression) 		–	–	■	–	E3S-CL1 2M
		–	–	–	■ M12	E3S-CL1-M1J
		–	–	■	–	E3S-CL2 2M
		–	–	–	■ M12	E3S-CL2-M1J

Specifications

Item		Distance-settable (background suppression)	
		E3S-CL1	E3S-CL2
Sensing distance		5 to 200 mm	5 to 500 mm
Light source (wave length)		Red LED (700 nm)	Infrared LED (860 nm)
Black/white error*1		2% max.	10% max.
Power supply voltage		10 to 30 VDC [ripple (p-p) 10% included]	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation or reset: 1 ms max.	Operation or reset: 2 ms max.
Ambient temperature		Operating/Storage: -25 to 55°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67	
Materials	Case	Zinc diecast	
	Operation panel cover	Polyethyl sulfon	
	Lens	Acrylics	

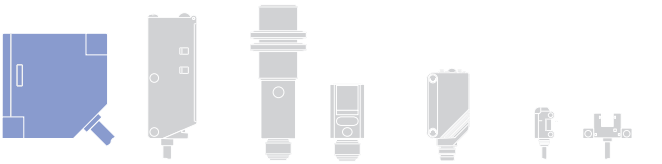
*1 Sensing distance difference between standard white paper (reflectivity 90%) and standard black paper (reflectivity 5%)



Long distance photoelectric sensor in plastic housing

Long distance retro-reflective and teachable distance-settable sensors in plastic housing.

- Distance-settable model with 1.2 m maximum setting distance
- M12 rotary connector or pre-wired models



Ordering information

Sensor type	Sensing distance	Connection method				Order code
						NPN/PNP selector
Retro-reflective with M.S.R. 	0.5 to 10 m*1	–	–	2 m	–	E3G-R13-G 2M
		–	■	–	–	E3G-R17-G
Distance-settable (background suppression) 	0.2 to 2 m (0.2 to 1.2 m distance settable)	–	–	2 m	–	E3G-L73 2M
		–	■	–	–	E3G-L77

*1 Measured with E39-R2

Specifications

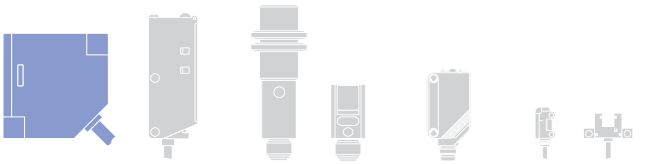
Item		Retro-reflective with M.S.R.		Distance-settable (background suppression)	
		E3G-R13-G	E3G-R17-G	E3G-L73	E3G-L77
Sensing distance		0.5 to 10 m (with E39-R2)		0.2 to 2 m (setting distance 0.2 to 1.2 m)	
Light source (wave length)		Red LED (700 nm)		Infrared LED (860 nm)	
Power supply voltage		10 to 30 VDC (Ripple (p-p) 10% included)		10 to 30 VDC (Ripple (p-p) 10% included)	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Ambient temperature		Operating: -25 to 55°C, Storage: -30 to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67 (with Protective Cover attached)			
Materials	Case	PBT (polybutylene terephthalate)			
	Lens	Acrylics (PMMA)			



All voltage photoelectric sensor in plastic housing

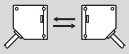
The square sized E3JK family provides 12 to 240 VDC and 24 to 240 VAC power supply voltage.

- 12 to 240 VDC and 24 to 240 VAC supply voltage
- Relay outputs with long life expectancy and high switching capacity (3 A, 250 VAC)
- cUL recognized



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Operation mode	Order code
							
Through-beam 	5 m	–	–	2 m	–	Light ON	E3JK-5M1 2M
						Dark ON	E3JK-5M2 2M
Retro-reflective with M.S.R. 	2 m					Light ON	E3JK-R2M1 2M
						Dark ON	E3JK-R2M2 2M
Retro-reflective without M.S.R. 	4 m (adjustable)					Light ON	E3JK-R4M1 2M
						Dark ON	E3JK-R4M2 2M
Diffuse-reflective 	300 mm (adjustable)					Light ON	E3JK-DS30M1 2M
						Dark ON	E3JK-DS30M2 2M

Specifications

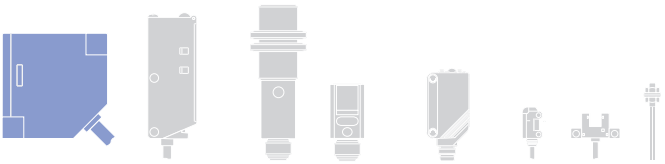
Item		Through-beam	Retro-reflective with M.S.R.	Retro-reflective without M.S.R.	Diffuse-reflective
		E3JK-5M_	E3JK-R2M_	E3JK-R4M_	E3JK-DS30M_
Sensing distance		5 m	2 m (with E39-R1)	4 m (with E39-R1)	300 mm
Light source (wave length)		Infrared LED (870 nm)	Red LED (660 nm)		Infrared LED (870 nm)
Power supply voltage		12 to 240 VDC ±10% ripple (p-p) : 10% max. 24 to 240 VAC ±10% 50/60 Hz			
Control output		Relay output 3A max. at 250VAC/10m A at 5VDC min.			–
Response time		≤ 30 ms			
Ambient temperature		Operating: -25 to 55°C, Storage: -30 to 70°C (with no icing or condensation)			
Degree of protection		IEC60529 IP64			
Material	Case	ABS			
	Lens	Acrylics (PMMA)			



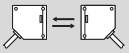
All voltage photoelectric sensor in plastic housing with timer function

The square sized E3JM family provides 12 to 240 VDC and 24 to 240 VAC power supply voltage, an enhanced sensing distance and a timer function.

- 12 to 240 VDC and 24 to 240 VAC supply voltage
- Relay or solid state relay output
- Timer function



Ordering information

Sensor type	Sensing distance	Connection method	Timer function	Order code		
				Relay output	DC SSR output	
					minus common	plus common
Through-beam 	10 m	Terminal block (with PG 13.5)	–	E3JM-10M4-G-N	E3JM-10S4-G-N	E3JM-10R4-G-N
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-10M4T-G-N	E3JM-10S4T-G-N	E3JM-10R4T-G-N
Retro-reflective with M.S.R. 	4 m		–	E3JM-R4M4-G	E3JM-R4S4-G	E3JM-R4R4-G
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-R4M4T-G	E3JM-R4S4T-G	E3JM-R4R4T-G
Diffuse-reflective 	700 mm (adjustable)		–	E3JM-DS70M4-G	E3JM-DS70S4-G	E3JM-DS70R4-G
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-DS70M4T-G	E3JM-DS70S4T-G	E3JM-DS70R4T-G

Specifications

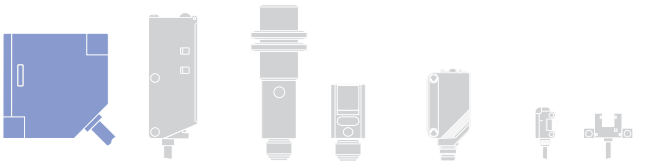
Item		Through-beam		Retro-reflective with M.S.R.		Diffuse-reflective	
		E3JM-10	E3JM-10_T	E3JM-R	E3JM-R_T	E3JM-D	E3JM-D_T
Sensing distance		10 m		4 m (with E39-R1)		700 mm	
Light source (wave length)		Infrared LED (950 nm)		Red LED (660 nm)		Infrared LED (950 nm)	
Power supply voltage		12 to 240 VDC ±10% ripple (p-p) : 10% max. 24 to 240 VAC ±10% 50/60 Hz					
Control output	Relay output	250 VAC, 3 A max.; 5 VDC, 10 mA min.					
	DC SSR output	48 VDC, 100 mA max.; residual voltage 2V					
Response time	Relay output	≤ 30 ms					
	DC SSR output	≤ 5 ms					
Timer function	ON/OFF delay	–	0.1 s to 5 s	–	0.1 s to 5 s	–	0.1 s to 5 s
Ambient temperature		Operating: -25 to 55°C, Storage: -30 to 70°C (with no icing or condensation)					
Degree of protection		IEC60529 IP66					
Material	Case	ABS					
	Lens	Methacrylate resin					



Long distance multi-voltage photoelectric sensor in plastic housing

The E3G-M series offers the long sensing distance of the E3G family for all voltage (AC and DC) installations.

- 12 to 240 VDC and 24 to 240 VAC power supply
- Terminal block connection



Special models M18 cylindrical Compact Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method	Timer function	Order code
				Relay output
Retro-reflective with M.S.R. 	0.5 to 10 m*1 (Red light)	Terminal block	–	E3G-MR19-G
			ON or OFF delay 0 to 5 s (adjustable)	E3G-MR19T-G
Distance-settable (background suppression) 	0.2 to 2 m (0.2 to 1.2 m distance settable)		–	E3G-ML79-G
			ON or OFF delay 0 to 5 s (adjustable)	E3G-ML79T-G

*1 Measured with E39-R2

Specifications

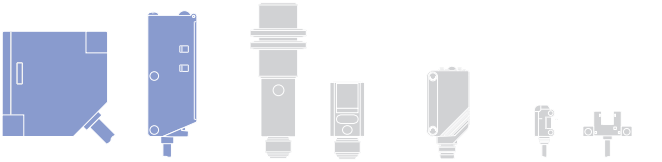
Item		Retro-reflective with M.S.R.		Distance-settable (background suppression)	
		E3G-MR19-G	E3G-MR19T-G	E3G-ML79-G	E3G-ML79T-G
Sensing distance		0.5 to 10 m (with E39-R2)		0.2 to 2 m (0.2 to 1.2m distance settable)	
Light source (wave length)		Red LED (700 nm)		Infrared LED (860 nm)	
Power supply voltage		12 to 240 VDC ±10% ripple (p-p): 10% max. 24 to 240 VAC ±10% 50/60 Hz		12 to 240 VDC ±10% ripple (p-p): 10% max. 24 to 240 VAC ±10% 50/60 Hz	
Response time		Operation/reset: 30 ms		Operation/reset: 30 ms	
Timer function		–	ON delay/OFF delay 0 to 5 s (Adjuster variable system)	–	ON delay/OFF delay 0 to 5 s (Adjuster variable system)
Ambient temperature		Operating: -25 to 55°C, Storage: -30 to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67 (with protective cover attached)			
Material	Case	PBT (polybutylene terephthalate)			
	Lens	Acrylics (PMMA)			



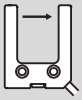
Photoelectric sensor in plastic fork shape housing

The forked shape optical through-beam sensors combine simple installation with reliable passage detection of object, machine parts or transportation elements like garment handling racks.

- Fork shape for simple installation
- 1 or 2 axis models



Ordering information

Sensor type	Sensing distance	Number of optical axes	Connection method				Order code	
							NPN output	PNP output
Through-beam 	25 mm (Infrared light)	1	–	–	2 m	–	E3Z-G61 2M	E3Z-G81 2M
			–	–	–	■ M8 4-pin	E3Z-G61-M3J	E3Z-G81-M3J
		2	–	–	2 m	–	E3Z-G62 2M	E3Z-G822M
			–	–	–	■ M8 4-pin	E3Z-G62-M3J	E3Z-G82-M3J

Specifications

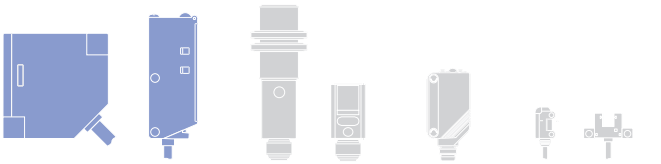
Item		Through-beam			
	NPN output	E3Z-G61	E3Z-G61-M3J	E3Z-G62	E3Z-G62-M3J
	PNP output	E3Z-G81	E3Z-G81-M3J	E3Z-G82	E3Z-G2-M3J
Number of optical axes		1		2	
Sensing distance		25 mm (distance between arms of fork)			
Power supply voltage		12 to 24 VDC ±10% max. ripple (p-p): 10%			
Protective circuits		Output short-circuit protection, and mutual interference. prevention, power supply, reverse polarity protection			
Response time		Operation or reset: 1 ms max.			
Ambient temperature		Operating: -25 to +55°C, Storage: -40 to +70°C (with no icing or condensation)			
Degree of protection		IEC60529 IP64			
Material		ABS			



Photoelectric sensor for structured object detection in plastic housing

The special wide beam and limited-reflective optics of the E3S-LS3 ensures reliable detection of structured objects (with holes or different heights) and can be used for example to detect printed circuit boards (PCBs).

- Wide beam and limited-reflective for reliable detection of structured, shiny and irregularly shaped objects



Ordering information

Sensor type	Output configurations	Sensing distance	Connection method				Timer function	Order code
								Light ON
Limited-reflective 	NPN	20 to 35 mm (Red light)	–	–	2 m	–	No	E3S-LS3N 2M
		10 to 60 mm (Red light)						E3S-LS3NW 2M
	PNP	20 to 35 mm	–	–	2 m	–	No	E3S-LS3P 2M
							Yes	E3S-LS3PT 2M
			–	–	–	■ M8 3-pin	No	E3S-LS3P-M5J
							Yes	E3S-LS3PT-M5J
			–	–	–	■ M8 4-pin	No	E3S-LS3P-M3J
							Yes	E3S-LS3PT-M3J
		10 to 60 mm	–	–	2 m	–	No	E3S-LS3PW 2M
							Yes	E3S-LS3PWT 2M
			–	–	–	■ M8 3-pin	No	E3S-LS3PW-M5J
							Yes	E3S-LS3PWT-M5J
			–	–	–	■ M8 4-pin	No	E3S-LS3PW-M3J
							Yes	E3S-LS3PWT-M3J

Specifications

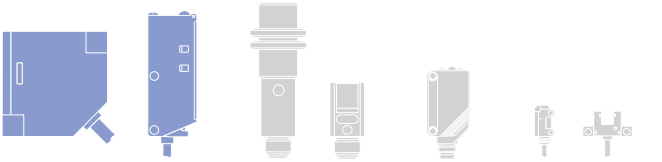
Item		Limited-reflective	
		E3S-LS3_	E3S-LS3_W
Sensing distance		20 to 35 mm	10 to 60 mm
Light source (wave length)		Red LED (660 nm)	
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.	
Response time		Operation or reset: 1 ms max.	
Timer function		Available with E3S-LS3P(W)T models only. Time range: 0.1 to 1.0 s (adjustable)	
Ambient temperature		Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 70°C (with no icing or condensation)	
Degree of protection		IEC60529 IP40	
Material	Case	ABS	
	Lens	Acrylic	



High precision Laser sensor with separate amplifier

The separate amplifier high precision photoelectric sensors feature a large variety of different LASER sensing heads for highest precision positioning and detection applications.

- Easy installation due to adjustable focus point and optical axis
- Wide range sensor head portfolio with different laser beam shapes
- Controller functions with easy wiring concept and power tuning function



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor heads

Sensor type	Beam type	Remarks	Order code
Diffuse-reflective 	Spot	Mounting a beam unit (sold separately) allows the use of line and area beams.	E3C-LD11 2M
	Line	This model number is for the set consisting of the E39-P11 mounted to the E3C-LD11.	E3C-LD21 2M
	Area	This model number is for the set consisting of the E39-P21 mounted to the E3C-LD11.	E3C-LD31 2M
Retro-reflective with M.S.R. (coaxial) 	Spot (variable)	Mounting a beam unit (sold separately) allows the use of line and area beams.	E3C-LR11 2M
	Spot (2.0 mm fixed dia.)	–	E3C-LR12 2M

Amplifier units

Item	Functions	Order code			
		pre-wired		with connector*1	
		NPN output	PNP output	NPN output	PNP output
Twin-output models	Area output, self-diagnosis, differential operation	E3C-LDA11	E3C-LDA41	E3C-LDA6	E3C-LDA8
External-input models	Remote setting, counter, differential operation	E3C-LDA21	E3C-LDA51	E3C-LDA7	E3C-LDA9
ATC models	Active threshold control	E3C-LDA11AT	E3C-LDA41AT	E3C-LDA6AT	E3C-LDA8AT

*1 order connector (E3X-CN21_) separately from accessories

Specifications

Sensor heads

Item	Diffuse-reflective			Retro-reflective with M.S.R. (coaxial)			
	E3C-LD11	E3C-LD21	E3C-LD31	E3C-LR11	E3C-LR11 + E39-P31	E3C-LR11 + E39-P41	E3C-LR12
Light source (emission wave length)	Red semiconductor laser diode (650 nm), 2.5 mW max. (JIS standard: Class 2, FDA standard: Class II)						1 mW max. (JIS standard Class 1)
Sensing distance	High-resolution mode: 30 to 1,000 mm Standard mode: 30 to 700 mm Super-high-speed mode: 30 to 250 mm			7 m 5 m 2 m	1,700 mm, 1,300 mm 700 mm	900 mm 700 mm 400 mm	7 m 5 m 2 m
Beam size (typical)	0.8 mm max. (at distances up to 300 mm)	33 mm (at 150 mm)	33x15 mm (at 150 mm)	0.8 mm max. (at distances up to 1,000 mm)	28 mm (at 150 mm)	28x16 mm (at 150 mm)	2.0 mm dia. (at distances up to 1,000 mm)
Functions	Variable focal point mechanism (beam size adjustment) , optical axis adjustment mechanism (axis adjustment)						
Degree of protection	IEC60529 IP40						

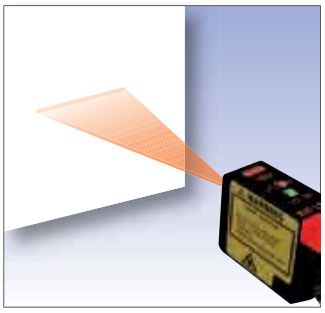
Amplifier units

Item		External-input models		Twin-output models		ATC-output models	
	NPN output	E3C-LDA21	E3C-LDA7	E3C-LDA11	E3C-LDA6	E3C-LDA11AT	E3C-LDA6AT
	PNP output	E3C-LDA51	E3C-LDA9	E3C-LDA41	E3C-LDA8	E3C-LDA41AT	E3C-LDA8AT
Supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.					
Response time	Super-high-speed mode	80 µs for operation and reset		100 µs for operation and reset			
	High-speed mode	250 µs for operation and reset					
	Standard mode	1 ms for operation and reset					
	High-resolution mode	4 ms for operation and reset					
Functions	Differential detection	Switchable between single edge and double edge detection mode. Single edge: Can be set to 250 µs, 500 µs, 1 ms, 10 ms, or 100 ms. Double edge: Can be set to 500 µs, 1 ms, 2 ms, 20 ms, or 200 ms.					
	Timer function	Select from OFF-delay, ON-delay, or one-shot timer. 1 ms to 5 s (1 to 20 ms set in 1-ms increments, 20 to 200 ms set in 10 ms increments, 200 ms to 1 s set in 100-ms increments, and 1 to 5 s set in 1 s increments)					
	Counter	Switchable between up counter and down counter. Set count: 0 to 9,999,999					
	I/O settings	External input setting (Select from teaching, power tuning, zero reset, light OFF,or counter reset.)		Output setting (Select from channel 2 output, area output, or self-diagnosis.)		Output setting (Select from channel 2 output, area output, self-diagnosis, or ATC error output.)	
Digital display		Select from digital incident level + threshold or six other patterns.					
Display orientation		Switching between normal/reversed display is possible.					
Degree of protection		IP50 (IEC 60529)					

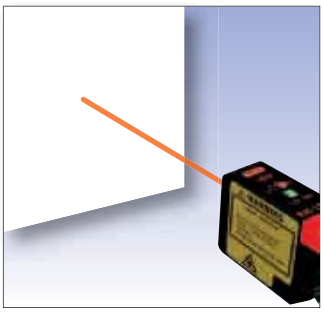
Amplifier Connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

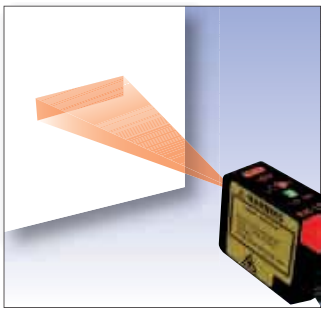
Full control over the beam shape



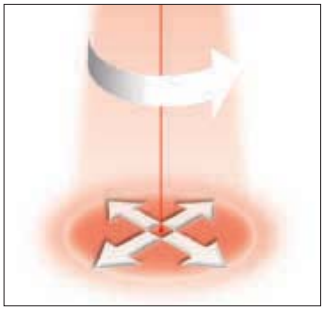
Line beam



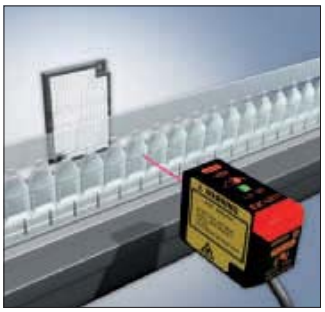
Spot beam



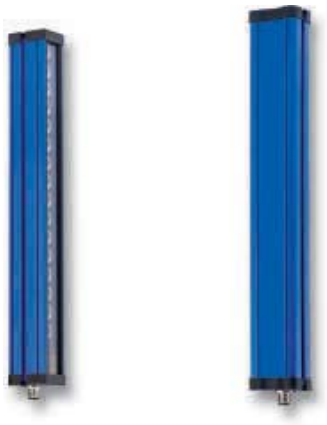
Area beam



Axis and focal point adjustment



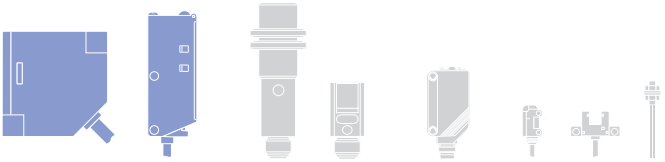
High precision positioning and detection over long range
Diffuse reflective: 1 m
Retro-reflective: 7 m



Light curtain in robust aluminium housing

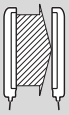
The F3ET light curtains provide a reliable area monitoring in a robust housing. The M12 5-pin connectors and optical synchronisation between emitter and receiver allow a fast and simple installation without special requirements.

- Optical synchronisation for reliable operation without additional wiring
- Robust aluminium housing
- NPN/PNP and light on/dark on selectable



Special models M18 cylindrical Compact Miniature & Photomicro

Ordering information

Sensor type	Detection area (Max_M)	Pitch	Sensing distance	Channels	Connection method				Output	Order code
Through-beam 	150	5 mm	3 m	30	–	5 pin	–	–	NPN/PNP	F3ET-005-150
		18 mm	15 m	8	–		–	–		F3ET-018-150
	300	5 mm	3 m	60	–		–	–		F3ET-005-300
		18 mm	15 m	16	–		–	–		F3ET-018-300
	600	5 mm	3 m	120	–		–	–		F3ET-005-600
		18 mm	15 m	32	–		–	–		F3ET-018-600
	900	5 mm	3 m	180	–		–	–		F3ET-005-900
		18 mm	15 m	48	–		–	–		F3ET-018-900
	2100	18 mm	15 m	112	–		–	–		F3ET-018-2100

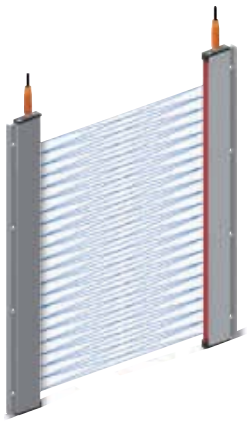
Lightcurtain accessories

Shape	Type	Comment	Order Code
	Laser alignment kit	snap-on Laser beam generator and level	F39-TGR-LLK2-SB
	Protective tube	for F3ET-_ -150	F3ET-IP150
		for F3ET-_ -300	F3ET-IP300
		for F3ET-_ -600	F3ET-IP600
		for F3ET-_ -900	F3ET-IP900

Specifications

Item		Through-beam	
		F3ET-005_	F3ET-018_
Sensing distance		0 to 3 m	0 to 15 m
Vertical detection area		0 to Max_M mm; Max_M: 150, 300, 600, 900, (2000)*1	0 to Max_M mm; Max_M: 150, 300, 600, 900, 2100*2
Minimum detectable object size		10 mm	30 mm
Pitch		5 mm	18 mm
Response time		t=5 ms + 0,18 x Channels ms	
Light source (wave length)		Infrared LED (950 nm)	
Power supply voltage		24 VDC ±10%	
Ambient temperature		0 to 50°C	
Degree of protection		IEC 60529 IP65	
Dimensions		35 x 45 x (55 + 1.06 x Max_M) mm	35 x 45 x (55 + 0.98 x Max_M) mm
Material	Case	Aluminium	

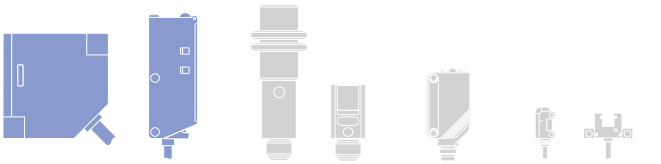
*1 Models with different detection ranges between 150 mm and 2000 mm are available in 50 mm intervals.
*2 Models with different detection ranges between 150 mm and 2100 mm are available in 150 mm intervals.



Light curtain in thin aluminium housing

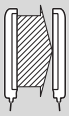
The crossing of the multiple sensor beams provides a reliable area monitoring in a thin, easy to install housing. The thin housing makes the light curtain ideal for the installation where space is crucial.

- Thin 9 mm shape for easy design-in in elevator constructions
- High ambient light immunity
- Robust aluminium housing
- Fulfils requirements of EN81-70 (1800 mm models) for mounting in elevators



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Detection area	Pitch	Sensing distance	Channels	Number of optical axis	Connection method				Output	Order code
Through-beam 	200 mm	40 mm	5 m	6	16	–	–	5 m	–	potential free output	F3E-06-T1 5M
						■	–	–	–		F3E-06-T6
	1320 mm	120 mm		12	34	–	–	5 m	–		F3E-12-T1 5M
						■	–	–	–		F3E-12-T6
	1800 mm	120 mm		16	46	–	–	5 m	–		F3E-16-T1 5M
						■	–	–	–		F3E-16-T6
		40 mm		46	136	–	–	5 m	–		F3E-46-T1 5M
						■	–	–	–		F3E-46-T6

Specifications

Item		Through-beam			
		F3E-06-T_	F3E-12-T_	F3E-16-T_	F3E-46-T_
Sensing distance		0 to 5 m			
Number of LEDs		6	12	16	46
Number of optical axes		16	34	46	136
Pitch		40 mm	120 mm	120 mm	40 mm
Vertical detection range		20 to 200 mm	20 to 1320 mm	20 to 1820 mm	
Response time		max. 110 ms (signal interruption)			
Light source (wave length)		Infrared LED (880 nm)			
Power supply voltage		10 to 30 VDC			
Ambient temperature		-20 to +60°C (operation), -40 to +70°C (storage)			
EMC conformity/standards		73/23/EWG; 89/336/EWG; 95/16/EG; EN81-1; EN81-2; EN12015; EN12016; EN61000-6-x			
Degree of protection		IEC 60529 IP54			
Dimensions		400x40.7x9 mm	1590x40.7x9 mm	2070x40.7x9 mm	2000x40.7x9 mm
Material	Case	Aluminium			

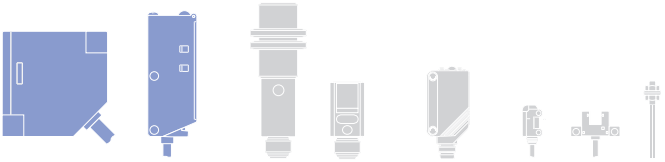




Measuring light curtain in robust aluminium housing

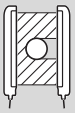
The F3EM provides easy to install and set up height and profile measurement. The analogue output provides a simple overall height detection and the serial output models provide single beam evaluation for profile measurements.

- Robust aluminium housing
- Analogue output for simple height detections
- Serial output with single beam evaluation for profile measurement



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Measurement range (Max_M)	Pitch*1	Sensing distance	Channels	Connection method				Order code	
									Analogue output	RS232 output*2
Through-beam (measuring) 	150	5 mm	3 m	30	–	5 pin	–	–	F3EM-005-150-AV	F3EM-005-150-D2
		18 mm	15 m	8	–		–	–	F3EM-018-150-AV	F3EM-018-150-D2
	300	5 mm	3 m	60	–		–	–	F3EM-005-300-AV	F3EM-005-300-D2
		18 mm	15 m	16	–		–	–	F3EM-018-300-AV	F3EM-018-300-D2
	600	5 mm	3 m	120	–		–	–	F3EM-005-600-AV	F3EM-005-600-D2
		18 mm	15 m	32	–		–	–	F3EM-018-600-AV	F3EM-018-600-D2
	900	5 mm	3 m	180	–		–	–	F3EM-005-900-AV	F3EM-005-900-D2
		18 mm	15 m	48	–		–	–	F3EM-018-900-AV	F3EM-018-900-D2
	2000	5 mm	3 m	400	–		–	–	–	F3EM-005-2000-D2
	2100	18 mm	15 m	112	–		–	–	F3EM-018-2100-AV	F3EM-018-2100-D2

*1 Models with 7.5 mm pitch are available. Contact your Omron representative.
*2 Models with RS485 serial output are available. Contact your Omron representative.

Lightcurtain accessories

Shape	Type	Comment	Order Code
	Laser alignment kit	snap-on Laser beam generator and level	F39-TGR-LLK2-SB
	Protective tube	for F3EM-_ -150	F3ET-IP150
		for F3EM-_ -300	F3ET-IP300
		for F3EM-_ -600	F3ET-IP600
		for F3EM-_ -900	F3ET-IP900

Specifications

Item		Through-beam	
		F3EM-005_	F3EM-018_
Sensing distance		0 to 3 m	0 to 15 m
Vertical measurement range		0 to Max_M mm; Max_M: 150, 300, 600, 900, (2000)*1	0 to Max_M mm; Max_M: 150, 300, 600, 900, 2100*2
Minimum detectable object size		10 mm	30 mm
Pitch		5 mm	18 mm
Response time		Analogue output: 5 ms + 0,18 x Channels; Serial output: 4.5 ms + 0.38 x Channels at 4800 bps	
Light source (wave length)		Infrared LED (950 nm)	
Power supply voltage		24 VDC ±10%	
Ambient temperature		0 to 50°C	
Degree of protection		IEC 60529 IP65	
Dimensions		35 x 45 x (55 + 1.06 x Max_M) mm	35 x 45 x (55 + 0.98 x Max_M) mm
Material	Case	Aluminium	

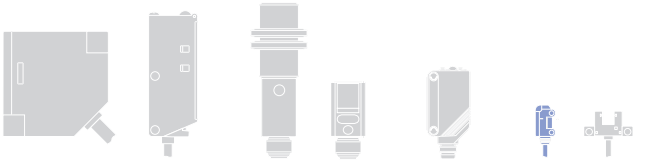
*1 Models with different measurement ranges between 150 mm and 2000 mm are available in 50 mm intervals. Please note that measurement ranges between 1000 mm and 2000 mm are only available for serial output models.
*2 Models with different measurement ranges between 150 mm and 2100 mm are available in 150 mm intervals.



Photoelectric sensor in miniature plastic housing

Small sized photoelectric sensors in flat and side view shape for demanding mounting conditions.

- Small size with precision pinpoint LED where space is crucial
- 3.5 mm flat model with reliable background suppression and small black/white error
- Unique optical alignment technology ensuring minimal deviation of optical axis
- High EMC and ambient light immunity



Ordering information

Sensor type	Sensing distance	Connection method				Operation mode	Order code*1	
							NPN output	PNP output
Through-beam	1 m	–	–	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	Light-ON	E3T-ST11 2M	E3T-ST13 2M
						Dark-ON	E3T-ST12 2M	E3T-ST14 2M
	300 mm					Light-ON	E3T-ST21 2M	E3T-ST23 2M
						Dark-ON	E3T-ST22 2M	E3T-ST24 2M
Through-beam	500 mm					Light-ON	E3T-FT11 2M	E3T-FT13 2M
						Dark-ON	E3T-FT12 2M	E3T-FT14 2M
	300 mm					Light-ON	E3T-FT21 2M	E3T-FT23 2M
						Dark-ON	E3T-FT22 2M	E3T-FT24 2M
Retro-reflective	30 to 200 mm*2 on reflectors/ 10 to 100 mm*2 on reflective foils					Light-ON	E3T-SR41-C 2M*3	E3T-SR43-C 2M*3
						Dark-ON	E3T-SR42-C 2M*3	E3T-SR44-C 2M*3
Diffuse-reflective	5 to 30 mm					Light-ON	E3T-FD11 2M	E3T-FD13 2M
						Dark-ON	E3T-FD12 2M	E3T-FD14 2M
Limited-reflective	5 to 15 mm					Light-ON	E3T-SL11 2M	E3T-SL13 2M
						Dark-ON	E3T-SL12 2M	E3T-SL14 2M
	5 to 30 mm					Light-ON	E3T-SL21 2M	E3T-SL23 2M
						Dark-ON	E3T-SL22 2M	E3T-SL24 2M
Diffuse-reflective (background suppression)	1 to 15 mm					Light-ON	E3T-FL11 2M	E3T-FL13 2M
						Dark-ON	E3T-FL12 2M	E3T-FL14 2M
	1 to 30 mm					Light-ON	E3T-FL21 2M	E3T-FL23 2M
						Dark-ON	E3T-FL22 2M	E3T-FL24 2M

*1 For pre-wired models with robotic cables add '-R' to the order code (example: E3T-FT21R 2M)
*2 The distances are measured with reflector E39-R4 and reflective foil E39-R37-CA. For applications with shorter distances between the sensor and the reflector contact your OMRON representative.
*3 Order reflector separately. Models with included reflectors are available.

Specifications

Item		Through-beam				Retro-reflective	
		Side-view		Flat		Side-view	
		NPN	PNP	NPN	PNP	NPN	PNP
		E3T-ST11 E3T-ST12 E3T-ST21 E3T-ST22	E3T-ST13 E3T-ST14 E3T-ST23 E3T-ST24	E3T-FT11 E3T-FT12 E3T-FT21 E3T-FT22	E3T-FT13 E3T-FT14 E3T-FT23 E3T-FT24	E3T-SR41 E3T-SR42	E3T-SR43 E3T-SR44
Sensing distance		E3T-ST1_: 1 m E3T-ST2_: 300 mm		E3T-FT1_: 500 mm E3T-FT2_: 300 mm		30 to 200 mm (with E39-R4) 10 to 100 mm (with E39-R37-CA)	
Light source (wave length)		Red LED (“Pin-point” LED) λ = 650 nm					
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.					
Protective circuits		Power supply and control output reverse polarity protection Output short-circuit protection				Power supply and control output reverse polarity protection Output short-circuit protection, mutual interference prevention, surge suppressor	
Ambient temperature range		Operating: -25 to 55°C (with no icing or condensation) Storage: -40 to 70°C (with no icing or condensation)					
Degree of protection		IP67 (IEC60529)					
Materials	Case	PBT (polybutylene terephthalate)					
	Display window	Denatured polyarylate					
	Lens	Denatured polyarylate				Methacrylic resin	

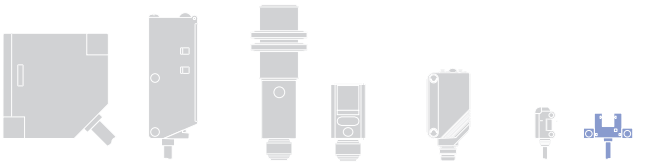
Item		Diffuse-reflective		Limited-reflective				Diffuse-reflective (background suppression)			
		Flat		Side-view				Flat			
		NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
		E3T-FD11 E3T-FD12	E3T-FD13 E3T-FD14	E3T-SL11 E3T-SL12	E3T-SL13 E3T-SL14	E3T-SL21 E3T-SL22	E3T-SL23 E3T-SL24	E3T-FL11 E3T-FL12	E3T-FL13 E3T-FL14	E3T-FL21 E3T-FL22	E3T-FL23 E3T-FL24
Sensing distance		5 to 30 mm		5 to 15 mm		5 to 30 mm		1 to 15 mm		1 to 30 mm	
Black/white error		–						15% max.			
Light source (wave length)		Red LED (“Pin-point” LED) λ = 650 nm									
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.									
Protective circuits		Power supply and control output reverse polarity protection Output short-circuit protection, Mutual interference prevention									
Ambient temperature		Operating: -25 to 55°C Storage: -40 to 70°C (with no icing or condensation)									
Degree of protection		IEC60529 IP67									
Materials	Case	PBT (polybutylene terephthalate)									
	Display window	Denatured polyarylate									
	Lens	Denatured polyarylate									



Photo microsensor in plastic fork shape housing

Standard photo microsensors with 50 to 100 mA direct switching capacity for best value-performance ratio to detect machine parts or small objects independent of material or magnetic fields.

- Response frequency up to 1 kHz
- Wide operating voltage range: 5 to 24 VDC



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Connector models

Sensor type	Sensing distance	Connection method	Operation Mode	Shape*1	Order code *2	
					NPN output	PNP output
Through-beam with slot	5 mm (slot width) (Infrared light)	Connector (4 pin)*3	Dark-ON/Light-ON (selectable)	Standard	EE-SX670	EE-SX670P
				L-shaped	EE-SX671	EE-SX671P
				T-shaped, 7 mm	EE-SX672	EE-SX672P
				Close-mounting	EE-SX673	EE-SX673P
					EE-SX674	EE-SX674P
				T-shaped, 10 mm	EE-SX675	EE-SX675P
				F-shaped	EE-SX676	EE-SX676P
				R-shaped	EE-SX677	EESX-677P

*1 For shape dimensions and variations refer to www.industrial.omron.eu
*2 For pre-wired models with 1 m cable add '-WR' to order reference (e.g. EE-SX670-WR) and for models with 30 cm cable and plug connector add '-C1J-R' to order reference (e.g. EE-SX670-C1J-R)
*3 Order connector separately from accessories

Specifications

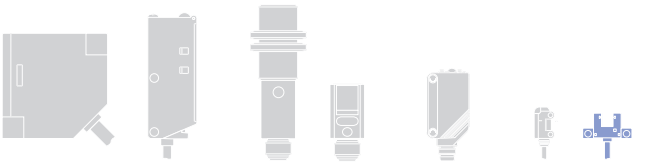
Item		Through-beam							
		Standard	L-shaped	T-shaped, slot center: 7 mm	Close-mounting		T-shaped, slot center: 10 mm	F-shaped	R-shaped
	NPN	EE-SX670	EE-SX671	EE-SX672	EE-SX673	EE-SX674	EE-SX675	EE-SX676	EE-SX677
	PNP	EE-SX670P	EE-SX671P	EE-SX672P	EE-SX673P	EE-SX674P	EE-SX675P	EE-SX676P	EE-SX677P
Sensing distance		5 mm (slot width)							
Power supply voltage		5 to 24 VDC ±10%, ripple (p-p): 10% max.							
Response frequency		1 kHz min. (3 kHz average)							
Ambient temperature		Operating: -25 to +55°C, Storage: -30 to +80°C							
Degree of protection		IEC60529 IP50							
Material	Case	PBT (polybutylene terephthalate)							
	Lens	Polycarbonate							



Photo microsensor in thin fork shape plastic housing

Thin shaped photo microsensor for space saving mounting.

- Compact, thin profile enables mounting where space is crucial
- Indicator is visible from both sides
- Operating voltage range: 5 to 24 VDC



Ordering information

Pre-wired models

Sensor type	Sensing distance	Connection method				Shape*1	Operation mode	Order code	
								NPN output	PNP output
Through-beam with slot	5 mm (slot width) (Infrared light)	–	–	2 m	–	Standard	Dark-ON	EE-SX770	EE-SX770P
							Light-ON	EE-SX870	EE-SX870P
						L-shaped	Dark-ON	EE-SX771	EE-SX771P
							Light-ON	EE-SX871	EE-SX871P
						T-shaped	Dark-ON	EE-SX772	EE-SX772P
							Light-ON	EE-SX872	EE-SX872P

*1 For shape dimensions refer to www.industrial.omron.eu

Specifications

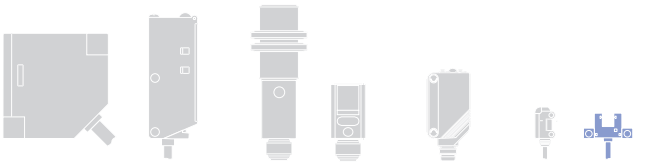
Item		Through-beam		
		Standard	L-shaped	T-shaped
	NPN	EE-SX770/EE-SX870	EE-SX771/EE-SX871	EE-SX772/EE-SX872
	PNP	EE-SX770P/EE-SX870P	EE-SX771P/EE-SX871P	EE-SX772P/EE-SX872P
Sensing distance		5 mm (slot width)		
Power supply voltage		5 to 24 VDC ±10%, ripple (p-p): 10% max.		
Response frequency		1 kHz min. (3 kHz average)		
Ambient temperature		Operating: -25 to +55°C, Storage: -30 to +80°C (with no icing)		
Degree of protection		IEC60529 IP60		
Material	Case	PBT (polybutylene terephthalate)		
	Lens	Polycarbonate		



High frequency photo microsensor in fork shape plastic housing

The small sized photo microsensors are ideally suited for the detection of machine parts where space is crucial.

- Min. 3 kHz (8 kHz average) switching frequency



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Operation mode	Shape*1	Order code	
								NPN output	PNP output
Through-beam with slot	5 mm (slot width) (Infrared light)	–	–	1 m	replace '-R' with '-C1J-R' in order code (example: EE-SX910-C1J-R)*2	Light-ON Dark-ON (2 outputs)	Standard	EE-SX910-R	EE-SX910P-R
							L-shaped	EE-SX911-R	EE-SX911P-R
							F-shaped	EE-SX912-R	EE-SX912P-R
							R-shaped	EE-SX913-R	EE-SX913P-R
							U-shaped	EE-SX914-R	EE-SX914P-R

*1 For shape dimensions refer to www.industrial.omron.eu
*2 Order special cable connector separately from accessories

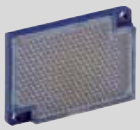
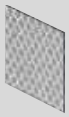
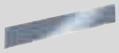
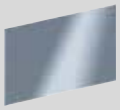
Specifications

Item		Through-beam				
		Standard	L-shaped	F-shaped	R-shaped	U-shaped
	NPN	EE-SX910-R	EE-SX911-R	EE-SX912-R	EE-SX913-R	EE-SX914-R
	PNP	EE-SX910P-R	EE-SX911P-R	EE-SX912P-R	EE-SX913P-R	EE-SX914P-R
Sensing distance		5 mm (slot width)				
Power supply voltage		5 to 24 VDC ±10%, ripple (p-p): 10% max.				
Protective circuits		Power supply reverse polarity protection; output reverse polarity protection				
Response frequency		3 kHz min. (8 kHz average) Light incident: 15 μs average; light interrupted: 40μs average				
Ambient temperature		Operating: -25 to +55°C, Storage: -30 to +80°C (with no icing or condensation)				
Degree of protection		IEC60529 IP50				
Material	Case	PBT (Polybutylene terephthalate)				
	Lens	Polycarbonate				

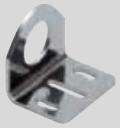
Accessories

Reflectors for retro-reflective photoelectric sensors

Shape	Type	Housing material	Features	Size in mm	Applicable Sensor	Order code
	**General purpose reflectors**	• ABS base • Acrylic surface	Surface screw mounting (diagonal holes)	40x60x7.5	• Retro-reflective photoelectric sensors - without M.S.R • Retro-reflective photoelectric sensors - with M.S.R.	E39-R1S
			Surface screw mounting (holes on one side only)	35.4x42.3x8		E39-R9
				51.4x60.3x8.5		E39-R42
	**Small size**		Side screw mounting or surface selfadhesive	41.8x22.5x11		E39-R3
			Surface screw mounting	23x13.7x4.9		E39-R4
	**Large size**			100x100x9		E39-R8
				84.5x84.5x8.7		E39-R40
	**High precision**		Microtripel for improved performance with fine beam sensors	52x40x4.8	Recommended for fine beam coaxial models (E3C-LR, E3S-CR62/67, E3T-SR4)	E39-R6
				30x45		E39-R12 E39-R14
				14x23x1		E39-R37-CA
				12x24		E39-R13
	**Simple mounting**		Round shape with centered mounting hole for simple screw mounting	Diameter: 84 Depth: 7.4	Photoelectric sensors with and without M.S.R.	E39-R7
	**Snap mounting**		Snap mounting for fast installation	Diameter: 30 Diameter of snap mount tool: 5	Recommended for snap mounting sensor E3FZ	E39-R49

Shape	Type	Housing material	Features	Size in mm	Applicable Sensor	Order code
	**Enhanced detergent resistance**	• PVC	• Surface screw mounting • IP69k after DIN 40050 part 9	40x60x7.5	Recommended for harsh environment sensors	E39-R50
				20x60x6		E39-R51
	**Highest detergent resistance**	• SUS316L • Borosilicat	• Surface screw mounting	43x30x5		E39-R16
	**Heat resistant**	• Borosilicat	• Surface screw mounting • 450°C heat resistance • Suitable for vacuum environment	95x51x8		E39-R47
	**Non-fogging reflector**	• ABS • Acrylic surface	Anti-fogging coating	40x60x7.5		E39-R1K
	**General purpose tape reflectors**	• Acrylic	• Self adhesive • Pre cut	35x10x0.6	Photoelectric sensors with and without M.S.R.	E39-RS1
					Optimised for E3T-SR4	E39-RS1-CA
				40x35x0.6		E39-RS2
					Optimised for E3T-SR4	E39-RS2-CA
				80x70x0.6		E39-RS3
					Optimised for E3T-SR4	E39-RS3-CA
			• Self adhesive • Self cut/roll material	25 mm x 5 m		E39-RS25 5 m
				25 mm x 22.8 m		E39-RS25 22.8 m
				50 mm x 5 m		E39-RS50 5 m
				50 mm x 22.8 m		E39-RS50 22.8 m
	**High precision tape reflectors**		• Self adhesive • Pre cut	195x22	Recommended for fine beam and laser sensors (E3S-CR62/67, E3C, E3X)	E39-RS4
				108x46		E39-RS5

Mounting brackets

Shape	Type	Order code
	Quick access - snap fix for cylindrical sensors; sizes M8, M12, M18, M30	Y92E-BC08 Y92E-BC12 Y92E-BC18 Y92E-BC30
	Surface mounting for snap mount sensor E3FZ	E39-EL8
	Telescope mounting for 12 mm rod for snap mount sensor E3FZ	E39-EL9
	Standard-surface mounting (for pre-wired or pigtail models)	E39-L104 *1
	Standard-backwall mounting	E39-L44 *1
	Protection-wall mounting (for pre-wired or pigtail models)	E39-L142 *1
	Protection-surface mounting	E39-L98 *1
	Telescope mounting	E39-L93FH
	3D rotation mounting	E39-EL4

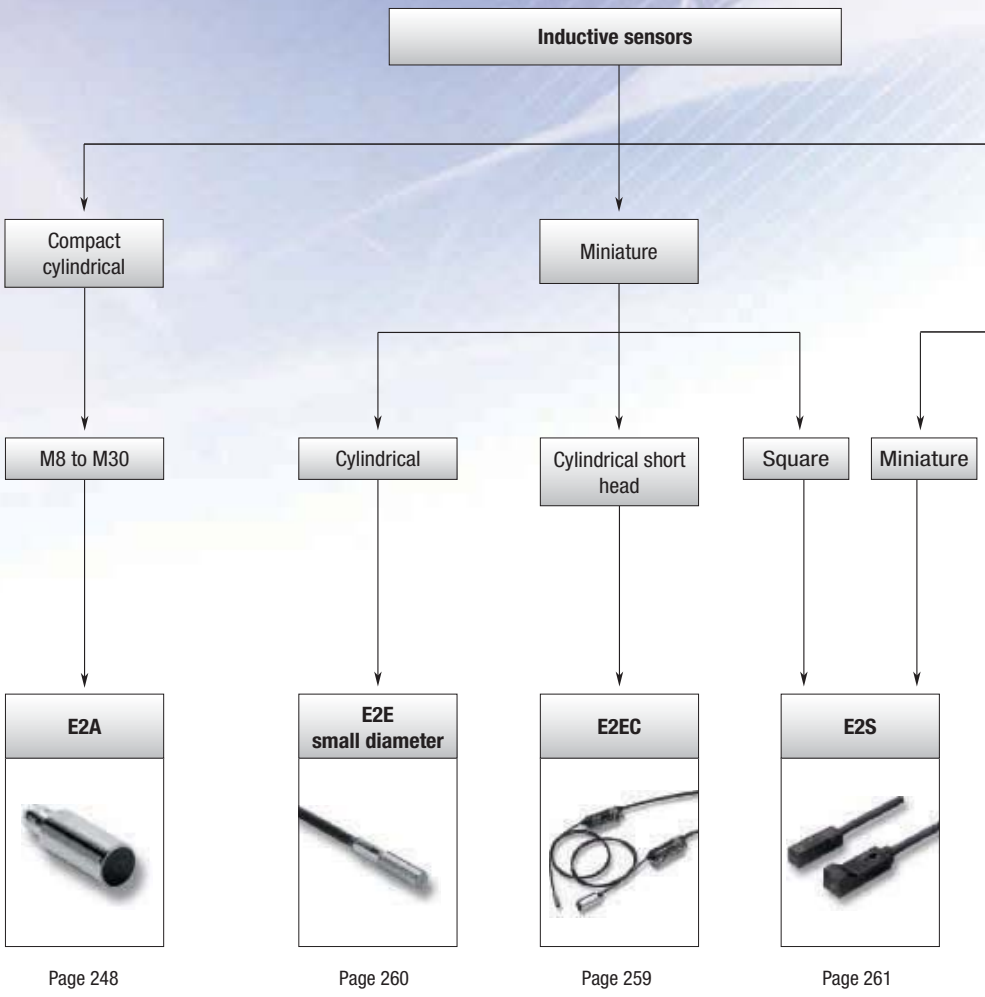
*1 The order references are examples for the E3Z sensor family. Refer to the sensor accessory datasheet E26E for the complete list of mounting brackets.

ZERO TOLERANCE ON FAILURE

Tested reliability for demanding conditions

Our inductive sensors are designed and tested to ensure a long service life and to achieve maximum machine availability even in the harshest environments.
This trusted reliability makes the E2A one of the world's most popular and successful inductive proximity sensors with more than one million units sold every year.

- Wide portfolio and application range
- Highest reliability even in demanding environments
- Designed for flexibility - modular housing design for best performance fit





Square/ block style

Longer distance

Special models

Compact

Longer distance

Square/ block style

Cylindrical

TL-W



E2Q5



E2A3



(see next page)

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Selection table

		Cylindrical				
						
Model		**E2A**	**E2A DC 2-wire**	**E2A3**	**E2EC**	**E2E small diameter**
Type		Compact	Compact	Long distance	Miniature – short head	Miniature
Material		Brass, SUS	Brass, SUS	Brass	Brass, SUS	Brass, SUS
Max. sensing distance	**dia 3**	–	–	–	0.8 mm	0.6 mm
	dia 4	–	–	–	–	0.8 mm
	M5	–	–	–	–	1 mm
	dia 5.4	–	–	–	1.5 mm	1 mm
	M8	2/4 mm	2/4 mm	3mm / –	–	–
	M12	4/8 mm	4/8 mm	6mm / –	4 mm	–
	M18	8/16 mm	8/16 mm	11mm / –	–	–
	M30	15/30 mm	15/30 mm	20mm / –	–	–
	19x6x6	–	–	–	–	–
	22x8x6	–	–	–	–	–
	31x18x10	–	–	–	–	–
	53x40x23	–	–	–	–	–
	67x40x40	–	–	–	–	–
Mount.	**Shielded**	■	■	■	■	■
	Non-shielded	■	■	–	–	–
Oper. mode	**NO**	■	■	■	■	■
	NC	■	■	■	■	■
	NO + NC	■	–	–	–	–
Wiring	**DC 2-wire**	–	■	–	■	–
	DC 3-wire	■	–	■	■	■
	DC 4-wire	■	–	–	–	–
	AC 2-wire	–	□	–	–	–
Voltage	**10-30 VDC**	■	■	■	■	■
	12-240 VAC	–	□	–	–	–
IP rating	**IP67**	■	■	■	■	■
	IP69K	■	■	■	–	–
	Page	248	250	251	259	260

Special models

Type	**Vehicle usage certified**	**ATEX 3D certified**	**Detergent and heat resistant**	**Chemical resistant**	**Full metal face**
					
Model	**E2AU**	**E2AX**	**E2EH**	**E2FQ**	**E2FM**
Key features	• e1 type approval (according to automotive directive 2005/83/EC)	• ATEX certification Group II category 3D (94/9/EC Appendix VIII) • typically for explosive areas zone 22 with non-leading dust	• stainless steel housing • 120°C heat resistance	• PTFE housing	• immune to aluminium and cast iron chips on sensing surface • oil resistant
3 mm	–	–	–	–	–
5.4 mm	–	–	–	–	–
M8	–	–	–	–	■
M12	■	■	■	■	■
M18	■	■	■	■	■
M30	■	■	■	■	■
Page	252	253	255	257	256

Format		Square		
				
Model		TL-W	E2S	E2Q5
Type		Compact	Miniature	Long distance
Material		ABS	Polyarylate	PBT
Max. sensing distance	dia 3	–	–	–
	dia 4	–	–	–
	M5	–	–	–
	dia 5.4	–	–	–
	M8	–	–	–
	M12	–	–	–
	M18	–	–	–
	M30	–	–	–
	19x6x6	–	1.6 mm	–
	22x8x6	3 mm	2.5 mm	–
	31x18x10	5 mm	–	–
	53x40x23	20 mm	–	–
	67x40x40	–	–	40 mm
Mount.	Shielded	■	–	■
	Non-shielded	■	■	■
Oper. mode	NO	■	■	■
	NC	■	■	–
	NO + NC	–	–	■
Wiring	DC 2-wire	■	■	–
	DC 3-wire	■	■	■
	DC 4-wire	–	–	■
	AC 2-wire	–	–	–
Voltage	10-30 VDC	■	■	■
	12-240 VAC	–	–	–
IP rating	IP67	■	■	■
	IP69K	–	–	■
	Page	262	261	263

Special models

Type		Oil resistant	High precision positioning
			
Model		E2E	E2C-EDA
Key features		• tested oil resistance on commonly used lubricants	• distance teaching up to µm accuracy
3 mm		–	■
5.4 mm		–	■
M8		■	–
M12		■	■
M18		■	■
M30		■	–
Page		254	258

■ Standard ☐ Available – No/not available



Extended sensing range inductive sensor in cylindrical brass housing

The high quality and the long-life design of the E2A extended sensing distance provides the best value performance ratio for standard applications

- Extended (double) sensing distance
- IP67 and IP69k for highest water protection
- DC 3-wire (NO, NC), DC 4-wire (NO+NC)
- Wide installation and connectivity range through modular concept

Ordering information

Pre-wired

(For different cable materials and lengths, special housing length or special connectors, please refer to complete datasheet.)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for pre-wired types with 2m cable length)		
						Operation mode NO	Operation mode NC	Operation mode NO + NC
M8	■	–	2.0 mm	27 (40) mm	PNP[*1]	E2A-S08KS02-WP-B1 2M	E2A-S08KS02-WP-B2 2M	E2A-S08LS02-WP-B3 2M[*2]
	–	■	4.0 mm	21 (40) mm	PNP[*1]	E2A-S08KN04-WP-B1 2M	E2A-S08KN04-WP-B2 2M	E2A-S08LN04-WP-B3 2M[*2]
M12	■	–	4.0 mm	34 (50) mm	PNP[*1]	E2A-M12KS04-WP-B1 2M	E2A-M12KS04-WP-B2 2M	E2A-M12KS04-WP-B3 2M
	–	■	8.0 mm	27 (50) mm	PNP[*1]	E2A-M12KN08-WP-B1 2M	E2A-M12KN08-WP-B2 2M	E2A-M12KN08-WP-B3 2M
M18	■	–	8.0 mm	39 (59) mm	PNP[*1]	E2A-M18KS08-WP-B1 2M	E2A-M18KS08-WP-B2 2M	E2A-M18KS08-WP-B3 2M
	–	■	16.0 mm	29 (59) mm	PNP[*1]	E2A-M18KN16-WP-B1 2M	E2A-M18KN16-WP-B2 2M	E2A-M18KN16-WP-B3 2M
M30	■	–	15.0 mm	44 (64) mm	PNP[*1]	E2A-M30KS15-WP-B1 2M	E2A-M30KS15-WP-B2 2M	E2A-M30KS15-WP-B3 2M
	–	■	20.0 mm	29 (64) mm	PNP[*1]	E2A-M30KN20-WP-B1 2M	E2A-M30KN20-WP-B2 2M	E2A-M30KN20-WP-B3 2M

Connector versions (M12)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for M12 connector types)		
						Operation mode NO	Operation mode NC	Operation mode NO + NC
M8	■	–	2.0 mm	27 (43) mm	PNP [*1]	E2A-S08KS02-M1-B1	E2A-S08KS02-M1-B2	E2A-S08LS02-M1-B3[*2]
	–	■	4.0 mm	21 (43) mm	PNP [*1]	E2A-S08KN04-M1-B1	E2A-S08KN04-M1-B2	E2A-S08LN04-M1-B3[*2]
M12	■	–	4.0 mm	24 (48) mm	PNP [*1]	E2A-M12KS04-M1-B1	E2A-M12KS04-M1-B2	E2A-M12KS04-M1-B3
	–	■	8.0 mm	27 (48) mm	PNP [*1]	E2A-M12KN08-M1-B1	E2A-M12KN08-M1-B2	E2A-M12KN08-M1-B3
M18	■	–	8.0 mm	39 (53) mm	PNP [*1]	E2A-M18KS08-M1-B1	E2A-M18KS08-M1-B2	E2A-M18KS08-M1-B3
	–	■	16.0 mm	29 (53) mm	PNP [*1]	E2A-M18KN16-M1-B1	E2A-M18KN16-M1-B2	E2A-M18KN16-M1-B3
M30	■	–	15.0 mm	44 (58) mm	PNP [*1]	E2A-M30KS15-M1-B1	E2A-M30KS15-M1-B2	E2A-M30KS15-M1-B3
	–	■	20.0 mm	29 (58) mm	PNP [*1]	E2A-M30KN20-M1-B1	E2A-M30KN20-M1-B2	E2A-M30KN20-M1-B3

[*1] NPN models are also available.
[*2] Longer housing models.

Specifications

(Exemplary for shielded versions. Sensing distance is double for non-shielded version

Item		M8	M12	M18	M30
		E2A-S08KS	E2A-M12KS	E2A-M18KS	E2A-M30KS
Sensing distance		2 mm ±10%	4 mm ±10%	8 mm±10%	15 mm±10%
Response frequency		1,500 Hz	1,000 Hz	500 Hz	250 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)			
Protective circuit		Power supply reverse polarity protection, surge suppressor, short-circuit protection	Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection		
Ambient temperature		Operating: -40°C to 70°C, storage: -40°C to 85°C (with no icing or condensation)			
Degree of protection		IP67 after IEC 60529; IP69K after DIN 40050 part 9			
Material	Case	Stainless steel	Brass-nickel plated		
	Sensing surface	PBT			



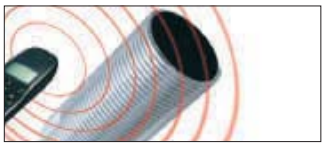
High water resistance



Cable breakage protection



High mechanical resistance



High electro-magnetic noise immunity



High resistance against temperature change



High vibration resistance



DC 2-wire inductive sensor in cylindrical brass housing

The DC 2-wire models of the E2A family are easy to install and allow the detection of cable breakage.

- Extended (double) sensing distance
- IP67 and IP69k for highest protection in wet environments
- DC 2-wire

Ordering information

Pre-wired

(For different cable materials and lengths, special housing length or special connectors, please refer to complete datasheet.)

Size			Sensing distance	Thread length (overall length)	Order code (for pre-wired types with 2m cable length)	
					Operation mode NO	Operation mode NC
M8	■	–	2.0 mm	27 (40) mm*1	E2A-S08KS02-WP-D1 2M	E2A-S08KS02-WP-D2 2M
	–	■	4.0 mm	21 (40) mm*1	E2A-S08KN04-WP-D1 2M	E2A-S08KN04-WP-D2 2M
M12	■	–	4.0 mm	34 (50) mm*1	E2A-M12KS04-WP-D1 2M	E2A-M12KS04-WP-D2 2M
	–	■	8.0 mm	27 (50) mm*1	E2A-M12KN08-WP-D1 2M	E2A-M12KN08-WP-D2 2M
M18	■	–	8.0 mm	39 (59) mm*1	E2A-M18KS08-WP-D1 2M	E2A-M18KS08-WP-D2 2M
	–	■	16.0 mm	29 (59) mm*1	E2A-M18KN16-WP-D1 2M	E2A-M18KN16-WP-D2 2M
M30	■	–	15.0 mm	44 (64) mm*1	E2A-M30KS15-WP-D1 2M	E2A-M30KS15-WP-D2 2M
	–	■	20.0 mm	29 (64) mm*1	E2A-M30KN20-WP-D1 2M	E2A-M30KN20-WP-D2 2M

Connector versions (M12)

Size			Sensing distance	Thread length (overall length)	Order code (for M12 connector types)	
					Operation mode NO	Operation mode NC
M8	■	–	2.0 mm	27 (43) mm*1	E2A-S08KS02-M1G-D1	E2A-S08KS02-M1G-D2
	–	■	4.0 mm	21 (43) mm*1	E2A-S08KN04-M1G-D1	E2A-S08KN04-M1G-D2
M12	■	–	4.0 mm	34 (48) mm*1	E2A-M12KS04-M1G-D1	E2A-M12KS04-M1G-D2
	–	■	8.0 mm	27 (48) mm*1	E2A-M12KN08-M1G-D1	E2A-M12KN08-M1G-D2
M18	■	–	8.0 mm	39 (53) mm*1	E2A-M18KS08-M1G-D1	E2A-M18KS08-M1G-D2
	–	■	16.0 mm	29 (53) mm*1	E2A-M18KN16-M1G-D1	E2A-M18KN16-M1G-D2
M30	■	–	15.0 mm	44 (58) mm*1	E2A-M30KS15-M1G-D1	E2A-M30KS15-M1G-D2
	–	■	20.0 mm	29 (58) mm*1	E2A-M30KN20-M1G-D1	E2A-M30KN20-M1G-D2

*1 Longer housing models are available.

Specifications

(Exemplary for shielded versions. Sensing distance is double for non-shielded version)

Item		M8	M12	M18	M30
		E2A-S08KS	E2A-M12KS	E2A-M18KS	E2A-M30KS
Sensing distance		2 mm ±10%	4 mm ±10%	8 mm±10%	15 mm±10%
Response frequency		1,500 Hz	1,000 Hz	500 Hz	250 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)			
Protective circuit		Surge suppressor, short-circuit protection			
Ambient temperature		Operating: –40 °C to 70 °C, storage: –40 °C to 85 °C (with no icing or condensation)			
Standard and listings (Degree of protection)		IP67 after IEC 60529; IP69K after DIN 40050 part 9			
Material	Case	Stainless steel	Brass-nickel plated		
	Sensing surface	PBT			



Long (triple) distance inductive sensor in cylindrical brass housing

The E2A3 family features an optimised sensing performance to achieve triple sensing distance for flush mounting requirements.

- Triple distance for enhanced sensor protection from mechanical damage
- IP67 and IP69k

Ordering information

Pre-wired

(For different cable materials and lengths, special housing length or special connectors, please refer to complete datasheet.)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for pre-wired types with 2 m cable length)	
						Operation mode: NO	Operation mode: NC
M8	■	–	3.0 mm	27 (40) mm	PNP	E2A3-S08KS03-WP-B1 2M	E2A3-S08KS03-WP-B2 2M
					NPN	E2A3-S08KS03-WP-C1 2M	E2A3-S08KS03-WP-C2 2M
M12	■	–	6.0 mm	34 (50) mm	PNP	E2A3-M12KS06-WP-B1 2M	E2A3-M12KS06-WP-B2 2M
					NPN	E2A3-M12KS06-WP-C1 2M	E2A3-M12KS06-WP-C2 2M
M18	■	–	11.0 mm	39 (60) mm	PNP	E2A3-M18KS11-WP-B1 2M	E2A3-M18KS11-WP-B2 2M
					NPN	E2A3-M18KS11-WP-C1 2M	E2A3-M18KS11-WP-C2 2M
M30	■	–	20.0 mm	44 (65) mm	PNP	E2A3-M30KS20-WP-B1 2M	E2A3-M30KS20-WP-B2 2M
					NPN	E2A3-M30KS20-WP-C1 2M	E2A3-M30KS20-WP-C2 2M

Connector versions (M12)

Size			Sensing distance	Connection	Thread length (overall length)	Output configuration	Order code (for M12 connector types)	
							Operation mode: NO	Operation mode: NC
M8	■	–	3.0 mm	M12 Connector	27 (44) mm	PNP	E2A3-S08KS03-M1-B1	E2A3-S08KS03-M1-B2
						NPN	E2A3-S08KS03-M1-C1	E2A3-S08KS03-M1-C2
M12	■	–	6.0 mm	M12 Connector	34 (49) mm	PNP	E2A3-M12KS06-M1-B1	E2A3-M12KS06-M1-B2
						NPN	E2A3-M12KS06-M1-C1	E2A3-M12KS06-M1-C2
M18	■	–	11.0 mm	M12 Connector	39 (54) mm	PNP	E2A3-M18KS11-M1-B1	E2A3-M18KS11-M1-B2
						NPN	E2A3-M18KS11-M1-C1	E2A3-M18KS11-M1-C2
M30	■	–	20.0 mm	M12 Connector	44 (59) mm	PNP	E2A3-M30KS20-M1-B1	E2A3-M30KS20-M1-B2
						NPN	E2A3-M30KS20-M1-C1	E2A3-M30KS20-M1-C2

Specifications

Item		M8	M12	M18	M30
		E2A3-S08KS03	E2A3-M12KS06-	E2A3-M18KS11	E2A3-M30KS20
Sensing distance		3 mm ±10%	6 mm ±10%	11 mm ±10%	20 mm ±10%
Response frequency		700 Hz	350 Hz	250 Hz	80 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)			
Protective circuit		Power supply reverse polarity protection, surge suppressor, short-circuit protection	Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection		
Ambient temperature		Operating: -25 to 70°C, storage: -25 to 70°C			
Degree of protection		IP67 after IEC 60529; IP69K after DIN 40050 part 9			
Material	Case	Stainless steel	Brass-nickel plated		
	Sensing surface	PBT			



Inductive sensor for mobile usage in cylindrical brass housing

Designed and tested to keep your mobile machines moving.

- IP69k tested and certified for highest water resistance
- e1 type approval (according to Automotive Directive 2005/83/EC)
- Cable breakage protection

Ordering information

Pre-wired

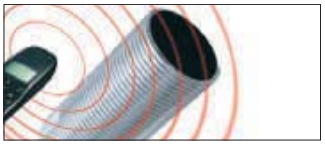
Size			Sensing distance	Output configuration	Order code (for pre-wired with 2m cable length)
					Operation mode: NO
M12	■	–	4.0 mm	PNP	E2AU-M12KS04-WP-B1 2M
				PNP	E2AU-M12LS04-WP-B1 2M
M18	■	–	8.0 mm	PNP	E2AU-M18KS08-WP-B1 2M
				PNP	E2AU-M18LS08-WP-B1 2M
M30	■	–	15.0 mm	PNP	E2AU-M30KS15-WP-B1 2M
				PNP	E2AU-M30LS15-WP-B1 2M

Connector versions (M12)

Size			Sensing distance	Output configuration	Order code (for M12 connector types)
					Operation mode: NO
M12	■	–	4.0 mm	PNP	E2AU-M12KS04-M1-B1
				PNP	E2AU-M12LS04-M1-B1
M18	■	–	8.0 mm	PNP	E2AU-M18KS08-M1-B1
				PNP	E2AU-M18LS08-M1-B1
M30	■	–	15.0 mm	PNP	E2AU-M30KS15-M1-B1
				PNP	E2AU-M30LS15-M1-B1

Specifications

Item		M12	M18	M30
		E2AU-M12_	E2AU-M18_	E2AU-M30_
Sensing distance		4 mm ±10%	8 mm ±10%	15 mm ±10%
Response frequency		1,000 Hz	500 Hz	250 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max.(10 to 32 VDC)		
Protective circuit		Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection		
Ambient temperature		Operating: -40 to 70°C, storage: -40 to 85°C (with no icing or condensation)		
Degree of protection		IP67 after IEC 60529, IP69K after DIN 40050 part 9		
Material	Case	Brass-nickel plated		
	Sensing surface	PBT		



High electro-magnetic noise immunity

e1

e1 type approval after 2005/83/EC



Inductive sensor for explosive environments in cylindrical brass housing

The high-reliability and robustness of the E2A family is also available for explosive environments. The protective structure of the E2A family (based on EN50014 and EN50281-1-1/2) allows the ATEX certification Group II category 3D (94/9/EC Appendix VIII) typically for explosive areas zone 22 with non-leading dust [e.g. flour].

- Protective connector cover to avoid disconnection under power
- Certified ATEX Group II category 3D (94/9/EC Appendix VIII)
- Rugged housing construction based on EN50014 and EN50281-1-1/2

Ordering information

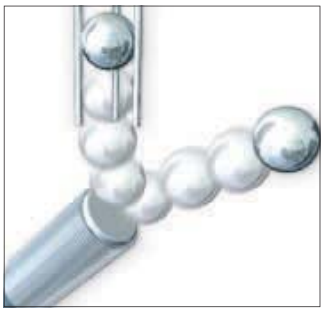
Connector versions (M12)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for M12 connector types)*1		
						Operation mode NO	Operation mode NC	Operation mode NO + NC
M12	■	–	4.0 mm	34 (48) mm	PNP	E2AX-M12KS04-M1-B1	E2AX-M12KS04-M1-B2	E2AX-M12KS04-M1-B3
					NPN	E2AX-M12KS04-M1-C1	E2AX-M12KS04-M1-C2	E2AX-M12KS04-M1-C3
	–	■	8.0 mm	27 (48) mm	PNP	E2AX-M12KN08-M1-B1	E2AX-M12KN08-M1-B2	E2AX-M12KN08-M1-B3
					NPN	E2AX-M12KN08-M1-C1	E2AX-M12KN08-M1-C2	E2AX-M12KN08-M1-C3
M18	■	–	8.0 mm	39 (53) mm	PNP	E2AX-M18KS08-M1-B1	E2AX-M18KS08-M1-B2	E2AX-M18KS08-M1-B3
					NPN	E2AX-M18KS08-M1-C1	E2AX-M18KS08-M1-C2	E2AX-M18KS08-M1-C3
	–	■	16.0 mm	29 (53) mm	PNP	E2AX-M18KN16-M1-B1	E2AX-M18KN16-M1-B2	E2AX-M18KN16-M1-B3
					NPN	E2AX-M18KN16-M1-C1	E2AX-M18KN16-M1-C2	E2AX-M18KN16-M1-C3
M30	■	–	15.0 mm	44 (58) mm	PNP	E2AX-M30KS15-M1-B1	E2AX-M30KS15-M1-B2	E2AX-M30KS15-M1-B3
					NPN	E2AX-M30KS15-M1-C1	E2AX-M30KS15-M1-C2	E2AX-M30KS15-M1-C3
	–	■	20.0 mm	29 (58) mm	PNP	E2AX-M30KN20-M1-B1	E2AX-M30KN20-M1-B2	E2AX-M30KN20-M1-B3
					NPN	E2AX-M30KN20-M1-C1	E2AX-M30KN20-M1-C2	E2AX-M30KN20-M1-C3

*1 Protective connector cover is included. Order cable connectors separately.

Specifications

Item		M12		M18		M30		
		E2AX-M12KS	E2AX-M12KN	E2AX-M18KS	E2AX-M18KN	E2AX-M30KS	E2AX-M30KN	E2AX-M30KN
Sensing distance		4 mm ±10%	8 mm ±10%	8 mm ±10%	16 mm ±10%	15 mm ±10%	20 mm ±10%	30 mm ±10%
Response frequency		1,000 Hz	800 Hz	500 Hz	400 Hz	250 Hz	100 Hz	100 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)						
Protective circuit		Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection						
Ambient air temperature		Operating: -40 to 70°C, storage: -40 to 85°C (with no icing or condensation)						
Degree of protection		IP67 after IEC 60529 EMC after EN60947-5-2 ATEX afterEN50014 EN50281-1-1/2						
Material	Case	Brass-nickel plated						
	Sensing surface	PBT						



Mechanical protection of electronic part proven in ball drop test



Protective cable connector cover to prevent disconnection under power

ATEX certified Group II cat. 3D



Oil resistant inductive sensor in cylindrical brass housing

The standard E2E family offers tested oil resistance on commonly used oils in the automotive industry for reliable long-life operation in automotive assembly lines.

- Oil resistant PUR cable
- M8, M12, M18 and M30 standard sizes
- IP67g (water and oil resistance)

Ordering information

DC 2-wire (pre-wired)

Size			Sensing distance	Order code (for pre-wired types with 2 m cable length)	
				Operation mode NO	Operation mode NC
M8	■	–	2 mm	E2E-X2D1-U	E2E-X2D2-U
M12			3 mm	E2E-X3D1-U	E2E-X3D2-U
M18			7 mm	E2E-X7D1-U	E2E-X7D2-U
M30			10 mm	E2E-X10D1-U	E2E-X10D2-U

DC 2-wire (pre-wired with M12)

Size			Sensing distance	Order code (for pre-wired types with 30 cm cable length an M12 connector)	
				Operation mode NO	Operation mode NC
M8	■	–	2 mm	E2E-X2D1-M1TGJ-U 0.3M	E2E-X2D2-M1TGJ-U 0.3M
M12			3 mm	E2E-X3D1-M1TGJ-U 0.3M	E2E-X3D2-M1TGJ-U 0.3M
M18			7 mm	E2E-X7D1-M1TGJ-U 0.3M	E2E-X7D2-M1TGJ-U 0.3M
M30			10 mm	E2E-X10D1-M1TGJ-U 0.3M	E2E-X10D2-M1TGJ-U 0.3M

Specifications

Item		M8	M12	M18	M30
		E2E-X2D_	E2E-X3D_	E2E-X7D_	E2E-X10D_
Sensing distance		2 mm ±10%	3 mm ±10%	7 mm ±10%	10 mm ±10%
Response frequency		1.5 kHz	1.0 kHz	0.5 kHz	0.4 kHz
Power supply voltage (operating voltage)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			
Protective circuit		Surge suppressor, output short-circuit protection (for control and diagnostic output)			
Ambient temperature		Operating: -25 °C to 70 °C, storage: -40 °C to 85 °C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67 (JEM standard IP67g (waterproof and oil-proof))			
Material	Case	Stainless steel (SUS303)	Brass-nickel plated		
	Sensing surface	PBT (polybutylene terephthalate)			
	Cable	PUR for jacket, PE			



Heat and detergent resistant inductive sensor in cylindrical stainless steel housing

The heat and detergent resistant inductive sensors allow reliable metal object or machine part detection in demanding environments such as food processing.

- Temperature resistant up to 120°C
- SUS316L housing with heat resistant plastic sensing face
- IP69k for highest water resistance
- ECOLAB tested and certified detergent resistance

Ordering information

Pre-wired

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 2 m cable length)	
					Operation mode NO	Operation mode NC
M12	■	–	3 mm	PNP	E2EH-X3B1 2M	E2EH-X3B2 2M
				NPN	E2EH-X3C1 2M	E2EH-X3C2 2M
				DC 2-wire	E2EH-X3D1 2M	E2EH-X3D2 2M
M18			7 mm	PNP	E2EH-X7B1 2M	E2EH-X7B2 2M
				NPN	E2EH-X7C1 2M	E2EH-X7C2 2M
				DC 2-wire	E2EH-X7D1 2M	E2EH-X7D2 2M
M30			12 mm	PNP	E2EH-X12B1 2M	E2EH-X12B2 2M
				NPN	E2EH-X12C1 2M	E2EH-X12C2 2M
				DC 2-wire	E2EH-X12D1 2M	E2EH-X12D2 2M

Connector versions (M12)

Size			Sensing distance	Output	Order code (for M12 connector types)	
					Operation mode NO	Operation mode NC
M12	■	–	3 mm	PNP	E2EH-X3B1-M1	E2EH-X3B2-M1
				NPN	E2EH-X3C1-M1	E2EH-X3C2-M1
				DC 2-wire	E2EH-X3D1-M1G	E2EH-X3D2-M1G
M18			7 mm	PNP	E2EH-X7B1-M1	E2EH-X7B2-M1
				NPN	E2EH-X7C1-M1	E2EH-X7C2-M1
				DC 2-wire	E2EH-X7D1-M1G	E2EH-X7D2-M1G
M30			12 mm	PNP	E2EH-X12B1-M1	E2EH-X12B2-M1
				NPN	E2EH-X12C1-M1	E2EH-X12C2-M1
				DC 2-wire	E2EH-X12D1-M1G	E2EH-X12D2-M1G

Specifications

Item		M12	M18	M30
		E2EH-X3__	E2EH-X7__	E2EH-X12__
Sensing distance		3 mm±10%	7 mm±10%	12 mm±10%
Response frequency (average)		500 Hz	300 Hz	100 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC, ripple (p-p): 10% max. (10 to 32 VDC) (24 VDC max. at 100°C or higher)		
Protective circuit		Surge suppression, short circuit protection, power supply reverse polarity protection, output reverse polarity protection		
Ambient temperature*1		DC 3-wire models: 0 to 100°C (0 to 120°C for 1,000 hours), DC 2-wire models: 0 to 100°C (0 to 110°C for 1,000 hours)		
Degree of protection		IEC 60529 IP67, IP69k after DIN 40050-9		
Materials	Case, clamping nuts	Stainless steel (SUS316L)		
	Sensing surface	PBT (polybutylene terephthalate)		
	Cable	Heat-resistant PVC		

*1 Operation with power supplied for 1,000 h has been verified at 120°C for DC 3-wire models and at 110°C for DC 2-wire models. Do not bend the cable repeatedly at 100°C or higher.

120°C

Enhanced temperature resistance



Inductive proximity sensor in cylindrical full metal housing

The high durability stainless steel sensing face provides more than 20 times longer protection against mechanical damage than Conventional sensors. The high mineral oil and coolant resistance and the immunity against small metal chips on the surface make this sensor ideal for metal cutting or drilling applications.

- Full body stainless steel housing for highest mechanical protection
- Low frequency modulation for metal chip immunity
- Flame retardant cable for high protection against welding spatter damage

Ordering information

DC 2-wire (with M12 pigtail connector)

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 30 cm cable length and M12 connector)
					Operation mode NO
M8	■	–	1.5 mm	DC 2-wire with polarity (pins 1-4)	E2FM-X1R5D1-M1GJ
M12			2 mm		E2FM-X2D1-M1GJ
M18			5 mm		E2FM-X5D1-M1GJ
M30			10 mm		E2FM-X10D1-M1GJ

DC 3-wire, M12 Connector versions

Size			Sensing distance	Output configuration	Order code (for M12 connector types)
					Operation mode NO
M8	■	–	1.5 mm	DC 3-wire, PNP	E2FM-X1R5B1-M1
M12			2 mm		E2FM-X2B1-M1
M18			5 mm		E2FM-X5B1-M1
M30			10 mm		E2FM-X10B1-M1

Specifications

(Exemplary for DC 2-wire)

Item		M8	M12	M18	M30
		E2FM-X1R5D1	E2FM-X2D1	E2FM-X5D1	E2FM-X10D1
Sensing distance		1.5 mm±10%	2 mm±10%	5 mm±10%	10 mm±10%
Response frequency		200 Hz	100 Hz	100 Hz	50 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			
Protective circuits		Surge suppressor, output short-circuit protection			
Ambient temperature range		Operating/Storage: -25°C to +70°C (with no icing or condensation)			
Degree of protection		IEC60529 IP67, IP69k after DIN 40050 part 9			
Materials	Case	Stainless steel (SUS303)			
	Sensing surface	Stainless steel (SUS303)			
	Cable	PVC (flame retardant)			

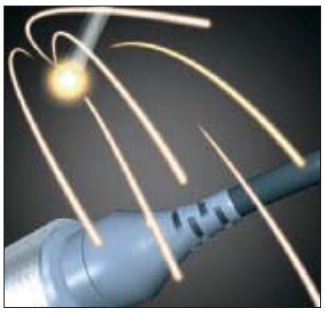


E2FM extra strong sensing face



Conventional metal face product


No interference from small metal chips on sensing surface


Cable resistant to welding spatter



Chemical resistant inductive sensor in cylindrical PTFE housing

The E2FQ features a full-body fluoro plastic housing for chemical resistance (e.g. against cleaning agents used in the semiconductor industry).

- Full body fluoro plastic housing for chemical resistance
- DC 2-wire and DC 3-wire models

Ordering information

DC 2-wire (pre-wired)

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 2 m cable length)
					Operation mode NO
M12	■	–	2 mm	DC 2-wire with polarity	E2FQ-X2D1
M18			5 mm		E2FQ-X5D1
M30			10 mm		E2FQ-X10D1

DC 3-wire (pre-wired)

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 2 m cable length)
					Operation mode NO
M12	■	–	2 mm	PNP	E2FQ-X2F1
				NPN	E2FQ-X2E1
M18			5 mm	PNP	E2FQ-X5F1
				NPN	E2FQ-X5E1
M30			10 mm	PNP	E2FQ-X10F1
				NPN	E2FQ-X10E1

Specifications

Item		M12	M18	M30
		E2FQ-X2_	E2FQ-X5_	E2FQ-X10_
Sensing distance		2 mm ±10%	5 mm ±10%	10 mm ±10%
Response frequency		E1, F1 models: 1.5 kHz D1 models: 800 Hz	E1, F1 models: 600 Hz, D1 models: 500 Hz	E1, F1 models: 400 Hz, D1 models: 300 Hz
Power supply voltage (Operating voltage)		E1, F1 models: 12 to 24 VDC, ripple (p-p) : 10% max., (10 to 30 VDC) D1 models: 12 to 24 VDC, ripple (p-p) : 20% max., (10 to 36 VDC)		
Protective circuit		D1 models: surge suppressor E1, F1 models: power supply, reverse polarity protection, short circuit protection, surge suppressor		
Ambient temperature		Operating/Storage: -25 to 70°C (with no icing or condensation)		
Degree of protection		IEC60529 IP67		
Material	Case	PTFE		
	Sensing surface	PTFE		



High precision positioning inductive proximity sensor with separate amplifier

The separate amplifier inductive sensor family E2C-EDA offers high precision distance positioning and detection. The teach-in function allows simple installation, and with the window function (2 outputs) production tolerance checks can easily be set up and modified.

- Typically several hundred µm detection precision
- Precision distance teaching
- Window function (2 outputs) for production tolerance checks

Ordering information

Sensor heads

Appearance				Sensing distance	Repeat accuracy	Order code
						
Cylindrical 	3 dia.×18	■	–	0.6 mm	1 µm	E2C-EDR6-F
	5.4 dia.×18			1 mm	1 µm	E2C-ED01*1
	8 dia.×22			2 mm	2 µm	E2C-ED02*1
Screw 	M10×22			2 mm	2 µm	E2C-EM02*1
Flat 	30×14×4.8			5 mm	2 µm	E2C-EV05*1
Screw 	M18×46.3	–	■	7 mm	5 µm	E2C-EM07M*1
Screw (heat resistant) 	M12×22	■	–	2 mm	2 µm	E2C-EM02H

*1 For models with cut-to-length cables add '-F' for example E2C-ED01-F
For models with protective stainless steel spiral tubes add '-S' for example E2C-ED01-S

Amplifier units with cables

Item	Functions	Order code	
		NPN output	PNP output
Twin-output models	Area output, open circuit detection, differential operation	E2C-EDA11	E2C-EDA41
External-input models	Remote setting, differential operation	E2C-EDA21	E2C-EDA51

Amplifier units with connectors*1

Item	Functions	Order code	
		NPN output	PNP output
Twin-output models	Area output, open circuit detection, differential operation	E2C-EDA6	E2C-EDA8
External-input models	Remote setting, differential operation	E2C-EDA7	E2C-EDA9

*1 Order fitting connector (E3X-CN21_) separately from accessories.

Specifications

Sensor heads

Item		3 dia.	5.4 dia.	8 dia.	M10	M18	30×14×4.8 mm	M12
		E2C-EDR6-F	E2C-ED01(-_)	E2C-ED02(-_)	E2C-EM02(-_)	E2C-EM07(-_)	E2C-EV05(-_)	E2C-EM02H
Sensing distance		0.6 mm	1 mm	2 mm		7 mm	5 mm	2 mm
Ambient temperature		Operating/Storage: -10°C to 60°C (with no icing or condensation)						Operating / storage: -10°C to 200°C
Degree of protection		IEC60529 IP67						IEC60529 IP60
Material	Case	Brass	Stainless steel	Brass			Zinc	Brass
	Sensing surface	Heat-resistant ABS						PEEK



Miniature short head inductive sensor for demanding mounting conditions with remote amplifier

The E2EC family features the smallest sensor heads for reliable sensing in areas where mounting space is crucial. The miniature sizes of the sensing heads are achieved by separating the sensing part from the amplifier. In contrast to standard separate amplifier models the E2EC family simplifies the installation as the amplifier is built into the cable.

- 3 mm diameter sensing head for smallest spaces
- 18 mm long ultra short M12 size housing
- Full metal housing model for highest resistance in demanding environments

Ordering information

Standard (plastic sensing surface) DC 2-wire

Size			Order code (pre-wired types with 2 m cable length)	
			Operation mode NO	Operation mode NC
3-mm dia.	■	–	E2EC-CR8D1	E2EC-CR8D2
5.4-mm dia.			E2EC-C1R5D1	E2EC-C1R5D2
8-mm dia.			E2EC-C3D1	E2EC-C3D2
M12			E2EC-X4D1	E2EC-X4D2

High protection (all metal face) DC 3-wire and DC 2-wire

Size			Order code (pre-wired types with 2 m cable length)	
			DC 3-wire Operation mode NO	DC 2-wire Operation mode NO
8-mm dia.	■	–	E2EC-MC2B1	E2EC-MC2D1
				E2EC-QC2D1-M1GJ-T (fluoroplastic coating)

*1 The remote amplifier is equipped with a M12 connector with 30 cm cable. Cable length from sensor head to remote amplifier is 0.5 m

Specifications

Item		dia 3	dia 5.4	dia 8		M12
		E2EC-CR8D_	E2EC-C1R5D_	E2EC-MC E2EC-QC	E2EC-C3D_	E2EC-X4D_
Sensing distance		0.8 mm ±15%	1.5 mm ±10%	2 mm ±10%	3 mm ±10%	4 mm ±10%
Response frequency		1.5 kHz		100 Hz	1 kHz	
Power supply voltage (Operating voltage)		12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.				
Protective circuit		Surge absorber, short-circuit protection				
Degree of protection		IEC60529 IP67				
Material	Case	Brass		Stainless steel (SUS303)	Brass	
	Sensing surface	ABS		Stainless steel (SUS303)	ABS	



Miniature inductive proximity sensor in cylindrical metal housing

The E2E Small Diameter line with housing sizes from dia 3 mm to dia 5.4 mm is part of the E2E family and is the ideal solution where space is crucial. The metal housing provides high mechanical protection.

- Miniature housing sizes from dia 3 mm to dia 5.4 mm
- Stainless steel or brass housing
- 3 kHz switching frequency

Ordering information

Pre-wired

Size			Sensing distance	Housing material	Output configuration	Order code (for pre-wired types with 2 m cable length)	
						Operation mode NO	Operation mode NC
dia 3 mm	■	–	0.6 mm	Stainless steel	PNP	E2E-CR6B1	E2E-CR6B2
					NPN	E2E-CR6C1	E2E-CR6C2
dia 4 mm			0.8 mm		PNP	E2E-CR8B1	E2E-CR8B2
					NPN	E2E-CR8C1	E2E-CR8C2
M5			1 mm	brass	PNP	E2E-X1B1	E2E-X1B2
					NPN	E2E-X1C1	E2E-X1C2
dia 5.4 mm					PNP	E2E-C1B1	E2E-C1B2
					NPN	E2E-C1C1	E2E-C1C2

Connector versions (M8, 3-pin)

Size			Sensing distance	Housing material	Output configuration	Order code (for M8 3-pin connector types)	
						Operation mode NO	Operation mode NC
dia 4 mm	■	–	0.8 mm	Stainless steel	PNP	E2E-CR8B1-M5	E2E-CR8B2-M5
					NPN	E2E-CR8C1-M5	E2E-CR8C2-M5
M5			1 mm	brass	PNP	E2E-X1B1-M5	E2E-X1B2-M5
					NPN	E2E-X1C1-M5	E2E-X1C2-M5

Specifications

Item		4 dia.	M5	5.4 dia.
		E2E-CR8C_/B_	E2E-X1C_/B_	E2E-C1C_/B_
Sensing distance		0.8 mm ±15%	1 mm ±15%	
Response frequency		3 kHz		
Power supply voltage (operating voltage)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.		
Protective circuit		Power supply reverse polarity protection, surge suppressor		
Ambient temperature		Operating/Storage: -25 °C to 70 °C (with no icing or condensation)		
Degree of protection		IEC 60529 IP67		
Material	Case	Stainless steel (SUS303)	Brass-nickel plated	
	Sensing surface	Heat-resistant ABS		



Miniature square inductive sensor in plastic housing

The E2S family features miniature block style plastic housings for simple mounting on flat surfaces. The durable plastic housing with front or side facing sensing surfaces, provides best value-performance ratio for machine part movement detection.

- Miniature housing with long sensing ranges
- Front and side facing sensing surfaces
- Models with simple one-screw mounting
- IP67

Ordering information

DC 2-wire models

Size in mm (HxWxD)			Sensing distance	Sensing surface	Order code (pre-wired types with 1 m cable length)	
					Operating status NO	Operating status NC
19x6x6	–	■	1.6 mm	Front face	E2S-W11 1M	E2S-W12 1M
				End face	E2S-Q11 1M	E2S-Q12 1M
23x8x8			2.5 mm	Front face	E2S-W21 1M	E2S-W22 1M
				End face	E2S-Q21 1M	E2S-Q22 1M

DC 3-wire models

Size in mm (HxWxD)			Sensing distance	Sensing surface	Output specifications	Order code	
						Operating status NO	Operating status NC
19x6x6	–	■	1.6 mm	Front face	NPN	E2S-W13 1M	E2S-W14 1M
				End face		E2S-Q13 1M	E2S-Q14 1M
27x8x8			2.5 mm	Front face		E2S-W23 1M	E2S-W24 1M
				End face		E2S-Q23 1M	E2S-Q24 1M
19x6x6			1.6 mm	Front face	PNP	E2S-W15 1M	E2S-W16 1M
				End face		E2S-Q15 1M	E2S-Q16 1M
23x8x8			2.5 mm	Front face		E2S-W25 1M	E2S-W26 1M
				End face		E2S-Q25 1M	E2S-Q26 1M

Specifications

DC 2-wire models

Item	E2S-W11 E2S-W12	E2S-Q11 E2S-Q12	E2S-W21 E2S-W22	E2S-Q21 E2S-Q22
Sensing surface	Front face	End face	Front face	End face
Sensing distance	1.6 mm ±10%		2.5 mm ±15%	
Response frequency	1 kHz min.			
Power supply voltage (operating voltage)	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			
Protective circuit	Surge suppressor; power supply reverse polarity protection			

DC 3-wire models

Item	E2S-W13 E2S-W14	E2S-Q13 E2S-Q14	E2S-W23 E2S-W24	E2S-Q23 E2S-Q24	E2S-W15 E2S-W16	E2S-Q15 E2S-Q16	E2S-W25 E2S-W26	E2S-Q25 E2S-Q26
Sensing surface	Front face	End face	Front face	End face	Front face	End face	Front face	End face
Sensing distance	1.6 mm ±10%		2.5 mm ±15%		1.6 mm ±10%		2.5 mm ±15%	
Response frequency	1 kHz min.							
Power supply voltage (operating voltage)	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.							
Protective circuit	Surge suppressor; power supply reverse polarity protection							
Ambient temperature	Operating: -25 to 70°C, storage: -40 to 85°C (with no icing or condensation)							
Degree of protection	IEC60529 IP67							
Material Case	Polyarylate							



Flat shape inductive sensor in compact plastic housing

The TL-W family offers a wide range of block style inductive sensors for simple mounting on flat surfaces. With sensing distances from 1.5 mm to 20 mm the TL-W is the ideal solution for all standard applications.

- Front and side facing surface
- IP67
- DC 2-wire and DC 3-wire models
- Sensing distances from 1.5 mm to 20 mm

Ordering information

DC 2-wire models (pre-wired)

Size in mm (HxWxD)			Sensing distance	Order code (for pre-wired types with 2 m cable length)	
				Operation mode NO	Operation mode NC
71x18x10	–	■	5 mm	TL-W5MD1	TL-W5MD2

DC 3-wire models

Size in mm (HxWxD)			Sensing distance	Order code			
				Output and operation mode			
				PNP-NO	PNP-NC	NPN-NO	NPN-NC
25x8x5	–	■	1.5 mm	TL-W1R5MB1	–	TL-W1R5MC1	–
22x8x6			3 mm	TL-W3MB1	TL-W3MB2	TL-W3MC1	TL-W3MC2
31x18x10			5 mm	TL-W5MB1	TL-W5MB2	TL-W5MC1	TL-W5MC2
53x40x23			20 mm	–	–	TL-W20ME1	TL-W20ME2
31x18x10	■	–	5 mm	TL-W5F1	TL-W5F2	TL-W5E1	TL-W5E2

Specifications

Item		TL-W5MD_	TL-W1R5M_1	TL-W3M__	TL-W5M__	TL-W5E_/F_	TL-W20ME_
Sensing distance		5 mm ±10%	1.5 mm ±10%	3 mm ±10%	5 mm ±10%		20 mm ±10%
Response frequency		0.5 kHz	1 kHz min.	600 Hz min.	500 Hz min.	300 Hz min.	40 Hz min.
Power supply voltage (operating voltage)		12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.				10 to 30 VDC with a ripple (p-p) of 20% max.	12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.
Protective circuit		Surge absorber; short-circuit protection	Surge suppressor; power supply reverse polarity protection				
Ambient temperature		Operating/Storage: -25 to 70°C (with no icing or condensation)					
Degree of protection		IEC60529 IP67					
Material	Case	Heat-resistant ABS resin				Diecast aluminium	Heat-resistant ABS resin
	Sensing surface	Heat-resistant ABS resin					



Long distance inductive proximity sensor in plastic housing

The long sensing distance and simple installation on flat surfaces make the E2Q5 ideal for the detection of large metal objects for example in automotive assembly lines.

- M12 Plug-in connection
- Integrated short circuit and reverse polarity protection
- Active face positioning: Y-axis 15°, X-axis 90° increments

Ordering information

Connector versions (M12)

Size in mm (HxWxD)			Sensing distance	Active face	Output configuration	Order code (for M12 connector types)	
						Operation mode NO	Operation mode NO + NC
67x40x40	■	–	20 mm	Changeable	NPN	E2Q5-N20E1-M1	E2Q5-N20E3-M1
					PNP	E2Q5-N20F1-M1	E2Q5-N20F3-M1
	–	■	40 mm		NPN	E2Q5-N40ME1-M1	E2Q5-N40ME3-M1
					PNP	E2Q5-N40MF1-M1	E2Q5-N40MF3-M1

Specifications

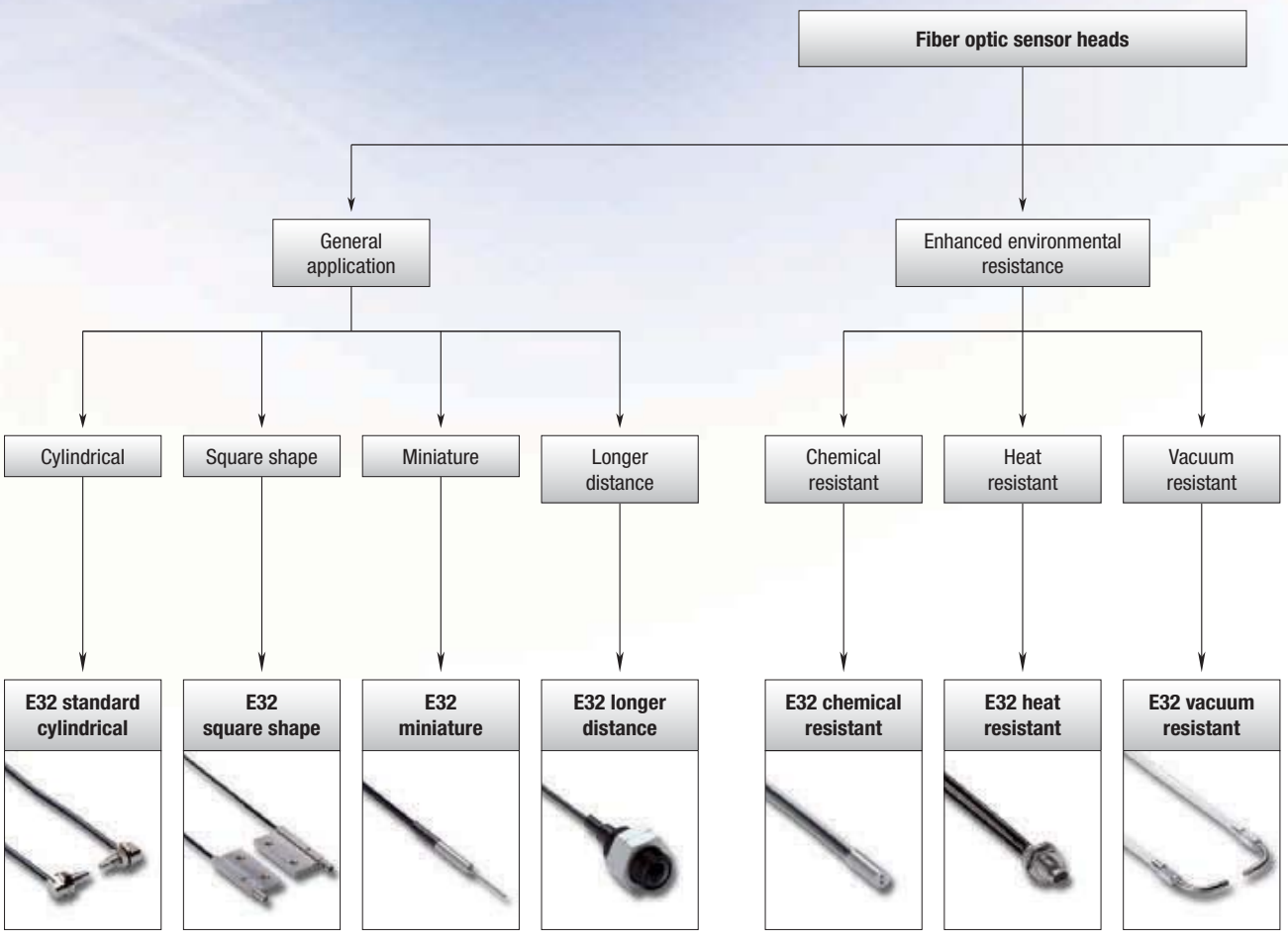
Item		E2Q5-N20__-M1	E2Q5-N40M_3-M1
Sensing distance		20 mm±10%	40 mm±10%
Response frequency		150 Hz	
Power supply voltage (operating voltage		10 to 30 VDC	
Protective circuit		Output reverse polarity protection, short-circuit protection	
Ambient temperature		Operating: -25 to 85°C	
Degree of protection		IEC 60529 IP 67; IP69k after DIN 40050 part 9	
Material	Case	PBT	
	Sensing face	PBT	

HIGH PRECISION IN SMALL SPACES

Precision and performance you can rely on

The requirements for fiber optic solutions can be very demanding particularly for applications with extreme temperatures and aggressive chemicals or for applications requiring highest precision with limited mounting space.
With the wide range of E32 fiber heads and the easy-usage amplifiers, the best performance fit for your application can be provided. The highest quality control procedures in design and manufacturing ensure that you get the precision and long service life that you can rely on.

- Long operational life
- Easy to install and adjust
- Wide portfolio range for best performance fit



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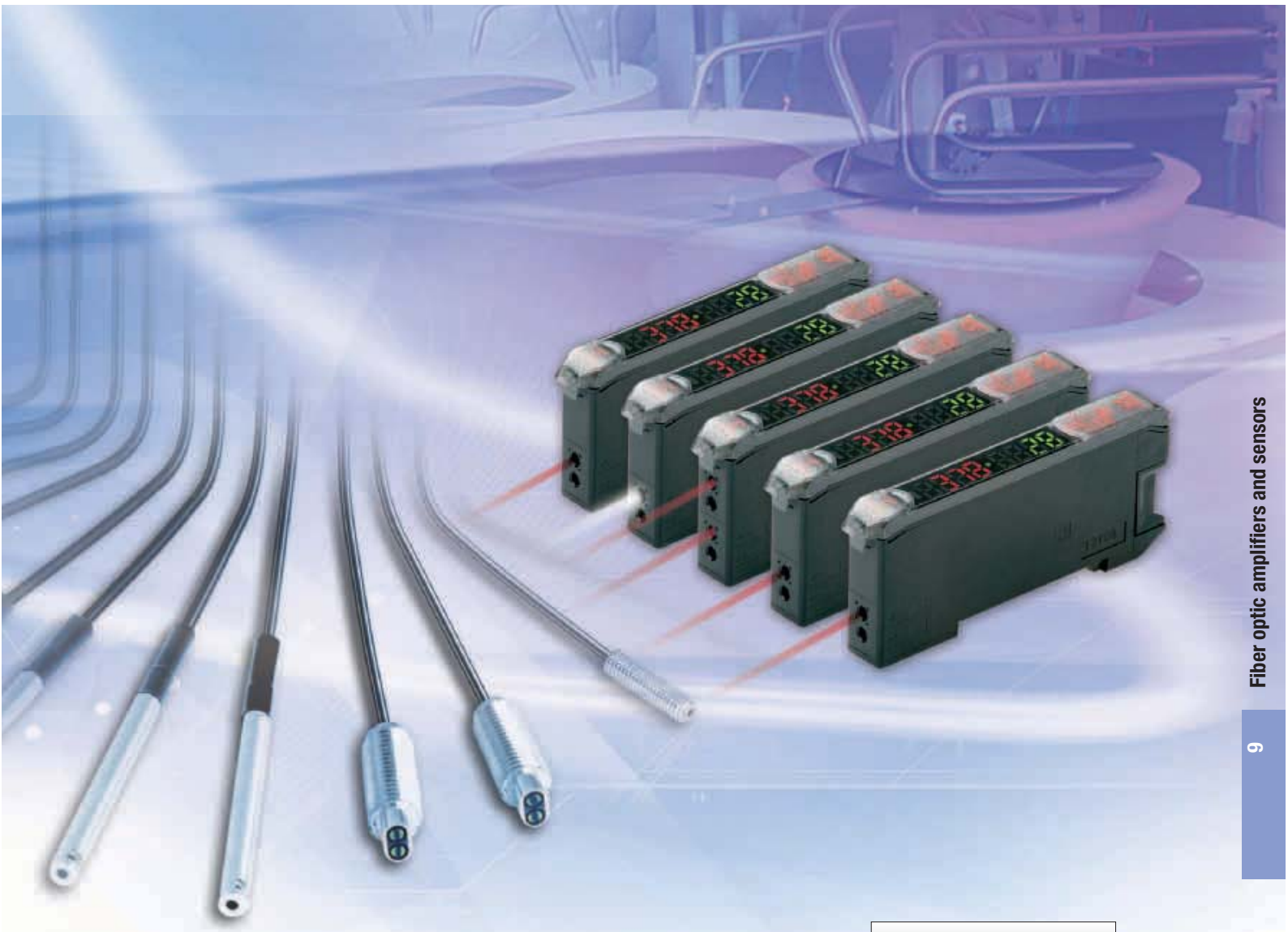

Fiber amplifiers

- **Special objects or installations**
  - Robot applications → **E32 robot**  Page 277
  - Precision detection → **E32 precision detection**  Page 278
  - Area monitoring → **E32 area monitoring**  Page 280
  - Special applications → **E32 special**  Page 281
- **Easy usage**
  - Easy-teach → **E3X-DA-SE-S**  Page 284
  - Potentiometer adjuster → **E3X-NA**  Page 285
- **Advanced functionality**
  - High functionality E3X-DA-S
  - High speed E3X-NA-F
  - Colour detection E3X-DAC-S
  - Double amplifier E3X-MDA
  - Infrared LED E3X-DAH-S

  

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Selection table

Fiber sensors

Type	Cylindrical	Square shape	Miniature	Longer distance	Chemical resistant
					
Model	**E32 Standard cylindrical**	**E32 Square shape**	**E32 Miniature**	**E32 Longer distance**	**E32 Chemical resistant**
Key features	• standard and high-flex fibers • sizes M3 to M6	• 3 or 4 mm thin housing • models in X,Y or Z-axis • direct mounting without bracket	• sizes from dia 500 µm to 3 mm • bendable sleeves	• built in focal lenses	• fluoroplastic cover or coating
Through-beam	760 mm	760 mm	750 mm	20 m	3 m
Retro-reflective	250 mm	–	–	1.5 m	–
Diffuse-reflective	300 mm	300 mm	300 mm	700 mm	170 mm
Page	269	270	271	273	274

Note: all sensing distances measured with E3X-DA-SE-S. Longer sensing distances up to 80% can be achieved with E3X-DA-S.

Fiber optic amplifiers

Type	Easy teach	Potentiometer adjuster	High functionality	Double amplifier
				
Model	**E3X-DA-SE-S**	**E3X-NA, E3X-SD**	**E3X-DA-S**	**E3X-MDA**
Key features	• 1 button object teaching • auto teach during operation	• easy adjustment by potentiometer	• High functionality signal processing (timer, counter, power tuning, etc. • up to 80% longer sensing distances	• 2 inputs and AND, OR signal comparison
Response time (min.)	1 ms	200 µs	1 ms (80 µs in high speed mode)	1 ms (130 µs in high speed mode)
Page	284	285	287	289

Heat resistant	Vacuum resistant	Robot applications	Precision detection	Area monitoring	Special application
					
E32 Heat resistant	**E32 Vacuum resistant**	**E32 Robot**	**E32 Precision detection**	**E32 Area monitoring**	**E32 Special**
• heat resistant up to 400°C	• leakage rate of $1x10^{-10}$ $Pa*m^3/s$ max	• free moving multicore fibers for >1 Mio bending cycles	• detection accuracy up to 100 µm • coaxial fibers • adjustable focal points	• area monitoring up to 70 mm	• detection of special objects (wafer, liquid level, flat glass, print mark,..)
1.3 m	480 mm	680 mm	1.9 m	2.8 m	1.9 m
–	–	–	–	–	–
280 mm	–	170 mm	300 mm	150 mm	300 mm
275	276	277	278	280	281

High speed	Colour/print mark detection	Infrared LED
		
E3X-NA-F	**E3X-DAC-S**	**E3X-DAH-S**
• Short turn on time of 20 µs	• White LED and RGB ratio comparison	• Infrared LED
20 µs	1 ms (60 µs in super high speed	1ms (55µs in super high speed
290	291	293

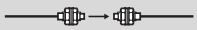
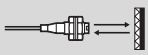


Standard cylindrical fiber sensor heads

The standard cylindrical fiber optic sensing heads provide reliable object detection, easy installation and long sensor lifetime for all general applications.

- High-flex fibers and 90° cable exit for fiber breakage prevention
- Models with hexagonal back for simplified one-nut mounting
- Sizes M3 to M6

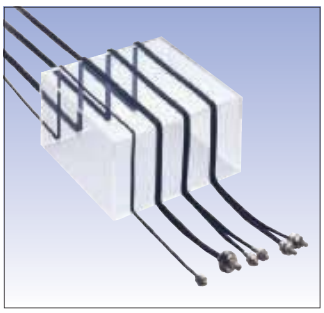
Ordering information

Sensor type	Size	Sensing distance (in mm) *1		Order code	
		Standard	High-flex	Standard	High-flex
	M4	760	530	E32-TC200 2M	E32-ET11R 2M
	M3	220	130	E32-TC200E 2M	E32-ET21R 2M
	M4	–	530	–	E32-T11N 2M
	M6	250 *2	–	E32-R21	–
	M6	300	170	E32-DC200 2M	E32-ED11R 2M
	M4	80	30	E32-D211 2M	E32-D211R 2M
	M3	80	30	E32-DC200E 2M	E32-ED21R 2M
	M6	–	170	–	E32-D11N 2M
	dia 6 mm	110	45	E32-D14L 2M	E32-D14LR 2M

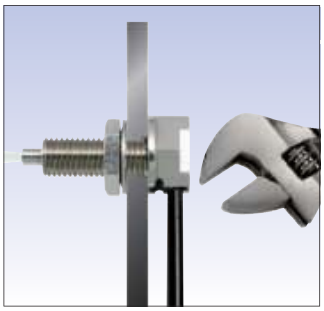
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Measured with E39-R3

Specifications

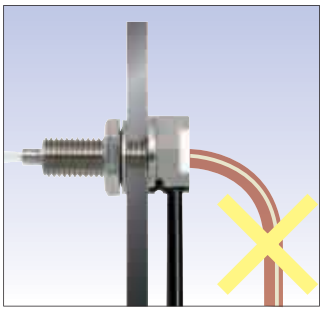
Item		Standard					High Flex			
		E32-_C200	E32-D14L	E32-_C200E	E32-D211	E32-R21	E32-E_R	E32-D14LR	E32-D211R	E32-_11N
Permissible bending radius		R25		R10			R1			
Cut to length		Yes								
Material	Head	Brass-nickel plated	Stainless steel	Brass-nickel plated	Stainless steel	Plastic (ABS)	Brass-nickel plated	Stainless steel		Brass-nickel plated
	Fiber	PMMA								
	Sheath	Polyethylene coating					PVC coating			
Degree of protection		IEC 60529 IP67								



Hi-flex multicore fibers for flexibility in installation without fiber breakage



Models with hexagonal back for simple one-nut mounting



Cable exit shifted by 90° for preventing fiber breakage

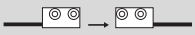
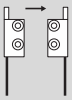


Square shape fiber sensor heads

The fiber heads in square shaped housing provide fast and easy installation on flat surfaces.

- Models with sensing direction in X, Y or Z axis
- 3 or 4mm thick housings for minimal height requirement
- Standard or high-flex fibers

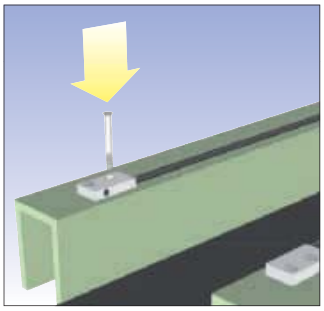
Ordering information

Sensor type	Size (in mm)	Sensing distance (in mm) *1		Order code	
		Standard	High-flex	Standard	High-flex
	15x8x3/ 15x10x4	760	560	E32-T15X 2M	E32-ETS10R 2M
	15x8x3	460	210	E32-T15Y 2M	E32-T15YR 2M
	15x8x3/ 15x9x4	460	480	E32-T15Z 2M	E32-ETS14R 2M
	15x10x3	300	170	E32-D15X 2M	E32-D15XR 2M
	15x10x3	100	40	E32-D15Y 2M	E32-D15YR 2M
	15x10x3/ 13x6x2.3	100	60	E32-D15Z 2M	E32-EDS24R 2M
	24.5x10x3	890	–	E32-A03-1 2M	–
	20.5x2x2	340	–	E32-A04-1 2M	–

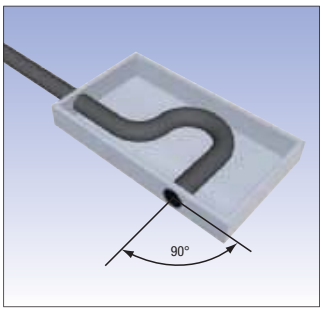
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

Specifications

Item		Standard		High flex	
		E32-_15	E32-A	E32-E	E32-_15_R
Permissible bending radius		R25	R10	R1	
Cut to length		Yes			
Material	Head	Aluminium	Brass-nickel plated	Aluminium	
	Fiber	PMMA			
	Sheath	Polyethylene coating			PVC coating
Degree of protection		IEC 60529 IP67	IEC 60529 IP50	IEC 60529 IP67	



Space saving and fast mounting without additional brackets



Precise positioning during manufacturing for 90° optics to achieve minimal tolerance variations in optical output axis angle

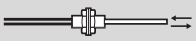


Miniature fiber sensor heads

The miniature fiber heads provide high accuracy in smallest spaces and reliable detection of minute objects.

- Sizes from dia 500 µm to 3 mm
- Side view models with precision axis alignment for highest accuracy
- Bendable sleeves for precision positioning

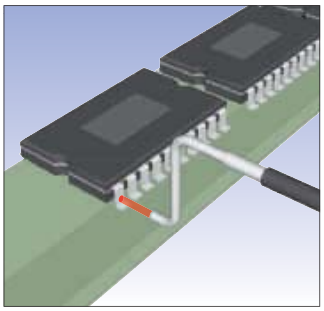
Ordering information

Sensor type	Size	Sensing distance (in mm)*1		Order code	
		Standard	High-flex	Standard	High-flex
	dia 3 mm	750	530	E32-T12 2M	E32-T12R 2M
	dia 2 mm	220	130	E32-T22 2M	E32-T22R 2M
	dia 1.5 mm	220	130	E32-T222 2M	E32-T222R 2M
	dia 1 mm	–	130	–	E32-T223R 2M
	dia 3 mm	460	210	E32-T14L 2M	E32-T14LR 2M
	dia 2 mm	340	–	E32-A04 2M	–
	dia 1 mm	130	50	E32-T24	E32-T24R 2M
 *2	dia 1.2 mm	750	530	E32-TC200B	E32-TC200BR
	dia 0.9 mm	220	130	E32-TC200F	E32-TC200FR
	dia 3 mm	80	30	E32-D22 2M	E32-D22R 2M
	dia 2 mm	75	40	E32-D32 2M	E32-D32R 2M
	dia 1.5 mm	–	30	–	E32-D22B 2M
	dia 2 mm	30	15	E32-D24	E32-D24R 2M
 *2	dia 2.5 mm	300	170	E32-DC200B 2M *3	E32-DC200BR *3
	dia 1.2 mm	80	30	E32-DC200F	E32-DC200FR
	dia 0.8 mm	–	16	–	E32-D33 2M
	dia 0.5 mm	–	3	–	E32-D331 2M

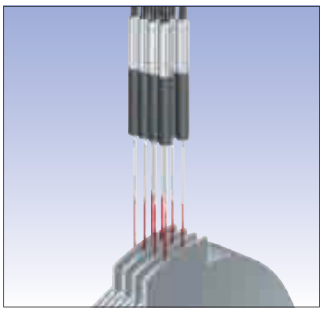
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Models with 40 mm sleeve instead of 90 mm sleeve are available by adding '4' to the order code at the end, e.g. E32-TC200B4
*3 Sleeve cannot be bent

Specifications

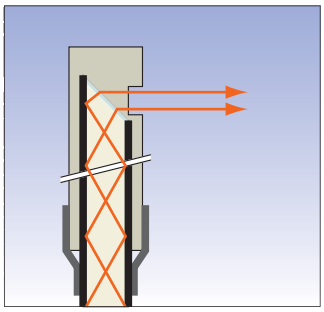
Item		Standard						High-flex				
		E32-DC200B E32-T12 E32-TC200B	E32-T14L	E32-D32	E32-D22 E32-T222 E32-TC200F	E32-D24 E32-DC200F E32-T22 E32-T24	E32-A04	E32-D32R E32-D33 E32-D331	E32-D22B	E32-DC200BR E32-T12R E32-TC200BR	E32-D22R E32-T222R E32-TC200FR	E32-D24R E32-DC200FR E32-T14LR E32-T22R E32-T223R E32-T24R
Permissible bending radius		R25			R10			R4		R1		
Cut to length		Yes										
Material	Head	Brass-nickel plated	Stainless steel		Brass-nickel plated	Stainless steel				Brass-nickel plated		Stainless steel
	Fiber	PMMA										
	Sheath	Polyethylene coating		PVC and polyethylene	Polyethylene coating			PVC and polyethylene	PVC coating		Polyethylene coating	
Degree of protection		IEC 60529 IP67					IEC 60529 IP50	IEC 60529 IP67				



Bendable metal sleeves for precision positioning of sensors after installation



0.5 mm diameter (diffuse reflective) or 1 mm diameter (through beam) when mounting space is crucial



High precision fiber surface cutting and positioning during manufacturing to achieve minimal deviation of optical output axis angle



Longer distance fiber sensor heads

With built-in focal lenses the longer distance fiber heads provide enhanced operational stability in dusty environments or long distance applications

- Sensing distance up to 20 m
- Built-in focal lens
- Sizes from dia 2 mm to M14

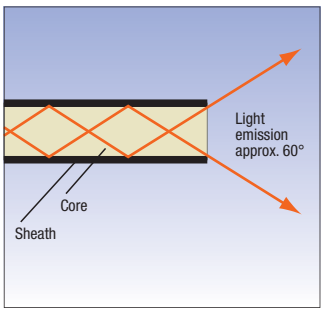
Ordering information

Sensor type	Size	Sensing distance (in mm)*1	Order code
	M14	20000	E32-T17L
	25,2x10.5x8 mm	3400	E32-T14
	M4	1330	E32-T11L 2M
	M3	680	E32-TC200A 2M
	dia 3 mm	1330	E32-T12L 2M
	dia 2 mm	440	E32-T22L 2M
Reflector	21.5x27x10 mm	1500 *2	E32-R16 2M
	22x17.5x9 mm	700	E32-D16 2M
	M6	400	E32-D11L 2M
	M4	130	E32-D21L 2M
	dia 3 mm	230	E32-D12 2M

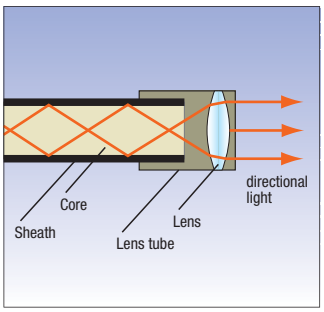
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Measured with E39-R1

Specifications

Item		Through-beam				Retro-reflective	Diffuse-reflective			
		E32-T17L/ E32-T14	E32-T11L/ E32-T12L	E32-TC200A	E32-T22L	E32-R16	E32-D16	E32-D11L	E32-D21L	E32-D12
Permissible bending radius		R25			R10	R25	R4	R25	R10	R25
Cut to length		Yes								
Material	Head	ABS	Brass-nickel plated		Stainless steel	ABS	Aluminium	Brass-nickel plated		Stainless steel
	Fiber	PMMA								
	Sheath	Polyethylene coating					PVC coating	Polyethylene coating		
Degree of protection		IEC 60529 IP67					IEC 60529 IP40	IEC 60529 IP67		



Light emission of conventional fibers



With built-in focal lenses, longer sensing distances can be achieved up to 5 times longer compared to conventional sensors



Chemical resistant fiber sensor heads

The chemical resistant fibers provide long sensor lifetime in areas with frequent cleaning, usage of chemicals and higher temperatures.

- fluoroplastic cover for highest chemical resistance
- temperature resistance up to 200°C

Ordering information

Sensor type	Size	Sensing distance (in mm)*1	Key feature	Order code
	M4	680	Fluororesin coating	E32-T11U 2M
	dia 5 mm	3,000	Fluororesin cover	E32-T12F
	dia 5 mm	1,400	Fluororesin cover	E32-T14F 2M
	M6	170	Fluororesin coating	E32-D11U 2M
	dia 6 mm	95	Fluororesin cover	E32-D12F
	dia 6 mm	40	Fluororesin cover	E32-D14F 2M
	dia 6 mm	700	Fluororesin cover Heat resistant to 200°C	E32-T81F-S 2M
	dia 5 mm	3,000	Fluororesin cover Heat resistant to 150°C	E32-T51F 2M

*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

Specifications

Item		Fluororesin coating		Full fluororesin cover	Full fluororesin cover and heat resistance	
		E32-T11U	E32-D11U	E32-_12F/E32-_14F	E32-T51F	E32-T81F-S
Permissible bending radius (in mm)		1	4	40		10
Cut to length		yes				no
Material	Head	Brass-nickel plated		Fluororesin		
	Fiber	PMMA				Glass
	Sheath	Fluororesin coating		Fluororesin cover		
Degree of protection		IEC60529 IP67				



The fluororesin cover provides highest chemical resistance for longest lifetime in frequently cleaned environments like aseptic filling in pharmaceutical applications

200°C

Enhanced temperature resistant models

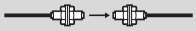
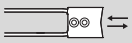


Heat resistant fiber sensor heads

The wide range of heat resistant fibers provides long sensor lifetime with highest protection in demanding environments

- heat resistant up to 400°C
- sizes from dia 2 mm to M6
- models for long distances or high detection accuracy

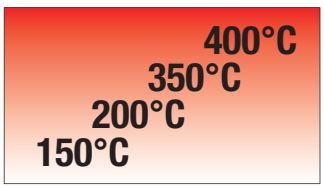
Ordering information

Sensor type	Size	Sensing distance (in mm)*1	Key feature	Order code	
				For E3X-DA-S teachable amplifier	for E3X-NA amplifier with potentiometer adjustment
	M4	450	-40°C to 150°C	E32-ET51 2M	
	M4	280	-40°C to 200°C	E32-T81R-S 2M	
	M4	450	-60°C to 350°C	E32-T61-S 2M	
	dia 2 mm	230	-40°C to 150°C	E32-T54 2M	
	dia 3 mm	1300	-40°C to 200°C	E32-T84S-S 2M	
	M6	230	-40°C to 150°C	E32-ED51 2M	
	M6	280	-40°C to 200°C	E32-D81R-S 2M	E32-D81R 2M
	M6	150	-60°C to 350°C	E32-D61-S 2M	E32-D61
	M4	60	-40°C to 400°C	E32-D73-S 2M	E32-D73
	23x20x9 mm	35	-40°C to 150°C	E32-A09H 2M	
	30x24x9 mm	25	-40°C to 300°C	E32-A09H2 2M	
	25x18x5 mm	5	-40 to 300°C	E32-L64 2M	
	36x18x5 mm	18		E32-L66 2M	

*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

Specifications

Item		-40°C to 150°C			-40°C to 200°C		-40°C to 300°C		-60°C to 350°C	-40°C to 400°C
		E32-E_51	E32-T54	E32-A09H	E32-_ 81_	E32-T84_	E32-A09H2	E32-L6_	E32-_ 61_	E32-D73_
Permissible bending radius (in mm)		R35			R10	R25				
Cut to length		Yes			No					
Material	Head	Brass-nickel plated	Stainless steel	Aluminium	Stainless steel					
	Fiber	PMMA			Glass					
	Sheath	Fluoro resin				Stainless steel spiral coating	Stainless steel tube	Stainless steel spiral coating		Stainless steel tube
Degree of protection		IEC 60529 IP67						IP40	IEC 60529 IP67	



The temperature range optimised material selection provides best application fit and value - performance ratio.



Stainless steel spiral coating for flexibility with highest mechanical protection.



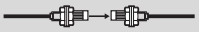
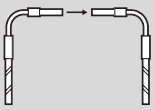
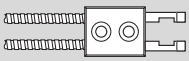
Vacuum resistant fiber sensor heads

For applications in cleanest and hot environments the vacuum resistant fibers and connecting flanges provide long operational lifetime and vacuum integrity.

- Leakage rate of $1x10^{-10}$ $Pa*m^3/s$ max
- Heat resistance up to 200°C
- Detergent resistant fluororesin or stainless steel fiber sheath

Ordering information

Sensor

Sensor type	Size	Sensing distance (in mm) *1	Temperature range	Order code
	M4	200	-40°C to 120°C	E32-T51V 1M
	dia 3	130	-40°C to 120°C	E32-T54V 1M
	dia 3	480	-60°C to 200°C	E32-T84SV 1M
	33x18x5.5 mm	5	-40°C to 70°C	E32-G86V-13M

*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

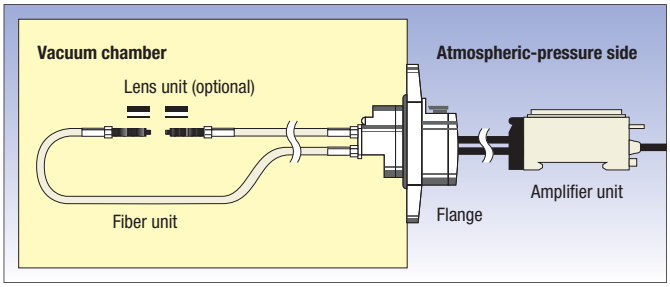
Flange

Type	Size	Order code
4 channel flange	80x80x49 mm	E32-VF4
1 channel flange	96 x dia30 mm max.	E32-VF1
Flange-to-amplifier connection fiber	2 m length	E32-T10V 2M

Specifications

Item		Fiber sensor heads				Flange-to-amplifier fiber
		E32-T51V	E32-T54V	E32-T84SV	E32-G86V-1	E32-T10V
Permissible bending radius		R30		R25		
Cut to length		No				Yes
Material	Head	Aluminium	Stainless steel			–
	Fiber	Glass				PMMA
	Sheath	Fluororesin coating		Stainless steel spiral coating		Polyethylene coating
Degree of protection		–				

Item		Flange	
		E32-VF1	E32-VF4
Leakage rate		1x10-10 $Pa*m^3/s$ max	
Ambient temperature		-25°C to 55°C	
Material	Flange	Aluminium and stainless steel	Aluminium
	Seal	Fluorocarbon rubber (viton)	



The vacuum resistant fiber heads and flanges are sealed to prevent gas leakage into vacuum areas

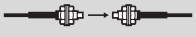
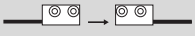


Robot application fiber sensor heads

For applications on frequently or fast moving parts, the robot fibers reduce the risk of fiber breakage with a guaranteed operational life of more than 1 million bending cycles

- Free moving multicore fibers for > 1 million bending cycles
- Square shapes for easy surface installation
- Cylindrical sizes from dia 1.5 mm to M6

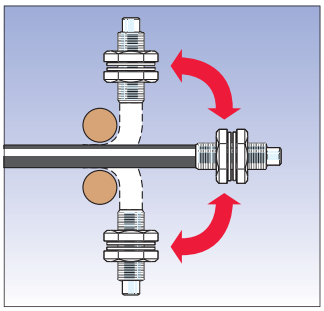
Ordering information

Sensor type	Size	Sensing distance (in mm) *1	Order code
	M4	680	E32-T11 2M
	M3	200	E32-T21 2M
	dia 3 mm	680	E32-T12B
	dia 2 mm	200	E32-T221B
	dia 1.5 mm	200	E32-T22B
	15x18x3 mm	680	E32-T15XB 2M
	M6	170	E32-D11 2M
	M4	70	E32-D21B 2M
	M3	30	E32-D21 2M
	dia 1.5 mm	30	E32-D22B 2M
	15x10x3 mm	170	E32-D15XB 2M

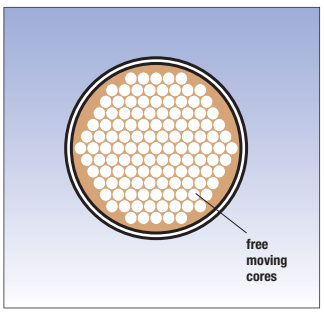
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

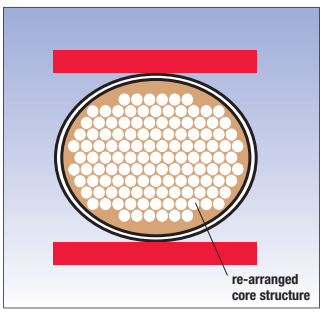
Specifications

Item		Square	Cylindrical			
		E32-D15XB E32-T15XB	E32-T21	E32-D11 E32-T11	E32-D21 E32-T12B E32-T22B	E32-D21B E32-D22B E32-T221B
Permissible bending radius		R4				
Cut to length		Yes				
Material	Head	Aluminium	Brass-nickel plated			Stainless steel
	Fiber	PMMA				
	Sheath	PVC coating	Polyethylene coating	PVC coating		
Degree of protection		IEC 60529 IP67				



Guaranteed more than 1 million bending operations





Free moving fiber cores prevent fiber breakage and light intensity loss when the fiber is bent.

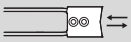


Precision detection fiber sensor heads

Highest precision in design and manufacturing of the fibers and focal lenses ensure highest beam and spot accuracy allowing the detection of smallest objects and height differences of less than 100 µm.

- Coaxial fibers with focal lenses for spot diameters of 100 µm
- Through-beam models with highly focused beam and precise optical axis alignment
- Limited reflective models for height difference detection of less than 100 µm

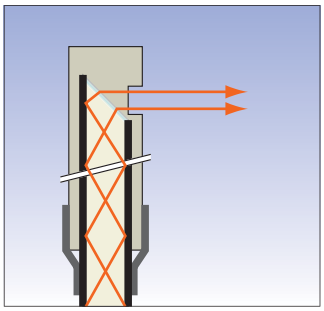
Ordering information

Sensor type	Preferred usage	Size	Key feature	Sensing distance (in mm)[*1]	Order code
	Precise thin object detection / accurate positioning	dia 3 mm	- High precision optical axis adjustment - Very focused beam	1900	E32-T22S
		dia 3 mm		890	E32-A03 2M
		dia 2 mm		340	E32-A04 2M
	Very small object detection	M6	–	300	E32-CC200 2M [*2]
		M3	Spot dia 0.5 mm	20	E32-EC31 2M
		M3	Spot dia 0.2 mm	17	E32-EC41 1M + E39-F3B
		M3	Spot dia 0.1 mm	7	E32-EC41 1M + E39-F3A-5
		dia 3 mm	–	150	E32-D32L
		dia 2 mm	–	75	E32-D32 2M [*2]
		M6	- 90° cable exit - Hexagonal back	170	E32-C11N 2M
		M3		25	E32-C31N 2M
		M3	Small spot	8-25 m adjustable	E32-EC31 2M + E39-EF51
		dia 2 mm	Spot dia 0.5 to 1 mm	6-15 mm adjustable	E32-D32 2M + E39-F3A
		dia 2 mm	Spot dia 0.1 to 0.6 mm	6-15 mm adjustable	E32-C42 1M + E39-F3A
	Precision height difference detection / flat surface detection	23x20x9 mm	–	35	E32-A09 2M
		16x18x4 mm	–	7.2	E32-L25L [*2]
		20x20x5 mm	–	3.3	E32-L25
		18x20x4 mm	Precise spot e.g. for detection of a flat / reflective surface	4	E32-L24L [*2]
		34x25x8 mm	High precision (detection accuracy 100 µm)	2.4	E32-EL24-1 2M
	Object detection in front of background	20.5x14x3.8 mm	Wide beam e.g. for object detection on a flat surface	15	E32-L16-N 2M

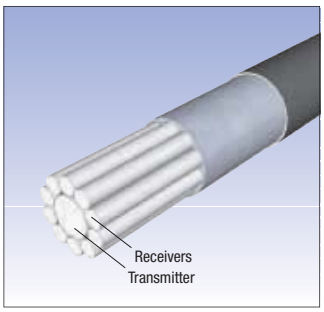
[*1] Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
[*2] A high flex cable version is available. Add 'R' to the order code, e.g. E32-CC200R

Specifications

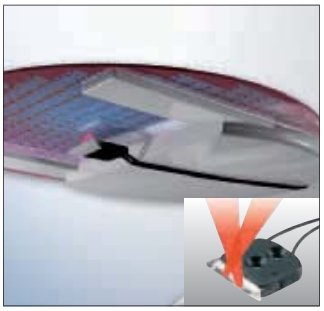
Item		Through-beam			Diffuse reflective (coaxial)			Limited reflective				
		E32-T22S	E32-A03	E32-A04	E32-C11N E32-C31N	E32-CC200	E32-C42 E32-D32/-D32L E32-EC31/-EC41	E32-EL24-1	E32-L24L E32-L25L	E32-L25	E32-L16	E32-A09
Permissible bending radius		R10	R1	R10	R4	R25		R10		R25		
Cut to length		Yes										
Material	Head	Brass-nickel plated		Stainless steel	Brass-nickel plated		Brass nickel plated	Brass-nickel plated and aluminium	Polycarbonate	ABS		Aluminium
	Fiber	PMMA										
	Sheath	PVC coating	Polyethylene coating		PVC coating	PVC, polyethylene and polyolefin coating		Polyethylene coating				
Degree of protection		IEC 60529 IP67	IEC 60529 IP50		IEC 60529 IP67			IEC 60529 IP50		IEC 60529 IP40		



Focused and high precision beam alignment during manufacturing. Models available with typical deviation of 0.1° for very precise detections



Coaxial fibers provide an enhanced positioning and detection accuracy and allow the easy adjustment of the focal point using adjustable focal lenses



Limited reflective fibers utilize the total reflection on shiny surfaces to detect height differences or objects at a pre-defined distance.

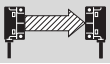
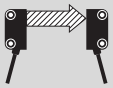
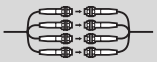


Area monitoring fiber sensor heads

The area monitoring fibers allow the detection of objects passing anywhere through the detection range and can be used for height comparisons of different objects.

- Area monitoring up to 70 mm height
- Multi-beam sensor with 4 separate heads for flexible detection points
- Standard or high flex fibers

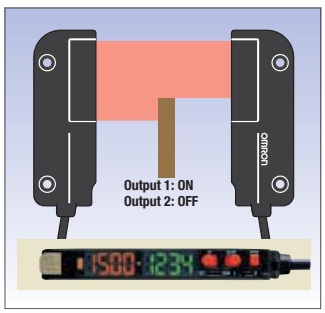
Ordering information

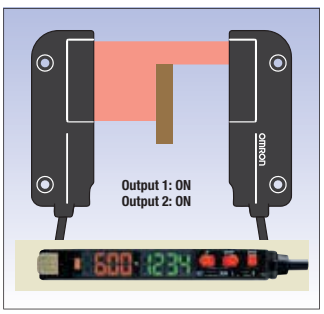
Sensor type	Area height (in mm)	Sensing distance (in mm)*1		Order code	
		Standard	High-flex	Standard	High-flex
	10	2800	–	E32-T16	–
 *2	11	1100	840	E32-T16P	E32-T16PR 2M
	30	1800	1300	E32-T16W 2M	E32-T16WR 2M
	50	–	1800	–	E32-ET16WR-2 2M
	70	–	2000	–	E32-ET16WR-1 2M
	11	1000	750	E32-T16J 2M	E32-T16JR 2M
	4* separate M3 heads	610	–	E32-M21	–
	11	–	150	–	E32-D36P1 2M

*1 Sensing distance measured with E3X-DA-SE-S. Longer sensing distances up to 80% can be achieved with E3X-DA-S.
*2 Sensing area aligned to top of housing.

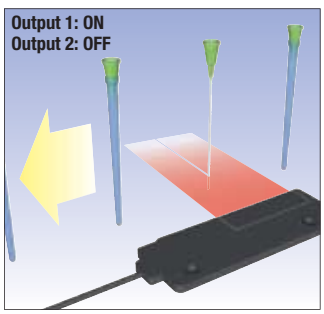
Specifications

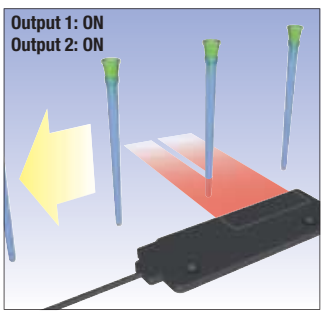
Item		Standard			High-flex		
		E32-T16	E32-M21	E32-T16J E32-T16P E32-T16W	E32-D36P1	E32-ET16WR-1 E32-ET16WR-2	E32-T16JR E32-T16PR E32-T16WR
Permissible bending radius		R25		R10	R4	R1	
Cut to length		Yes					
Material	Head	ABS	Stainless steel	ABS	Brass-nickel plated	Aluminium	ABS
	Fiber	PMMA					
	Sheath	Polyethylene coating		PVC coating	Polyethylene coating		PVC coating
Degree of protection		IEC 60529 IP67		IEC 60529 IP50		IEC 60529 IP54	IEC 60529 IP50





The two outputs of the E3X-DA-S can be used to detect two different light levels





In combination with the twin output function of the E3X-DA-S amplifier, the diffuse reflective area monitoring fibers can detect very small objects (e.g. needles) and a second state (e.g cover present). The area beam compensates for position variations at high speed.

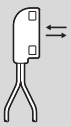
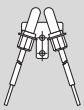


Special application fiber sensor heads

For a wide range of special applications, the task optimised fiber heads provide best fitting sensing performance and adaptation to environmental requirements.

- Detection of special objects (liquids, labels on foils, etc.)
- Fiber heads ideal for colour mark detection
- Fiber heads optimised for special tasks (wafer mapping, flat glass, etc.)

Ordering information

Sensor type		Size	Sensing distance (in mm) *1	Comment	Order code
	Fork shape	36x24x8 mm	10	–	E32-G14
	Wafer mapping	dia 3	1900	–	E32-T22S
		dia 3	1300	–	E32-T24S
		dia 3	890	–	E32-A03 2M
		dia 2	340	–	E32-A04 2M
	Liquid level sensor	dia 6	liquid contact	Liquid level contact	E32-D82F1 4M
		15x23.5x5 mm	tube contact	Liquid level detection through transparent tube or container	E32-D36T 2M
	Glass detection	21x16.5x4 mm	8 mm	Metal housing	E32-A10 2M
		20.5x14x3.8 mm	15 mm	Plastic housing	E32-L16-N 2M
	Glass detection in hot environment	25x18x5 mm	5 mm	Heat resistant up to 300°C	E32-L64 2M
		36x18x5.5 mm	18 mm		E32-L66 2M
	Glass detection in wet processes	38.5x39x17.5 mm	8 to 20 (recommended: 11 mm)	- Heat resistant up to 85°C - Recommended usage with 'tough mode' of E3X-DA-S	E32-L11FS 2M
	Label detection	20x20x5 mm	7.2	–	E32-L25L
		18x20x4 mm	4	–	E32-L24L
		34x25x8 mm	2.4	Very precise spot (detection accuracy 100 µm)	E32-EL24-1 2M
	Colour/print mark detection *2	M6	300	Recommended for standard colour and colour mark detection	E32-CC200 2M
		29x25.5x11.2	55	Recommended for challenging colour and colour mark detection	E32-L15 2M
		23x20x9 mm	35		E32-A09 2M
		M3	20	Recommended for very precise colour mark detection	E32-EC31 2M

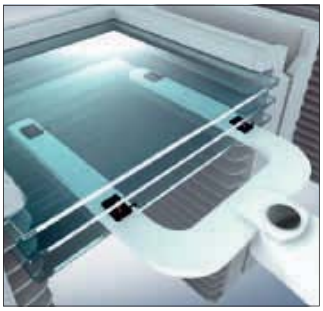
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 With amplifier E3X-DAC-S

Specifications

Item		E32-D82F1 E32-L11FS	E32-G14	E32-A09	E32-L15	E32-CC200	E32-EC31	E32-L66	E32-EL24-1	E32-T24S	E32-L24L E32-L25L	E32-A04	E32-D36T	E32-A03	E32-ET11R E32-T22S
Permissible bending radius		R40	R25						R10				R4	R1	
Cut to length		Yes						No	Yes						
Material	Head	PFA	ABS	Aluminium	PAR	Brass-nickel plated	Stainless steel		Brass-nickel plated and aluminium	Stainless steel	Brass-nickel plated	Stainless steel	ABS	Brass-nickel plated	
	Fiber	PMMA						Glass	PMMA						
	Sheath	Polyethylene coating				PVC, polyethylene and polyolefin coating		Stainless steel spiral coating	Polyethylene coating	PVC coating	Polyethylene coating		PVC coating	Polyethylene coating	PVC coating
Degree of protection		IEC 60529 IP67		IEC 60529 IP40	IEC 60529 IP50	IEC 60529 IP67		IEC 60529 IP40	IEC 60529 IP67		IEC 60529 IP50		IEC 60529 IP67	IEC 60529 IP50	IEC 60529 IP67



In combination with the colour/mark detection amplifier E3X-DAC-S, the recommended fibers for colour/mark detection fiber heads allow the detection of standard and challenging marks even for complex designs or with small contrast.



The limited reflective fiber heads for glass detection provide a stable detection of flat glass in standard, hot or wet environment. The shapes and materials are optimized to provide the best value - performance ratio depending on the requirements.



For the detection of very small height differences like labels on foils in applications where space is crucial, the small sized limited reflective sensors provide accurate detection up to 100µm resolution.

Accessories

Shape	Type	Comment	Order code
	Focal lens	- Extends sensing distance by more than 500% - For M4 Through beam fibers E32-TC200, E32-ET11R, E32-T11 (fits M2.6 thread) - 2 pcs per set	E39-F1
	Focal lens (side view)	- For M4 through beam fibers E32-TC200, E32-ET11R, E32-T11, E32-T61-S, E32-T81R-S (fits M2.6 thread) - Temperature range -40°C to +200°C - 2 pcs per set	E39-F2
	Focal lens (variable)	- For precision detection with E32-D32	E39-F3A
	Focal lens	- For precision detection with E32-EC41	E39-F3A-5
	Focal lens	- For precision detection with E32-EC41	E39-F3B
	Focal lens (side view, variable)	- For precision detection with E32-EC31	E39-EF51
	Focal lens (heat resistant)	- Extends sensing distance by more than 500% - For M4 through beam fibers E32-ET51, E32-T61, E32-T61-S, E32-T81R, E32-T81R-S (fits M4 thread) - Temperature range -60°C to +350°C - 2 pcs per set	E39-EF1-37-2
	Focal lens (vacuum resistant, heat resistant)	- Fits E32-T51V and E32-T54V (fits M2.6 thread) - 2 units per set - Heat resistant up to 120°C	E39-F1V
	Fiber cutter	- Included in applicable fiber	E39-F4
	Thin fiber attachment	- Amplifier adapter for thin fibers - Included in applicable fiber (2 sets)	E39-F9
	Sleeve bender	- For E32-TC200B(4) - For E32-TC200F(4) - For E32-DC200F(4)	E39-F11
	Single fiber extension connector	- Fiber extension connector for 2.2 mm dia standard fibers - One unit	E39-F10
	Dual fiber extension connector	- For fibers with dia 2.2	E39-F13
		- For fiber with dia 1.0	E39-F14
		- For fibers with dia between 1.0 and 2.2	E39-F15
	Protective spiral tube *1	- For M3 diffuse type sensors - Length 1 m	E39-F32A
		- For M3 through beam type sensors - Length 1 m	E39-F32B
		- For M4 through beam type sensors - Length 1 m	E39-F32C
		- For M6 diffuse type sensors - Length 1 m	E39-F32D
	Fiber on roll *2	- Dia 2.2 mm - Standard monocore, 10 mm bending radius - -40°C to 80°C	E32-E01 100M
		- Dia 1.1 mm - Standard monocore, 15 mm bending radius - -40°C to 80°C	E32-E02 100M
		- Dia 2.2 mm - High flex multicore, 1 mm bending radius - -40°C to 80°C	E32-E01R 100M
		- Dia 1.1 mm - High flex multicore, 1 mm bending radius - -40°C to 80°C	E32-E02R 100M
		- Dia 2.2 mm - High temperature monocore, 20 mm bending radius - -60°C to 150°C	E32-E05 100M

*1 Protective spiral tubes with 0.5 m length are available. Add '5' to order code…e.g. E39-F32A5
*2 Fiber length 100 m on a roll - cuttable



Digital fiber amplifier with one button teaching

E3X-DA-SE-S allows easy one button setting and provides the best value performance ratio for standard applications.

- Auto-teaching during machine operation
- Digital double display for incident level and threshold
- Object or 2-point teaching within a few seconds

Ordering information

Item	Order code	
	NPN output	PNP output
Pre-wired	E3X-DA11SE-S 2M	E3X-DA41SE-S 2M
Fiber amplifier connector*1	E3X-DA6SE-S	E3X-DA8SE-S

*1 Order connector separately. For M8 connector models see E3X-DA-S.

Specifications

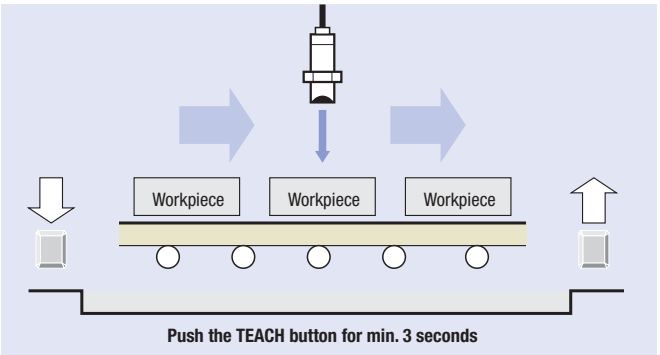
Item		E3X-DA_SE-S
Light source (wave length)		Red LED (650 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention
Response time		Operation or reset: 1 ms
Sensitivity setting		Teaching and digital up/down keys
Functions	Auto power control	High speed control method for emission current
	Mutual interference prevention	Optical communications sync, possible for up to 10 units
Digital displays		Incident level + threshold

Fiber amplifier connectors

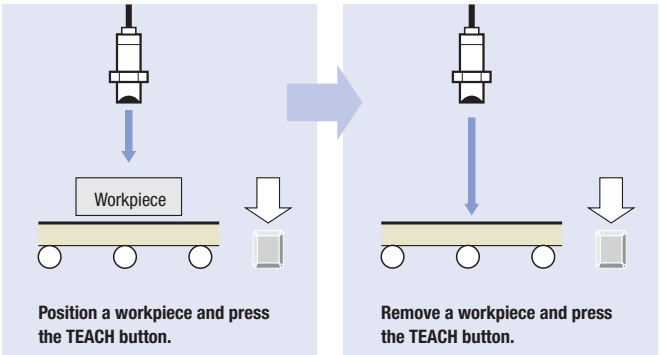
Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M



1-button auto-teaching



2-point teaching





Fiber amplifier for basic applications

The E3X-NA/E3X-SD is the ideal amplifier for basic fiber applications providing quick & easy adjustment.

- Easy adjustment with potentiometer (E3X-NA) or up/down keys (E3X-SD)
- Mutual interference prevention
- Enhanced water resistance types
- Bar graph display

Ordering information

Pre-wired

Item	Order code (for pre-wired types with 2 m cable length)			
	Manual adjuster		Up/down keys	
	NPN output	PNP output	NPN output	PNP output
Standard	E3X-NA11 2M	E3X-NA41 2M	E3X-SD11 2M	E3X-SD41 2M
Enhanced water resistance	E3X-NA11V 2M	E3X-NA41V 2M	-	-

Connector version

Item	Order code			
	NPN output	PNP output	Up/down keys	
			NPN output	PNP output
Standard (fiber amplifier connector)*1	E3X-NA6	E3X-NA8	E3X-SD6	E3X-SD8
Enhanced water resistance (M8 4-pin connector)	E3X-NA14V	E3X-NA44V	-	-

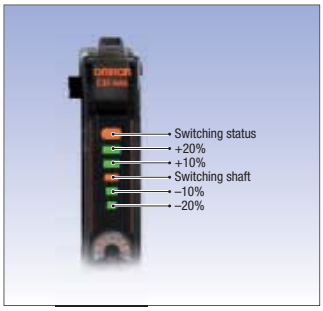
*1 Order connector separately.

Specifications

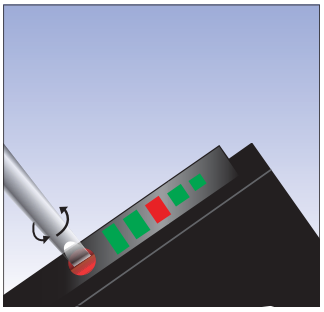
Item		Manual adjuster		Up/down keys
		Standard	Enhanced water resistance	Standard
Output	NPN output	E3X-NA11, E3X-NA6	E3X-NA11V, E3X-NA14V	E3X-SD6/E3X-SD11
	PNP output	E3X-NA41, E3X-NA8	E3X-NA41V, E3X-NA44V	E3X-SD8/E3X-SD41
Light source (wave length)		Red LED (680 nm)		Red LED (620 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.		
Protective circuit		Reverse polarity protection, output short-circuit protection, mutual interference prevention		
Response time		Operation or reset: 200 µs max.		
Sensitivity setting		8-turn endless adjuster (potentiometer)		Digital up/down keys
Functions		OFF-delay timer: 40 ms (fixed)		ON/OFF delay timer: 10 ms (fixed)
Degree of protection		IEC 60529 IP50 (with protective cover attached)	IEC 60529 IP66 (with protective cover attached)	IEC 60529 IP50 (with protective cover attached)

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M



Bargraph display with light level, switching status and threshold indicators



Simple sensitivity adjustment by potentiometer



High functionality digital fiber amplifier

High functionality digital fiber amplifier with advanced timing, LED power control and signal processing functionality providing highest detection accuracy and stability even for the most challenging objects and settings.

- Power tuning function to adjust the received light to a maximum, minimum or pre-defined value
- Auto power and threshold adjustment functions for highest operational stability
- Two outputs for window monitoring or two level detections (e.g. object + object state change)

Ordering information

Item		Function								Order code	
		Power tuning	Timer	Auto-threshold compensation (ATC)	Twin output	External input	Differential operation	Wet process 'tough mode'	Power saving 'Eco' functions (display/LED off)	NPN	PNP
Pre-wired		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	E3X-DA21-S 2M	E3X-DA51-S 2M
Fiber amplifier connector*1		Yes	Yes	Yes	Yes - selectable		Yes	Yes	Yes	E3X-DA7-S	E3X-DA9-S
M8 connector	3 pin	Yes	Yes	*2						E3X-DA13-S	E3X-DA43-S
	4 pin									E3X-DA14-S	E3X-DA44-S

*1 Order fiber amplifier connector E3X-CN_ separately
*2 For fiber amplifiers with these functions and connecting with M8 connector, order the fiber amplifier connector models above and the pigtail connector E3X-CN21-M3J-2 with 30cm PVC cable and M8 plug.

Specifications

Item		Pre-wired models	Fiber amplifier connector models	M8 connector models
		E3X-DA_1-S	E3X-DA7-S, E3X-DA9-S	E3X-DA_3-S, E3X-DA_4-S
Light source (wave length)		Red LED (650 nm)		Red LED (625 nm)
Power supply voltage		12 to 24 VDC ± 10%; ripple (p-p): 10% max		
Protective circuits		Reverse polarity protection, output short circuit protection, mutual interference prevention*1		
Response time	Super-high-speed mode	80 µs for operation and reset max.		55 µs for operation and reset max.
	Standard mode	1 ms for operation and reset		
	High resolution mode	4 ms for operation and reset		
	Wet process 'tough mode'	16 ms for operation and reset		*2
Sensitivity setting		Teaching and digital up/down keys		
Functions	Power tuning	Light emission power and reception gain, digital control method		
	Timer	OFF-delay, ON-delay, one-shot timer. 1 ms to 5 s (1 to 20 ms set in 1-ms increments, 20 to 200 ms set in 10-ms increments, 200 ms to 1 s set in 100-ms increments, and 1 to 5 s set in 1 s-increments)		
	Auto power control (APC)	LED power monitoring and auto-control function by LED emission current adjustment.		
	Active-threshold control (ATC)	Monitoring of received light average and deviation adjustment of threshold for output 1		*2
	Twin output	Output 1: incident level Output 2: incident level or alarm output	Output 1: incident level Output 2: incident level or alarm output (not available if external input is used)	*2
	External input	External teach or function trigger (power tuning, emitter OFF, ATC start)	External teach or function trigger (power tuning, emitter OFF, ATC start) (not available if output 2 is used)	*2
	Differential operation	Single edge or double edge detection mode		*2
	Wet process 'tough mode'	Incident level triggering on floating average of received light.		*2
	Power saving 'Eco' functions	LED: ON/OFF switchable (external input) Display: ON/ DIM / OFF selectable		*2
Digital display		Incident level + threshold or user specific		

*1 The reverse polarity protection for the pre-wired and fiber amplifier connector models is for the power supply and the output. For M8 connector models the reverse polarity protection is for the power supply.
*2 For fiber amplifiers with these functions and connecting with M8 connector, order the fiber amplifier connector models above and the pigtail connector E3X-CN21-M3J-2 with 30 cm PVC cable and M8 plug.

Fiber amplifier connectors

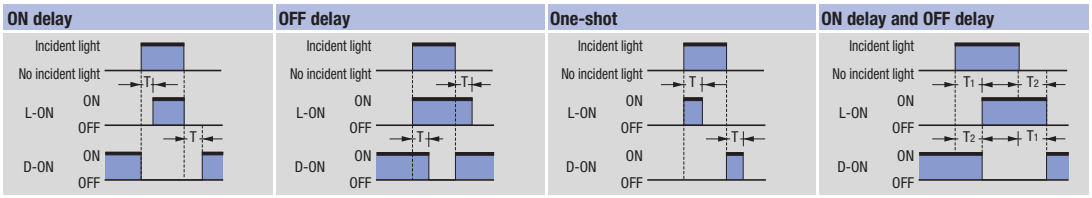
Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

Power tuning



Increase or decrease the LED power and received light intensity to the desired level e.g. a pre-defined value.

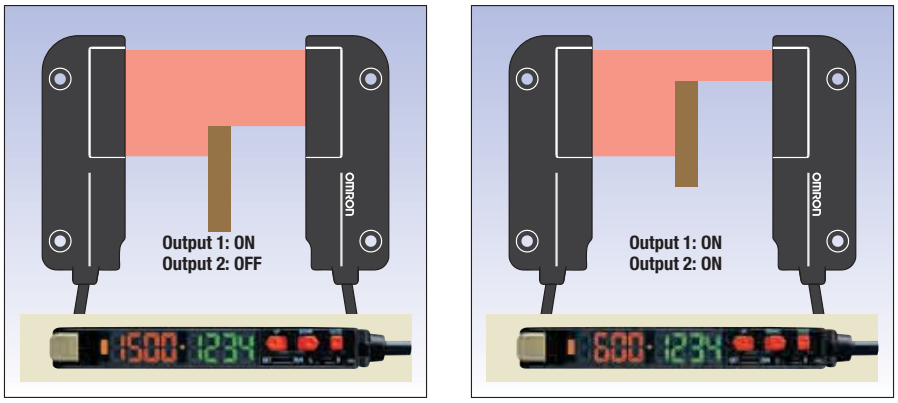
Timer functions



T_1: ON-delay set time
T_2: OFF-delay set time
T_1 and T_2 can be set separately.

Adjust the output signal length and timing

Twin output



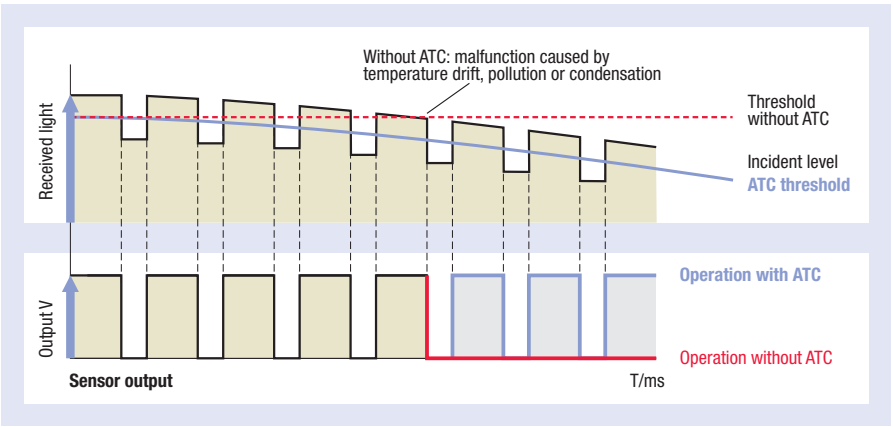
The two outputs can be used to detect two different light levels

Differential detection



Triggering on single or double signal edges

Active-threshold control (ATC)



Higher signal stability compensating for power reduction caused by temperature drift, dust or condensation.



2-in-1 digital fiber amplifier

E3X-MDA incorporates 2 digital fiber amplifiers in one slimline housing. For applications requiring the detection of two objects simultaneously the E3X-MDA provides an easy to use operation saving space and set-up time.

- Two digital amplifiers in one slimline housing
- Twin output models – on/off or area (between two threshold values)
- Signal comparison functions (AND, OR, etc.)

Ordering information

Item	Functions	Order code	
		NPN output	PNP output
Pre-wired	AND/OR output	E3X-MDA11	E3X-MDA41
Fiber amplifier connector*1	AND/OR output	E3X-MDA6	E3X-MDA8

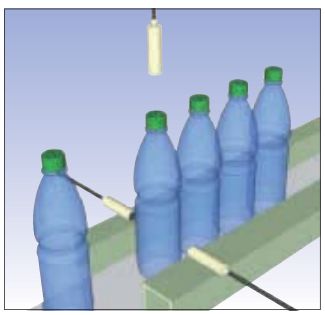
*1 Order connector separately.

Specifications

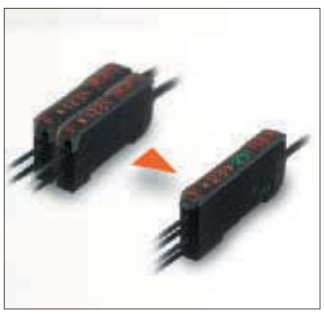
Item		E3X-MDA
Light source (wave length)		Red LED (650 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention
Response time	Super-high-speed mode	130 µs for operation and reset respectively
	Standard mode	1 ms for operation and reset respectively
	High-resolution mode	4 ms for operation and reset respectively
Sensitivity setting		Teaching and digital up/down keys
Functions	Power tuning	Light emission power and reception gain, digital control method
	Timer function	Select from OFF-delay, ON-delay, or one-shot timer. 1 ms to 5 s (1 to 20 ms set in 1-ms increments, 20 to 200 ms set in 10-ms increments, 200 ms to 1 s set in 100-ms increments, and 1 to 5 s set in 1 s-increments)
	I/O settings	Output setting (select from channel 2 output, AND, OR, leading edge sync, falling edge sync, or differential output)
Digital displays		Select from the following: Incident level for channel 1 + incident level for channel 2, Incident level + threshold, incident level percentage + threshold, incident light peak level + no incident light bottom level, minimum incident light peak level + maximum no incident light bottom level, long bar display, incident level + peak hold, incident level + channel

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M



The AND and OR functionality for the two fiber channels allows simple signal processing without the need for a PLC.
This allows the addition of sensor checks to machines without reprogramming the PLC.



The 2 in 1 amplifier replaces two standard amplifiers reducing space requirements and hardware cost.



Fast response amplifier with potentiometer

The E3X-NA_F provides a very fast response time and is the ideal amplifier for high speed detection applications.

- Short turn on time of only 20 µs
- Easy adjustment with potentiometer
- Bar graph display

Ordering information

Item	Order code	
	NPN output	PNP output
Pre-wired	E3X-NA11F	E3X-NA41F
M8 connector (4 pin)	-*1	E3X-NA44FV

*1 Contact your Omron representative

Specifications

Item			
	NPN output	E3X-NA11F	-
	PNP output	E3X-NA41F	E3X-NA44FV
Light source (wave length)		Red LED (680 nm)	
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.	
Protective circuit		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation: 20 µs max. Reset: 30 µs max.	
Sensitivity adjustment		8-turn endless adjuster (potentiometer)	
Functions		OFF-delay timer: 40 ms (fixed)	
Degree of protection		IEC 60529 IP50 (with protective cover attached)	IEC 60529 IP66 (with protective cover attached)



E3X-DAC-S colour (RGB) digital fiber amplifier

The E3X-DAC-S detects the colour and returned light intensity of a mark or object and compares it with a stored RGB ratio or intensity value. The RGB ratio or contrast difference allows the stable detection of differently coloured, black, grey or white marks or objects.

- White LED for colour independence
- Fast response time of min. 60 µs
- Timer function for variable ON or OFF delay up to 5 s
- Remote teaching or easy one-button teaching

Ordering information

Pre-wired

Item	Functions	Order code (for pre-wired types with 2 m cable length)	
		NPN output	PNP output
Standard models	Timer, response speed change	E3X-DAC11-S	E3X-DAC41-S
Advanced models	Standard models + simultaneous determination (2 colours) AND/OR output, remote setting	E3X-DAC21-S	E3X-DAC51-S

Connector versions

Item	Functions	Order code	
		NPN output	PNP output
Standard models (fiber amplifier connector) *1	Timer, response speed change	E3X-DAC6-S	E3X-DAC8-S

*1 Order connector separately

Specifications

Item		Standard models	Advanced models
		E3X-DAC1, E3X-DAC4 E3X-DAC6, E3X-DAC8	E3X-DAC2, E3X-DAC5
Light source (wave length)		White LED (420 to 700 nm)	
Number of registered colours		1	2 (simultaneous determination)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.	
Protective circuits		Power supply reverse polarity protection, output short circuit protection, output reverse polarity protection, mutual interference prevention	
Response time	Super-high-speed mode	Operation or reset: 60 µs	Operation or reset: 120 µs
	High-speed mode	Operation or reset: 300 µs	Operation or reset: 600 µs
	Standard mode	Operation or reset: 1 ms	Operation or reset: 2 ms
	High-resolution mode	Operation or reset: 4 ms	Operation or reset: 8 ms
Sensitivity setting (colour registration, allowable range)		Teaching (one-point teaching or teaching with/without workpiece) or manual adjustment	
Functions	Detection mode	Automode (automatic selection of C-mode or I-mode) C-mode (RGB ratio) I-mode (light intensity) Mark mode (Intensity and ratio of RGB values)	
	Operating mode	ON for match (ON for same colour as registered colour) or ON for mismatch (ON for different colour from registered colour)	
	Timer function	Timer type: OFF delay, ON delay, or one-short Timer time: 1 ms to 5 s (variable)	
	Control outputs	–	Output for each channel, AND output, and OR output
	Remote control	–	One-point teaching, teaching with/without workpiece, zero reset, and light emission OFF
Degree of protection		IEC60529 IP50 (with protective cover attached)	

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M



Detection of differently coloured objects or marks by RGB ratio comparison.



Contrast detection by returned light intensity comparison.



Digital fiber amplifier with infrared LED

The digital fiber amplifiers with infrared LED are ideal for water detection applications or where visible light is not desired.

- Infrared LED
- LED power control and signal processing function

Ordering information

Pre-wired

Item	Order code (for pre-wired types with 2 m cable length)	
	NPN output	PNP output
Infrared light	E3X-DAH11-S 2M	E3X-DAH41-S 2M

Connector version

Item	Order code	
	NPN output	PNP output
Infrared light (fiber amplifier connector)*1	E3X-DAH6-S	E3X-DAH8-S

*1 Order connector separately

Specifications

Amplifier units with cables

Item			
		NPN output	E3X-DAH11-S, E3X-DAH6-S
		PNP output	E3X-DAH41-S, E3X-DAH8-S
Light source (wave length)			Infrared LED
Power supply voltage			12 to 24 VDC ±10%, ripple (p-p) 10% max.
Protective circuits			Power supply reverse polarity protection, output short circuit protection, mutual interference prevention
Response time	Super-high-speed mode	NPN	48 µs for operation and 50 µs for reset
		PNP	53 µs for operation and 55 µs for reset
	Standard mode		1 ms for operation and reset respectively
	High-resolution mode		4 ms for operation and reset respectively
Sensitivity setting			Teaching and digital up/down keys
Functions	Power tuning		Light emission power and reception gain, digital control method
	Timer function		Select from OFF-delay, ON-delay, or one-shot timer. 1 ms to 5 s (1 to 20 ms set in 1-ms increments, 20 to 200 ms set in 10-ms increments, 200 ms to 1 s set in 100-ms increments, and 1 to 5 s set in 1 s-increments)
Digital displays			Incident level + threshold or user specific

Fiber amplifier connectors

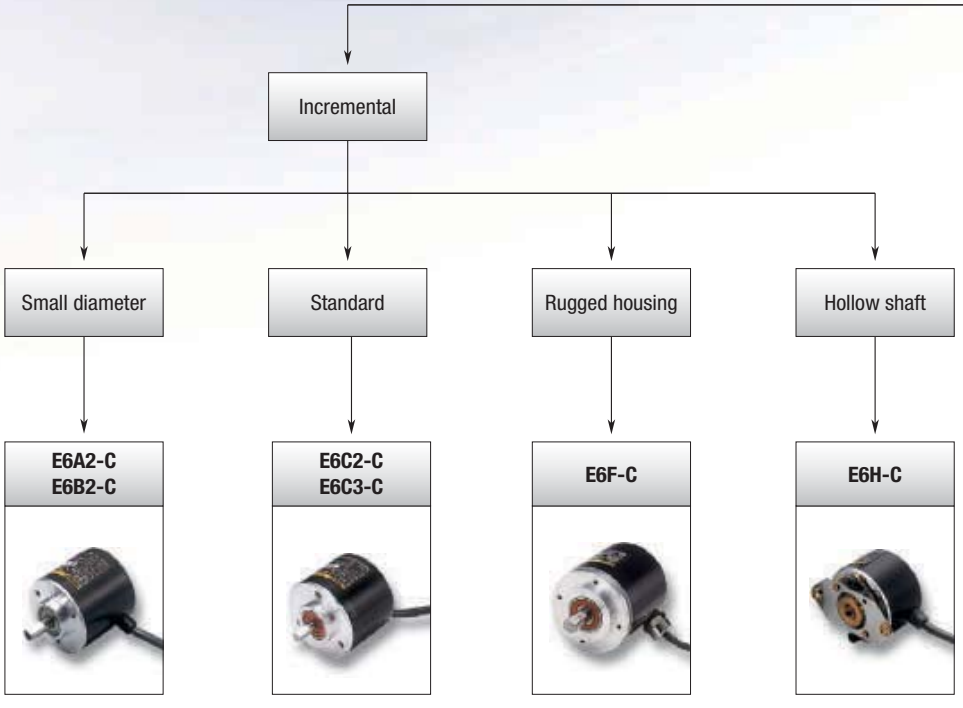
Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

ACCURACY AND ROBUSTNESS MADE RELIABLE

Close the loop – angle, position and velocity on hand

Rotary encoders create information which represent the movement of your application. To meet challenging demands, Omron offers a wide range of absolute and incremental encoders.

- Wide resolution variety
- Models with rugged housing
- Models for multi- turn applications





Rotary encoders

- Absolute
  - Multi-turn → **E6C-N**



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  - Standard → **E6C3-A**



Page 300

  - Rugged housing → **E6F-A**



Page 300

Output		Incremental				
						
Model		E6A2-C	E6B2-C	E6C2-C	E6C3-C	E6F-C
Type		Small diameter shaft		Standard		Rugged housing
Resolution range	Min	10			100	
	Max	500	2,000		3,600	1,000
Output	NPN	■	■	■	■	■
	PNP	–	■	■	–	–
Size dia. in mm		25	40	50	50	60
Max force	radial	10	30	50	80	120
	axial	5	20	30	50	50
IP rating	IP50	■	■	–	–	–
	IP64	–	–	■	–	–
	IP65	–	–	–	■	■
Max. rotation frequency		5,000	6,000		5,000	
Page		297		298		

Output		Incremental	Absolute			
						
Model		E6H-C	E6C-N	E6C3-A	E6F-A	
Type		Hollow shaft	Multiturn	Standard	Rugged housing	
Resolution Range	Min	300	500	6	256	
	Max	3,600	500	1,024		
Output	NPN	■	■	■	■	
	PNP	–	–	■	■	
Size dia. in mm		40 (hollow)	50 (full and hollow)	50	60	
Max force	radial	29.4	30	80	120	
	axial	4.9	20	50	50	
IP rating	IP50	■	■	–	–	
	IP64	–	–	–	–	
	IP65	–	–	■	■	
Max. rotation frequency		10,000	1,500	5,000	5,000	
Page		299		300		

■ Standard ☐ Available – No/not available



Incremental rotary encoder in miniature housing

The E6A family of rotary encoders features a small sized dia 25 mm housing.

- Small sized dia 25 mm housing

Ordering information

Size dia. in mm	Output phase	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
25	A	5 to 12 VDC	NPN voltage output	10, 20, 60, 100, 200, 300, 360, 500	E6A2-CS3E
			NPN open collector	10, 20, 60, 100, 200, 300, 360, 500	E6A2-CS3C
		12 to 24VDC			E6A2-CS5C
	A, B	5 to 12 VDC	NPN voltage output	100, 200, 360, 500	E6A2-CW3E
			NPN open collector	100, 200, 360, 500	E6A2-CW3C
		12 to 24VDC			E6A2-CW5C
	A, B, Z	5 to 12 VDC	NPN voltage output	100, 200, 360, 500	E6A2-CWZ3E
			NPN open collector	100, 200, 360, 500	E6A2-CWZ3C
		12 to 24VDC			E6A2-CWZ5C

E6B2-C



Incremental rotary encoder in compact housing

The E6B family of incremental rotary encoders features a housing size dia 40 mm.

- Line driver output models available

Ordering information

Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
40	5 to 24 VDC	NPN open collector output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500 1,800, 2,000	E6B2-CWZ6C
	12 to 24VDC	PNP open collector output	100, 200, 360, 500, 600, 1,000, 2,000	E6B2-CWZ5B
	5 to 12 VDC	NPN voltage output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 1,000, 1,200, 1,500 1,800, 2,000	E6B2-CWZ3E
	5 VDC	Line driver output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 1,000, 1,024, 1,200, 1,500 1,800, 2,000	E6B2-CWZ1X



Incremental rotary encoder with enhanced water resistance

The E6C family of dia 50 mm incremental rotary encoders features an improved water resistance compared to standard models.

- IP64F or IP65F drip-proof, oil-proof construction

Ordering information

	Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
Standard models	50	5 to 24 VDC	NPN open collector output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ6C
		12 to 24VDC	PNP open collector output	100, 200, 360, 500, 600, 1,000, 2,000	E6C2-CWZ5B
		5 to 12 VDC	NPN voltage output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ3E
		5 VDC	Line driver output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ1X
8 dia. tough model		12 to 24VDC	Complimentary output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ5GH
		5 to 12 VDC	NPN voltage output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ3EH
		5 to 12 VDC	Line driver output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ3XH

E6F-C



Incremental rotary encoder in rugged housing

The E6F family of dia 60 mm rotary encoders features a rugged housing.

- Strong shaft for max 120 N in radial direction and max 50 N in thrust direction)
- Water- and oil-proof structure (IP65F)

Ordering information

Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
60	12 to 24VDC	Complimentary output	100, 200, 360, 500, 600, 1000	E6F-CWZ5G



Incremental rotary encoder with hollow shaft

The E6H family of incremental encoders features a dia 40 mm housing with hollow shaft.

- Wide operating voltage range from 5 to 24 VDC
- Line drive output available (100 m max.)

Ordering information

Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
40	5 to 24 VDC	Open collector output	300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6H-CWZ6C
	5 to 12 VDC	Voltage output	300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6H-CWZ3E
	5 to 12 VDC	Line drive output	300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6H-CWZ3X

E6C-N



Multi-turn rotary encoder

The E6C-N rotary encoder provides a multi-turn function for applications with rotations over 360°.

- Multi-turn function

Ordering information

Size dia. in mm	Name	Order code
50	Shaft model with cable	E6C-NN5C
	Hollow-shaft model with cable	E6C-NN5CA
	Shaft model with connector	E6C-NN5C-C
	Hollow-shaft model with connector	E6C-NN5CA-C



Absolute rotary encoder with enhanced water resistance

The E6C family of dia 50 mm incremental rotary encoders features an improved water resistance compared to standard models.

- IP65F drip-proof, oil-proof construction

Ordering information

Size dia. in mm	Power supply voltage	Output form	Output code	Resolution (pulse/rotation)	Connection method	Order code
50	12 to 24VDC	NPN open collector output	Gray code	256, 360	Connector type	E6C3-AG5C-C
				256, 360, 720, 1,024	Pre-wired type	E6C3-AG5C
			Binary	32, 40		E6C3-AN5C
			BCD	6, 8, 12		E6C3-AB5C
		PNP open collector output	Gray code	256, 360, 720, 1,024		E6C3-AG5B
			Binary	32, 40		E6C3-AN5B
			BCD	6, 8, 12		E6C3-AB5B
	5 VDC	NPN voltage output	Binary	256		E6C3-AN1E
	12 VDC					E6C3-AN2E

E6F-A



Absolute rotary encoder in rugged housing

The E6F family of dia 60 mm rotary encoders features a rugged housing.

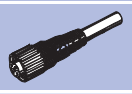
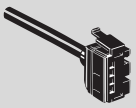
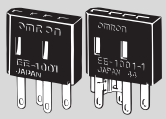
- Stronger shaft and higher durability (120 N in radial direction and 50 N in thrust direction) than previous E6F Encoders
- Drip-proof construction meets IP64F standards
- High resolution models (1024 pulses max. per revolution)
- Faster response for high speed control applications (grey code: 20 kHz)

Ordering information

Size dia. in mm	Power supply voltage	Output form	Output code	Resolution (pulses/revolution)	Connection method	Order code
60	12 to 24 VDC	NPN open collector	BCD	360	Pre-wired	E6F-AB5C
					Connector type*1	E6F-AB5C-C
			Gray code	256, 360, 720, 1,024	Pre-wired	E6F-AG5C
		PNP open collector	BCD	360	Pre-wired	E6F-AB5B
			Gray code	256, 360, 720, 1,024	Pre-wired	E6F-AG5B

*1 For extension cables order E69-DF5 (5M) or E69-DF10 (10M).

Cable connectors

Size	Shape	Type	Features	Material		Order code	
				Nut	Cable		
M8		**General purpose (screw)**	• 3 pin (LED optionally)	Brass (CuZn)	PVC 2 m PUR 2 m	XS3F-M08PVC3S2M XS3F-M08PUR3S2M	XS3F-M08PVC3A2M XS3F-M08PUR3A2M
			• 4pin		PVC 2 m PUR 2 m	XS3F-M08PVC4S2M XS3F-M08PUR4S2M	XS3F-M08PVC4A2M XS3F-M08PUR4A2M
		**Detergent resistant**	4 pin	Stainless steel (SUS316L)	PVC 2 m	Y92E-S08PVC4S2M-L	Y92E-S08PVC4A2M-L
		**Robotic**	4 pin	Brass (CuZn)	Robotic PVC 2m	XS3F-M421-402-R	XS3F-M422-402-R
M12		**General purpose (screw)**	• 3 wire (LED optionally)	Brass (CuZn)	PVC 2 m PUR 2 m	XS2F-M12PVC3S2M XS2F-M12PUR3S2M	XS2F-M12PVC3A2M XS2F-M12PUR3A2M
			• 4 wire		PVC 2 m PUR 2 m	XS2F-M12PVC4S2M XS2F-M12PUR4S2M	XS2F-M12PVC4A2M XS2F-M12PUR4A2M
			• 5 wire		PVC 2 m PUR 2 m	XS2F-M12PVC5S2M XS2F-M12PUR5S2M	XS2F-M12PVC5A2M XS2F-M12PUR5A2M
		**Detergent resistant**	4 wire	Stainless steel (SUS316L)	PVC 2 m	Y92E-S12PVC4S2M-L	Y92E-S12PVC4A2M-L
		**105°C Heat resistant**	4 wire	Stainless steel (SUS316L)	Heat resistant PVC 2 m	XS2F-E421-D80-E	XS2F-E422-D80-E
		**Twist & click**	4 wire	Nickel plated Zinc	PVC 2m PUR 2m	XS5F-D421-D80-A XS5F-D421-D80-P	XS5F-D422-D80-A XS5F-D422-D80-P
		**Robotic**	4 wire	Brass (CuZn)	Robotic PVC 2M	XS2F-D421-D80-R	XS2F-D422-D80-R
Fiber amplifier (E3X) connector		**Fiber amplifier connectors**	Special fiber connector - 4 wire	PBT	PVC 2 m	E3X-CN21	
			Special fiber connector + M8 plug	Plug: Zinc diecast	PVC 30 cm with M8 4-pin plug	E3X-CN21-M3J-2 0.3M	
			Special fiber connector + M12 plug		PVC 30 cm with M12 4-pin plug	E3X-CN21-M1J 0.3M	
Photo-micro-sensor (EE-SX) connector		**Pin connector for soldering**	For dark-on usage	Nylon	-	EE-1001	
			For light-on usage			EE-1001-1	
		**Cable connector**	standard cable		PVC 2m	EE-1010 2M	
			robotic cable			EE-1010-R 2M	
		**Cable connector for sensors with cable+plug (pigtail)**	robotic cable			EE-1016-R	

Note: Refer to accessory datasheet E26E for specification details and the extended product range including:
- AC 2-wire cable connectors
- DC 2-wire cable connectors
- T-connectors
- customisable plugs and connectors
- I/O field boxes
- Flame retardant cable connectors
- welding spatter proof cable connectors

ZERO DEFECT FOR PRODUCTION THAT NEVER FAILS!

Customer satisfaction highly depends on the quality of the finished goods or the performance of the machine in use. Zero defect during production is a key criterion for success. The speed of production lines is getting increasingly faster. On the other hand the machines should never fail. But can you trust the result?

The necessity for quality inspection and control in any production process is no longer a discussion point. The cost of non quality is much higher than the investment, which pays for itself within a short time. In order to further reduce the number and cost of defective goods, there is a clear trend from having just one inspection at the end of the process towards several quality checks within or even at the beginning of the process. This effect further increases the demand for accurate, reliable and fast inspection systems.

Omron offers a complete portfolio of measurement and inspection systems using different technologies and principles, but following the same guideline: keep it simple for the user.

Quality control & Inspection – Table of contents

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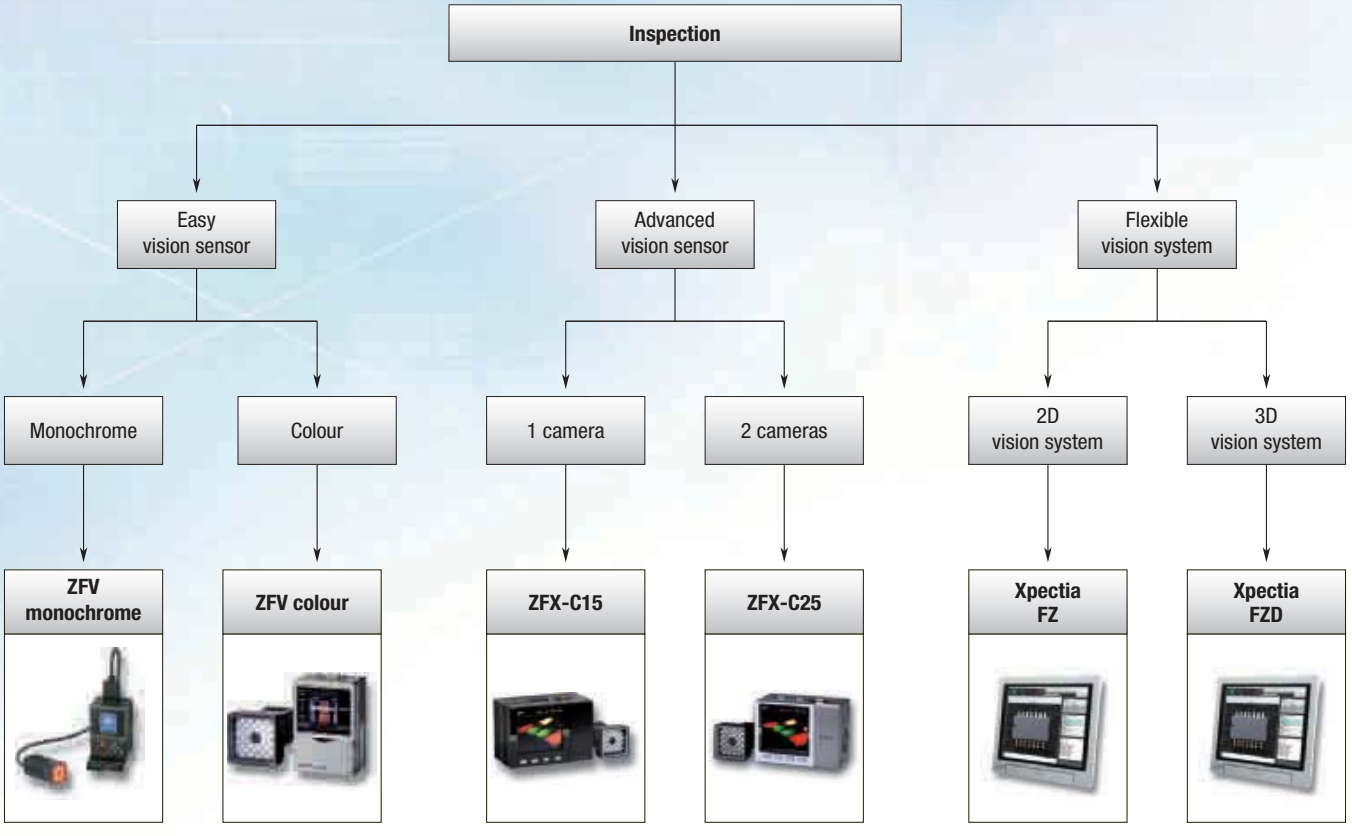
EASY VISION: TOUCH, COMMUNICATE AND GO

Built-in LCD monitor for setup and immediate image visualization

The easy vision sensor ZFV solves the applications by an intuitive teach & go procedure. For advanced applications features such as multiple inspections, position correction, intelligent image filtering and ethernet communication are offered by the ZFX. The high end is addressed by the new FZ.

- Easy vision – intuitive user interfaces
- Communication – centralized set-up & inspection via Ethernet
- High-end vision – PC-based system (Windows-CE inside) for challenging applications
- True colour – close to human eye identification and image processing



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Ident system

- Barcode
  - **V500-R5**  Page 325
- Barcode & Datamatrix
  - **V400-R1**  Page 323
- Datamatrix
  - Fixed
    - **V400-F**  Page 322
  - Handheld
    - **V400-H**  Page 324
- RFID
  - **V680**  Page 326

Selection table

			Vision sensors			
						
Selection criteria	Model		ZFV Monochrome	ZFV Colour	ZFX-C15	ZFX-C25
	Number of connectable cameras		1	1	1	2
	Camera type		Digital black&white	Digital colour	Digital Colour or black & white	Digital Colour or black & white
	Resolution (usable) Display dots		468×432	468x432	up to 608 x 464	up to 608 x 464
	Working distance mm	Min.	34	34	Depends on selected head and lens	Depends on selected head and lens
		Max.	194	227	–	–
	Field of view mm	Min.	5	5	Depends on selected head and lens	Depends on selected head and lens
		Max.	50	150	–	–
	Number of storable configurations		8	8	32	32
	Number of tools/configuration		1	1-8	32	128
	Cycle time		app. 4-25 ms depending on setup	app. 7-25 ms depending on setup	Depends on setup and used tools	Depends on setup and used tools
	IP-Rating camera head		IP65	IP65/IP67	Depend on head, up to IP65/IP67	Depend on head, up to IP65/IP67
	Supply voltage		24 VDC			
Features	Image processing tools		Up to seven (area, brightness, width, position, character, count, pattern)	Up to seven (hue, area, brightness, width, position, character, count, pattern)	App. 20 image processing tools, plus position compensation, calculations and others, in -CD version: Barcode + Datamatrix	App. 30 image processing tools, plus position compensation, calculations and others, flexible search, graphical search, grouping, labelling, in -CD version: Barcode + Datamatrix
	Image preprocessing		–	–	Smoothing, erosion, dilation, edge enhancement, median, sharpen and background suppression	Smoothing, edge enhancement, edge extraction, erosion, dilation, median, background suppression
	Optional macro programming interface		–	–	–	–
	User interface		On board 'teach&go'	On board 'teach&go'	On board "teach&go" touch screen	On board "teach&go" touch screen
	Optional PC configuration software		–	–	–	–
	Security tools		–	–	–	–
Communication	RS-232C		Optional via ZS-DSU	■	■	■
	USB		–	■	■	■
	Ethernet		–	–	■	■
	Number of digital I/O		5 in/3 out	5 in/3 out	12 in/22 out	12 in/22 out
	Page		309	311	314	314

			Vision systems	Code reader		
						
Selection criteria	Model		XpectiaFZ	V400-F	V400-R1	V400-H
	Number of connectable cameras		4	1	1	1
	Camera type		Digital colour & black&white	Digital	Digital	Digital black&white
	Resolution (usable) Display dots		from 640x480 to 2448 x 2044	512x484	1280x1024	–
	Working distance mm	Min.	depends on selected lens	100 mm	60 mm	40 mm
		Max.	–	200 mm	–	40 mm
	Field of view mm	Min.	depends on selected lens	14x18 mm	52x41 mm	5x5 mm
		Max.	–	31x42 mm	–	30x30 mm
	Number of storable configurations		–	–	–	limited by SD card
	Number of tools/configuration		limited only by memory space	–	–	–
	Cycle time		Depends on setup & tools	Depends on code side, type and orientation	Depends on code, type and orientation	–
	IP-Rating camera head		IP20	IP67	IP54	IP64
	Supply voltage		–	24 VDC	5 VDC	5 VDC
Features	Image processing tools		App. 70 processing tools for object or defect recognition, measurements, calculations, input/output, display and more. Includes also character recognition and high precision edge code inspection tools.	Data Matrix, ECC200, 10x10 to 64x64, 8x18 to 16x48, QR Code (Models 1, 2), 21x21 to 57x57 (Versions 1 to 10)	Barcode: JAN/EAN/UPC (A, E), CODE39, NW-7, ITF Industrial2of5, CODE93, CODE128 (including EAN128), RSS DataMatrix (ECC200), QR Code, Micro QR Code, PDF417, RSS	Data Matrix, ECC200, 10x10 to 64x64, 8x18 to 16x48, QR Code (Models 1, 2), 21x21 to 57x57 (Versions 1 to 10)
	Image preprocessing		Smoothing, edge enhancement, edge extraction, erosion, dilation, median, background suppression - multiple passes, configurable	Smoothing, Dilation, Erosion, and Median.	–	–
	Optional macro programming interface		■	–	■	–
	User interface		■	–	point to point GUI	–
	Optional PC configuration software		■	–	■	–
	Security tools		■	–	Yes, user log in, 3 user levels, change history log, etc., via optional PC software	–
Communication	RS-232C		■	■	■	–
	USB		■	–	–	–
	Ethernet		■	–	–	–
	Number of digital I/O		11 in/26 out	–	–	–
	Page		317	322	323	324

■ Standard – No/not available





Easy vision – “teach&go”

The ZFV proves that vision sensors can be “teach & go”. Parameter settings are available at the touch of a button. A smart user interface allows intuitive configuration using a built-in colour monitor. In Run-mode, the display gives live feedback showing results and images in real time.

- Intuitive – “teach & go” user interface
- Live – LCD display for setup and live inspection feedback
- Versatile – up to seven inspection tools included
- Scalable – add controllers to add functionality
- Flexible – adjustable working distance and area

Ordering information

Sets of camera and controller

Type	Order code	
	NPN	PNP
Narrow view/single function	ZFV-R1010	ZFV-R1015
Narrow view/standard	ZFV-R1020	ZFV-R1025
Wide view/single function	ZFV-R5010	ZFV-R5015
Wide view/standard	ZFV-R5020	ZFV-R5025

Cameras

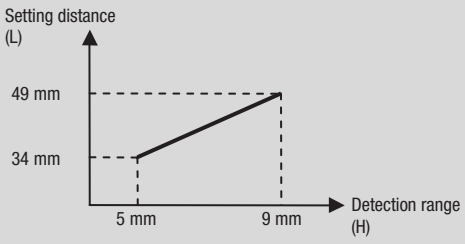
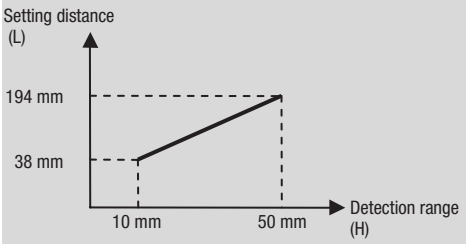
Type	Working length	Sensing area	Order code
Narrow view	34 to 49 mm (variable)	5x4.6 mm (HxV) to 9x8.3 mm (HxV)	ZFV-SR10
Wide view	38 to 194 mm (variable)	10x9.2 mm (HxV) to 50x46 mm (HxV)	ZFV-SR50

Controller

Type	Power supply	Output type	Order code
Single function	24 VDC ±10%	NPN	ZFV-A10
		PNP	ZFV-A15
Standard		NPN	ZFV-A20
		PNP	ZFV-A25

Specifications

Cameras

Item	ZFV-SR10 (narrow view)	ZFV-SR50 (wide view)
Setting distance (L)	34 to 49 mm	38 to 194 mm
Detection range (H×V)	5x4.6 mm to 9x8.3 mm	10x9.2 mm to 50x46 mm
Relation between setting distance and detection range		
Guide light	Provided (center, sensing area)	
Built-in lens	Focus: f15.65	Focus: f13.47
Object lighting method	Pulse lighting	
Object light source	Eight red LEDs	
Sensing element	1/3-inch CCD, partial scan	
Shutter	Electronic shutter, shutter time: 1/1,000 to 1/4,000	
Power supply voltage	15 VDC (supplied from Amplifier Unit.)	
Current consumption	Approx. 200 mA	
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min	
Vibration resistance (destruction)	10 to 150 Hz, 0.35 mm single amplitude, 10 times each in X, Y, and Z directions for 8 min	
Shock resistance (destruction)	150 m/s^2, three times each in six directions (up/down, left/right, forward/backward)	
Ambient temperature	Operating: 0 to 40°C, storage: -25 to 65°C (with no icing or condensation)	
Ambient humidity	Operating and storage: 35% to 85% (with no condensation)	
Ambient atmosphere	Must be free of corrosive gas	
Connection method	Prewired, standard cable length: 2 m	
Degree of protection	IEC60529, IP65	
Materials	Case: ABS, mounting bracket: PBT	
Weight	Approx. 200 g (including mounting bracket and cord)	
Accessories	Mounting bracket (1), ferrite core (1), instruction sheet	

Controller

Item		Single function models		Multi function models	
		ZFV-A10	ZFV-A15	ZFV-A20	ZFV-A25
Output method		NPN	PNP	NPN	PNP
Inspection items		Pattern (PTRN), Brightness (BRGT)		Patterns (PTRN), Brightness (BRGT), Area (AREA), Width (WID), Position (POSI), Count (CNT), Characters (CHAR)	
Teaching area		Rectangular, one area			
Teaching area size		• Pattern (PTRN), Brightness (BRGT): any rectangular area (256x256 max.) • Area (AREA), Width (WID), Position (POSI), Count (CNT), Characters (CHAR): any rectangular area (full screen max.)			
Sensing area		Full screen			
Resolution		468 Hx432 V max.			
Bank selection		Supported for 8 banks			
Response time		Pattern (PTRN), Brightness (BRGT): High-speed: 4 ms, standard: 8 ms, high-precision: 12 ms (not using partial scan) Area (AREA), Width (WID), Position (POSI), Count (CNT), Characters (CHAR): 128x128: 15 ms max.			
Other functions		Control output switching: ON for OK or ON for NG ON-delay/OFF-delay, one-shot output, 'ECO' mode			
Output signals		(1) Control output (OUTPUT), (2) Enable output (ENABLE), (3) Error output (ERROR)			
Input signals		(1) Simultaneous measurement input (TRIG) or continuous measurement input (TRIG), switched by using menu (2) Bank selection inputs (BANK1 to BANK3) (3) Workpiece still teaching (TEACH) or workpiece moving teaching (TEACH), switched by using menu			
Connecting to ZS-DSU	Image logging trigger	Stores NG images or all images			
	Sampling rate	ZFV measurement cycle *1			
	Number of logged image	Logs up to 128 images in series			
	Number of connected	15 max. (ZFV: 5 units max., ZS-LDC: 9 units max., ZS-MDC *2: 1 unit max.)			
	External bank function	Amplifier unit setting data can be saved to the memory card as bank data. Reading bank data enables bank switching.			
Sensor head interface		Digital interface			
Image display		Compact TFT 1.8-inch LCD (Display dots: 557x234)			
Indicators		• Judgement result indicator (OUTPUT) • Inspection mode indicator (RUN)			
Operation interface		• Cursor keys (up, down, left, right) • Setting key (SET) • Escape key (ESC) • Operating mode switching (slide switch) • Menu switching (slide switch) • Teaching/display switching key (TEACH/VIEW)			
Power supply voltage		20.4 to 26.4 VDC (including ripple)			
Current consumption		600 mA max. (with sensor head connected)			
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between leads and amplifier unit case			
Noise immunity		1 kV, Pulse rise: 5 ns, pulse width: 50 ns, burst duration: 15 ms, cycle: 300 ms			
Vibration resistance		Destruction: 10 to 150 Hz, 0.1-mm single amplitude, 10 times each in X, Y, and Z directions for 8 min			
Shock resistance		Destruction: 150 m/s^2, three times each in six directions (up/down, left/right, forward/backward)			
Ambient temperature		Operating: 0 to 50°C, storage: -25 to 65°C (with no icing or condensation)			
Ambient humidity		Operating and storage: 35% to 85%			
Ambient atmosphere		Must be free of corrosive gas			
Degree of protection		IEC60529, IP20			
Materials		Polycarbonate			
Weight		Approx. 300 g (including cord)			
Accessories		Ferrite core (1), instruction sheet			

*1 This is the sampling rate when logging images. To log measurement data only, use the ZS-DSU settings.
*2 Image logging is not possible when the ZS-MDC is connected.



Easy vision – “teach&go” – in colour

The ZFV colour comes with the same intuitive user interface as the grey scale version. But by using the colour information in the image, it adds more security and reliability to your application. More cameras and communication options make it more versatile.

- Intuitive – “teach&go” user interface
- Live – LCD display for setup and live inspection feedback
- Versatile – 8 inspection tools included
- Scalable – add controllers to add functionality
- Flexible – adjustable working distance and area
- Multiple – up to 8 simultaneous inspections

Ordering information

Cameras

Type	Setting distance	Sensing area	Order code
Narrow view	39 to 49 mm (variable)	5x4.6 mm to 9x8.3 mm (variable)	ZFV-SC10
Standard view	31 to 187 mm (variable)	10x9.2 mm to 50x46 mm (variable)	ZFV-SC50
Wide view	66 to 141 mm (variable)	50x46 mm to 90x83 mm (variable)	ZFV-SC90
Ultra-wide view	114 to 226 mm (variable)	90x83 mm to 150x138 mm (variable)	ZFV-SC150

Controller units ZFV colour series

Power supply		Output type	Order code
24 VDC	single inspection	NPN	ZFV-CA40
		PNP	ZFV-CA45
	multi inspection	NPN	ZFV-CA50
		PNP	ZFV-CA55

Accessories ZFV colour series (order separately)

Data storage units

Power supply	Output type	Order code
24 VDC	NPN	ZS-DSU11
	PNP	ZS-DSU41

Controller link unit

Type	Order code
Controller link unit	ZS-XCN

External lightning

Type	Order code
Bar lightning	ZFV-LTL01
Bar double lightning	ZFV-LTL02
Bar low-angle lightning	ZFV-LTL04
Light source for through-beam lightning	ZFV-LTF01

Camera Extension Cable

Cable length	Order code
3 m	ZFV-XC3B *1
8 m	ZFV-XC8B

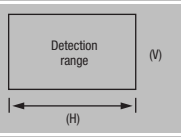
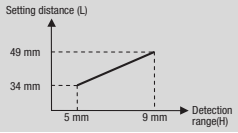
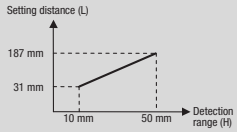
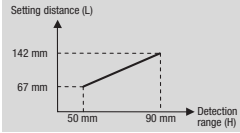
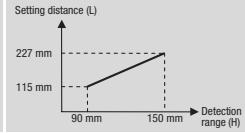
*1 ZFV-XC3BR robot cable is also available.

Panel-mounting adapter

Type	Order code
First unit	ZS-X0M1
Additional units (for expansion)	ZS-XPM2

Specifications

Cameras

Item	ZFV-SC10 (Narrow View)	ZFV-SC50/SC50W (Standard View)	ZFV-SC90/SC90 (Wide view)	ZFV-SC150/SC150W (Ultra wide view)
Setting distance (L)	34 to 49 mm (variable)	31 to 187 mm (variable)	67 to 142 mm (variable)	115 to 227 mm (variable)
Sensing range (HxV) 	5x4.6 mm to 9x8.3 mm (variable)	10x9.2 mm to 50x46 mm (variable)	50x46 mm to 90x83 mm (variable)	90x83 mm to 150x183 mm (variable)
Relation between setting distance and detection range				
Built-in lens	Focus: f15.65	Focus: f13.47	Focus: f6.1	
Object lighting method	Pulse lighting			
Object light source	8 white LEDs	36 white LEDs	20 white LEDs	72 white LEDs
Lightning I/F (option)	None	Yes		None
Sensing element	1/3-inch CCD			
Shutter	Electronic shutter, shutter time: 1/500 to 1/8,000			
Power supply voltage	15 VDC (supplied from amplifier unit)	15 VDC, 48 VDC (supplied from amplifier unit)		
Current consumption	Approx. 200 mA	Approx. 350 mA [15 V: approx. 150 mA, 48 V: approx. 200 mA] (Including the current consumed when external light is connected)		
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min			
Vibration resistance (destructive)	10 to 150 Hz, 0.35 mm single amplitude, 10 times each in X, Y, and Z directions for 8 min			
Shock resistance (destructive)	150 m/s^2, three times each in six directions (up/down, left/right, forward/backward)			
Ambient temperature	Operating: 0 to +40°C, storage: -25 to +65°C (with no icing or condensation)			
Ambient humidity	Operating and storage: 35% to 85% (with no condensation)			
Ambient atmosphere	Must be free of corrosive gas			
Connection type	Prewired, standard cable length: 2 m			
Degree of protection (IEC 60529)	IP65	ZFV-SC__: IP65 ZFV-SC__W: IP67		
Material	Case: ABS, mounting bracket: PBT			
Weight	Approx. 200 g (including mounting bracket and cord; packaged condition: approx. 300 g)	Approx. 270 g (including mounting bracket and cord; packaged condition: approx. 350 g)	Approx. 300 g (including mounting bracket and cord; packaged condition: approx. 380 g)	Approx. 600 g (including mounting bracket and cord; packaged condition: approx. 780 g)
Accessories	Mounting bracket ZFV-XMF (1), ferrite core (1), instruction sheet	Mounting bracket ZFV-XMF2 (1), ferrite core (2), warning label (1) instruction sheet	Mounting bracket ZFV-XMF2 (1), ferrite core (2), warning label (1) instruction sheet	Ferrite core (2), instruction sheet
LED class*1	Class 1	Class 2	Class 2	Class 1

*1 Applicable standards: IEC60825-1: 1993 +A1:1997 +A2:2001, EN60825-1:1994 +A:2002 +A:2001

Controller

Item		ZFV-CA40/ZFV-CA50	ZFV-CA45/ZFV-CA55
Output specifications		NPN open collector, 30 VDC 50 mA max., residual voltage 1.2 V max.	PNP open collector, 50 mA max., residual voltage 1.2 V max.
Input specifications	ON	Short-circuited with 0 V terminal or 1.5 V or less	Supply voltage short-circuited or within supply voltage -1.5 V max.
	OFF	Open (leakage current 0.1 mA max)	Open (leakage current 0.1 mA max)
Serial I/O	USB2.0	1 port, full-speed (12 Mbps) MINI-B	
	RS-232C	1 port, 115,200 bps max.	
Inspection items		PATTERN, AREA, HUE (Colour), WIDTH, POSITION, COUNT, BRIGHT, CHARA, multi inspection (ZFV-CA50/55 only)	
Teaching area		Rectangular, one area	
Teaching area size		• PATTERN, BRIGHT: any rectangular area (256x256 max.) • AREA, HUE (Colour), WIDTH, POSITION, COUNT, CHARA: Any rectangular area (full screen max.)	
Sensing area		Full screen	
Resolution		468x432 (HxV) max.	
Bank switching		Supported for 8 banks	
Image input interval		13 ms (standard), 8 ms (1/2 for partial scan), 5 ms (1/4 for partial scan)	
Other functions		Control output switching: ON for OK or ON for NG, ON-delay/OFF-delay, One-shot output, “ECO” mode	
Output signals		(1) Control output (OUTPUT) (2) Enable output (ENABLE) (3) Error output (ERROR)	
Input signals		(1) Sync measurement input (TRIG)/continuous measurement input (TRIG); switched from menu (2) Bank selection input (BANK1-3) (3) Object stationary teaching (TEACH)/object motion teaching (TEACH); switched from menu	
Sensor head interface		Digital interface	
Image display		TFT 1.8-inch colour LCD (Display dots: 557x234)	

Item	ZFV-CA40/ZFV-CA50	ZFV-CA45/ZFV-CA55
Indicators	• Judgment result indicator (OUTPUT, colour: orange) • Inspection mode indicator (RUN, colour: green) • Error indicator (ERR, colour: red) • Ready status indicator (READY, colour: blue)	
Operation interface	• Cursor keys (up, down, left, right) • Setting key (SET) • Escape key (ESC) • Operating mode switching (slide switch) • Menu switching (slide switch) • Teaching/display switching key (TEACH/VIEW) • Function keys (A to D, 4 inputs)	
Power supply voltage	20.4 to 26.4 VDC (including ripple)	
Current consumption	800 mA max. (with sensor head connected)	
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between leads and amplifier unit case	
Noise resistance	1 kV, pulse rise: 5 ns, pulse width: 50 ns, burst duration: 15 ms, cycle: 300 ms	
Vibration resistance (destructive)	10 to 150 Hz, 0.1 mm single amplitude, 10 times each in X, Y, and Z directions for 8 min	
Shock resistance (destructive)	150 m/s^2, three times each in six directions (up/down, left/right, forward/backward)	
Ambient temperature range	Operating: 0 to 50°C, storage:-25 to 65°C (with no icing or condensation)	
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)	
Ambient atmosphere	Must be free of corrosive gas	
Degree of protection	IEC 60529, IP20	
Material	Polycarbonate (PC)	
Weight	Approx. 300 g (including cord; packaged condition: 450 g)	
Accessories	Ferrite core (1), instruction sheet, label (1)	

External light units (optional)

Item	ZFV-LTF01	ZFV-LTL01	ZFV-LTL02	ZFV-LTL04
Applicable sensor head	ZFV-SC50/SC50W/SC90/SC90W			
Lighting method	Pulse lighting			
Lighting interval	Fixed (1.1 to 1.4 ms)			
Light source (Qty.)	White LEDs			
	60	20	40	80
Power supply voltage	48 VDC (supplied from sensor head)			
Current consumption	Approx. 160 mA	Approx. 80 mA	Approx. 120 mA	Approx. 210 mA
Dielectric strength	300 VAC, 50/60 Hz for 1 min			
Vibration resistance (destructive)	10 to 150 Hz, 0.35 mm single amplitude, 10 times each in X, Y and Z directions for 8 min			
Shock resistance (destructive)	150 m/s^2, 3 times each in six directions (up/down, left/right, forward/backward)			
Ambient temperature	Operating: 0 to 40°C, storage: -20 to 65°C (with no icing or condensation)			
Ambient humidity	Operating and storage: 35% to 85% RH (with no condensation)			
Ambient atmosphere	Must be free of corrosive gas			
Connection type	Prewired, standard cable length: 2 m			
Degree of protection	IEC60529 IP20			
Material	SPCC	SPCC, aluminium		
Weight	Approx. 500 g (when packaged: approx. 550 g)	Approx. 250 g (when packaged: approx. 300 g)	Approx. 650 g (when packaged: approx. 900 g)	Approx. 900 g (when packaged: approx. 1,150 g)
LED class	Class 1 Applicable standards IEC0825-1: 1993 +A1:1997 +A2:2001 EN60825-1: 1994 +A1:2002 +A2:2001			



Easy vision – touch, connect & go

- Easy vision – intuitive “teach & go” user interfaces
- Live – built-in LCD touch monitors for setup and immediate feedback
- Communication – centralized setup & inspection via Ethernet
- Versatile – approx. 20 tools, 32 inspections per image
- Simplicity – auto-adjustment functions for easy image setup
- Reading - Barcode and Datamatrix

Ordering Information

Controller

Power supply	Circuit type	Order code	
		Standard models	Code reading models
21.6 to 26.4 VDC	NPN	ZFX-C10	ZFX-C10-CD
	PNP	ZFX-C15	ZFX-C15-CD
21.6 to 26.4 VDC	NPN	ZFX-C20	ZFX-C20-CD
	PNP	ZFX-C25	ZFX-C25-CD

Cameras

Type		Setting distance	Sensing area	Remarks	Order code
Camera with lighting	Monochrome type	34 to 49 mm	5x4.9 mm to 9x8.9 mm (variable)	Cable length: 2 m	ZFX-SR10
		38 to 194 mm	10x9.8 mm to 50x49 mm (variable)		ZFX-SR50
	Colour type	34 to 49 mm	5x4.9 mm to 9x8.9 mm (variable)		ZFX-SC10
		34 to 187 mm	10x9.8 mm to 50x49 mm (variable)		ZFX-SC50 ZFX-SC50W(IP67)
		67 to 142 mm	50x49 mm to 90x89 mm (variable)		ZFX-SC90 ZFX-SC90W(IP67)
		115 to 227 mm	90x89 mm to 150x148 mm (variable)		ZFX-SC150 ZFX-SC150W(IP67)
Camera only	Monochrome type	The CCTV lens is selected according to the range of detection and the installation distance.		–	ZFX-S
	Colour type				ZFX-SC

Cables

Type		Cable length	Order code
Camera cable*1	Normal type	3 m, 8 m	ZFX-VS
	Robot cable type	3 m	ZFX-VSR
Camera extension cable	Normal type	3 m	ZFX-XC3A
		8 m	ZFX-XC8A
	Robot cable type	3 m	ZFX-XC3AR
Parallel I/O cable		2 m, 5 m	ZFX-VP
RS-232C cable		2 m	ZFX-XPT2A
RS-422 cable		2 m	ZFX-XPT2B
Monitor cable		2 m, 5 m	FZ-VM

*1 It is necessary for ZFX-S and ZFX-SC. ZFX-SR_/SC_ is a cable drawing out type, it doesn't use it.

Accessories

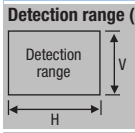
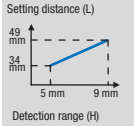
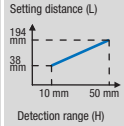
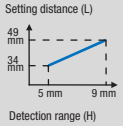
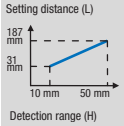
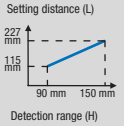
Type		Order code
Console		ZFX-KP (2 m / 5 m)
LCD monitor		FZ-M08
Panel mount adapters		ZFX-XPM
Optional lighting	bar lighting	ZFV-LTL01
	bar double-lighting	ZFV-LTL02
	bar low-angle lighting	ZFV-LTL04
	light source for through beam	ZFV-LTF01

Specifications

Controller

Item			ZFX-C10(-CD)	ZFX-C15(-CD)	ZFX-C20(-CD)	ZFX-C25(-CD)
Number of connected cameras			1		2	
Connectable camera			ZFX-SR_/SC_/S/SC			
Processing resolution			When ZFX-SR_/SC_ is connected: 464(H)x464(V) When ZFX-S/SC is connected: 608(H)x464(V)			
Display		LCD monitor	3.5" TFT colour LCD (320x240 pixels)			
		Indicator	"Measuring" indicator (colour: green): RUN Trigger indicator (colour: blue): ENABLE Judgment indicator (colour: orange): OUTPUT Error indicator (colour: red): ERROR			
External I/F	Parallel interface	Input	12 points (RESET, DSA, DI0 to 8, TRIG)			
		Output	22 points (OR, ERROR, RUN, ENABLE, GATE, STGOUT0, DO0 to 15)			
		Circuit type	NPN	PNP	NPN	PNP
	Serial interface	USB2.0	1 port, FULL SPEED, MINI-B connector			
		RS-232C	1 port, max. 115200 bps (cannot be used simultaneously with RS-422 interface)			
		RS-422	1 port, max. 115200 bps (cannot be used simultaneously with RS-232C interface)			
	Network communications	Ethernet	1 port, 100BASE-TX/10BASE-T			
	Monitor output		Analogue RGB output, 1 ch (resolution VGA: 640x480)			
	Memory card I/F		SD card slot 1 ch			
Operation I/F			Touch panel, key operation, console connection			
Main functions	Number of registered banks		32 banks			
	Number of setup items		32 items/1 bank		128 items/1 bank	
	Measurement items	Shape inspection	Pattern search, sensitive search		Pattern, sensitive, graphic, flexible search	
		Size inspection	Area		Area, labelling	
		Edge inspection	Position, width, count			
		Brightness/colour inspection	Brightness, HUE			
		Application-based inspection	Defects		Defects, grouping	
		Code reading (-CD models only)	Barcode (WPC(JAN/EAN/UPC), Code 39, Codebar (NW-7), ITF (Interleaved 2 of 5), Code 93, Code 128, GS1-128, GS1 Databar, Pharmacode) Datamatrix (ECC200, QR Code, MicroQR Code, PDF417, MicroPDF417, Maxi Code, AZtec Code, Codablock)			
	Position correction		1 model search, 2 model search, position, area			
Support	Image memory function		Max. 100 images		Max. 100 images (50 for 2 x cameras)	
Ratings		Power supply voltage	21.6 to 26.4 VDC (including ripple)			
		Current consumption	1.0 A max.		1.5 A max.	
		Insulation resistance	Across all lead wires and controller case: 20 MΩ (by 250 V megger)			
		Dielectric strength	Across all lead wires and controller case, 1000 VAC, 50/60 Hz, 1 min			
Operation environment robustness		Ambient temperature range	Operating: 0 to +50°C, storage: -15 to +60°C (with no icing or condensation)			
		Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)			
		Ambient atmosphere	No corrosive gases allowed			
		Degree of protection	IP20 (IEC60529)			
		Vibration resistance (durability)	Vibration frequency: 10 to 150 Hz single-amplitude: 0.35 mm acceleration: 50 m/s^2 10 times for 8 minutes			
		Shock resistance (destructive)	150 m/s^2 3 times each in 6 directions (up/down, left/right, forward/backward)			

Camera

Item	ZFX-SR10	ZFX-SR50	ZFX-SC10	ZFX-SC50 /SC50W	ZFX-SC90 /SC90W	ZFX-SC150 /SC150W	ZFX-S (monochrome type)	ZFX-SC (colour type)
Detection range (H x V) 	5x4.9 mm to 9x8.9 mm (variable)	10x9.8 mm to 50x49 mm (variable)	5x4.9 mm to 9x8.9 mm (variable)	10x9.8 mm to 50x49 mm (variable)	50x49 mm to 90x89 mm (variable)	90x89 mm to 150x148 mm (variable)	The CCTV lens is selected according to the detection range and the setting distance.	
Setting distance (L)	34 to 49 mm	38 to 194 mm	34 to 49 mm	31 to 187 mm	67 to 142 mm	115 to 227 mm		
Relationship between setting distance and detection range								
Image rate function	All-pixel capture inter-line transfer type 1/3" CCD (monochrome)		All-pixel capture inter-line transfer type 1/3" CCD (colour)				All-pixel capture inter-line transfer type 1/3" CCD (mono-chrome)	All-pixel capture inter-line transfer type 1/3" CCD (colour)
Lens mount	–						C mount	

Item		ZFX-SR10	ZFX-SR50	ZFX-SC10	ZFX-SC50 /SC50W	ZFX-SC90 /SC90W	ZFX-SC150 /SC150W	ZFX-S (monochrome type)	ZFX-SC (colour type)
Lighting	Lighting method	Pulse lighting						–	
	LED	Red LED		White LED					
	Type	Direct lighting							
	Guide light	Available (center, measurement region)		Not available					
	Optional lighting I/F	Not available		Not available	Available (ZFV-LT Series)		Not available	Available external lighting: 3Z4S-LT Series Flash Controller: made by Moritex Corporation 3Z4S-LT MLEK-C100E1TSX	
	Indicator class*1	–		Class 1	Class 2	Class 2	Class 1	–	
Ratings	Current consumption	Approx. 200 mA			Approx. 350 mA (15 VDC: approx. 150 mA, 48 VDC: approx. 200 mA) (including current consumption when optional lighting is connected)			Approx. 100 mA	
Operation environment robustness	Ambient temperature range	Operating: 0 to +40°C, storage: -20 to +65°C (with no icing or condensation)						Operating: 0 to +50°C, storage: -20 to +65°C (with no icing or condensation)	
	Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)							
	Ambient atmosphere	No corrosive gases allowed							
	Degree of protection	IP65 (IEC60529)		ZFX-SC___: IP65 (IEC60529), ZFX-SC___W: IP67 (IEC60529)				IP20 (IEC60529)	
	Dielectric strength	1000 VAC 50 Hz/60 Hz 1 min						500 VAC 50 Hz/60 Hz 1 min	
	Vibration resistance (durability)	10 to 150 Hz single-amplitude 0.35 mm 10 times for 8 min each in X, Y, and Z directions							
	Shock resistance (destructive)	150 m/s^2 3 times each in 6 directions (up/down, left/right, forward/backward)							
Connection method		Cable built-in type (cable length: 2 m)						Connector connection type (camera cable ZFX-VS/VSR required)	

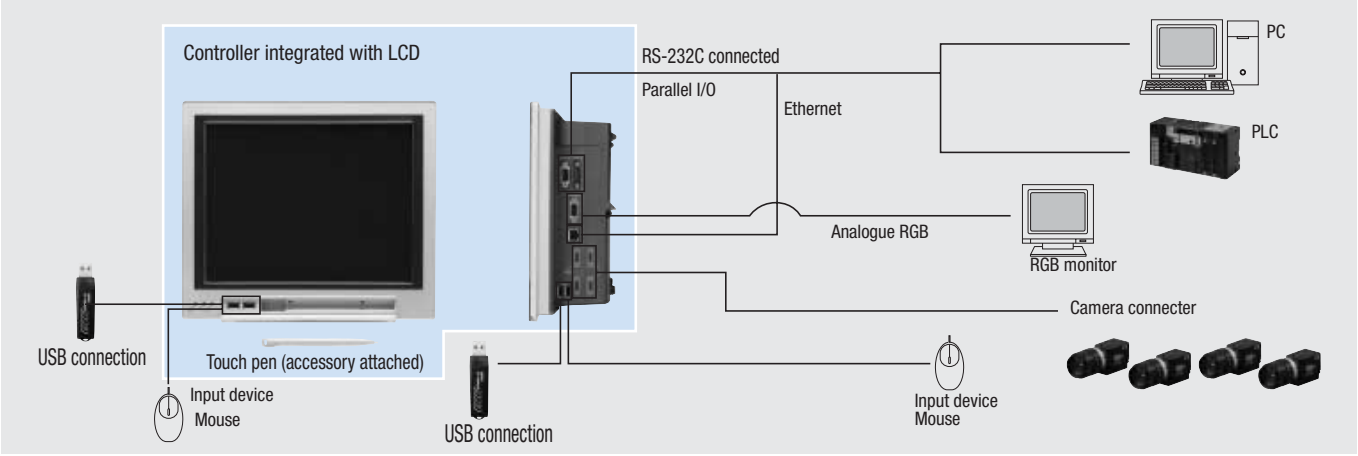
*1 Applicable standards IEC60825-1:1993 +A1:1997 +A2:2001, EN60825-1:1994 +A2:2001

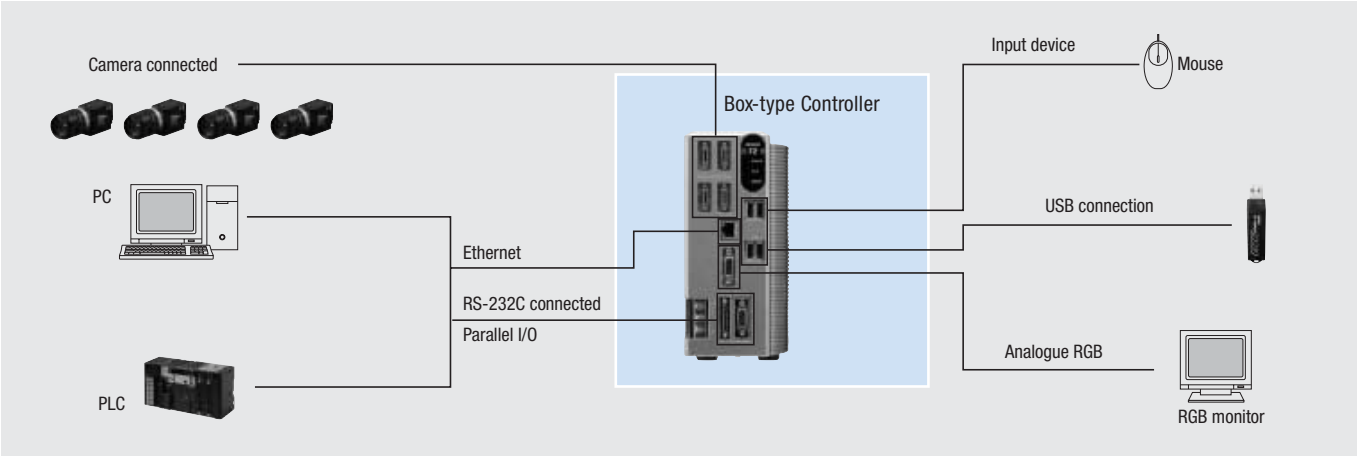


Simplicity in touch with performance

- True real colour system
- Intelligent and high resolution cameras
- Touch screen for easy operation
- Customization – open & programmable
- Industry grade PC platform

System configuration





Ordering information

FZ3 series

Item		Descriptions			Remarks	Order code
Controllers	Multi-core, high grade, high speed controllers	Controller integrated with LCD	Two-camera controllers	PNP/NPN	With touch pen	FZ3-H905/FZ3-H900
			Four-camera controllers	PNP/NPN		FZ3-H905-10/FZ3-H900-10
		Box-type Controller	Two-camera controllers	PNP/NPN	---	FZ3-H955/FZ3-H950
			Four-camera controllers	PNP/NPN		FZ3-H955-10/FZ3-H950-10
	Multi-core, high speed controllers	Controller integrated with LCD	Two-camera controllers	PNP/NPN	With touch pen	FZ3-905/FZ3-900
			Four-camera controllers	PNP/NPN		FZ3-905-10/FZ3-900-10
		Box-type Controller	Two-camera controllers	PNP/NPN	---	FZ3-955/FZ3-950
			Four-camera controllers	PNP/NPN		FZ3-955-10/FZ3-950-10
	High grade, high speed controllers	Controller integrated with LCD	Two-camera controllers	PNP/NPN	With touch pen	FZ3-H705/FZ3-H700
			Four-camera controllers	PNP/NPN		FZ3-H705-10/FZ3-H700-10
		Box-type Controller	Two-camera controllers	PNP/NPN	---	FZ3-H755/FZ3-H750
			Four-camera controllers	PNP/NPN		FZ3-H755-10/FZ3-H750-10
	High grade controllers	Controller integrated with LCD	Two-camera controllers	PNP/NPN	With touch pen	FZ3-H305/FZ3-H300
			Four-camera controllers	PNP/NPN		FZ3-H305-10/FZ3-H300-10
		Box-type Controller	Two-camera controllers	PNP/NPN	---	FZ3-H355/FZ3-H350
			Four-camera controllers	PNP/NPN		FZ3-H355-10/FZ3-H350-10
	High speed controllers	Controller integrated with LCD	Two-camera controllers	PNP/NPN	With touch pen	FZ3-705/FZ3-700
			Four-camera controllers	PNP/NPN		FZ3-705-10/FZ3-700-10
		Box-type Controller	Two-camera controllers	PNP/NPN	---	FZ3-755/FZ3-750
			Four-camera controllers	PNP/NPN		FZ3-755-10/FZ3-750-10
	Standard controllers	Controller integrated with LCD	Two-camera controllers	PNP/NPN	With touch pen	FZ3-305/FZ3-300
			Four-camera controllers	PNP/NPN		FZ3-305-10/FZ3-300-10
		Box-type Controller	Two-camera controllers	PNP/NPN	---	FZ3-355/FZ3-350
			Four-camera controllers	PNP/NPN		FZ3-355-10/FZ3-350-10
Cameras	Intelligent cameras	Wide field of vision	Colour		Camera + Zoom, Autofocus Lens + Intelligent Lighting	FZ-SLC100
		Narrow field of vision	Colour			FZ-SLC15
	Autofocus cameras	Wide field of vision	Colour		Camera + Zoom, Autofocus Lens	FZ-SZC100
		Narrow field of vision	Colour			FZ-SZC15
	Digital cameras	300,000 Pixels	Monochrome		Lens required	FZ-S
			Colour			FZ-SC
		2 million pixels	Monochrome			FZ-S2M
			Colour			FZ-SC2M
		5 million pixels	Monochrome			FZ-S5M2
			Colour			FZ-SC5M2
	Small digital cameras	300,000-pixel flat type	Monochrome		CCTV lens required	FZ-SF
			Colour			FZ-SFC
		300,000-pixel pen type	Monochrome			FZ-SP
			Colour			FZ-SPC
Cameras, peripheral devices	Intelligent camera diffusion plate		Wide field of vision		---	FZ-SLC100-DL
			Narrow field of vision		---	FZ-SLC15-DL
	CCTV Lenses				---	3Z4S-LE Series
	Extension Tubes					
	Low-distortion Lenses				Low distortion lens for 2-million pixel cameras and 5 million-pixel cameras	FZ-LEH5/LEH8/LEH12/LEH16/LEH25/LEH35/LEH50/LEH75/LEH100
	Lenses for small camera				Lens for 300,000-pixel small cameras	FZ-LES3/LES6/LES16/LES30
	Extension Tubes for small camera				Extension Tubes for 300,000-pixel small cameras	FZ-LESR
Cables	Camera Cable				Cable length: 2 m, 5 m, or 10 m *1	FZ-VS
	Bend resistant Camera Cables				Cable length: 2 m, 5 m, or 10 m *2	FZ-VSB
	Right-angle Camera Cable *3				Cable length: 2 m, 5 m, or 10 m *1	FZ-VSL
	Long-distance camera cable				Cable length: 15 m *4	FZ-VS2
	Long-distance right-angle camera cable				Cable length: 15 m *4	FZ-VSL2
	Cable extension unit				Up to two Extension Units and three Cables can be connected.(Maximum cable length: 45 m *5)	FZ-VSJ
	Monitor cable				Cable length: 2 m or 5 m	FZ-VM
	Parallel cable				Cable length: 2 m or 5 m	FZ-VP
Peripheral devices		LCD monitor			For Box-type Controllers	FZ-M08
		USB memory	1GB		Capacity: 1 GB	FZ-MEM1G
		VESA attachment			For installing the LCD integrated-type controller	FZ-VESA
		Desktop controller stand			For installing the LCD integrated-type controller	FZ-DS
Mouse					Recommended Products (Optical Mouse) • Microsoft Corporation: Compact Optical Mouse, U81 Series	---
External Lighting					---	3Z4S-LT Series

Item	Descriptions	Remarks	Order code
Strobe Controller (for FZ Series Vision Sensors)		Required to control external lighting from a Controller	Manufactured by MORITEX Corporation 3Z4S-LT MLEK-C100E1TS2
Adapter for the strobe controller designed specifically for the 5 million-pixel camera		Required to mount a strobe controller on a 5 million-pixel camera	Manufactured by MORITEX Corporation 3Z4S-LT LBK-003

*1 The 10-m cable cannot be used for the intelligent camera, autofocus camera and 5 million-pixel camera.
*2 The 10-m cable cannot be used for the intelligent camera, autofocus camera 2 million-pixel camera and 5 million-pixel camera.
*3 This Cable has an L-shaped connector on the Camera end.
*4 The 15-m cable cannot be used for the intelligent camera, autofocus camera and 5 million-pixel camera.
*5 The maximum cable length depends on the Camera being connected, and the model and length of the Cable being used.For further information, please refer to the "Ratings and specifications" table on page 320.

FZD series (for 3D measurements)

Item		Description	Remarks	Model
Controllers	Controller integrated with LCD	PNP/NPN	–	FZD-505-10/FZD-500-10
	Box-type Controller	PNP/NPN		FZD-555-10/FZD-550-10
Cameras	3D Vision Camera	Colour	Integrated Camera (installation distance: 24 cm max.)	FZD-STC2M
	Digital Camera	Monochrome	2-million-pixels (lens required)	FZ-S2M
		Colour	2-million-pixels (lens required)	FZ-SC2M
3D Camera Base Plate		Short-distance Version	Installation distance of up to 30 cm	FZD-CBS
		Medium-distance Version	Installation distance of 30 cm to 1 m	FZD-CBM
		Long-distance Version	Installation distance of 1 m to 2 m	FZD-CBL
3D Calibration Tool			–	FZD-CAL
High-luminance lighting	Line pattern		White LEDs	FZD-LTW
	Custom pattern		White LEDs	FZD-LTPW

Ratings and specifications

Controllers

Model		NPN Output	FZ3-700	FZ3-700-10	FZ3-H700	FZ3-H700-10	FZ3-750	FZ3-750-10	FZ3-H750	FZ3-H750-10
		PNP Output	FZ3-705	FZ3-705-10	FZ3-H705	FZ3-H705-10	FZ3-755	FZ3-755-10	FZ3-H755	FZ3-H755-10
No. of Cameras[*1]			2	4	2	4	2	4	2	4
Processing resolution	When connected to a 300,000-pixel camera		640(H)×480(V)							
	When connected to a 2 million-pixel camera		1600(H)×1200(V)							
	When connected to a 5 million-pixel camera		2448(H)×2044(V)							
No. of scenes			32							
Number of logged images[*2]	When connected to a 300,000-pixel camera	Connected to 1 camera	Colour camera: 250, Monochrome Camera: 252							
		Connected to 2 cameras	Colour camera: 125, Monochrome Camera: 126							
		Connected to 3 cameras	Colour camera: 83, Monochrome Camera: 84							
		Connected to 4 cameras	Colour camera: 62, Monochrome Camera: 63							
	When connected to a 2 million-pixel camera	Connected to 1 camera	Colour camera: 40, Monochrome Camera: 40							
		Connected to 2 cameras	Colour camera: 20, Monochrome Camera: 20							
		Connected to 3 cameras	Colour camera: 13, Monochrome Camera: 13							
		Connected to 4 cameras	Colour camera: 10, Monochrome Camera: 10							
	When connected to a 5 million-pixel camera	Connected to 1 camera	Colour camera: 11, Monochrome Camera: 11							
		Connected to 2 cameras	Colour camera: 5, Monochrome Camera: 5							
Codes that can be read with FZ3-H			< Bar Codes > JAN/EAN/UPC (including add-on codes), Code 39, Codabar (NW-7), ITF (Interleaved 2 of 5), Code 93, Code 128, GS1-128, GS1 DataBar (RSS-14 / RSS Limited / RSS Expanded) < 2D Codes > Data Matrix (ECC200), QR Code							
Operation			Touch pen, mouse, etc.				Mouse or similar device			
Settings			Create series of processing steps by editing the flowchart (Help messages provided).							
Serial communications			RS-232C/422A:1CH							
Network communications			Ethernet 100BASE-TX/10BASE-T							
Parallel I/O			11 inputs (RESET, STEP, DSA, and DI 0 to 7), 26 outputs (RUN, BUSY, GATE, OR, READY, ERROR, STGOUT 0 to 3, and DO 0 to 15)							
Monitor interface			Integrated Controller and LCD 12.1 inch TFT colour LCD (Resolution: XGA 1,024 × 768 dots)				Analogue RGB video output, 1 channel (Resolution: XGA 1,024 × 768 dots)			
USB interface			4 channels (supports USB 1.1 and 2.0)							
Power supply voltage			20.4 to 26.4 VDC							
Current consumption[*3]	When connected to a intelligent or autofocus camera		5 A max.	7.5 A max.	5 A max.	7.5 A max.	5 A max.	7.5 A max.	5 A max.	7.5 A max.
	When connected to a 300,000-pixel camera		3.7 A max.	4.9 A max.	3.7 A max.	4.9 A max.	3.7 A max.	4.9 A max.	3.7 A max.	4.9 A max.
	When connected to a 2 million-pixel camera									
	When connected to a 5 million-pixel camera									
Ambient temperature range			Operating: 0 to 45°C, 0 to 50°C [*4], Storage: 20 to 65°C (with no icing or condensation)							
Ambient humidity range			Operating and storage: 35% to 85% (with no condensation)							
Weight			Approx. 3.2 kg	Approx. 3.4 kg	Approx. 3.2 kg	Approx. 3.4 kg	Approx. 1.8 kg	Approx. 1.9 kg	Approx. 1.8 kg	Approx. 1.9 kg
Accessories			Touch pen (one, inside the front panel), Please Read First, Instruction Manual (Setup), 6 mounting brackets				Please Read First, Instruction Manual (Setup)			

[*1] When connecting 5 million-pixel cameras, up to two cameras can be connected.
[*2] The number of logged images will vary when connecting multiple Cameras with different models.
[*3] When the strobe controller is connected to the lights, the controller uses power as much as it does when connected to the intelligent camera.
[*4] The operating mode can be switched from the Controller Menu settings.

Cameras

Intelligent camera, autofocus camera

	FZ-SLC100	FZ-SLC15	FZ-SZC100	FZ-SZC15
Image elements	Interline transfer reading all pixels, 1/3-inch CCD image elements			
Colour/Monochrome	Colour			
Effective pixels	640(H)×480(V)			
Pixel size	7.4×7.4 µm			
Shutter function	Electronic shutter; select shutter speeds from 1/10 to 1/50,000 s			
Partial function	12 to 480 lines			
Frame rate (image read time)	80 fps(12.5 ms)			
Field of vision[*1]	13 to 100 mm[*2]	2.9 to 14.9 mm[*2]	13 to 100 mm[*2]	2.9 to 14.9 mm[*2]
Installation distance	70 to 190 mm[*2]	35 to 55 mm[*2]	77.5 to 197.5 mm[*2]	47.5 to 67.5 mm
LED class[*3] (lighting)	Class 2		---	
Ambient temperature range	Operating: 0 to 50°C Storage: 25 to 65°C (with no icing or condensation)			
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)			
Weight	Approx. 670 g	Approx. 700 g	Approx. 500 g	
Accessories	Instruction Sheet and hexagonal wrench			

[*1] The length of the visual field is the lengths along the Y axis.
[*2] Tolerance: ±5% max.
[*3] Applicable standards: IEC 60825-1: 1993 + A1: 1997 + A2-2001, EN 60825-1: 1994 + A1: 2002 + A2: 2001

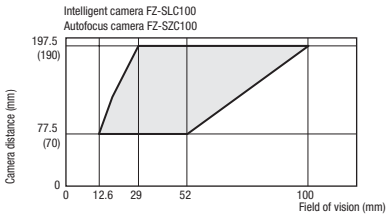
Digital cameras

	FZ-S	FZ-SC	FZ-S2M	FZ-SC2M	FZ-S5M	FZ-SC5M
Image elements	Interline transfer reading all pixels, 1/3-inch CCD image elements		Interline transfer reading all pixels, 1/1.8-inch CCD image elements		Interline transfer reading all pixels, 2/3-inch CCD image elements	
Colour/Monochrome	Monochrome	Colour	Monochrome	Colour	Monochrome	Colour
Effective pixels	640(H)×480(V)		1600(H)×1200(V)		2448(H)×2044(V)	
Pixel size	7.4×7.4 µm		4.4×4.4 µm		3.45×3.45 µm	
Shutter function	Electronic shutter; select shutter speeds from 1/10 to 1/50,000 s		Electronic shutter; select shutter speeds from 1/10 to 1/50,000 s		Electronic shutter; select shutter speeds from 1/10 to 1/50,000 s	
Partial function	12 to 480 lines		12 to 1200 lines		12 to 2044 lines	
Frame rate (image read time)	80 fps(12.5 ms)		30 fps(33.3 ms)		16 fps(62.5 ms)	
Field of vision, installation distance	Selecting a lens according to the field of vision and installation distance					
Ambient temperature range	Operating: 0 to 50°C Storage: 25 to 65°C (with no icing or condensation)		Operating: 0 to 40°C Storage: 25 to 65°C (with no icing or condensation)		Operating: 0 to 40°C Storage: 25 to 65°C (with no icing or condensation)	
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)					
Weight	Approx.55 g		Approx. 76 g		Approx.140 g	
Accessories	Instruction manual					

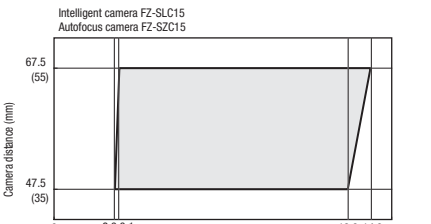
Small digital cameras

	FZ-SF	FZ-SFC	FZ-SP	FZ-SPC
Image elements	Interline transfer reading all pixels, 1/3-inch CCD image elements			
Colour/Monochrome	Monochrome	Colour	Monochrome	Colour
Effective pixels	640(H)×480(V)			
Pixel size	7.4×7.4 µm			
Shutter function	Electronic shutter; select shutter speeds from 1/10 to 1/50,000 s			
Partial function	12 to 480 lines			
Frame rate (image read time)	80 fps(12.5 ms)			
Field of vision, installation distance	Selecting a lens according to the field of vision and installation distance			
Ambient temperature range	Operating: 0 to 50°C (camera amp) 0 to 45°C (camera head) Storage: 25 to 65°C (with no icing or condensation)		Operating: 0 to 50°C (camera amp) 0 to 45°C (camera head) Storage: 25 to 65°C (with no icing or condensation)	
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)		Operating and storage: 35% to 85% (with no condensation)	
Weight	Approx.150 g		Approx.150 g	
Accessories	Instruction manual, installation bracket, Four mounting brackets(M2)		Instruction manual	

Optical chart

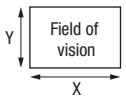


The value in parentheses is for the camera installation distance when using an intelligent camera.



The value in parentheses is for the camera installation distance when using an intelligent camera.

- Be sure to check the instruction sheet packed with the product before using an intelligent camera or autofocus camera.
- The lengths of the fields of vision given in the optical charts are the lengths of the Y axis.





One step to read the code

- Easy adjustment of parameters
- Accurate reading of codes
- Direct print marks on any material
- Eliminate the effects of print quality and work piece changes

Ordering information

2D code readers

Name	Field of vision	Order code
Special lighting lens	14x18 mm	V400-F250
	31x42 mm	V400-F350
C-mount	Changes according to the lens	V400-F050

Accessories (order separately) and cables

Name	Cable length	Remarks	Order code
Communications cable	5 m	For connection to SYSMAC series PLC (includes power line)	V400-W23 (NPN)
			V400-W23P (PNP)
		For connection to an IBM PC/AT or compatible (includes power line)	V400-W24 (NPN)
			V400-W24P (PNP)
Monitor cable		–	V400-WM0

Monitor

Name	Order code
LCD monitor	F150-M05L-2D*1

*1 There is no need for an external power supply when this monitor is used. (Power is supplied from the V400-F).

Specifications

Item	V400-F050	V400-F250	V400-F350
Dimensions	40x50x75.3 mm	40x50x97.1 mm	
Working distance (WD)	Depends on the lens	Approx. 100 mm	Approx. 200 mm
Field of vision	Depends on the lens	Approx. 14x18 mm	Approx. 31x42 mm
Lighting	Up to two can be directly powered	Red LED	
Image sensor	1/3" CCD		
Effective pixels	640x480 pixels		
Power supply voltage	24 VDC ±10%		
Power consumption	0.5 A max.		
Insulation resistance	20 MΩ min.		
Withstand voltage	1,000 VAC for 1 min.		
Leakage current	0.25 mA max.		
Noise resistance	Power line: 2 kVp-p, pulse width: 50 ns, rise time: 5 ns, consecutive burst time: 15 ms, cycle: 300 ms		
Applicable standards	CE: EN 61326:1997, +A1:1998, +A2:2001 (EMI: class A)		
Vibration resistance	10 to 150 Hz, 0.35-mm half-amplitude (maximum acceleration: 50 m/s^2), 10 times for 8 minutes each in 3 directions		
Shock resistance	150 m/s^2 3 times each in 6 directions		
Ambient temperature	Operating: 0 to 45°C, storage: -25 to 65°C		
Ambient humidity	Operating/storage: 25% to 85% (with no icing or condensation)		
Ambient environment	No corrosive gases		
Degree of protection	None	IEC 60529 IP67	
Weight	Approx. 130 g	Approx. 150 g	



Multi-code reading at a touch

- Accurate reading of barcode and datamatrix
- Easy adjustment of parameters
- 1.3 MPixel CMOS image sensor
- Flexible installation: front and side view variants

Ordering information

Code Reader

Name	Type	Order code
Multi code reader	Front view	V400-R1CF
	Side view	V400-R1CS

Cables

Name	Length	Order code
PC communication cable (incl. power)	0.8 m	V509-W011D
	5 m	V509-W016D
PLC communication cable (incl. power)	0.8 m	V509-W011
	5 m	V509-W016

Specifications

Item	V400-R1CF/V400R1CS
Bar code	JAN/EAN/UPC (A, E), CODE39, NW-7, ITF Industrial2of5, CODE93, CODE128 (including EAN128), RSS
2D code	DataMatrix (ECC200), QR code, micro QR code, PDF417, RSS
Number of reading digits	No upper limit (depends on bar width and reading distance)
Light source	Four red LEDs (wave length: 630 nm)
Aiming light	Two green LEDs (wave length: 527 nm)
Minimum resolution	0.1 mm (bar code), 0.169 mm (2D code)
Image capture device	CMOS area sensor 1280x1024 (H+V)
Working distance (WD)	60 mm
Field of view	52x41 mm (for WD = 60 mm)
Skew angle	-50 to 0 , 0 to +50
Pitch angle	-50 to 0 , 0 to +50
Tilt angle	360
Reading of bar codes on curved surfaces	R > 15 mm (JAN8), R > 20 mm (JAN13)
Communication specification	RS-232C
OK/NG outputs	NPN open collector output
Function setting method	Menu sheet reading method or host command method
Reading trigger	External trigger (transistor input) Trigger by command (RS-232C) Trigger a test reading by pressing the SCAN button on the product
OK/NG signals	OK signal is turned on to indicate a successful read OK signal is turned on to indicate a successful read of registered label NG signal is turned on to indicate a successful read of a non-registered label
Indication LED	OK LED (green) illuminates to indicate a successful read NG LED (red) illuminates for failed reading with an error message output
Buzzer	Notifies a successful reading with a buzzer sound (muting available)
Power voltage	4.5 to 5.5 VDC
Consumption current	During operation: 500 mA or less; during standby: 300 mA or less
Ambient temperature	Operation: 0 to +45 C, storage: 2 to +60 C
Ambient humidity	Operation and storage: 20 to 85% RH (with no icing or condensation)
Ambient atmosphere	No corrosive gases
Ambient light resistance	10,000 lx (fluorescent lamp), 100,000 lx (sunlight)
Vibration resistance	12 to 100 Hz, 19.6 m/s^2 (2G), 1 hour each in three directions
Degree of protection	IP54 (IEC60529)
Weight	Approximately 270 g (including cables, ferrite core, mounting bracket, insulation board and screws)
Dimensions	58x46x24.2 mm
Input connector	Round DIN connector
Accessories	Operation manual, ferrite core, menu sheet, mounting bracket, insulation board, M3x8 screws (four), M5x10 screws (two)
Housing	Aluminium die-cast (ADC12)



Target, “touch&go”

- Easy to use – target, “touch&go”
- Built-in LCD monitor for immediate display of results
- Accurate – reading of direct print marks
- Variable field of view

Ordering information

Main unit

Name	Communications interface	Field of vision	Remarks	Order code
2D code reader	RS-232C	5x5 to 10x10 mm	–	V400-H111
	RS-232C	15x15 to 30x30 mm	–	V400-H211

Accessories

Name	Cable length	Remarks	Order code
Contactor	–	Contactor for positioning (detachable)	V400-AC2
Communications cable	2 m	For SYSMAC series connection (with power cord)	V400-W20-2M
	5 m		V400-W20-5M
	2 m	For PC-compatible connection (with power cord)	V400-W21-2M
	5 m		V400-W21-5M
	2 m	For PC-compatible connection (when using AC adaptor)	V400-W22-2M
	5 m		V400-W22-5M
AC adaptor	–	–	V600-A22

Ratings and specifications

Item	V400-H111	V400-H211
Field of vision	5x5 to 10x10 mm	15x15 to 30x30 mm
Working distance	40 mm (flush when contactor is mounted)	
Power supply	5 VDC ±10%	
Current consumption	1.0 A max.	
Serial interface	RS-232C	
Applicable codes	Data matrix, ECC200, 10x10 to 64x64, 8x18 to 16x48, QR code (models 1, 2), 21x21 to 57x57 (versions 1 to 10)	
Operation method	Pressing the trigger button	
Settings	Make settings by using the manual setting window, uploading from an SD memory card, or by using support software.	
Memory card	SD memory card	
Monitor	1.8 inch TFT LCD, displaying images and read data	
Display illumination	Operation display, memory card access	
Ambient temperature	Operation: 0 to 40°C, storage: -25 to 60°C	
Ambient humidity	35 to 85% (with no condensation)	
Ambient conditions	No corrosive gases	
Vibration resistance	10 to 150 Hz, single amplitude 0.35 mm (50 m^2/s max. acceleration)	
Shock resistance	150 m^2/s in ±X, Y, and Z directions, 3 times	
Weight	Approx. 230 g	
Degree of protection	IEC 60529 IP64	
Materials	Case: ABS; optical surface: PC; display surface: PMMA	



Compact Laser

- Compact design
- Easy installation & setup
- Strong reading performance

Ordering information

Name	Product	Model
Barcode Readers	Cable output	V500-R521B2
	Round DIN connector	V500-R521C2
ID Link Unit (sold separately)		V700-L12
Cables (sold separately)	SYSMAC D-sub 9-pin cable, 0.8 m	V509-W011
	SYSMAC D-sub 9-pin cable, 5 m	V509-W016
	IBM PC/AT or compatible D-sub 9-pin cable, 0.8 m	V509-W011D
	IBM PC/AT or compatible D-sub 9-pin cable, 5 m	V509-W016D

Ratings and Specifications

Item		V500-R_
Applicable barcodes	Type of barcode	Code 39, NW-7, ITF, STF (2 of 5 bars), Code 93, Code 128 (including EAN128), EAN/UPC (A and E)
	Number of read digits	32 digits max. (depends on bar width and read size)
Reading performance *1	Resolution	0.15 mm (for PCS0.9)
	Contrast (PCS value)	0.45 min. (70% white reflectance min.)
	Reading distance	60 to 270 mm (with 1.0-mm thin bar)
	Reading angle	Within 40° (including left and right margins)
	Skew angle	±50° (excluding the upper 10° and lower 5° ranges)
	Pitch angle	±25° (25° right and left)
	Light source	Red laser diode (wavelength: 650 nm)
	Optical output	1.0 mW max.
	Scan type	Raster scan
	Number of scans	500 scans/s
	Number of read repetitions	2 to 6 times
	Reading verification	Buzzer and LED indicators
Interfaces	Communications specifications	RS-232C
	OK/NG output (V500-R521B2 only)	30 mA at 24 VDC, NPN open-collector output
Function setting method		Menu sheet reading or host commands
Read trigger		· External trigger (transistor input) · Trigger by command (RS-232C) · Test read trigger with the TEST Button on the Reader
Read results output	RS-232C output	Read data is output.
	OK/NG signal (V500-R521B2 only)	The OK signal turns ON when reading is successful. The NG signal turns ON when reading fails.
	LED indicators	The OK indicator lights when reading is successful. The NG indicator lights when reading fails.
	Buzzer	The buzzer sounds when reading is successful. (The buzzer can be muted.)
Power supply specifications	Power supply voltage	5 VDC ±10% *2
	Current consumption	220 mA typ. (330 mA max.)
	Inrush current	2.5 A max.
Environment	Ambient temperature	Operating: 0 to 45°C, Storage: -10°C to 60°C (with no icing or condensation)
	Ambient humidity	Operating and storage: 30% to 85% (with no icing or condensation)
	Vibration resistance	12 to 100 Hz, 19.6 m/s2 acceleration in X, Y, and Z directions for 3 hours each
	Allowable ambient light	3,000 lx max. (fluorescent light; excluding inverter fluorescent lighting)
Enclosure rating		IP54 (IEC 60529 standard)
Weight		80 g (excluding cable and connector)
I/O connector		V500-R521B2: Cable output
		V500-R521C2: DIN 8-pin connector
Cable length		2 m

*1 Unless otherwise specified, specifications are for a barcode set to JAN 1´ with an MRD of 63% or higher (a PCS value of 0.9 or higher) is used with the pitch angle (a) set to 0°, the skew angle (b) set to 15°, the tilt angle (g) set to 0°, and the curvature (R) set to infinity.

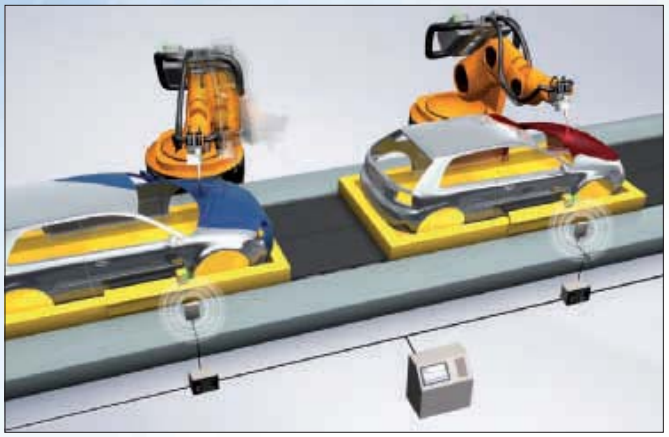
*2 The power supply voltage is specified at the I/O connector of the Barcode Reader

V680 RFID SYSTEM

One for all

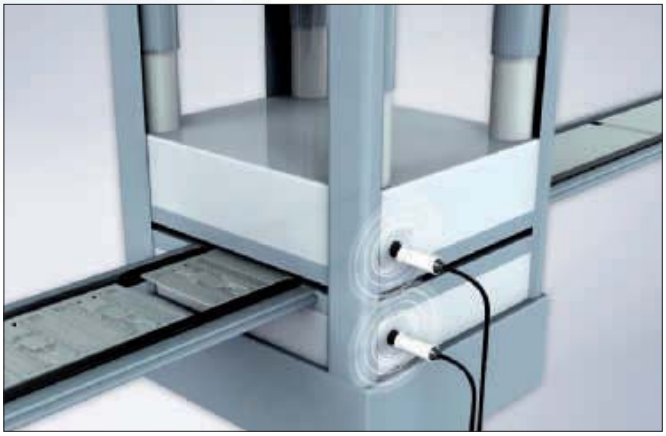
The powerful Omron V680 series offers a complete set of tags, antennas and control devices for any RFID application. V680 can run in an autonomous stand alone environment as well as in high speed communication with PLCs. A wireless handheld RFID reader complements the portfolio.

- Diagnostic functions for maintenance
- One for all: modular platform concept
- Flexible installation: Long range antennas
- Fit for speed: Short communication time
- Save time & costs: easy setup & maintenance



Production ID system for the paint shop

A RFID system is used to store the process parameters needed for the production of the car throughout the process. Harsh conditions through chemicals and high temperatures occur during the production steps. RFID is ideal for this application as it features high resistance tags for tough conditions.

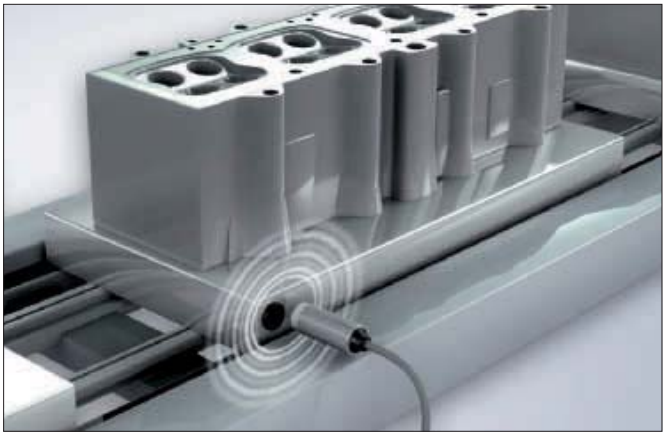


Monitoring of the moulding history

Process and maintenance related information of a moulding press can be stored by using RFID. The information can be read out permanently or on demand from a remote location and can be used to control the process.

YOUR BENEFITS

- High speed air communication
- Standardized protocol (ISO15693)
- Large memory (up to 32kByte) and very compact tags
- Long life time of tags (FERAM variants)
- All protocols for PLC communication



Traceability of automotive parts

Track the parts in the production process. Process related information can be stored to guarantee high quality production.



Carrier Management

For the administration and traceability of transport carriers along the hole process RFID represents a smart solution. V680 is working on the standardized universal frequency of 13.56MHz. The flexible platform with its versatile and compact design can be easily integrated into any point in the production process.

V680 RFID Platform overview

Mobile transponder (FeRAM + EEPROM)

Please refer to the datasheet for the recommended antennas

V680-D1KP52MT, 1 kByte (metal mounting)
V680-D2KF52M, 2 kByte (metal mounting)



V680-D1KP66T, 2 kBytes
V680-D1KP66MT, 1 kBytes (metal mounting)



V680-D2KF67, 2 kBytes
V680-D2KF67M, 2 kBytes (metal mounting)
V680-D8KF67, 8 kBytes
V680-D8KF67M, 8 kBytes (metal mounting)



V680-D1KP66T-SP, 1 kByte
(PFA enclosure / chemical resistant)



V680-D8KF68, 8 kBytes
V680-D32KF68, 32 kBytes



Other tags are available on request.

Wireless data acquisition

Antenna/Interrogator*

V680-HS51/M12



V680-HS52/M22



V680-HS63, rectangular



V680-HS65, rectangular



Amplifier*

V680-HA63A, 1kByte
V680-HA63B, >1kByte



Amplifier with noise measurement function (for use of serial controller or PLC unit)

Please contact your local Sales Representative to recommend you best suitable tag/antenna combination.

V680-H01-V2, rectangular
(with integrated amplifier)



Handheld reader/writer



Handheld reader
USB for PC/IPC use
V680 CHUD (V680-CH1D / RS232 / 5V DC connector)

Handheld reader
RS-232C for handheld terminal
V680-CH1D-PSI
5V AC adapter for V680-CH1D: E3X-MC11-S-PS3 BYOMG

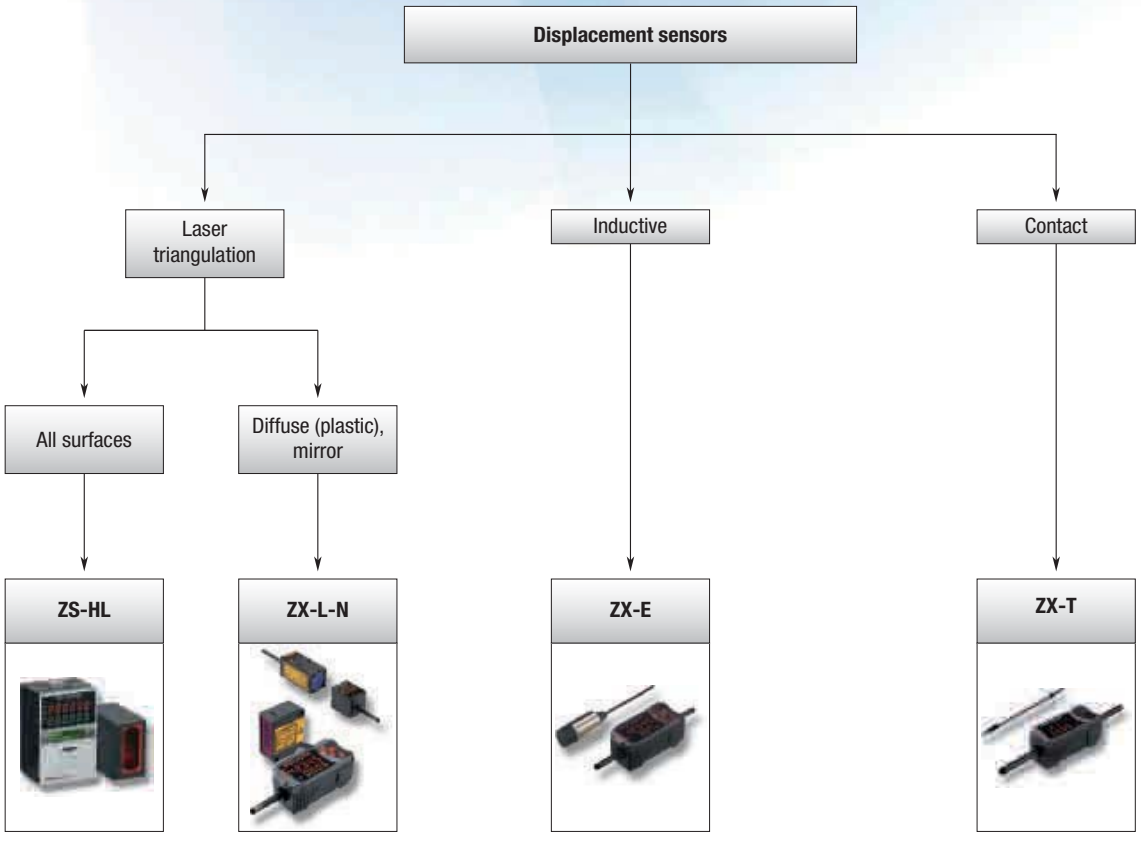
Controlling device	Feature and benefits	Communication and system integration
Easy to maintain 1/2 controller for long wired serial communication V680-CA5D01-V2 (1 channel) V680-CA5D02-V2 (2 channels) 	High speed communication system noise and distance measurement for self diagnosis and preventive maintenance. Protocol analyzer function comfortable software for quick start-up and operation.	**Serial communication for long wiring (<500 m)**
Modular multi functional RFID communication system CJ1W-V680-C11 (1 channel) CJ1W-V680-C12 (2 channels) CS1W-V680-C11 (1 channel) CS1W-V680-C12 (2 channels) 	Future-proofed RFID system with enhanced connectivity and additional functionality. Up to 160 antennas can be cascaded Multi-functional intelligent controller for multi-purpose use. V680-C#-SYS can be operated as multi-tasking stand-alone system beside of existing PLC setups CX-One Software allows easy integration using function blocks.	**Advanced modular RFID communication system:** **- Ethernet IP** **- DeviceNet** **- PROFIBUS-DP** **- CAN** **- CompoBus/S**
V680-HAM81 PNP ID Flag Sensor V680-HAM91 NPN ID Flag Sensor 	Cost effective DeviceNet slave controller with integrated amplifier for direct connection to any DeviceNet nodes.	**DeviceNet fieldbus high speed communication (integrated amplifier)**
ID Flag Sensor (PNP/NPN) V680-HAM81/HAM91 	Easy to setup ID flag system addressing up to 64.000 ID's.	**ID flag sensor communication**
Handheld Terminal V680-A-7527S-G2-EG-S 	Wireless handheld to R/W data at any time in production process or logistics. Further possibility to communicate on PC/IPC platform via USB. Demosoftware is pre-installed.	**Handheld/PLC/PC communication**

HIGH PRECISION QUALITY INSPECTION

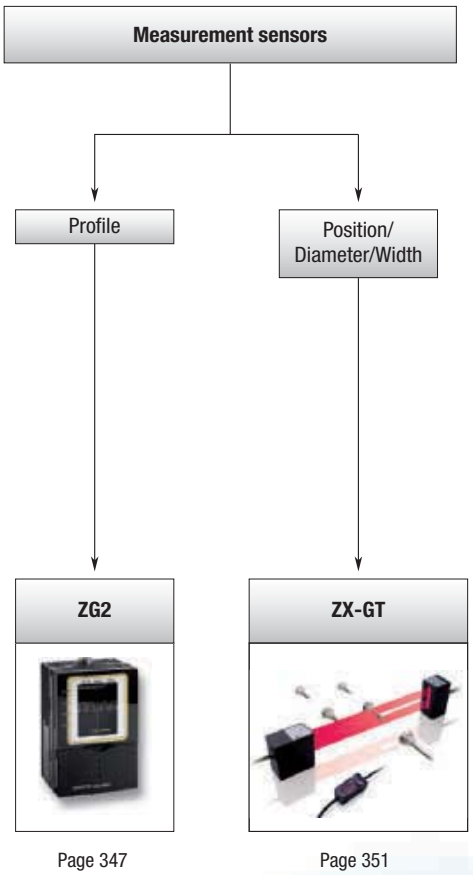
Zero defect becomes reality – scalable accuracy in inspection

The Smart displacement sensor family offers a modular and scalable approach to solve the most challenging measurement tasks. The powerful portfolio enables you to measure profiles, thickness, distance, evenness/warpage, as well as width, edge, etc. Several measurement profiles can be performed simultaneously, using a single- or multi-controller unit. Aided by Omron's advanced technologies, the highest accuracy over long distances, speed and reliability will be achieved.

- Accurate and fast – 0.25 µm at less than 110 µs sampling time
- Scalable – multi-controller unit to coordinate and calculate up to 9 units
- Smart – data storage and remote control via networking capabilities







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Selection table

		1D smart laser measuring sensors		Inductive measuring sensors
				
Selection criteria	Model	ZS-HL	ZX-L-N	ZX-E
	Measurement range Z Min.	10 ±0.5 mm	30 ±2 mm	0.5 mm
	Max.	1500 ±500 mm	300 ±200 mm	7 mm
	Measurement range X Min.	–	–	–
	Max.	–	–	–
	Resolution Z	0.25 µm	0,25 µm	1 µm
	Resolution X	–	–	–
	Linearity (±% of full scale)	0.05%	0,2%	0.5%
	Response time	110 µs	150 µs	150 µs
	Spot beam	■	■	–
	Line beam	■	■	–
	IP-rating head	IP64/IP67	IP50	IP67
	IP-rating controller	IP40	IP40	IP40
	Ambient oper. temperature	0 to 50°C	0 to 50°C	0 to 50°C
	Number of connectable sensors	9	5	5
Features	Thickness measurement	■	■	■
	Eccentricity	■	■	■
	Height	■	■	■
	Step	■	■	■
	Profile	–	–	–
	Distance	–	–	■
	Evenness	–	–	■
	Warpage	–	–	■
	Edge	–	–	–
	Width	–	–	–
	Peak	■	■	■
	Peak to peak	■	■	■
	Bottom	■	■	■
	Self-trigger	■	■	■
	Calibration	■	■	–
	Signal scaling	–	–	■
	PC-software	■	■	■
Application	Mirror	■	–	–
	Glass	■	–	–
	Metal	■	□	■
	Plastic	■	■	–
	Black rubber	■	–	–
	Paper	■	□	–
Supply voltage	12 to 24 VDC	–	■	■
	21.6 to 26.4 VDC	■	–	–
Control I/O	4 to 20 mA	■	■	■
	1 to 5 VDC	–	■	■
	Judgement output High/Pass/Low	■	■	■
	Trigger	■	■	■
Commu-nication	RS-232C	■	■	■
	USB2.0	■	–	■
	Page	334	339	342

		Contact measuring sensors	Profile measuring sensor	Smart laser micrometer
				
Selection criteria	Model	ZX-T	ZG2	ZX-GT
	Measurement range Z Min.	1 mm	20 ±0.5 mm	–
	Max.	10 mm	210 ±30 mm	28 mm
	Measurement range X Min.	–	3 mm	–
	Max.	–	70 mm	–
	Resolution Z	0.1 µm	0.2 µm	10 µm
	Resolution X	–	3 mm/631 pixels	–
	Linearity (±% of full scale)	0.3%	0.5%	0.1%
	Response time	1 ms	5 ms	150 µs
	Spot beam	–	–	–
	Line beam	–	□	–
	IP-rating head	IP67	IP64/66	IP40
	IP-rating controller	IP40	IP20	IP40
	Ambient oper. temperature	0 to 50°C	0 to 50°C	0 to 50°C
	Number of connectable sensors	7	1	5
Features	Thickness measurement	■	■	■
	Eccentricity	■	■	■
	Height	■	■	■
	Step	■	■	■
	Profile	–	□	–
	Distance	■	–	–
	Evenness	■	–	–
	Warpage	■	–	–
	Edge	–	–	■
	Width	–	□	■
	Peak	■	■	■
	Peak to peak	■	■	■
	Bottom	■	■	■
	Self-trigger	■	■	■
	Calibration	–	■	–
	Signal scaling	■	–	■
	PC-software	■	■	■
Application	Mirror	■	■	■
	Glass	■	■	■
	Metal	■	■	■
	Plastic	■	■	■
	Black rubber	■	■	■
	Paper	–	■	■
Supply voltage	12 to 24 VDC	■	–	■
	21.6 to 26.4 VDC	–	■	■
Control I/O	4 to 20 mA	■	■	■
	1 to 5 VDC	■	–	■
	Judgement output High/Pass/Low	■	■	■
	Trigger	■	■	■
Commu-nication	RS-232C	■	■	■
	USB2.0	–	■	–
	Page	344	347	351

■ Standard □ Available – No/not available



The scalable high-precision laser measurement sensor

The ZS laser sensor family provides outstanding measurement performance on all kind of materials. Its huge range of sensor heads and scalable concept makes it a versatile platform for all high precision sensing applications.

- Highest resolution and dynamic sensing range for all surfaces
- Modular and scalable platform concept for up to 9 sensors
- Easy to use, install and maintain for all user levels
- Fast response time of 110 µs
- Multi-tasking capability – manages up to 4 measurement tools in one controller

Ordering information

Sensors

ZS-HL-series sensor heads

Optical system	Sensing distance	Beam shape	Beam diameter	Resolution*1	Order code
Regular reflective models	20±1 mm	Line beam	1.0 mmx20 µm	0.25 µm	ZS-HLDS2T
	25±2 mm		2.2 mmx45 µm	0.6 µm	ZS-HLDS2VT
Diffuse reflective models	50±5 mm		1.0 mmx30 µm	0.25 µm	ZS-HLDS5T
	100±20 mm		3.5 mmx60 µm	1 µm	ZS-HLDS10
	600±350 mm		16 mmx0.3 mm	8 µm	ZS-HLDS60
	1500±500 mm		40 mmx1.5 mm	500 µm	ZS-HLDS150

*1 Refer to the table of ratings and specifications for details.

ZS-HL-series sensor heads (for nozzle gaps) also compatible with ZS-L controller

Optical system	Sensing distance	Beam shape	Beam diameter	Resolution*1	Order code
Regular reflective models	10±0.5 mm	Line beam	900x25 µm	0.25 µm	ZS-LD10GT
	15±0.75 mm				ZS-LD15GT

*1 Refer to the table of ratings and specifications for details.

ZS-L-series sensor heads

Optical system	Sensing distance	Beam shape	Beam diameter	Resolution*1	Order code
Regular reflective models	20±1 mm	Line beam	900x25 µm	0.25 µm	ZS-LD20T
		Spot beam	25 µm dia.		ZS-LD20ST
	40±2.5 mm	Line beam	2000x35 µm		ZS-LD40T
Diffuse reflective models	50±5 mm	Line beam	900x60 µm	0.8 µm	ZS-LD50
		Spot beam	50 µm dia.		ZS-LD50S
	80±15 mm	Line beam	900x60 µm	2 µm	ZS-LD80
	130±15 mm	Line beam	600x70 µm	3 µm	ZS-LD130
	200 ±50 mm	Line beam	900x100 µm	5 µm	ZS-LD200
	350 ±135 mm	Spot beam	240 µm dia.	20 µm	ZS-LD350S

*1 This is the peak-to-peak displacement conversion value in the displacement output at the measuring center distance in high-precision mode when the number of samples to average is set to 128 and the measuring mode is set to the high-resolution mode. The standard workpiece is white aluminium ceramics in diffuse reflection mode and glass in the regular reflection mode.

ZS-HL-series sensor controllers

Supply voltage	Control outputs	Order code
24 VDC	NPN outputs	ZS-HLDC11
	PNP outputs	ZS-HLDC41
		ZS-HLDC41A (incl. USB cable + Smart monitor)

Multi-controllers

Supply voltage	Control outputs	Order code
24 VDC	NPN outputs	ZS-MDC11
	PNP outputs	ZS-MDC41

Data storage units

Supply voltage	Control outputs	Order code
24 VDC	NPN outputs	ZS-DSU11
	PNP outputs	ZS-DSU41

Accessories (sold separately)

Controller link

Item	Order code
Controller link	ZS-XCN

Panel mount adapter

Model	Order code
For 1st controller	ZS-XPM1
For expansion (from 2nd controller on)	ZS-XPM2

Cables for connecting to a Personal Computer

Type	Quantity	Order code
RS-232C	1	ZS-XRS2
USB	1	ZS-XUSB2

Extension cables for sensor heads

Cable length	Quantity	Order code
1 m	1	ZS-XC1A
4 m	1	ZS-XC4A
5 m	1	ZS-XC5B*1,*2
8 m	1	ZS-XC8A
10 m	1	ZS-XC10B*1

*1 Up to two ZS-XC_B cables can be connected (22 m max.).
*2 A robot cable (ZS-XC5BR) is also available.

Logging software

Item	Order code
Smart monitor zero professional	ZS-SW11E

Memory card

Model	Order code
64 MB	F160-N64S(S)
128 MB	QM300-N128S
256 MB	F160-N256S

Safety precautions for using laser equipment

Laser Label Indications

Attach the following warning label to the side of the ZS-L-series Sensor Head.



Specifications

Sensor heads

ZS-HL-series sensor heads

Item		ZS-HLDS2T		ZS-HLDS2VT	ZS-HLDS5T		ZS-HLDS10		ZS-HLDS60	ZS-HLDS150
Applicable controllers		ZS-HLDC series								
Optical system		Regular reflection	Diffuse reflection	Regular reflection	Regular reflection	Diffuse reflection	Regular reflection	Diffuse reflection	Diffuse reflection	Diffuse reflection
Measuring center distance		20 mm	5.2 mm	25 mm	44 mm	50 mm	94 mm	100 mm	600 mm	1,500 mm
Measuring range		±1 mm	±1 mm	±2 mm	±4 mm	±5 mm	±16 mm	±20 mm	±350 mm	±500 mm
Light source		Visible semiconductor laser (wavelength: 650 nm, 1 mW max., JIS Class							Visible semiconductor laser (wavelength 658 nm, 1 mW max., Class 2)	
Beam shape		Line beam								
Beam diameter*1		1.0 mmx20 µm		2.2 mmx45 µm	1.0 mmx30 µm		3.5 mmx60 µm		0.3 mmx16 mm	1.5 mmx40 mm
Linearity*2		±0.05% F.S.		±0.2 %F.S.	±0.1% F.S.				±0.07 %F.S. (250 mm to 750 mm) ±0.1% F.S. (750 mm to 950 mm)	±0.2 %F.S.
Resolution*3		0.25 µm (No. of samples to average: 256)		0.5 µm (No. of samples to average: 128)	0.25 µm (No. of samples to average: 512)		1 µm (No. of samples to average: 64)		8 µm (average 64) (at 250 mm) 40 µm (average 64) (at 600 mm)	500 µm (average 64)
Temperature characteristic*4		0.01% F.S./°C		0.1% F.S./°C	0.01% F.S./°C					
Sampling cycle		110 µs (high-speed mode), 500 µs (standard mode), 2.2 ms (high-precision mode), 4.4 ms (high-sensitivity mode)								
Indicators	NEAR indicator	Lights near the measurement center, and nearer than the measurement center distance inside the measuring range. Flashes when the measurement target is outside of the measuring range or when the received light amount is insufficient.								
	FAR indicator	Lights near the measurement center, and further than the measurement center distance inside the measuring range. Flashes when the measurement target is outside of the measuring range or when the received light amount is insufficient.								
Operating ambient illumination		Illumination on received light surface 3,000 lx or less (incandescent light)							Illumination on received light surface 1,000 lx or less (incandescent light)	Illumination on received light surface 500 lx or less (incandescent light)
Ambient temperature		Operating: 0 to +50°C, storage: -15 to +60°C (with no icing or condensation)								
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)								
Degree of protection		IP64		IP67	Cable length 0.5 m: IP66, cable length 2 m: IP67				IP66 (IEC60529)	
Vibration resistance (destructive)		10 to 150 Hz, 0.7 mm double amplitude, 80 min each in X, Y, and Z directions								
Shock resistance (destructive)		150 m/s² 3 times each in six directions (up/down, left/right, forward/backward)								
Materials		Case: aluminium die-cast, front cover: glass								
Cable length		0.5 m, 2 m		2 m	0.5 m, 2 m					
Weight		Approx. 350 g			Approx. 600 g				Approx. 800 g	

*1 Defined as 1/e² (13.5%) of the center optical intensity in the measurement center distance. The beam diameter is sometimes influenced by the ambient conditions of the workpiece such as leaked light from the main beam.

*2 This is the error on the measured value with respect to an ideal straight line. Linear curve may change according to the workpiece. The following lists the workpieces

Model	Diffusive reflection	Mirror reflection
ZS-HLDS2T	SUS block	Glass
ZS-HLDS5T/HLDS10	White alumina ceramic	Glass
ZS-HLDS60/HLDS150	White alumina ceramic	-
ZS-HLDS2VT	-	Glass

*3 This is the "peak-to-peak" displacement conversion value of the displacement output in the measurement center distance when high-resolution mode and the average number in the table are set (For ZS-HLDS60, the maximum resolution at 250 mm is also included). The following lists the workpieces.

Model	Diffusive reflection	Mirror reflection
ZS-HLDS2T	SUS block	Glass
ZS-HLDS5T	White alumina ceramic	Glass
ZS-HLDS10	White alumina ceramic	
ZS-HLDS60/HLDS150	White alumina ceramic	-
ZS-HLDS2VT	-	Glass

*4 Value obtained when the sensor part and object part are fixed with an aluminium jig.

ZS-L-series sensor heads

Item		ZS-LD20T		ZS-LD20ST		ZS-LD40T		ZS-LD10GT	ZS-LD15GT
Applicable controllers		ZS-HLDC/LDC series							
Optical system		Regular reflection	Diffuse reflection	Regular reflection	Diffuse reflection	Regular reflection	Diffuse reflection	Regular reflection	
Measuring center distance		20 mm	6.3 mm	20 mm	6.3 mm	40 mm	30 mm	10 mm	15 mm
Measuring range		±1 mm	±1 mm	±1 mm	±1 mm	±2.5 mm	±2 mm	±0.5 mm	±0.75 mm
Light source		Visible semiconductor laser (wavelength: 650 nm, 1 mW max., JIS Class 2)							
Beam shape		Line beam		Spot beam		Line beam			
Beam diameter*1		900 x 25 µm		25 µm dia.		2,000 x 35 µm		Approx. 25 x 900 µm	
Linearity*2		±0.1%F.S							
Resolution*3		0.25 µm		0.25 µm		0.4 µm		0.25 µm	0.25 µm
Temperature characteristic*4		0.04% FS/°C		0.04% FS/°C		0.02% FS/°C		0.04% FS/°C	
Sampling cycle*5		110 µs (high-speed mode), 500 µs (standard mode), 2.2 ms (high-precision mode), 4.4 ms (high-sensitivity mode)							
Indicators	NEAR indicator	Lights near the measuring center distance, and nearer than the measuring center distance inside the measuring range. Flashes when the measurement target is outside of the measuring range or when the received light amount is insufficient.							
	FAR indicator	Lights near the measuring center distance, and further than the measuring center distance inside the measuring range. Flashes when the measurement target is outside of the measuring range or when the received light amount is insufficient.							
Operating ambient illumination		Illumination on received light surface: 3,000 lx or less (incandescent light)							
Ambient temperature		Operating: 0 to 50°C, storage: -15 to 60°C (with no icing or condensation)							
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)							
Degree of protection		Cable length 0.5 m: IP66, cable length 2 m: IP67						IP40	
Materials		Case: Aluminium die-cast, front cover: Glass							
Cable length		0.5 m, 2 m							
Weight		Approx. 350 g						Approx. 400 g	
Accessories		Laser labels (1 each for JIS/EN, 3 for FDA), ferrite cores (2), insure Locks (2), instruction sheet						Laser safety labels (1 each for JIS/EN),ferrite cores (2), insure locks (2)	

*1 Defined as 1/e² (13.5%) of the center optical intensity at the actual measurement center distance (effective value). The beam diameter is sometimes influenced by the ambient conditions of the workpiece, such as leaked light from the main beam.
*2 This is the error in the measured value with respect to an ideal straight line. The standard workpiece is white aluminium ceramics in diffuse reflection mode and glass in the regular reflection mode of the ZS-LD20T/40T/50. Linearity may change according to the workpiece.
*3 This is the peak-to-peak displacement conversion value in the displacement output at the measuring center distance in high-precision mode when the number of samples to average is set to 128 and the measuring mode is set to the high-resolution mode. The standard workpiece is white aluminium ceramics in diffuse reflection mode and glass in the regular reflection mode.
*4 This is the value obtained at the measuring center distance when the Sensor and workpiece are fixed by an aluminium jig.
*5 This value is obtained when the measuring mode is set to the high-speed mode.

ZS-L-series sensor heads

Item		ZS-LD50		ZS-LD50S		ZS-LD80		ZS-LD130		ZS-LD200		ZS-LD350S
Applicable controllers		ZS-HLDC/LDC series										
Optical system (reflection)		Diffuse	Regular	Diffuse	Regular	Diffuse	Regular	Diffuse	Regular	Diffuse	Regular	Diffuse
Measuring center distance		50 mm	47 mm	50 mm	47 mm	80 mm	78 mm	130 mm	130 mm	200 mm	200 mm	350 mm
Measuring range		±5 mm	±4 mm	±5 mm	±4 mm	±15 mm	±14 mm	±15 mm	±12 mm	±50 mm	±48 mm	±135 mm
Light source		Visible semiconductor laser (wavelength: 650 nm, 1 mW max., JIS Class 2)										
Beam shape		Line beam		Spot beam		Line beam		Line beam		Line beam		Spot beam
Beam diameter*1		900 x 60 µm		50 µm dia.		900 x 60 µm		600 x 70 µm		900 x 100 µm		240 µm dia.
Linearity*2		±0.1%F.S.							±0.25%F.S.	±0.1%F.S.	±0.25%F.S.	±0.04%F.S.
Resolution*3		0.8 µm		0.8 µm		2 µm		3 µm		5 µm		20 µm
Temperature characteristic*4		0.02% FS/°C		0.02% FS/°C		0.01% FS/°C		0.02% FS/°C		0.02% FS/°C		0.04% FS/°C
Sampling cycle*5		110 µs (high-speed mode), 500 µs (standard mode), 2.2 ms (high-precision mode), 4.4 ms (high-sensitivity mode)										
Indicators	NEAR indicator	Lights near the measuring center distance, and nearer than the measuring center distance inside the measuring range. Flashes when the measurement target is outside of the measuring range or when the received light amount is insufficient.										
	FAR indicator	Lights near the measuring center distance, and further than the measuring center distance inside the measuring range. Flashes when the measurement target is outside of the measuring range or when the received light amount is insufficient.										
Operating ambient illumination		Illumination on received light surface: 3,000 lx or less (incandescent light)						Illumination on received light surface: 2,000 lx or less (incandescent light)		Illumination on received light surface: 3,000 lx or less (incandescent light)		
Ambient temperature		Operating: 0 to 50°C, storage: -15 to 60°C (with no icing or condensation)										
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)										
Degree of protection		Cable length 0.5 m: IP66, cable length 2 m: IP67										
Materials		Case: AAluminium die-cast, front cover: Glass										
Cable length		0.5 m, 2 m										
Weight		Approx. 350 g										
Accessories		Laser labels (1 each for JIS/EN, 3 for FDA), ferrite cores (2), insure Locks (2), instruction sheet										

*1 Defined as 1/e² (13.5%) of the center optical intensity at the actual measurement center distance (effective value). The beam diameter is sometimes influenced by the ambient conditions of the workpiece, such as leaked light from the main beam.
*2 This is the error in the measured value with respect to an ideal straight line. The standard workpiece is white aluminium ceramics in diffuse reflection mode and glass in the regular reflection mode of the ZS-LD20T/40T/50. Linearity may change according to the workpiece.
*3 This is the peak-to-peak displacement conversion value in the displacement output at the measuring center distance in high-precision mode when the number of samples to average is set to 128 and the measuring mode is set to the high-resolution mode. The standard workpiece is white aluminium ceramics in diffuse reflection mode and glass in the regular reflection mode.
*4 This is the value obtained at the measuring center distance when the sensor and workpiece are fixed by an aluminium jig.
*5 This value is obtained when the measuring mode is set to the high-speed mode.

Sensor controllers

ZS-HL-series sensor controllers

Item			ZS-HLDC11	ZS-HLDC41
NPN/PNP			NPN	PNP
No. of samples to average			1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1,024, 2,048, or 4,096	
Number of mounted sensors			1 per sensor controller	
External interface	Connection method		Serial I/O: connector, other: pre-wired (standard cable length: 2 m)	
	Serial I/O	USB 2.0	1 port, full speed (12 Mbps max.), MINI-B	
		RS-232C	1 port, 115,200 bps. max.	
	Output	Judgement output	HIGH/PASS/LOW 3 outputs NPN open collector, 30 VDC, 50 mA max., residual voltage 1.2 V max	HIGH/PASS/LOW: 3 outputs PNP open collector, 50 mA max., residual voltage 1.2 V max
		Linear output	Selectable from 2 types of output, voltage or current (selected by slide switch on bottom). Voltage output: .10 to 10 V, output impedance: 40 Ω Current output: 4 to 20 mA	
	Inputs	Laser OFF, ZERO reset timing, RESET	ON: Short-circuited with 0 V terminal or 1.5 V or less OFF: Open (leakage current: 0.1 mA max.)	ON: Short-circuited to supply voltage or within 1.5 V of supply voltage. OFF: Open (leakage current: 0.1 mA max.)
Functions			Display: Measured value, threshold value, voltage/current, received light amount, and resolution/terminal block output Sensing: Mode, gain, measurement object, head installation Measurement point: Average, peak, bottom, thickness, step, and calculations Filter: Smooth, average, and differentiation Outputs: Scaling, various hold values, and zero reset I/O settings: Linear (focus/correction), judgments (hysteresis and timer), non-measurement, and bank (switching and clear) System: Save, initialization, measurement information display, communications settings, key lock, language, and data load Task: Single task or multitask (up to 4)	
Status indicators			HIGH (orange), PASS (green), LOW (orange), LDON (green), ZERO (green), and ENABLE (green)	
Segment display		Main digital	8-segment red LED, 6 digits	
		Sub-digital	8-segment green LEDs, 6 digits	
LCD			16 digitsx2 rows, colour of characters: green, resolution per character: 5x8 pixel matrix	
Setting inputs		Setting keys	Direction keys (UP, DOWN, LEFT, and RIGHT), SET key, ESC key, MENU key, and function keys (1 to 4)	
		Slide switch	Threshold switch (2 states: High/Low), mode switch (3 states: FUN, TEACH, and RUN)	
Power supply voltage			21.6 V to 26.4 VDC (including ripple)	
Current consumption			0.5 A max. (when sensor head is connected)	
Ambient temperature			Operating: 0 to 50°C, storage: -15 to +60°C (with no icing or condensation)	
Ambient humidity			Operating and storage: 35% to 85% (with no condensation)	
Degree of protection			IP20	
Materials			Case: Polycarbonate (PC)	
Weight			Approx. 280 g (excluding packing materials and accessories)	
Accessories			Ferrite core (1), instruction sheet	

ZS-MDC11/MDC41 multi controllers

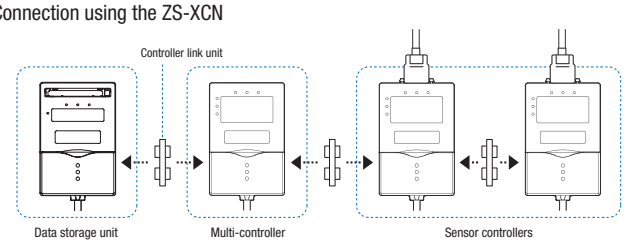
Basic specifications are the same as those for the sensor controllers.

The following points, however, are different.

(1) Sensor heads cannot be connected.
(2) A maximum 9 of controllers can be connected. Control link units are required to connect controllers.
(3) Processing functions between controllers: Math functions

Controller link unit

Connection using the ZS-XCN



Data storage units

Sensor controllers	Model		ZS-DSU11	ZS-DSU41
Number of mounted censor heads			Cannot be connected	
Number of connectable controllers			10 controllers max. (ZS-MDC: 1 controller, ZS-HLDC: 9 controllers max.)*1	
Connectable controllers			ZS-HLDC__, ZS-MDC__	
External interface	Connection method		Serial I/O: connector, other: pre-wired (standard cable length: 2 m)	
	Serial I/O	USB 2.0	1 port, full speed (12 Mbps), MINI-B	
		RS-232C	1 port, 115,200 bps max.	
	Outputs		3 outputs: HIGH, PASS, and LOW NPN open-collector, 30 VDC, 50 mA max., residual voltage: 1.2 V max.	3 outputs: HIGH, PASS, and LOW PNP open-collector, 50 mA max., residual voltage: 1.2 V max.
	Inputs		ON: Short-circuited with 0V terminal or 1.5 V or less OFF: Open (leakage current: 0.1 mA max.)	ON: Short-circuited to supply voltage or within 1.5 V of supply voltage OFF: Open (leakage current: 0.1 mA max.)
Data resolution			32 bits	
Functions	Logging trigger functions		Start and stop triggers can be set separately; external triggers, data triggers (self-triggers), and time triggers	
	Other functions		External banks, alarm outputs, saved data format customization, and clock	
Status indicators			OUT (orange), PWR (green), ACCESS (orange), and ERR (red)	
Segment display			8-segment green LEDs, 6 digits	
LCD			16 digitsx2 rows, colour of characters: green, resolution per character: 5x8 pixel matrix	
Setting inputs		Setting keys	Direction keys (UP, DOWN, LEFT, and RIGHT), SET key, ESC key, MENU key, and function keys (1 to 4)	
		Slide switch	Threshold switch (2 states: High/Low), mode switch (3 states: FUN, TEACH, and RUN)	

Sensor controllers	Model	ZS-DSU11	ZS-DSU41
Power supply voltage		21.6 V to 26.4 VDC (including ripple)	
Current consumption		0.5 A max.	
Ambient temperature		Operating: 0 to 50°C, storage: -15 to 60°C (with no icing or condensation)	
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)	
Materials		Case: Polycarbonate (PC)	
Weight		Approx. 280 g (excluding packing materials and accessories)	
Accessories		Ferrite core (1) instruction sheet, tools for data storage unit: CSV file converter for data storage unit, smart analyzer macro edition (Excel macros for analysis of collected data)	

*1 Control link units are required to connect controllers.



Smart, fast and accurate laser measurement sensor

Smart ZX-L-N offers plug & measure technology for applications where high resolution and fast response time is required. A wide range of interchangeable sensor heads provide greater flexibility in solving most demanding applications.

- Small and light sensor heads for easy integration
- High speed response time of 150 µs
- Easy sensor head replacement
- Scalability through a modular platform concept
- Multipoint measurement with up to 5 sensors
- Wide range of sensor heads offering laser beam width from 1 mm to 30 mm

Ordering information

Sensors

Sensor head (reflection type)

Optical method	Beam shape	Sensing distance	Resolution *1	Size in mm (HxWxD)	Order code
Diffuse-reflective	Spot beam	40±10 mm	2 µm	39x33x17	ZX-LD40
		100±40 mm	16 µm		ZX-LD100
		300±200 mm	300 µm		ZX-LD300
	Line beam	40±10 mm	2 µm		ZX-LD40L
		100±40 mm	16 µm		ZX-LD100L
		300±200 mm	300 µm		ZX-LD300L
Regular reflection type	Spot beam	30±2 mm	0.25 µm	45x55x25	ZX-LD30V
	Line beam				ZX-LD30VL

*1 At average count of 4,096 times

Sensor head (through-beam)

Optical method	Measurement width	Sensing distance	Resolution *1	Size in mm (HxWxD)		Order code
				Transmitter	Receiver	
Through-beam	1 mm dia.	0 to 2,000 mm	4 µm	15x15x34	15x15x19	ZX-LT001
	5 mm	0 to 500 mm				ZX-LT005
	10 mm			20x20x42	20x20x25	ZX-LT010
	30 mm		12 µm	64.25x70x22.6	64.25x54x22.6	ZX-LT030

*1 At average count of 64 times

Amplifier units

Power supply	Output specifications	Order code
DC	NPN output	ZX-LDA11-N
	PNP output	ZX-LDA41-N

Note: Compatible with sensor head connection.

Accessories (order separately)

Calculating unit

	Order code
Calculating unit	ZX-CAL2

Side-view attachments

Applicable sensor head	Order code
ZX-LT1001/LT005	ZX-XF12
ZX-LT010	ZX-XF22

SmartMonitor sensor setup tool for Personal Computer connection

Name	Order code
ZX-series communications interface unit	ZX-SF11
ZX-series communications interface unit + Setup Software (CD-ROM)	ZX-SFW11EV3*1,*2
ZX-series sensor setup and logging software (CD-ROM)	ZX-SW11EV3*1

*1 When using the ZX-TDA11/41 with the SmartMonitor, either the ZX-SFW11EV3 or the ZX-SW11EV3 SmartMonitor must be used. Earlier versions cannot be used.
*2 The ZX-SFW11EV3 SmartMonitor can be used only to set functions and monitor waveforms.

Cables with connectors on both ends (for extension)*1

Cable length	Order code
1 m	ZX-XC1A
4 m	ZX-XC4A
8 m	ZX-XC8A
9 m*2.	ZX-XC9A

*1. Robot cable models are also available. The model numbers are ZX-XC_R.
*2. For use only with reflective sensors.

Specifications

Sensor head (reflection type)

Item	ZX-LD40	ZX-LD100	ZX-LD300	ZX-LD30V	ZX-LD40L	ZX-LD100L	ZX-LD300L	ZX-LD30VL
Optical method	Diffuse reflection			Regular reflection	Diffuse reflection			Regular reflection
Light source (wave length)	Visible-light semiconductor laser (wavelength 650 nm, 1 mW or less, Class 2)							
Measurement center distance	40 mm	100 mm	300 mm	30 mm	40 mm	100 mm	300 mm	30 mm
Measurement range	±10 mm	±40 mm	±200 mm	±2 mm	±10 mm	±40 mm	±200 mm	±2 mm
Beam shape	Spot				Line			
Beam diameter *1	50 µm dia.	100 µm dia.	300 µm dia.	75 µm dia.	75 µmx2mm	150 µmx2 mm	450 µmx2 mm	100 µmx1.8 mm
Resolution*2	2 µm	16 µm	300 µm	0.25 µm	2 µm	16 µm	300 µm	0.25 µm
Linearity*3	±0.2% F.S. (entire range)	±0.2% F.S. (80 to 121 mm)	±2% F.S. (200 to 401 mm)	±0.2% F.S. (entire range)	±0.2% F.S. (32 to 49 mm)	±0.2% F.S. (80 to 121 mm)	±2% F.S. (200 to 401 mm)	±0.2% F.S. (entire range)
Temperature characteristic*4	±0.03% FS/°C (except for ZX-LD300 and ZX-LD300L, which are ±0.1% FS/°C.)							
Ambient illumination	Incandescent lamp: 3,000 lx max. (on light receiving side)							
Ambient temperature	Operating: 0 to 50°C, storage: -15 to 60°C (with no icing or condensation)							
Ambient humidity	Operating and storage: 35% to 85% (with no condensation)							
Insulation resistance	20 MΩ min. at 500 VDC							
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min							
Vibration resistance (destruction)	10 to 150 Hz, 0.7-mm double amplitude 80 min each in X, Y, and Z directions							
Shock resistance (destruction)	300 m/s^2 3 times each in six directions (up/down, left/right, forward/backward)							
Protective structure	IEC 60529 IP50			IEC standard IP40	IEC 60529 IP50			IEC standard IP40
Connection method	Connector relay (standard cable length: 500 mm)							
Weight (packed state)	Approx. 150 g			Approx. 250 g	Approx. 150 g			Approx. 250 g
Materials	Case: PBT (polybutylene terephthalate), Cover: Aluminium, lens: Glass			Case and cover: Aluminium, lens: Glass	Case: PBT (polybutylene terephthalate), Cover: Aluminium, lens: Glass			Case and cover: Aluminium, lens: Glass
Accessories	Instruction sheet, Laser warning label (English)							

*1 Beam diameter: This is the value of the measurement center distance (actual value), and is defined at 1/e^2 (13.5%) of the central light intensity. If there is stray light outside, the defined area and the area around the object has a higher reflectance than the object.
*2 Resolution: Indicates the amount of fluctuation (±3 δ) in the linear output when connected to the ZX-LDA. (The measured value when the average count of the ZX-LDA is set to 4,096 and our standard object (white ceramic) is used for the central distance.) This indicates the repeatability precision when the work is in a static state, and does indicate the distance precision. The resolution performance may not be satisfactory in a strong electromagnetic field.
*3 Linearity: This indicates the error with respect to the ideal straight line of the displacement output when measuring our standard object.
*4 Temperature characteristic: The temperature characteristic is measured at the measurement point with the sensor and reference object (Omron's standard reference object) secured with an aluminium jig.

Note: Highly reflective objects can result in incorrect detection by causing out-of-range measurements.

Sensor head (through-beam)

Item		ZX-LT001		ZX-LT005	ZX-LT010	ZX-LT030
Optical method		Through-beam				
Light source (wave length)		Visible-light semiconductor laser (wavelength 650 nm, 1 mW or less, Class 1)				
	Maximum output	0.2 mW max.		0.35 mW max.		0.2 mW max.
Measurement width		1 mm dia.	1 to 2.5 mm dia.	5 mm	10 mm	30 mm
Sensing distance		0 to 500 mm	500 to 2,000 mm	0 to 500 mm		
Min. sensing object		8 mm dia. opaque object	8 to 50 µm opaque object	opaque: 0.05 mm dia.	opaque: 0.1 mm dia.	opaque: 0.3 mm dia.
Resolution*1		4 µm*2	–	4 µm*3		12 µm*4
Temperature characteristic		±0.2% FS/°C				±0.3% FS/°C
Ambient illumination		Incandescent lamp: 10,000 lx max. (on light-receiving side)				
Ambient temperature		Operating: 0 to 50°C, storage: -25 to 70°C (with no icing or condensation)				
Ambient humidity		Operating: 35% to 85% (with no condensation)				
Protective structure		IEC 60529 IP40				IP 40
Connection method		Connector relay (standard cable length: 500 mm)				
Weight (packed state)		Approx. 220 g				Approx. 450 g
Cable length		Extendable up to 10 m with special extension cable.				
Materials	Case	Polyetherimide				Zinc die-cast
	Cover	Polycarbonate				
	Front filter	Glass				
Tightening torque		0.3 Nm max.				
Accessories		Instruction sheet, sensor head-amplifier connection cable				
		Optical axis adjustment seal				Mounting Bracket

*1 The amount of fluctuation (±3 δ) of the linear output when connected to an amplifier unit, converted to a detection span.
*2 When the average count is 64. 5 µm when the count is 32. The value when the smallest detection object shades the vicinity of the center of the 1 mm dia. detection span.
*3 When the average count is 64. 5 µm when the count is 32.
*4 For an average count of 64. The value is 15 µm for an average count of 32.

Amplifier units

Item	ZX-LDA11-N	ZX-LDA41-N
Measurement period	150 μs	
Possible average count settings*1	1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1,024, 2,048, or 4,096	
Temperature characteristic	When connected to a reflective sensor head: 0.01% FS/°C, when connected to a through-beam sensor head: 0.1% FS/°C	
Linear output*2	4 to 20 mA/FS, max. load resistance: 300 Ω, ±4 V (± 5 V, 1 to 5 V *3), output impedance: 100 Ω	
Judgement outputs (3 outputs: HIGH/PASS/LOW)*1	NPN open-collector outputs, 30 VDC, 50 mA max. Residual voltage: 1.2 V max.	PNP open-collector outputs, 30 VDC, 50 mA max. Residual voltage: 2 V max.
Laser OFF input, zero reset input, timing input, reset input	ON: Short-circuited with 0-V terminal or 1.5 V or less OFF: Open (leakage current: 0.1 mA max.)	ON: Supply voltage short-circuited or supply voltage within 1.5 V OFF: Open (leakage current: 0.1 mA max.)
Functions	Measurement value display, present value/set value/light level/resolution display, scaling, display reverse, display OFF mode, ECO mode, number of display digit changes, sample hold, peak hold, bottom hold, peak-to-peak hold, self-peak hold, self-bottom hold, average hold, delay hold, intensity mode, zero reset, initial reset, ON-delay timer, OFF-delay timer, one-shot timer, deviation, previous value comparison, sensitivity adjustment, keep/clamp switch, direct threshold value setting, position teaching, 2-point teaching, automatic teaching, hysteresis width setting, timing inputs, reset input, monitor focus, linear output compensation, (A-B) calculations*4, (A+B) calculations*4, mutual interference*4, laser deterioration detection, zero reset memory, zero reset display, key lock	
Indications	Operation indicators: High (orange), pass (green), low (yellow), 7-segment main display (red), 7-segment subdisplay (yellow), laser ON (green), zero reset (green), enable (green)	
Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p): 10% max.	
Current consumption	140 mA max. with power supply voltage of 24 VDC (with sensor connected)	
Ambient temperature	Operating: 0 to 50°C, storage: -15 to 60°C (with no icing or condensation)	
Ambient humidity	Operating and storage: 35% to 85% (with no condensation)	
Insulation resistance	20 MΩ min. at 500 VDC	
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min	
Vibration resistance (destruction)	10 to 150 Hz, 0.7-mm double amplitude 80 min each in X, Y, and Z directions	
Shock resistance (destruction)	300 m/s^2 3 times each in six directions (up/down, left/right, forward/backward)	
Connection method	Prewired (standard cable length: 2 m)	
Weight (packed state)	Approx. 350 g	
Materials	Case: PBT (polybutylene terephthalate), cover: Polycarbonate	
Accessories	Instruction sheet	

*1 The response speed of the linear output is calculated as the measurement period x (average count setting + 1) (with fixed sensitivity).
The response speed of the judgement outputs is calculated as the measurement period x (average count setting + 1) (with fixed sensitivity).
*2 The output can be switched between a current output and voltage output using a switch on the bottom of the amplifier unit.
*3 Setting is possible via the monitor focus function.
*4 A calculating unit (ZX-CAL2) is required.

Calculating unit

Item	ZX-CAL2
Applicable amplifier units	ZX-LDA11-N/41-N/ZX-EDA11/41/ZX-TDA11/41
Current consumption	12 mA max. (supplied from the smart sensor amplifier unit)
Ambient temperature	Operating: 0 to 50°C, storage: -15 to 60°C (with no icing or condensation)
Ambient humidity	Operating and storage: 35% to 85% (with no condensation)
Connection method	Connector
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min
Insulation resistance	100 MΩ (at 500 VDC)
Vibration resistance (destructive)	10 to 150 Hz, 0.7-mm double amplitude 80 min each in X, Y, and Z directions
Shock resistance (destructive)	300 m/s^2 3 times each in six directions (up/down, left/right, forward/backward)
Materials	Display: Acrylic, case: ABS resin
Weight (packed state)	Approx. 50 g

ZX-series Communications Interface Unit

Item		ZX-SF11
Current consumption		60 mA max. (supplied by the amplifier unit)
Applicable amplifier units		ZX series
Applicable amplifier unit versions		ZX-LDA_1-N Ver. 1.000 or higher ZX-EDA_1 Ver. 1.100 or higher ZX-TDA_1 Ver. 1.000 or higher
Max. No. of amplifier units		5
Communications functions	Communications port	RS-232C port (9-pin D-Sub connector)
	Communications protocol	CompoWay/F*1
	Baud rate	38,400 bps
	Data configuration	Data bits: 8, parity: none, start bits: 1, stop bits: 1, flow control: none
Indicators		Power supply: green, sensor communications: green, sensor communications error: red, external terminal communications: green, external terminal communications error: red
Protective circuits		Reverse polarity protection
Ambient temperature		Operating: 0 to 50°C, storage: -15 to 60°C (with no icing or condensation)
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)
Insulation resistance		20 MΩ min. (at 500 VDC)
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min, Leakage current: 10 mA max.
Materials		Case: PBT (polybutylene terephthalate), cover: Polycarbonate
Accessories		Instruction sheet, 2 clamps

*1 Contact your Omron representative for CompoWay/F communications specifications.



Smart inductive measurement sensor

ZX-E offers the best solution for the accurate measurement of metallic objects. It is highly recommended in harsh environments such as automotive and metal working machines.

- High resolution of 1 µm
- High speed response time of 150 µs
- Easy sensor head replacement
- Modular platform concept for different sensing technologies
- Easy linearity adjustment for any metal

Ordering information

Sensors

Sensor heads

Shape	Dimensions	Sensing distance	Resolution*1	Order code
Cylindrical	3 dia. x 18 mm	0.5 mm	1 µm	ZX-EDR5T
	5.4 dia. x 18 mm	1 mm		ZX-ED01T *2
	8 dia. x 22 mm	2 mm		ZX-ED02T *2
Screw-shaped	M10x22 mm	2 mm		ZX-EM02T *2
	M18x46.3 mm	7 mm		ZX-EM07MT *2
Flat	30x14x4.8 mm	4 mm		ZX-EV04T *2,*3
Heat-resistant, cylindrical	M12x22 mm	2 mm		ZX-EM02HT*4

*1 For an average count of 4,096.
*2 Models with protective spiral tubes are also available. Add a suffix of "-S" to the above model numbers when ordering. (Example: ZX-ED01T-S)
*3 Be sure to use ZX-EDA amplifier unit version 1,200 or later with the ZX-EV04.
*4 Be sure to use ZX-EDA amplifier unit version 1,300 or later with the ZX-EM02H.

Amplifier units

Power supply	Output type	Order code
DC	NPN	ZX-EDA11
	PNP	ZX-EDA41

Note: Compatible connection with the sensor head.

Accessories (order separately)

Calculating unit

	Model
Calculating unit	ZX-CAL2

Amplifier mounting brackets

Remarks	Model
Attached to each sensor head	ZX-XBE1
For DIN track mounting	ZX-XBE2

SmartMonitor sensor setup tool for Personal Computer connection

Name	Model
ZX-series communications interface unit	ZX-SF11
ZX-series communications interface unit + setup software (CD-ROM)	ZX-SFW11EV3*1
ZX-series sensor setup and logging software (CD-ROM)	ZX-SW11EV3

*1 The ZX-SFW11EV3 SmartMonitor can be used only to set functions and monitor waveforms.

Cables with connectors on both ends (for extension)*

Cable length	Model
1 m	ZX-XC1A
4 m	ZX-XC4A
8 m	ZX-XC8A

* Robot cable models are also available. The model numbers are ZX-XC_R.

Specifications

Sensor heads

Item		ZX-EDR5T	ZX-ED01T	ZX-ED02T/EM02T	ZX-EM07MT	ZX-EV04T	ZX-EM02HT
Measurement range		0 to 0.5 mm	0 to 1 mm	0 to 2 mm	0 to 7 mm	0 to 4 mm	0 to 2 mm
Sensing object		Magnetic metals (Measurement ranges and linearities are different for non-magnetic metals. Refer to engineering data on B-67.)					
Standard reference object		18x18x3 mm		30x30x3 mm	60x60x3 mm		45x45x3 mm
		Material: Ferrous (S50C)					
Resolution *1		1 µm					
Linearity *2		±0.5% F.S.					±1% F.S. *3
Linear output range		Same as measurement range.					
Temperature characteristic *4 (including amplifier unit)		0.15% F.S./°C	0.07% F.S./°C				0.1% F.S./°C
Ambient temperature	Operating *5	0 to 50°C (with no icing or condensation)	-10 to 60°C (with no icing or condensation)				-10 to 200°C
	Storage *5		-20 to 70°C (with no icing or condensation)				-20 to 200°C

Item			ZX-EDR5T	ZX-ED01T	ZX-ED02T/EM02T	ZX-EM07MT	ZX-EV04T	ZX-EM02HT
Ambient humidity			Operating and storage: 35% to 85% (with no condensation)					
Insulation resistance			50 MΩ min. (at 500 DC)					
Dielectric strength			1,000 VAC, 50/60 Hz for 1 min between charged parts and case					
Vibration resistance (destruction)			10 to 55 Hz with 1.5-mm double amplitude for 2 h each in X, Y, and Z directions					
Shock resistance (destruction)			500 m/s^2, 3 times each in X, Y, and Z directions					
Degree of protection (sensor head)			IEC60529, IP65	IEC60529, IP67				IEC60529, IP60 *6
Connection method			Connector relay (standard cable length: 2 m)					
Weight (packed state)			Approx. 120 g	Approx. 140 g		Approx. 160 g	Approx. 130 g	Approx. 160 g
Materials	Sensor head	Case	Brass	Stainless steel	Brass		Zinc (nickel-plated)	Brass
		Sensing surface	Heat-resistant ABS					PEEK
	Preamplifier		PES					
Accessories			Amplifier mounting brackets (ZX-XBE1), instruction manual					

*1 Accuracy: The resolution is the deviation (±3σ) in the linear output when connected to the ZX-EDA amplifier unit. The above values indicate the deviations observed 30 minutes after the power is turned ON.
(The resolution is measured with Omron's standard reference object at ½ of the measurement range with the ZX-EDA set for the maximum average count of 4,096 per period.)
The resolution is given at the repeat accuracy for a stationary workpiece, and is not an indication of the distance accuracy. The resolution may be adversely affected under strong electromagnetic fields.
*2 Linearity: The linearity is given as the error in an ideal straight line displacement output when measuring the standard reference object. The linearity and measurement values vary with the object being measured.
*3 The value given is for an ambient temperature of 25°C.
*4 Temperature characteristic: The temperature characteristic is measured with Omron's standard reference object at ½ of the measurement range.
*5 The ambient temperature given is only for the sensor head. It is -10 to 60°C for the preamp.
*6 Do not use in moist environments because the case is not waterproof.

Amplifier units

Item	ZX-EDA11	ZX-EDA41
Measurement period	150 µs	
Possible average count settings*1	1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1,024, 2,048, or 4,096	
Linear output*2	Current output: 4 to 20 mA/F.S., max. load resistance: 300 Ω Voltage output: ±4 V (±5 V, 1 to 5 V *3), output impedance: 100 Ω	
Judgement outputs (3 outputs: HIGH/PASS/LOW)	NPN open-collector outputs, 30 VDC, 50 mA max. Residual voltage: 1.2 V max.	PNP open-collector outputs, 30 VDC, 50 mA max. Residual voltage: 2 V max.
Zero reset input, timing input, reset input, judgement output hold input	ON: Short-circuited with 0-V terminal or 1.5 V or less OFF: Open (leakage current: 0.1 mA max.)	ON: Supply voltage short-circuited or supply voltage within 1.5 V OFF: Open (leakage current: 0.1 mA max.)
Function	- Measurement value display - Linearity adjustment (materials selection) - Display reverse - Number of display digit changes - Bottom hold, peak-to-peak hold - Average hold - Initial reset - OFF-delay timer - Non-measurement setting - Automatic teaching - Reset input - Linear output correction - K-(A+B) calculation*4 - Sensor disconnection detection - Key lock - set value/output value/ resolution display - display OFF mode - sample hold - self-peak hold - delay hold - linearity initialization - one-shot timer - direct threshold value setting - hysteresis width setting - judgement output hold input - (A-B) calculations*4 - mutual interference prevention*4 - zero reset memory - Scaling - ECO mode - peak hold - self-bottom hold - zero reset - ON-delay timer - previous value comparison - position teaching - timing inputs - monitor focus - (A+B) calculations*4 - zero reset indicator	
Indications	Judgement indicators: High (orange), pass (green), low (yellow), 7-segment main digital display (red), 7-segment sub-digital display (yellow), power ON (green), zero reset (green), enable (green)	
Voltage influence (including sensor)	0.5% F.S. of linear output value at ±20% of power supply voltage	
Power supply voltage	12 to 24 VDC ±10%, ripple (p-p): 10% max.	
Current consumption	140 mA max. with power supply voltage of 24 VDC (with sensor connected)	
Ambient temperature	Operating and storage: 0 to 50°C (with no icing or condensation)	
Ambient humidity	Operating and storage: 35% to 85% (with no condensation)	
Insulation resistance	20 MΩ min. (at 500 DC)	
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min	
Vibration resistance (destruction)	10 to 150 Hz with 0.7-mm double amplitude for 80 min each in X, Y, and Z directions	
Shock resistance (destruction)	300 m/s^2, 3 times each in 6 directions (up, down, left, right, forward, backward)	
Connection method	Prewired (standard cable length: 2 m)	
Weight (packed state)	Approx. 350 g	
Materials	Case: PBT (polybutylene terephthalate), cover: Polycarbonate	
Accessories	Instruction manual	

*1 The response speed of the linear output is calculated as the measurement period x (average count setting + 1) (with fixed sensitivity).
The response speed of the judgement outputs is calculated as the measurement period x (average count setting + 1) (with fixed sensitivity).
*2 The output can be switched between a current output and voltage output using a switch on the bottom of the amplifier unit.
*3 Setting is possible via the monitor focus function.
*4 A calculating unit (ZX-CAL or ZX-CAL2) is required.



Smart contact measurement sensor

ZX-T is ideal for applications where the target object may contain oil deposits or other micro-structures. In this case contact measurement is the most reliable way.

- Modular platform concept for different sensing technologies
- Air-retracting types for automated inspection
- Multipoint measurement with up to 8 sensors
- Pressing force alarm prevents malfunction
- Strong ball bearing structure assures long life time

Ordering information

Sensors

Sensor heads

Size	Type	Sensing distance	Resolution (See note.)	Order code
6 dia.	Short type	1 mm	0.1 µm	ZX-TDS01T
	Standard type	4 mm		ZX-TDS04T
	Low-load type			ZX-TDS04T-L
8 dia.	Standard type	10 mm	0.4 µm	ZX-TDS10T
	Ultra-low-load type			ZX-TDS10T-L
	Air lift type			ZX-TDS10T-V
	Air lift/air push type			ZX-TDS10T-VL

Note: The resolution refers to the minimum value that can be read when a ZX-TDA_1 amplifier unit is connected.

Amplifier units

Power supply	Output type	Order code
DC	NPN	ZX-TDA11
	PNP	ZX-TDA41

Accessories (order separately)

Calculating unit

	Order code
Calculating unit	ZX-CAL2

SmartMonitor sensor setup tool for Personal Computer connection

Name	Order code
ZX-series communications interface unit	ZX-SF11
ZX-series communications interface unit + setup software (CD-ROM)	ZX-SFW11EV3*1,*2
ZX-series sensor setup and logging software (CD-ROM)	ZX-SW11EV3*1

*1 When using the ZX-TDA11/41 with the SmartMonitor, either the ZX-SFW11EV3 or the ZX-SW11EV3 SmartMonitor must be used. Earlier versions cannot be used.
*2 The ZX-SFW11EV3 SmartMonitor can be used only to set functions and monitor waveforms.

ZX-series communications interface unit

Name	Order code
ZX-series communications interface unit	ZX-SF11

Cables with connectors on both ends (for extension)*

Cable length	Order code
1 m	ZX-XC1A
4 m	ZX-XC4A
8 m	ZX-XC8A

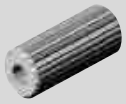
* Robot cable models are also available. The model numbers are ZX-XC_R.

Preamplifier mounting brackets

Remarks	Order code
Attached to each sensor head	ZX-XBT1
For DIN track mounting	ZX-XBT2

Actuators

Type (material)	Screw section	Appearance	Application	Applicable sensor (see note.)	Order code
				ZX-TDS_T	
Ball type (steel)	Female screw M2.5x0.45		Measuring ordinary flat surfaces (standard actuator supplied with the ZX-TDS series)	○	D5SN-TB1
Ball type (carbide steel)	Female screw M2.5x0.45		Measurements where abrasion resistance is critical Measured objects: Carbide (HR90) or lower.	○	D5SN-TB2
Ball type (ruby)	Female screw M2.5x0.45		Measurements where abrasion resistance is critical Measured objects: Carbide (HR90) or higher.	○	D5SN-TB3
Needle type (carbide steel)	Male screw M2.5x0.45		Measuring the bottom of grooves and holes	△	D5SN-TN1

Type (material)	Screw section	Appearance	Application	Applicable sensor (see note.)	Order code
				ZX-TDS_T	
Flat (carbide steel)	Male screw M2.5x0.45		Measuring spherical objects	△	D5SN-TF1
Conversion adapter (stainless steel)	Through-hole female screw M2.5x0.45		Mounting D5SN-TN1/-TF1 or commercially available actuators on ZX-TDS-series sensors	○	D5SN-TA

Note: ○ Replacement possible △ Conversion adapter required

Specifications

Amplifier units

Item	ZX-TDA11	ZX-TDA41
Measurement period	1 ms	
Possible average count settings *1	1, 16, 32, 64, 128, 256, 512, or 1,024	
Linear output *2	Current output: 4 to 20 mA/F.S., max. load resistance: 300 Ω Voltage output: ±4 V (±5 V, 1 to 5 V*3), output impedance: 100 Ω	
Judgement outputs (3 outputs: HIGH/PASS/LOW)	NPN open-collector outputs, 30 VDC, 30 mA max. Residual voltage: 1.2 V max.	PNP open-collector outputs, 30 VDC, 30 mA max. Residual voltage: 2 V max.
Zero reset input, timing input, reset input, judgement output hold input	ON: Short-circuited with 0-V terminal or 1.5 V or less OFF: Open (leakage current: 0.1 mA max.)	ON: Supply voltage short-circuited or supply voltage of 1.5 V or less OFF: Open (leakage current: 0.1 mA max.)
Function	- Measurement value display - present value/set value/output value display - Display reverse - ECO mode - number of display digit changes - Sample hold - peak hold - bottom hold, peak-to-peak hold - Self-peak hold - self-bottom hold - zero reset - Initial reset - direct threshold value setting - position teaching - Hysteresis width setting - timing inputs - reset input - Judgement output hold input - monitor focus - (A-B) calculations*4 - (A+B) calculations (see note 4.) - sensor disconnection detection - Zero reset memory - function lock - non-measurement setting - Clamp value setting - scale inversion - zero reset indicator - Span adjustment - warming-up display - pressing force alarm	
Indicators	Judgement indicators: High (orange), pass (green), low (yellow), 7-segment main digital display (red), 7-segment sub-digital display (yellow), power ON (green), zero reset (green), enable (green)	
Power supply voltage	12 to 24 VDC ±10%, ripple (p-p): 10% max.	
Current consumption	140 mA max. (with sensor connected), for 24-VDC power supply voltage: 140 mA max. (with sensor connected)	
Ambient temperature	Operating and storage: 0 to 50°C (with no icing or condensation)	
Temperature characteristic	0.03% F.S./°C	
Connection method	Prewired (standard cable length: 2 m)	
Weight (packed state)	Approx. 350 g	
Materials	Case: PBT (polybutylene terephthalate), cover: Polycarbonate	

*1 The response speed of the linear output is calculated as the measurement period x (average count setting + 1).
The response speed of the judgement outputs is calculated as the measurement period x (average count setting + 1).
*2 The output can be switched between a current output and voltage output using a switch on the bottom of the amplifier unit.
*3 Setting is possible via the monitor focus function.
*4 A calculating unit (ZX-CAL2) is required.

Sensor heads

Item		ZX-TDS01T	ZX-TDS04T	ZX-TDS04T-L
Measurement range		1 mm	4 mm	
Maximum actuator travel distance		Approx. 1.5 mm	Approx. 5 mm	
Resolution*1		0.1 μm		
Linearity*2		±0.3% F.S.		
Operating force *3		Approx. 0.7 N		Approx. 0.25 N
Degree of protection (sensor head)		IEC60529, IP67		IEC60529, IP54
Mechanical durability		10,000,000 operations min.		
Ambient temperature		Operating: 0 to 50°C, storage: -15 to 60°C (with no icing or condensation)		
Ambient humidity		Operating and storage: 35 to 85% (with no icing or condensation)		
Temperature characteristic*4	Sensor head	0.03% F.S./°C		
	Preamplifier	0.01% F.S./°C		
Weight (packed state)		Approx. 100 g		
Materials	Sensor head	Stainless steel		
	Preamplifier	Polycarbonate		
Accessories		Instruction manual, preamplifier mounting brackets (ZX-XBT1)		

*1 The resolution is given as the minimum value that can be read when a ZX-TDA_1 amplifier unit is connected. This value is taken 15 minutes after turning ON the power with the average number of operations set to 256.
*2 The linearity is given as the error in an ideal straight line displacement output.
*3 These figures are representative values that apply for the measurement mid-point, and are for when the provided actuator is used, with the actuator moving downwards. If the actuator moves horizontally or upwards, the operating force will be reduced. Also, if an actuator other than the standard one is used, the operating force will vary with the weight of the actuator itself.
*4 These figures are representative values that apply for the mid-point of the measurement range.

Sensor heads (long-range type)

Item		ZX-TDS10T	ZX-TDS10T-V	ZX-TDS10T-L	ZX-TDS10T-VL
Vacuum retract (VR) and air push (AP) compatible		No	VR	No	VR/AP
Measurement range		10 mm			
Maximum actuator travel distance		10.5 mm			
Resolution*1,*2		0.4 µm			
Linearity*2,*3		±0.5% FS			
Operating force *4		Approx. 0.7 N	Approx. 0.6 N	Approx. 0.065 N	0.09 to 1.41N
Air pressure	Vacuum retracting	–	-0.55 to 0.70 (bar)	–	-0.05 to 0.22 (bar)
	Air push		–		0.125 to 2 (bar)
Degree of protection	Sensor head	IP65		IP50	
	Preamplifier	IP40			
Mechanical durability		10,000,000 operations min.			
Ambient temperature		Operating: 0 to 50°C, storage: -10 to 60°C (with no icing or condensation)			
Ambient humidity		Operating and storage: 35 to 85% (with no icing or condensation)			
Temperature characteristic*5	Sensor head	±0.01% FS/°C			
	Preamplifier	±0.01% FS/°C			
Vibration resistance		0.35 mm single amplitude at 10 to 55 Hz for 50 min each in the X, Y, and Z directions			
Shock resistance		150 m/s^2 3 times each in 6 directions (up/down, left/right, and forward/backward)			
Connection method		Prewired connector (2 m from the sensor head to the preamplifier, 0.2 m from the preamplifier to the connector)			
Weight (packed state)		Approx. 100 g			
Materials	Sensor head	Stainless steel			
	Rubber sleeve	Viton		None	
	Preamplifier	Polycarbonate			
	Mounting brackets	Stainless steel			
Accessories		Instruction manual, preamplifier mounting brackets (ZX-XBT1), right-angle adapter *6			

*1 The resolution is given as the minimum value that can be read when a ZX-TDA_1 amplifier unit is connected. This value is taken 15 minutes after turning ON the power with the average number of operations set to 256.
*2 These values were measured at an ambient temperature of 23°C.
*3 The linearity is given as the error in an ideal straight line displacement output.
*4 These figures are representative values that apply for the measurement mid-point, and are for when the provided actuator is used, with the actuator moving downwards. If the actuator moves horizontally or upwards, the operating force will be reduced. Also, if an actuator other than the standard one is used, the operating force will vary with the weight of the actuator itself.
*5 These figures are representative values that apply for the mid-point of the measurement range.
*6 The ZX-TDS10_ comes with a right-angle adapter.



Easy profile measurement – “Teach & Go”

The ZG2 enables precise shape measurement on challenging materials and surfaces. An easy and intuitive user interface enables efficient installation, setup and operation. A built-in LCD monitor indicates the measurement result in real time.

- Easy to use – intuitive user interface
- Live – built-in LCD monitor for setup and immediate profile display
- Versatile – 18 measurement tools
- Accurate – 5 µm resolution (3 mm / 631 pixels)
- Wide profiles – up to 70 mm

Ordering information

Sensor heads

Optical method	Sensing distance		Resolution		Order code
	Height direction	Width direction	Height direction	Width direction	
Diffuse reflective	210±48 mm	70 mm	6 µm	111 µm	ZG2-WDS70
Diffuse reflective	100±12 mm	22 mm	2.5 µm	35 µm	ZG2-WDS22
Diffuse reflective	50±3 mm	8 mm	1 µm	13 µm	ZG2-WDS8T
Regular reflective	22.3±0.5 mm	3 mm	0.25 µm	5 µm	ZG2-WDS3VT

Note: - For details, refer the ratings and specifications table.
- Designate the cable length (0.5 m, 2 m) when ordering.

Sensor controllers

Power supply	Output type	Order code
24 VDC	NPN	ZG2-WDC11A*1
	PNP	ZG2-WDC41A

*1 Setup support software for PC is attached

Accessories (order separately)

Real-time parallel output unit

Output type	Order code
NPN	ZG-RPD11
PNP	ZG-RPD41

RS-232C cable

Connecting device	Order code
For personal computer connection (2 m)	ZS-XRS2
For PLC/PT connection (2 m)	ZS-XPT2

Sensor head extension cable

Name	Order code
3 m extension cable	ZG2-XC3CR
8 m extension cable	ZG2-XC8CR
15 m extension cable	ZG2-XC15CR
25 m extension cable	ZG2-XC25CR
Digital equalizer (relay device)	ZG2-XEQ
0.2 m digital equalizer connection cable	ZG2-XC02D

Parallel mounting adaptor

	Order code
For 1 unit	ZS-XPM1
For 2 units or more	ZS-XPM2

Controller link unit

Item	Order code
Controller link unit	ZS-XCN

Memory card

Capacity	Order code
128 MB	F160-N1285
256 MB	F160-N2565

Specifications

Sensor heads

Item		ZG2-WDS70	ZG2-WDS22		ZG2-WDS8T		ZG2-WDS3VT	
Optical system		Diffuse reflective	Diffuse reflective	Regular reflective	Diffuse reflective	Regular reflective	Regular reflective	Diffuse reflective
Measurement range	Height direction	210±48 mm (In the high-precision mode)	100±12 mm	94±10 mm	50±3 mm	44±2 mm	22.3±0.5 mm	10.6±0.4 mm
	Width direction (typical)	70 mm	22 mm		8 mm		3 mm	
Resolution	Height direction*1	6 μm	2.5 μm		1 μm		0.25 μm	
	Width direction	111 μm (70 mm/631 pixels)	35 μm (22 mm/631 pixels)		13 μm (8 mm / 631 pixels)		5 μm (3 mm / 631 pixels)	
Linearity (in the height direction)*2		±0.1% F.S.						
Temperature characteristic*3		0.02% F.S./°C			0.03% F.S./°C		0.08% F.S./°C	
Light source	Type	Visible semiconductor laser						
	Wavelength	658 nm					650 nm	
	Output	5 mW max. output, 1 mW max. exposure (without using optical instruments)					1 mW max.	
	Laser class	Class 2M of EN60825-1 / IEC60825-1 Class IIIB of FDA (21CFR 1040.10 and 1040.11)					Class 2 of EN60825-1 / IEC60825-1 Class II of FDA (21CFR 1040.10 and 1040.11)	
Beam shape (at measurement center distance)*4		120 μm × 75 mm (typical)	60 μm × 45 mm (typical)		30 μm × 24 mm (typical)		25 μm × 4 mm (typical)	
LED		STANDBY : Lights when laser irradiation preparation is complete (indication colour: green)						
		LD_ON : Lights when the laser is irradiating (indication colour: green)						
Measurement object		Surface of non-transparent objects	Surface of non-transparent / transparent objects					
Environmental resistance	Ambient light intensity	Illumination on the photo-receiving face 7,000 lx max.: Incandescent lamp						
	Ambient temperature	Operating : 0 to 50°C, Storage : -15 to 60°C (with no icing or condensation)						
	Ambient humidity	Operating and storage : 35 to 85 % (with no condensation)						
	Degree of protection	IP66 (IEC60529)					IP67 (IEC60529)	
	Vibration resistance (destruction)	10 to 150 Hz with 0.35 mm single amplitude for 80 min each in X, Y, and Z directions						
	Shock resistance (destruction)	150 m/s², 3 times each in 6 directions (up / down, right / left, forward / backward)						
Materials		Case: Aluminium diecast, Front cover : Glass, Cable insulation : Heat-resistive polyvinyl chloride (PVC), Connector : Zinc alloy or brass						
Cable length		0.5 m, 2 m (flexible cable)						
Weight		Approx. 650 g	Approx. 500 g				Approx. 300 g	
Accessories		Laser labels (EN : 2 labels, FDA : 3 labels), Ferrite core (1), Instruction manual						

*1 Obtained by setting an Omron standard measurement object at the measurement center distance and determining the average height of the beam line. The conditions are given in the table below. However, satisfactory resolution cannot be attained in strong electromagnetic fields.The minimum resolution of the ZG2-WDS8T/WDS3VT is 0.25 ƒÊm, even when the average number of operations is increased. Resolution does not go any lower.

Model	CCD Mode	Average No. of operations	Measurement object	
			Regular reflective	Diffuse reflective
ZG2-WDS70/WDS22/WDS8T	Standard mode	64	Omron standard white alumina ceramic object	
ZG2-WDS3VT	Standard mode		Omron standard mirrored object	Omron standard diffuse reflective object

*2 The tolerance for an ideal straight line obtained by determining the average height of an Omron standard measurement object for the beam line. The CCD high-resolution mode is used. Linearity varies depending on the measurement object.

Model	Measurement object	
	Regular reflective	Diffuse reflective
ZG2-WDS70/WDS22/WDS8T	Omron standard white alumina ceramic object	
ZG2-WDS3VT	Omron standard mirrored object	Omron standard diffuse reflective object

*3 A value attained by using an aluminium jig to secure the distance between the Sensor head and the measurement object. The CCD standard mode is used.

*4 Defined as $1/e^2$ (13.5%) of the center light intensity. This may be influenced when light leakage also exists outside the defined area and the reflectivity of the light around the measurement object is higher than that of the measurement object.

Sensor controllers

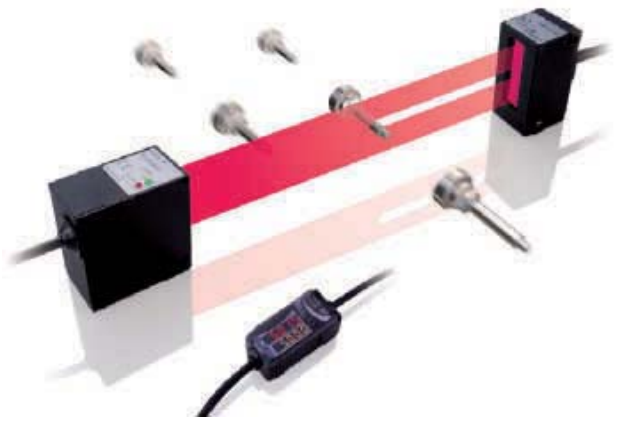
Item			ZG2-WDC11/WDC11A	ZG2-WDC41/WDC41A
Input/output type			NPN	PNP
No. of connectable Sensor Heads			1 per Controller	
No. of connectable Controllers			2	
Measurement cycle *1			16 ms (high-precision mode), 8 ms (standard mode), 5 ms (high-speed mode)	
Min. display unit			10 nm	
Display range			-999.99999 to 999.99999	
Display		LCD monitor	1.8-inch TFT colour LCD (557x234 pixels)	
		LEDs	• Judgment indicators for each task (indication colour: orange): T1, T2, T3, T4 • Laser indicator (indication colour: green): LD_ON • Zero reset indicator (indication colour: green): ZERO • Trigger indicators (indication colour: green): TRIG	
External interface	Input/output signal lines	Analogue outputs	Select voltage or current (using the sliding switch on the bottom surface) • Voltage output: .10 to 10 V, output impedance: 40 Ω • Current output: 4 to 20 mA, maximum load resistance: 300 Ω	
		Judgment output (ALL-PASSING/ERROR)	NPN open collector 30 VDC, 50 mA max. Residual voltage: 1.2 V max.	PNP open collector 50 mA max. Residual voltage: 1.2 V max.
		Trigger auxiliary output (ENABLE/GATE)		
		Laser stop input (LD-OFF)	ON: 0 V short or 1.5 V max. OFF: Open (leakage current: 0.1 mA max.)	ON: Power supply voltage short or power supply voltage -1.5 V max. OFF: Open (leakage current: 0.1 mA max.)
		Zero reset input (ZERO)		
		Measurement trigger input (TRIG)		
		Bank switching input (BANK A, B)		
	Serial I/O	USB2.0	1 port, full speed (12 Mbps), MINI-B	
		RS-232C	1 port, 115,200 bps max.	
	Parallel output*2	Output	18 - terminal	
Main functions		No. of settings banks	16	
		Sensitivity adjustment	Multi, High speed multi, Auto, Fixed	
		Measurement items	Height, 2-point Step, 3-point Step, Edge position, Edge width, Angle, Intersection coordinates, Intersection angle, Sectional area (up to eight items can be measured simultaneously)	
		Auxiliary functions	Filter, Laser power adjustment, Position correction (height, position, lope), Linked operation, Point of inflection measurement	
		Profiles saved	16 profiles (1 profile per bank)	
		Trigger modes	External trigger / continuous	
Ratings		Power supply voltage	21.6 to 26.4 VDC (including ripple current)	
		Current consumption	0.8 A max. (per sensor head)	
		Insulation resistance	20 MΩ at 250 V between lead wires and Controller case	
		Dielectric strength	1,000 VAC, 50 / 60 Hz for 1 min between lead wires and Controller case	
Environmental resistance		Ambient temperature	Operating : 0 to 50°C, Storage : -15 to 60°C (with no icing or condensation)	
		Ambient humidity	Operating and storage : 35 to 85 % (with no condensation)	
		Degree of protection	IP20 (IEC 60529)	
		Vibration resistance (destruction)	Vibration frequency: 10 to 150 Hz, single amplitude: 0.35 mm, acceleration: 50 m/s²	
		Shock resistance (destruction)	150 m/s², 3 times each in 6 directions (up/down, right/left, forward/backward)	
Material			Case : Polycarbonate (PC), Cable insulation : Heat-resistive polyvinyl chloride (PCV)	
Cable length			2 m	
Weight			Approx. 300 g (including cable) (Packed state: Approx. 450 g)	
Accessories			ZG2-WDC_1: Large Ferrite Core (1 piece), Instruction Manual ZG2-WDC_1A: Large Ferrite Core (1 piece), Small Ferrite Core (2 pieces), Instruction Manual, Setup Support Software (CD-ROM), USB cable (1 m)	

*1 The image input periods listed here are for fixed/auto sensitivity. The image input period will be longer for multi-sensitivity, high-speed multi-sensitivity, or other settings. When the high-power mode is ON, the shortest image input period is 95 ms regardless of the setting of the CCD mode. Use the eco monitor in the RUN mode to determine the actual image input period.
*2 when ZG-RPD is mounted

Data storage unit

Item			ZG2-DSU11	ZG2-DSU41
Input/output type			NPN	PNP
No. of connectable Controllers			2*1	
Connectable controllers			ZG2-WDC11/WDC41	
External interface	Input/output signal lines	Inputting starting/ terminating logging	ON: 0 V short or 1.5 V max. OFF: Open (leakage current : 0.1 mA max.)	ON: Power supply voltage short or power supply voltage -1.5 V max. OFF: Open (leakage current: 0.1 mA max.)
		Judgment output (HIGH/PASS/LOW/ERROR)	NPN open collector 30 VDC, 50 mA max. Residual voltage : 1.2 V max.	PNP open collector 50 mA max. Residual voltage : 1.2 V max.
	Serial I/O	USB2.0	1 port, full speed (12 Mbps), MINI-B	
		RS-232C	1 port, 115,200 bps max.	
Functions	No. of logged data*2	Memory of the main unit	Profiles saved: 5,120 profiles Measurement values saved: 65,000 values max.*3	
		Memory card (256 MB)*4	Profiles saved: 35,328 profiles max. (256 profiles x 138 files) Measurement values saved: 7,150,000 values max. (65,000 values x 110 files)	
	Logging trigger functions		External triggers, data triggers (self-triggers), and time triggers	
	External banks functions		4096	
	Other functions		Alarm output functions	
Ratings		Power supply voltage	21.6 to 26.4 VDC (including ripple current)	
		Current consumption	0.5 A max.	
Environmental resistance		Ambient temperature	Operating : 0 to 50°C, Storage: 0 to 60°C (with no icing or condensation)	
		Ambient humidity	Operating and storage : 35 to 85% (with no condensation)	
Material			Case : Polycarbonate (PC)	
Cable length			2 m	
Weight			Approx. 280 g	
Accessories			Ferrite Core (1 piece), Instruction Manual	

*1 The controller link unit is necessary for linking.
*2 Data is saved in the memory of the main unit during logging. The data is automatically saved in a memory card after logging is completed. The maximum number of logging differs according to set conditions. For details, refer to the Users Manual.
*3 Measurement values for 65,000 measurements can be saved even when two sensor controllers are connected and each performs eight tasks.
*4 The value is the maximum number achieved in the following conditions:
- One sensor controller performs one measurement task.
- Either profiles or measurement values are logged.



Smart laser micrometer

- High accuracy: 5-10 µm
- All surfaces
- Long sensing distance: < 500 mm
- Line width up to 28 mm
- Calculation unit for multiple heads
- Fast sampling time: 0.5 ms
- PC software for setup

Ordering information

Sensors

Type	Optical system	Measuring width	Sensing distance	Resolution	Output type	Order code
Separate type	Through-beam	28 mm	0 to 500 mm	10 µm	NPN	ZX-GT28S11
					PNP	ZX-GT28S41
Integrated type			40 mm		NPN	ZX-GT2840S11
					PNP	ZX-GT2840S41

Controller

Power supply	Output type	Order code
DC	NPN	ZX-GTC11
	PNP	ZX-GTC41

Accessories (order separately)

Set of interface unit and setup software PCs

Output type	Order code
NPN	ZX-GIF11A
PNP	ZX-GIF41A

Interface unit(RS-232C/binary output)

Power supply	Output type	Order code
DC	NPN	ZX-GIF11
	PNP	ZX-GIF41

Setup software PCs

Name	Order code
Smart monitor GT	ZX-GSW11

Calculating units

	Order code
Calculating unit	ZX-CAL2

Receiver-controller extension cable

Cable length	Quantity	Order code	
		Standard cable	Flexible cable
1 m	1 m	ZX-XGC1A	ZX-XGC1R
2 m		ZX-XGC2A	ZX-XGC2R
5 m		ZX-XGC5A	ZX-XGC5R
8 m		ZX-XGC8A	ZX-XGC8R
20 m		ZX-XGC20A	ZX-XGC20R

Up to two extension cables can be connected. However, be sure to limit the total extension cable length between the receiver and the controller to 30 meters (including the receiver cable).

Specifications

Sensor

Item	ZX-GT28S11	ZX-GT2840S11	ZX-GT28S41	ZX-GT2840S41
Output type	NPN		PNP	
Appearance	Separate type	Integrated type	Separate type	Integrated type
Light source	Visible semiconductor laser diode (wavelength 650 nm, CLASS 1 of EN60825-1/IEC60825-1, CLASS of FDA(21CFR 1040.10 and 1040.11)			
Measuring width	28 mm			
Sensing distance	0 to 500 mm	40 mm	0 to 500 mm	40 mm
Minimum sensing object	0.5 mm dia.*1	0.2 mm dia.	0.5 mm dia.(*1)	0.2 mm dia.
Linearity	±0.1% F.S.*2			
Resolution	10 µm (number of process values to average: 16)*3			
Temperature characteristic	±0.01% F.S/C*4			
Indicators (emitter)	Laser ON indicator (green), laser alarm indicator (red)			
Indicator (receiver)	Optical axis setting indicator (green)			
Laser OFF input/sync input	ON: Short-circuited with 0 V or 1.5 V max. OFF: Open (leakage current: 0.1 mA max.)		ON: Short-circuited with power supply voltage or power supply voltage -1.5 V max. OFF: Open (leakage current: 0.1 mA max.)	
Laser deterioration alarm output	NPN open-collector output 30 VDC 20 mA max. Residual voltage 1.2 V max.		PNP open-collector output 30 VDC 20 mA max. Residual voltage 2 V max.	
Power consumption (emitter)	30 mA max.			
Power supply voltage (emitter)	24 VDC +10%, -15% ripple (p-p) 10% max.			
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min			
Insulation resistance	20 MΩ (at 500 VDC megger)			
Operating ambient illumination (emitter)	3,000 lx (incandescent light)			
Operating ambient illumination (receiver)	1,000 lx (incandescent light)*5			
Ambient temperature	Operating: 0 to +40°C, storage: -15 to +50°C (with no icing or condensation)			
Ambient humidity	Operating and storage: 35 to 85% (with no condensation)			
Vibration resistance (durability)	10 to 150 Hz single-amplitude: 0.75 mm for 80 min each in X, Y and Z directions			
Degree of protection	IEC60529 IP40			
Cable length	2 m			
Material	Case: aluminium die-cast, Lens: glass			
Weight (packed state)	Approx. 550 g	Approx. 570 g	Approx. 550 g	Approx. 570 g
Accessories	Laser warning labels, instruction sheet			

F.S.: 28 mm measuring range of receiver

*1 Distance between emitter and receiver: 500 mm, measurement object at 250 mm from receiver. Glass ends of chamfer 0.1 mm or more can be detected in glass edge measurement mode. (at binary level 70%)

*2 Linearity is given to be a typical error with respect to an ideal straight line when the distance between the emitter and receiver is 100 mm and light is blocked at a distance of 50 mm from the receiver. (On the ZX-GT2840_, the measurement object is measured at a distance of 20 mm from the receiver.)

*3 The amount of fluctuation (±3 σ) in the analogue output when the distance between the emitter and receiver is 100 mm and a ZX-GTC_ is connected

*4 Change in the light cutoff value on one side when the distance between the emitter and receiver is 100 mm and the light is half-cutoff at a distance of 50 mm from the receiver (On the ZX-GT2840_, the measurement object is measured at a distance of 20 mm from the receiver.)

*5 Standard mode (NORM) used

Controller

Item		ZX-GTC11	ZX-GTC41
Output type		NPN	PNP
Measurement cycle*1		1.5 ms (standard mode (NORM)) 0.5 ms (high-speed mode (FAST))*2	
Samples to average		1/2/4/8/16/32/64/128/256/512/1024/2048/4096	
Analogue output*3		For current output: 4 to 20 mA/F.S., max. load resistance 300 Ω For voltage output: ±4 V, (±5 V, 1 to 5 V*4), output impedance 100 Ω	
Timing input, bank switching input, zero reset input, reset input		ON: short-circuited with 0 V or 1.5 V max. OFF: Open (leakage current: 0.1 mA max.)	ON: short-circuited with power supply voltage or power supply voltage -1.5 V max. OFF: Open (leakage current: 0.1 mA max.)
HIGH/PASS/LOW Judgment output*5 Sync output*6		NPN open-collector output 30 VDC 50 mA max. Residual voltage 1.2 V max.	PNP open-collector output 30 VDC 50 mA max. Residual voltage 2 V max.
Indicator		Judgment output indicator: HIGH (orange), PASS (green), LOW (orange) Main display (red) sub-display (yellow) bank 1/2 (orange), zero reset (green)	
Main functions	Number of registered setups	2 banks	
	Measurement mode	Interrupted beam width measurement, incident beam width measurement, outer diameter measurement, center position measurement, IC lead pitch, IC lead width judgment, specified edge measurement, wire position measurement, glass edge position measurement	
	Display during measurement	Measured value, resolution, threshold, voltage output value, current output value (number of display digits can be changed)	
	Zero reset functions	Offset setting of zero reset value, zero reset value memory	
	Hold	Sample hold, peak hold, bottom hold, peak-to-peak hold, average hold, delay hold	
	Timer functions	ON-delay, OFF-delay, one-shot	
	Adjustment functions	Optical axis adjust mode/light intensity writing mode, variable binary level, variable edge filter, analogue output scaling	
	Calculation	2 possible on up to two controllers (calculation Unit ZX-CAL2 is required for connecting controllers to each other.) A-B, A+B, width	
	Other	Measurement cycle setting, threshold setting, hysteresis setting, initialization, key lock	
Temperature characteristic		±0.005% F.S./°C	

Item	ZX-GTC11	ZX-GTC41
Current consumption	150 mA max. (including receiver)	
Power supply voltage	24 VDC +10%, -15% ripple (p-p) 10% max.	
Dielectric strength	1,000 VAC, 50/60 Hz for min	
Insulation resistance	20 MΩ (at 500 VDC megger)	
Ambient temperature	Operating: 0 to +50°C, storage: -15 to +60°C (with no icing or condensation)	
Ambient humidity	Operating and storage: 35 to 85% (with no condensation)	
Vibration resistance(durability)	10 to 150 Hz single-amplitude: 0.35 mm for 80 min each in X, Y and Z directions	
Degree of protection	IEC60529 IP20	
Cable length	2 m	
Material	Case: PBT (polybutylene terephthalate), cover: Polycarbonate	
Weight (packed state)	Approx. 330 g	
Accessories	Instruction sheet	

*1 The first response time is “measurement cycle x (number of samples to average setting + 1) + 1 ms” max. For the second response time onwards, the specified measurement cycle time is output.
*2 The response time in the high-speed mode (FAST) for the IC lead pitch and IC lead width judgment modes is 1 ms.
*3 Current/voltage can be switched using the switch provided on the rear of the Controller.
*4 Can be set by the analogue output scaling function.
*5 The error (ERR) state is displayed when all HIGH/PASS/LOW outputs turn OFF.
*6 Normally, wire the sync output wire directly to the emitter's sync input wire and run the controller in the standard mode. On an NPN type controller, use an NPN type emitter, and on a PNP type controller, use a PNP type emitter. Wiring of the sync wires is not required when the controller is run in the high-speed mode.
(Note, however, that the controller becomes more susceptible to the influence of ambient light in this case.)

Interface unit

Item	ZX-GIF11/-GIF11A	ZX-GIF41/-GIF41A
Compatible controller	ZX-GTC11	ZX-GTC41
Indicator	Power ON (green), controller communications (orange), controller communications error (red), RS-232C communications (orange), RS-232C communications error (red), binary output (orange)	
Communications port	RS-232C (9-pin D-sub connector)	
12-bit binary output (D11 toD0, GATE)	NPN open-collector output 30 VDC 20 mA max. Residual voltage 1.2 V max.	PNP open-collector output 30 VDC 20 mA max. Residual voltage 2 V max.
Power supply voltage	Supplied from controller (power consumption: 60 mA max.)	
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min	
Insulation resistance	20 MΩ (at 500 VDC megger)	
Ambient temperature	Operating: 0 to +50°C, storage: -15 to +60°C (with no icing or condensation)	
Ambient humidity	Operating and storage: 35 to 85% (with no condensation)	
Vibration resistance(durability)	10 to 150 Hz single-amplitude: 0.35 mm for 80 min each in X, Y and Z directions	
Degree of protection	IEC60529 IP20	
Cable length	RS-232C 0.5 m, binary output 2 m	
Material	Case: PBT (polybutylene terephthalate), cover: Polycarbonate	
Weight (packed state)	ZX-GIF_1A: Approx. 550 g ZX-GIF_1: Approx. 330 g	
Accessories	ZX-GIF_1A: Setup software (CD-ROM), 2 clamps, instruction sheet ZX-GIF_1: 2 clamps, instruction sheet	

SAFETY SIMPLIFIED TO THE MAX

Making safety transparent and understandable

In order to implement safety controls, it is essential to begin taking safety into consideration at the design stage. We offer safety systems that incorporate the latest sensing and control technologies combined with safety design, consulting services to ensure optimum machine and equipment safety and secure a safe production environment.

Understand safety in minutes and ask for your own free safety guide at:
www.ce-safety.info

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Reliability data of Omron components 424

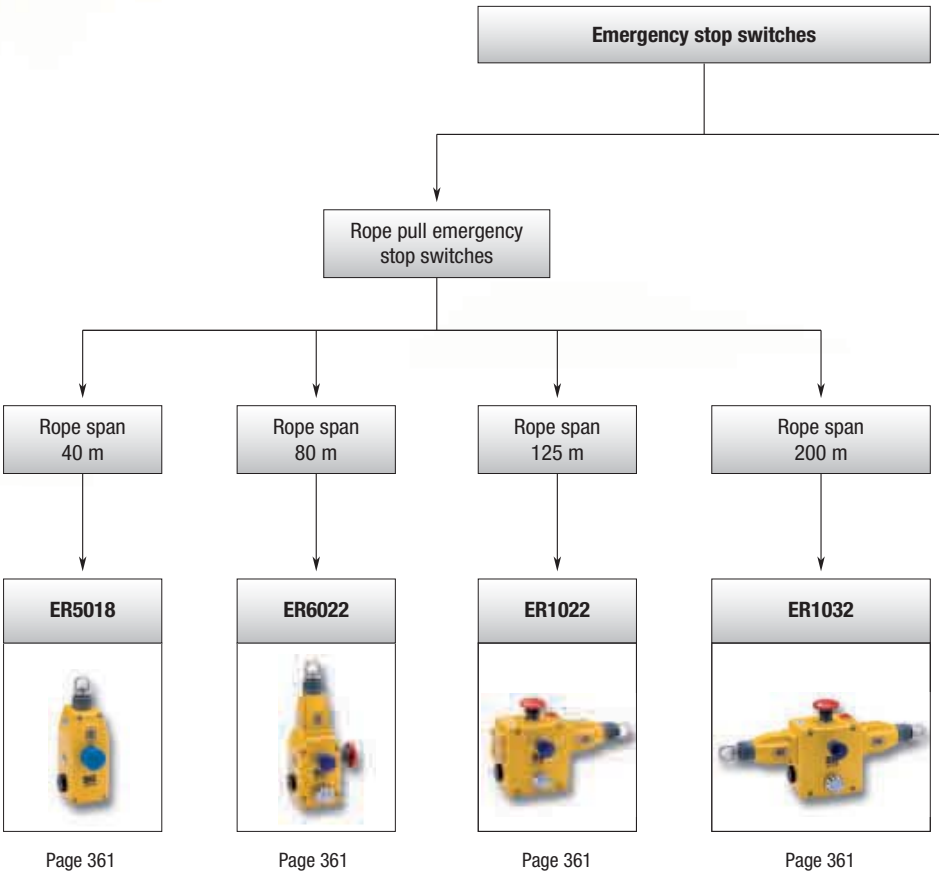
STOP THE MACHINE IN HAZARD SITUATIONS

Safe stop at any point along the machine: ER series rope pull switches

European Standards require Emergency Stop function on every machine to enable workers to stop machines as quickly as possible in a dangerous situation, this can be achieved with our Emergency stop pushbuttons or along a line with our rope pull emergency stop switches.

- Long rope span up to 200 m per switch
- Tension indicator for easy installation and maintenance
- Switch and accessories in stainless steel for demanding environment

Select your emergency stop equipment in a split second:
www.omron-industrial.com/safety





Emergency stop pushbutton switches

- 22 mm mounting
  - **A22E**
  - Page 364
- 16.5 mm mounting
  - **A165E**
  - Page 365

Selection table

		Rope pull switches			
					
Selection criteria	Model	ER 5018	ER 6022	ER 1022	ER 1032
	Housing	Metal			
	Protection class	IP67			
	Operating Temperature Range	-25 to +80°C			
	Head Size	–			
	Conformity	IEC947-5-1, IEC947-5-5, EN418, UL508, BS5304			
Features	Max. Rope Span	40 m	80 m	125 m	200 m
	Conduit size M20	■			
	Additional E-Stop button	■			
	LED indicator beacon	–	■	■	■
	Stainless steel housing	–	Available	–	–
	Explosion proof housing	–	■	■	■
	Lighted Head	–			
	Push lock - pull reset	–			
	Push lock, turn reset	–			
	Push lock, lock key reset	–			
Application	E-Stop application	■			
	General safety application	■			
Contact configuration	2NC+1NO	■	■	–	–
	3NC	■	■	–	–
	4NC+2NO	–	–	■	■
	SPST (NC)	–			
	DPST (NC)	–			
	SPST (NO) + SPST (NC)	–			
	TPST (NC)	–			
	Page	361			

		Emergency stop pushbutton switches	
			
Selection criteria	Model	A22E	A165E
	Housing	Plastic	
	Protection class	IP65	
	Operating Temperature Range	-20 to 70°C	-10 to 55°C
	Head Size	30 mm, 40 mm, 60 mm	30 mm, 40 mm
	Conformity	EN 60947-5-1	
Features	Max. Rope Span	–	
	Conduit size M20	–	
	Additional E-Stop button	–	
	LED indicator beacon	–	
	Stainless steel housing	–	
	Explosion proof housing	–	
	Lighted Head	■	
	Push lock - pull reset	■	–
	Push lock, turn reset	■	
	Push lock, lock key reset	■	–
Application	E-Stop application	■	
	General safety application	■	
Contact configuration	2NC+1NO	–	
	3NC	–	
	4NC+2NO	–	
	SPST (NC)	■	
	DPST (NC)	■	
	SPST (NO) + SPST (NC)	■	–
	TPST (NC)	–	■
	Page	364	365

■ Standard – No/not available



Emergency Stop Switch

- Tension indicator – the tension indicator makes the system easy to set up and to maintain the proper rope tension
- Heavy-duty housing – the die-cast housing and stainless steel eye nut makes the ER series rope pull switches suitable for demanding industrial applications
- Vibration tolerant – the snap-acting switch contacts protect against nuisance tripping due to vibration
- Integral E-stop – the E-stop button provides emergency stopping capability at the extreme end of the installation and is field serviceable
- ER6022 available in stainless steel housing
- ER6022, ER1022 and ER1032 available in explosion proof housing

Ordering information

Standard models

Aluminium die-cast housing

E-Stop	Indicator Beacon	Contacts	Wiring Entry	Order code
Not included	–	2 N/C + 1 N/O	3 x M20	ER5018-021M
Not included	–	3 N/C	3 x M20	ER5018-030M
Included	–	2 N/C + 1 N/O	3 x M20	ER5018-021ME
Included	–	3 N/C	3 x M20	ER5018-030ME
Not included	Not included	2 N/C + 1 N/O	3 x M20	ER6022-021M
Not included	Not included	3 N/C	3 x M20	ER6022-030M
Not included	Included (24 VDC)	2 N/C + 1 N/O	3 x M20	ER6022-021ML
Not included	Included (24 VDC)	3 N/C	3 x M20	ER6022-030ML
Included	Not included	2 N/C + 1 N/O	3 x M20	ER6022-021ME
Included	Not included	3 N/C	3 x M20	ER6022-030ME
Included	Included (24 VDC)	2 N/C + 1 N/O	3 x M20	ER6022-021MEL
Included	Included (24 VDC)	3 N/C	3 x M20	ER6022-030MEL
Included	Included (24 VDC)	4 N/C + 2 N/O	4 x M20	ER1022-042MELL
Included	Included (24 VDC)	4 N/C + 2 N/O	4 x M20	ER1022-042MELR
Included	Included (24 VDC)	4 N/C + 2 N/O	4 x M20	ER1032-042MEL

Stainless steel housing

E-Stop	Indicator Beacon	Contacts	Wiring Entry	Order code
Not included	Not included	2 N/C + 2 N/O	3 x M20	ER6022-022MSS
Not included	Not included	3 N/C + 1 N/O	3 x M20	ER6022-031MSS
Not included	Included	2 N/C + 2 N/O	3 x M20	ER6022-022MLSS
Not included	Included	3 N/C + 1 N/O	3 x M20	ER6022-031MLSS
Included	Not included	2 N/C + 2 N/O	3 x M20	ER6022-022MESS
Included	Not included	3 N/C + 1 N/O	3 x M20	ER6022-031MESS
Included	Included	2 N/C + 2 N/O	3 x M20	ER6022-022MELSS
Included	Included	3 N/C + 1 N/O	3 x M20	ER6022-031MELSS

Explosion proof models

Aluminium die-cast housing

E-Stop	Indicator Beacon	Contacts	Wiring Entry	Order code
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	XER6022-011C3
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	XER1022-011C3L
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	XER1022-011C3R
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	XER1032-011C3

Stainless steel housing

E-Stop	Indicator Beacon	Contacts	Wiring Entry	Order code
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	XER6022-011C3SS
Not included	Not included	2 N/C	pre-wired, 3 m	XER6022-020C3SS

Accessories

Item	Applicable model	Order code
Replacement Lid	ER 5018	SM06-SL400
	ER 6022	SM06-SL500
	ER6022-SS stainless steel	SM06-SLXER6022SS
Replacement Lid/LED, 24 VDC	ER 1022	EM06-SL710
	ER 1032	SM06-SL711
	ER6022-SS stainless steel	SM06-SLXER622LSS
Replacement Lid/LED	ER 6022	SM06-SL510
Rope Kit, 5 m, Stainless Steel	ER 5018, ER 6022, ER 1022, ER 1032	RK5
Rope Kit, 10 m, Stainless Steel	ER 5018, ER 6022, ER 1022, ER 1032	RK10
Rope Kit, 20 m, Stainless Steel	ER 5018, ER 6022, ER 1022, ER 1032	RK20
Rope Kit, 50 m, Stainless Steel	ER 5018, ER 6022, ER 1022, ER 1032	RK50
Rope Kit, 80 m, Stainless Steel	ER 6022, ER1022, ER1032	RK80
Rope Only, 5 m	ER 5018, ER 6022, ER 1022, ER 1032	R5M
Rope Only, 10 m	ER 5018, ER 6022, ER 1022, ER 1032	R10M
Rope Only, 20 m	ER 5018, ER 6022, ER 1022, ER 1032	R20M
Rope Only, 50 m	ER 5018, ER 6022, ER 1022, ER 1032	R50M
Rope Only, 100 m	ER 5018, ER 6022, ER 1022, ER 1032	R100M
Rope Only, 126 m	ER 5018, ER 6022, ER 1022, ER 1032	R126M
Tensioner Gripper, Stainless Steel	ER 5018, ER 6022, ER 1022, ER 1032	SM06-TG00
Eye Bolt Stainless Steel, 8 per pack	ER 5018, ER 6022, ER 1022, ER 1032	SM06-EB10
Double Loop Clip, Stainless Steel, 4 per pack	ER 5018, ER 6022, ER 1022, ER 1032	SM06-DL20
Thimble Stainless Steel, 4 per pack	ER 5018, ER 6022, ER 1022, ER 1032	SM06-THSS
Turnbuckle, Stainless Steel	ER 5018, ER 6022, ER 1022, ER 1032	SM06-TB30
Spring, Stainless Steel	ER 5018, ER 6022, ER 1022, ER 1032	SM06-SP50
Rope Pulley, Stainless Steel	ER 5018, ER 6022, ER 1022, ER 1032	SM06-RPSS
E-Stop Mechanism	ER 5018, ER 6022, ER 1022, ER 1032	SM06-ES60

Specifications

Standard models

Item		Applicable model			
		ER 5018	ER 6022	ER 1022	ER 1032
Electrical	Contact Configurations	2 N/C + 1 N/O, 3 N/C	2 N/C + 1 N/O, 3 N/C, 3N/C + 1N/O	4 N/C + 2 N/O	4 N/C + 2 N/O
	Safety Contacts	2 N/C, 3 N/C	2 N/C, 3 N/C	4 N/C	
	Switching Ability	AC: 120 V–6 A, 240 V–3 A, Inductive DC: 24 V–2.5 A, Inductive			
	Auxiliary Contacts	1 N/O		2 N/O	
	Max. Switching Current/Volt/Amp	240 V/720 VA			
	Electrical Life	1,000,000 minimum			
	LED Indicator Beacon	–	24 VDC		
Mechanical	Max. Rope Span	40 m	80 m	125 m	125 m each side
	Case Material	Die-cast aluminium alloy			
	Eye Nut Material	Stainless steel			
	Wiring Entry	3 x M20		4 x M20	
	Mechanical Life	1,000,000 minimum			
Environmental	Protection	IP67 (NEMA 6)			
	Operating Temperature	-25 to 80°C			
	Cleaning	Water washdown			
Compliance	Standards	IEC947-5-1, IEC947-5-5, EN418, UL508, BS5304			
	Approvals/Listings	CE marked for all applicable directives, UL and C-UL			

Explosion proof models

Item			Applicable model		
			XER6022	XER1022	XER1032
Electrical	Contact configuration		1 N/C + 1 N/O, 2 N/C		
	Safety Contact		1 N/C, 2 N/C		
	Auxiliary Contact		1 N/O		
	Rated voltage AC15		400 VAC	250 VAC	250 VDC
	Rated Current		2 A AC	4 A AC	0.15 A DC
	Switching ability AC Ratings	Voltage	250 V	125 V	
		Resistive Load	5A		
		Inductive Load	3A		
	Switching ability DC Ratings	Voltage	250V	30V	
		Resistive Load	0,4A	7A	
		Inductive Load	0,03A	5A	
Compliance	Ex-Classification		II 2 G	EEx d II C T6	
	Certification		PTB 00 ATEX 1093X	IBExU 01 ATEX 1007X	

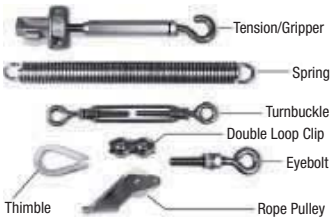
Accessories

RK Rope Tension Kit



The RK Rope Tension Kit comes with all of the required hardware for most installations. A spring is required as shown in the installation example below.

Installation Hardware



Individual hardware items may be purchased for specific installation requirements.



Emergency Stop Switch

The A22E line-up of E-Stop switches offers various head types as well as lighted models. E-stop shrouds and control boxes as accessories provide flexibility in application.

- Direct opening mechanism with minimum contact separation of 3 mm
- Safety lock mechanism prevents misuse
- Easy mounting of switch block
- Lighted models for easy diagnosis and maintenance
- Modular design for flexibility in application

Ordering Information

Non-lighted Models

Description	Output	Colour of cap	Order code
30-dia. head Push-lock Turn-reset	SPST-NC	Red	A22E-S-01
	SPST-NO/SPST-NC		A22E-S-11
	DPST-NC		A22E-S-02
40-dia. head Push-lock Turn-reset	SPST-NC		A22E-M-01
	SPST-NO/SPST-NC		A22E-M-11
	DPST-NC		A22E-M-02
60-dia. head Push-lock Turn-reset	SPST-NC		A22E-L-01
	SPST-NO/SPST-NC		A22E-L-11
	DPST-NC		A22E-L-02
30-dia. head Push-lock Key-reset	SPST-NC		A22E-SK-01
	SPST-NO/SPST-NC		A22E-SK-11
	DPST-NC		A22E-SK-02
40-dia. head Push-lock Key-reset	SPST-NC		A22E-MK-01
	SPST-NO/SPST-NC		A22E-MK-11
	DPST-NC		A22E-MK-02

Lighted Models

Description	Output	Lighting	Rated voltage	Colour of cap	Order code
40-dia. head Push-lock Turn-reset	SPST-NC	LED	24 VAC/VDC	Red	A22EL-M-24A-01
	SPST-NO/SPST-NC		24 VAC/VDC		A22EL-M-24A-11
	DPST-NC		24 VAC/VDC		A22EL-M-24A-02
40-dia. head Push-lock Turn-reset	SPST-NC		220 VAC		A22EL-M-T2-01
	SPST-NO/SPST-NC		220 VAC		A22EL-M-T2-11
	DPST-NC		220 VAC		A22EL-M-T2-02

Accessories (Order Separately)

Item	Classification	Remarks	Order code
Control Boxes (Enclosures)	One hole	Material: Polycarbonate resin	A22Z-B101
	One hole, yellow box (for emergency stop)		A22Z-B101Y
	Two holes		A22Z-B102
	Three holes		A22Z-B103
Legend Plates for Emergency Stop	60-dia. black letters on yellow back-ground	"EMERGENCY STOP" is indicated on the plate.	A22Z-3466-1
	90-dia. black letters on yellow back-ground		A22Z-3476-1

Specifications

Contacts (Standard Load)

Rated carry current	Rated voltage	Rated current (A)			
		AC15	AC12	DC13	DC12
10	24 VAC	10	10	---	---
	220 VAC	3	6		
	24 VDC	---	---	1.5	10
	220 VDC			0.2	0.6

Note: 1. Rated current values are determined according to the testing conditions. The above ratings were obtained by conducting tests under the following conditions.
(1) Ambient temperature: 20×±2°C
(2) Ambient humidity: 65±5%
(3) Operating frequency: 20 operations/minute
2. Minimum applicable load: 10 mA at 5 VDC

Contacts (Microload)

Rated applicable load	Minimum applicable load
50 mA at 5 VDC (Resistive load)	1 mA at 5 VDC

Characteristics

Item		Emergency Stop Switches	
		Non-lighted model: A22E	Lighted model: A22EL
Dielectric strength		2,500 VAC, 50/60 Hz for 1 min between terminals of same polarity 2,500 VAC, 50/60 Hz for 1 min between terminals of different polarity and also between each terminal and ground	
Durability	Mechanical	Momentary operation: 300,000 operations min.	
	Electrical	300,000 operations min.	
Degree of protection		IP65 (oil-resistant)	IP65



Emergency stop switch

The A165E line-up offers E-Stop switches with various head types. For flexible applications, a wide range of accessories is provided. To set up easy installation and maintenance, various contact combinations are available.

- Direct opening mechanism with minimum contact separation of 3 mm
- Safety lock mechanism prevents misuse
- Short mounting depth
- Modular construction; easy installation using snap-in switch

Ordering information

Switches	Rated voltage	Pushbutton colour	Pushbutton size	Terminal	Contact	Order code
						Standard load (125 VAC at 5 A, 250 VAC at 3 A, 30 VDC at 3 A)
LED	24 VDC	Red	30 dia.	Solder terminal	SPST-NC	A165E-LS-24D-01
					DPST-NC	A165E-LS-24D-02
None	–				SPST-NC	A165E-S-01
					DPST-NC	A165E-S-02
					TPST-NC	A165E-S-03U
LED	24 VDC		40 dia.		SPST-NC	A165E-LM-24D-01
					DPST-NC	A165E-LM-24D-02
None	–				SPST-NC	A165E-M-01
					DPST-NC	A165E-M-02
					TPST-NC	A165E-M-03U

Note: The above models have a surface indication of “RESET.” Models with “STOP” indication are also available. For further information, contact your Omron representative.

Accessories (order separately)

Item	Type	Precautions	Order code
Yellow plate	Yellow, 45 dia.	Use this as an emergency stop nameplate.	A16Z-5070
Panel plug	Round	Used for covering the panel cutouts for future panel expansion.	A16ZT-3003
Tightening tool	–	Useful for repetitive mounting. Be careful not to tighten excessively.	A16Z-3004
Extractor	–	Convenient for extracting the switch and lamp.	A16Z-5080

Specifications

Rated voltage	Resistive load	
	A165E series	A165E_-U series
125 VAC	5 A	1 A
250 VAC	3 A	0.5 A
30 VDC	3 A	1 A
Minimum applicable load	150 mA at 5 VDC	1 mA at 5 VDC

Features	Characteristics
Operating force (OF) max.	14.7 N
Releasing force (RF) min.	0.1 N·m
Pretravel (PT)	3.5±0.5 mm (3±0.5 mm In case of A165E_U series)

Item		Emergency stop switch
Allowable operating frequency	Mechanical	20 operations/minute max.
	Electrical	10 operations/minute max.
Insulation resistance		100 MΩ min. (at 500 VDC)
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity 2,000 VAC, 50/60 Hz for 1 min between terminals of different polarity and also between each terminal and ground 1,000 VAC, 50/60 Hz for 1 min between lamp terminals *1
Durability	Mechanical	100,000 operations min.
	Electrical	100,000 operations min.
Ambient temperature		Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 65°C (with no icing or condensation)
Protection against electric shock		Class II

*1 LED not mounted. Test them with the LED removed.

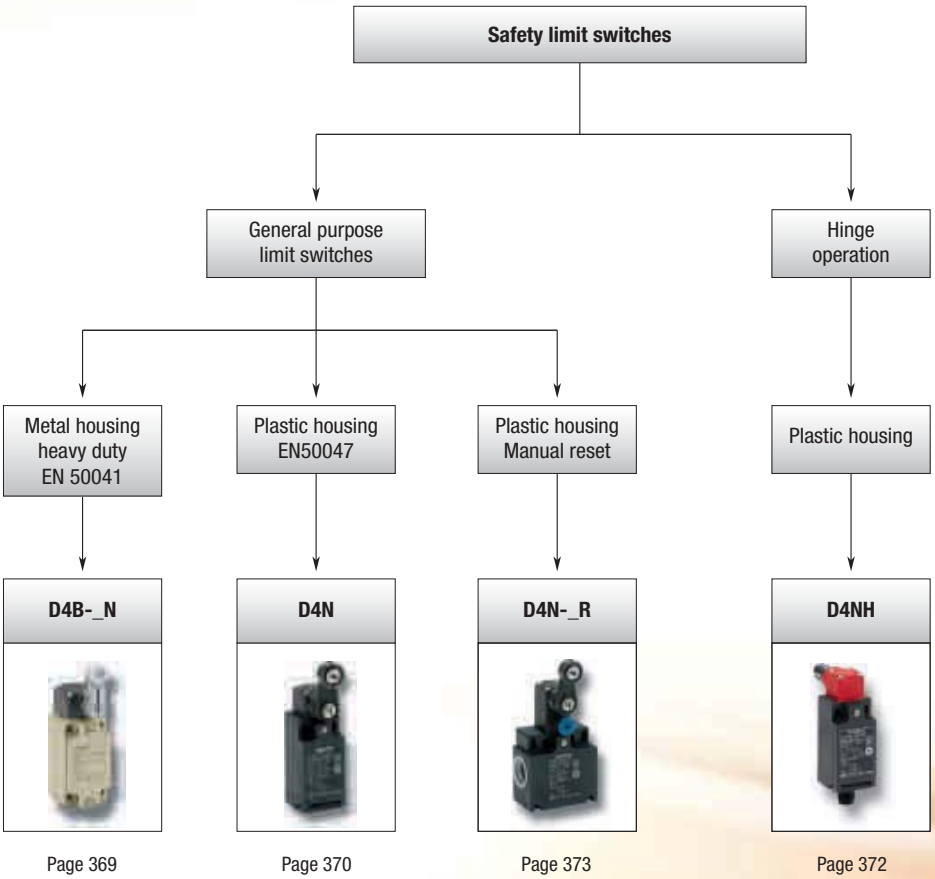
PRECISE MONITORING OF GUARD POSITION

Detect linear or rotational movement of guards: D4N

Guards and covers on machines protect workers. They limit access to the dangerous parts of the machine. Our safety limit switches guarantee that the guards and covers are in place before the machine is started.

- Wide variety of actuators to fit wide range of applications
- Gold-plated contacts for reliable operation with micro loads
- 1- and 2-conduit models for flexibility in wiring
- M12 connector for fast installation and maintenance




Safety limit switches
General purpose limit switches
Hinge operation
Metal housing heavy duty EN 50041
Plastic housing EN50047
Plastic housing Manual reset
Plastic housing
D4B-_N
D4N
D4N-_R
D4NH
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		Safety limit switches			
					
Selection criteria	Model	D4B-_N	D4N	D4NH	D4N-_R
	Housing	Metal	Plastic	Plastic	Plastic
	M12 Plug connector	–	■	■	–
	Protection class	IP67			
	Operating Temperature Range	-40 to 80°C	-30 to 70°C	-30 to 70°C	-30 to 70°C
	Conformity	EN50047, EN1088			
Features	Conduit size PG13.5	■	■	■	■
	Conduit size M20	■	■	■	■
	Conduit size G1/2	■	■	■	■
	Conduit size 1/2-14NPT	■	■	■	■
	Gold clad contacts	■	■	■	■
	Actuators				
	Resin roller, resin lever	–	■	–	■
	Resin roller, metal lever	■	■	–	–
	Metal roller, metal lever	–	■	–	–
	Bearing lever, metal lever	–	■	–	–
	Adj. resin roller, metal lever	■	■	–	■
	Adj. Rubber roller, metal lever	–	■	–	■
	Adj. Rod lever	■	–	–	–
	Top plunger	■	■	–	■
	Top roller plunger	■	■	–	■
	Horizontal roller arm lever	–	■	–	■
	Vertical roller arm lever	–	■	–	■
	Cat whisker	–	■	–	–
	Plastic Rod	■	■	–	–
	Fork lever lock (right operation)	–	■	–	–
	Fork lever lock (left operation)	–	■	–	–
	Hinge operation	■	–	■	–
Application	Position monitoring	■	■	■	■
	General safety application	–	–	–	–
Contact configuration	1NC/1NO snap action	■	■	–	–
	2NC snap action	–	■	–	–
	1NC/1NO slow action	■	■	■	■
	2NC slow action	■	■	■	■
	2NC/1NO slow action	–	■	■	■
	3NC slow action	–	■	■	■
	1NC/1NO (MBB slow action)	–	■	■	–
	2NC/1NO (MBB slow action)	–	■	■	–
	Page	369	370	372	373

■ Standard – No/not available



Safety limit switch with metal housing

The D4BN family is a complete line-up of safety limit switches in metal housing. They are available with two built-in contacts and a wide range of head and actuator types. To set up easy installation and maintenance, various conduit types, e.g. M20, are provided.

- Direct opening mechanism
- Various actuators
- Robust metal housing
- Gold-plated contacts for handling micro loads
- Metric conduit types available

Ordering information

Switches (EN50041)		Order code		
		1NC/1NO (snap-action)	1NC/1NO (slow-action)	2NC (slow-action)
Side rotary	Roller lever (form A)	**D4B-4111N**	**D4B-4511N**	**D4B-4A11N**
	Adjustable roller lever	D4B-4116N	D4B-4516N	D4B-4A16N
	Adjustable rod lever (form D)	D4B-4117N	D4B-4517N	D4B-4A17N
Top plunger	Plain (form B)	**D4B-4170N**	**D4B-4570N**	**D4B-4A70N**
	Roller (form C)	**D4B-4171N**	**D4B-4571N**	**D4B-4A71N**
Wobble lever	Coil spring	D4B-4181N	–	–
	Plastic rod	D4B-4187N	–	–

Note: Conduit sizes G1/2 and Pg 13,5 are also available

3-conduit Switch		Order code		
		1NC/1NO (snap-action)	1NC/1NO (slow-action)	2NC (slow-action)
Side rotary	Roller lever (form A)	**D4B-8111N**	–	–
	Adjustable roller lever	D4B-8116N	–	–
	Adjustable rod lever (form D)	D4B-8117N	–	–
Top plunger	Plain (form B)	–	–	–
	Roller (form C)	**D4B-8171N**	–	**D4B-8A71N**
Wobble lever	Coil spring	–	–	–
	Plastic rod	–	–	–

bold = safety limit switch, mechanical form lock

Specifications

Item		Snap-action	Slow-action
Durability *1	Mechanical	30,000,000 operations min.	10,000,000 operations min.
	Electrical	500,000 operations min. (at a 250 VAC, 10 A resistive load)	
Operating speed		1 mm/s to 0.5 m/s	
Operating frequency		Mechanical: 120 operations/min Electrical: 30 operations/min	
Rated frequency		50/60 Hz	
Contact resistance		25 mΩ max. (initial value)	
Pollution degree (operating environment)		3 (EN60947-5-1)	
Conditional short-circuit current		100 A (EN60947-5-1)	
Conventional enclosed thermal current (I_{th})		20 A (EN60947-5-1)	
Protection against electric shock		Class I (with ground terminal)	
Ambient temperature		Operating: -40 to 80°C (with no icing) *2	
Degree of protection		IP67 (EN60947-5-1)	

*1 The durability is for an ambient temperature of 5 to 35°C and ambient humidity of 40 to 70%. For further conditions, consult your Omron sales representative.
*2 -25 to 80°C for the flexible-rod type.



Safety limit switch with plastic housing

The D4N family is a complete line-up of safety limit switches. They are available with one, two or three built-in contacts and a wide range of head and actuator types. To set up easy installation and maintenance, various conduit types, e.g. M20 and M12 connector types, are provided.

- Direct opening mechanism
- Various actuators
- Double insulation
- Gold-plated contacts for handling micro loads
- Metric conduit types available

Ordering information

Switches		Conduit size		Built-in switch mechanism					
				1NC/1NO (snap-action)		1NC/1NO (slow-action)		2NC (slow-action)	
				Direct opening	Order code	Direct opening	Order code	Direct opening	Order code
	Roller lever (resin lever, resin roller)	1-conduit	M20	⊖	D4N-4120	⊖	D4N-4A20	⊖	D4N-4B20
			M12 connector		D4N-9120		D4N-9A20		D4N-9B20
	Plunger	1-conduit	M20	⊖	D4N-4131	⊖	D4N-4A31	⊖	D4N-4B31
			M12 connector		D4N-9131		D4N-9A31		D4N-9B31
		2-conduit	M20	⊖	D4N-8131	⊖	D4N-8A31	⊖	D4N-8B31
	Roller plunger	1-conduit	M20	⊖	D4N-4132	⊖	D4N-4A32	⊖	D4N-4B32
			M12 connector		D4N-9132		D4N-9A32		D4N-9B32
		2-conduit	M20	⊖	D4N-8132	⊖	D4N-8A32	⊖	D4N-8B32
	One-way roller arm lever (horizontal)	1-conduit	M20	⊖	D4N-4162	⊖	D4N-4A62	⊖	D4N-4B62
			M12 connector		D4N-9162		D4N-9A62		D4N-9B62
		2-conduit	M20	⊖	D4N-8162	⊖	D4N-8A62	⊖	D4N-8B62
	One-way roller arm lever (vertical)	1-conduit	M20	⊖	D4N-4172	⊖	D4N-4A72	⊖	D4N-4B72
	Adjustable roller lever, form lock (metal lever, resin roller)	1-conduit	M20	⊖	D4N-412G	⊖	D4N-4A2G	⊖	D4N-4B2G
			M12 connector		D4N-912G		D4N-9A2G		D4N-9B2G
	Adjustable roller lever, form lock (metal lever, rubber roller)	1-conduit	M20	⊖	D4N-412H	⊖	D4N-4A2H	⊖	D4N-4B2H
			M12 connector		D4N-912H		D4N-9A2H		D4N-9B2H

Note: Conduit sizes 1/2-14NPT, G1/2 and Pg13,5 are also available.

Switches with two contacts and MBB contacts

Actuator		Conduit size		Built-in switch mechanism		MBB		MBB	
				2NC/1NO (slow-action)		1NC/1NO (slow-action)		2NC/1NO (slow-action)	
				Direct opening	Order code	Direct opening	Order code	Direct opening	Order code
	Roller lever (resin lever, resin roller)	1-conduit	M20	⊖	D4N-4C20	⊖	D4N-4E20	⊖	D4N-4F20
			M12 connector		–		D4N-9E20		–
		2-conduit	M20	⊖	D4N-8C20	⊖	D4N-8E20	⊖	D4N-8F20
	Roller plunger	1-conduit	M20	⊖	D4N-4C32	⊖	D4N-4E32	⊖	D4N-4F32
			M12 connector		–		D4N-9E32		–
		2-conduit	M20	⊖	D4N-8C32	⊖	D4N-8E32	⊖	D4N-8F32
	One-way roller arm lever (horizontal)	1-conduit	M20	⊖	D4N-4C62	⊖	D4N-4E62	⊖	D4N-4F62
			M12 connector		–		D4N-9E62		–
		2-conduit	M20	⊖	D4N-8C62	⊖	D4N-8E62	⊖	D4N-8F62

Note: Conduit sizes 1/2-14NPT, G1/2 and Pg13,5 are also available.

General-purpose switches with two contacts

Actuator		Conduit size		Built-in switch mechanism							
				1NC/1NO (snap-action)		2NC (snap-action)		1NC/1NO (slow-action)		2NC (slow-action)	
				Direct opening	Order code	Direct opening	Order code	Direct opening	Order code	Direct opening	Order code
	Cat whisker	1-conduit	M20	–	D4N-4180	–	D4N-4280	–	–	–	D4N-4B80
	Plastic rod	1-conduit	M20	–	D4N-4187	–	D4N-4287	–		–	D4N-4B87

Note: Conduit sizes 1/2-14NPT, G1/2 and Pg13,5 are also available.

Specifications

Degree of protection		IP67 (EN60947-5-1)
Durability *1	**Mechanical**	15,000,000 operations min./Fork lever 10,000,000 operations min.
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC 300,000 operations min. for a resistive load of 10 A at 250 VAC
Operating speed		1 mm/s to 0.5 m/s (D4-1120)
Operating frequency		30 operations/minute max.
Minimum applicable load		Resistive load of 1 mA at 5 VDC (N-level reference value)
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		3 (EN60947-5-1)
Contact gap		Snap-action: 2x0.5 mm min Slow-action: 2x2 mm min
Conditional short-circuit current		100 A (EN60947-5-1)
Rated open thermal current (I_{th})		10 A (EN60947-5-1)
Ambient temperature		Operating: -30°C to 70°C with no icing

*1 The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40 to 70%. For more details, consult your Omron representative.

Note: - The above values are initial values.



Safety door hinge switch

D4NH safety door hinge switches are available with one or two built-in contacts, shaft or arm lever actuator and various conduit types, e.g. M20.

- Direct opening mechanism
- Shaft or arm lever actuator
- Wide temperature range
- Metric conduit and M12 connector types are available

Ordering information

Switches

Actuator	Conduit size		Built-in switch mechanism		
			1NC/1NO (slow-action)	2NC (slow-action)	2NC/1NO (slow-action)
Shaft	1-conduit	M20	D4NH-4AAS	D4NH-4BAS	D4NH-4CAS
		M12 connector	D4NH-9AAS	D4NH-9BAS	–
	2-conduit	M20	D4NH-8AAS	D4NH-8BAS	D4NH-8CAS
Arm lever	1-conduit	M20	D4NH-4ABC	D4NH-4BBC	D4NH-4CBC
		M12 connector	D4NH-9ABC	D4NH-9BBC	–
	2-conduit	M20	D4NH-8ABC	D4NH-8BBC	D4NH-8CBC

Actuator	Conduit size		Built-in switch mechanism		
			3NC (slow-action)	1NC/1NO MBB (slow-action)	2NC/1NO MBB (slow-action)
Shaft	1-conduit	M20	D4NH-4DAS	D4NH-4EAS	D4NH-4FAS
		M12 connector	–	D4NH-9EAS	–
Arm lever	1-conduit	M20	D4NH-4DBC	D4NH-4EBC	D4NH-4FBC
		M12 connector	–	D4NH-9EBC	–

Note: Conduit types with G1/2, 1/2-14NPT and Pg13,5 are also available.

Specifications

Degree of protection		IP67 (EN60947-5-1)
Durability	**Mechanical**	1,000,000 operations min.
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC 300,000 operations min. for a resistive load of 10 A at 250 VAC
Operating speed		2 to 360°/s
Operating frequency		30 operations/minute max.
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		3 (EN60947-5-1)
Contact gap		Snap-action: 2x9.5 mm min Slow-action: 2x2 mm min
Conditional short-circuit current		100 A (EN60947-5-1)
Rated open thermal current (I_{th})		10 A (EN60947-5-1)
Ambient temperature		Operating: -30°C to 70°C with no icing



Safety limit switch with manual reset

The D4NR family is a complete line-up of safety limit switches with manual reset. They are available with one, two or three built-in contacts and a wide range of actuator types. To set up easy installation and maintenance, various conduit types, e.g. M20 and M12 connector types, are provided.

- Direct opening mechanism
- Various actuators
- Pull-reset switches
- Gold-plated contacts for handling micro loads
- Metric conduit types available

Ordering information

Switches		Conduit size		Order code	
				Built-in switch mechanism	
				1NC/1NO (slow-action)	2NC/1NO (slow-action)
	Roller lever (resin lever, resin roller)	1-conduit	M20	D4N-4A20R	D4N-4C20R
			M12 connector	D4N-9A20R	–
		2-conduit	M20	D4N-8A20R	D4N-8C20R
	Adjustable roller lever, form lock (metal lever, rubber roller)	1-conduit	M20	D4N-4A2HR	D4N-4C2HR
			M12 connector	D4N-9A2HR	–
		2-conduit	M20	D4N-8A2HR	D4N-8C2HR
	Plunger	1-conduit	M20	D4N-4A31R	D4N-4C31R
			M12 connector	D4N-9A31R	–
		2-conduit	M20	D4N-8A31R	D4N-8C31R
	Roller plunger	1-conduit	M20	D4N-4A32R	D4N-4C32R
			M12 connector	D4N-9A32R	–
		2-conduit	M20	D4N-8A32R	D4N-8C32R

Note: Conduit types with G1/2, 1/2-14NPT and Pg13,5 are also available.

Specifications

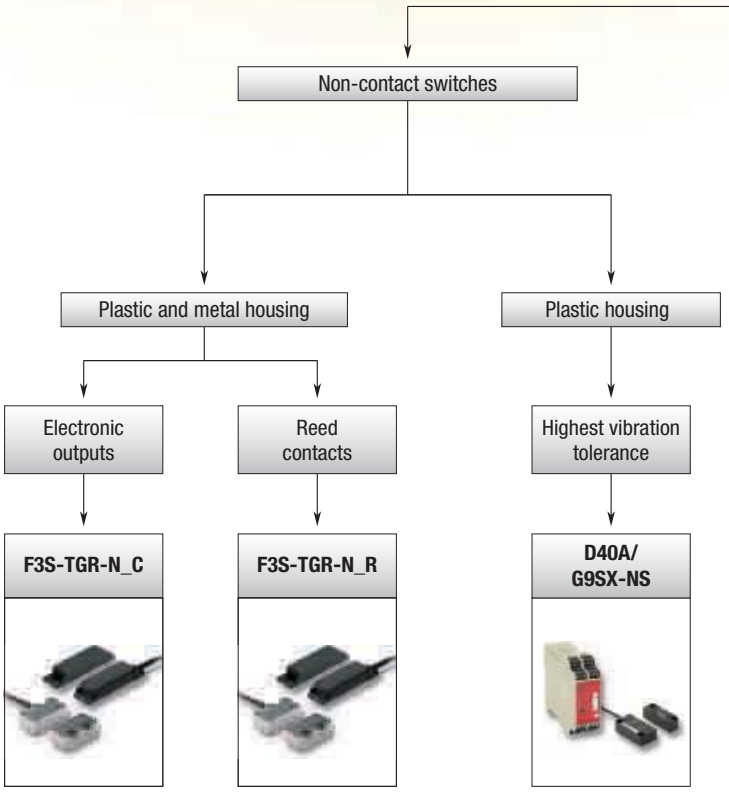
Degree of protection		IP67 (EN60947-5-1)
Durability	Mechanical	1,000,000 operations min.
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC 300,000 operations min. for a resistive load of 10 A at 250 VAC
Operating speed		1 mm/s to 0.5 m/s (D4N-1A20R)
Operating frequency		30 operations/minute max.
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		3 (EN60947-5-1)
Contact gap		Snap-action: 2×0.5 mm min Slow-action: 2×2 mm min
Rated open thermal current (I_{th})		10 A (EN60947-5-1)
Ambient temperature		Operating: -30°C to 70°C with no icing

BREAK CONVENTIONAL BARRIERS IN SAFETY DESIGN

Flexibility selecting best fit control device for non-contact switch application: F3S-TGR-N

Omron has introduced a series of magnetic coded contactless switches for interlocking machine guard doors. The switches feature a built-in control function, thus saving the cost and space required for an external controller. The non-contact switches offer advantages in applications where a precise approach of the guard and lock is not possible. Applications with a large amount of dirt or high hygienic standards can also be addressed.

- Operates with all Omron safety relay units and safety bus interfaces
- Operates behind stainless steel fittings
- Non-contact – no abrasion – no particles
- Conforms to safety categories up to 4 acc. EN 954-1 and PDF-M acc. EN60947-5-3



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Safety door switches

- Key operated switches
  - Safety switch
    - Plastic housing
      - **D4NS** — Page 382
    - Metal housing
      - **D4BS** — Page 383
  - Safety guard lock switch
    - Plastic housing
      - Square size 1300 N
        - **D4NL** — Page 379
      - Slim size 1000 N
        - **D4GL** — Page 380
    - Metal housing
      - Heavy duty 700 N
        - **D4BL** — Page 381

Selection table

		Safety door switches		Non-contact safety door switches		
						
Selection criteria	Model	D4NS	D4BS	D40A/G9SX-NS	F3S-TGR-N_C	F3S-TGR-N_R
	Housing	Plastic	Metal	Plastic	Plastic/Metal	Plastic/Metal
	Head mounting	4 directions	4 directions	–	–	–
	Actuation	Straight	Straight	–	–	–
	Key holding force	–	–	–	–	–
	Protection class	IP67				
	Conformity	EN50047, EN1088		EN 954-1	EN954-1, EN60947-5-3	EN954-1, EN60947-5-3
Features	Conduit size PG13.5	■	■	–	–	–
	Conduit size M20	■	■	–	–	–
	Conduit size G1/2	■	■	–	–	–
	Conduit size 1/2-14NPT	■	■	–	–	–
	Cable length 2 m	–	–	■	■	■
	Cable length 5 m	–	–	■	■	■
	Cable length 10 m	–	–	–	■	■
	Connector type M12	■	–	–	■	■
	Gold clad contacts	■	■	–	–	–
	Operation key horizontal	■	■	–	–	–
	Operation key vertical	■	■	–	–	–
	Operation key adjustable horizontal	■	■	–	–	–
	Operation key adjustable horizontal and vertical	■	–	–	–	–
	Mechanical lock/24 VDC solenoid release	–	–	–	–	–
	Mechanical lock/110 VAC solenoid release	–	–	–	–	–
	Mechanical lock/230 VAC solenoid release	–	–	–	–	–
	24 VDC solenoid lock/mechanical release	–	–	–	–	–
	110 VAC solenoid lock mechanical release	–	–	–	–	–
	240 VAC solenoid lock mechanical release	–	–	–	–	–
	High temperature Sensor	–	–	–	■	■
	operates with G9SA, G9SB	■	■	–	■	■
	operates wit h G9SX	■	■	■	■	■
	operates with programmable safety units NE1A	■	■	–	■	■
Application	Door monitoring	■	■	■	■	■
	Door locking	–	–	–	–	–
Contact configuration	1NC/1NO	–	–	■	–	–
	1NC/1NO SL	■	■	–	–	–
	1NC/NO SL	–	■	–	–	–
	2NC	–	–	–	■	■
	2NC SL	■	■	–	–	–
	2NC/1NO	–	–	–	■	■
	2NC/1NO SL	■	–	–	–	–
	3NC	–	–	–	–	–
	3NC SL	■	–	–	–	–
	1NC/1NO (MBB contact)	■	–	–	–	–
	2NC/1NO (MBB contact)	■	–	–	–	–
	1NO/1NC	–	–	–	–	–
	2NO/1NC	–	–	–	–	–
	1NC/1NO SL + 1NC/1NO SL	–	–	–	–	–
	1NC/1NO SL + 2NC SL	–	–	–	–	–
	1NC/1NO SL + 1NC SL	–	–	–	–	–
	2NC SL + 1NC/1NO SL	–	–	–	–	–
	2NC/1NO SL + 1NC/1NO SL	–	–	–	–	–
	2NC/1NO SL + 2NC SL	–	–	–	–	–
	2NC SL + 2NC SL	–	–	–	–	–
	2NC SL + 1NC SL	–	–	–	–	–
	3NC SL + 1NC/1NO SL	–	–	–	–	–
	3NC SL + 2NC SL	–	–	–	–	–
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		Safety door lock switches		
				
Selection criteria	Model	D4NL	D4GL	D4BL
	Housing	Plastic	Plastic	Metal
	Head mounting	4 directions	4 directions	4 directions
	Actuation	Straight	Straight	Straight
	Key holding force	1,300 N	1,000 N	700 N
	Protection class	IP67		
	Conformity	EN1088	EN1088	EN1088
Features	Conduit size PG13.5	■	■	■
	Conduit size M20	■	■	■
	Conduit size G1/2	■	■	■
	Conduit size 1/2-14NPT	–	–	–
	Cable length 2 m	–	–	–
	Cable length 5 m	–	–	–
	Cable length 10 m	–	–	–
	Connector type M12	–	–	–
	Gold clad contacts	■	■	■
	Operation key horizontal	■	■	■
	Operation key vertical	■	■	■
	Operation key adjustable horizontal	■	■	■
	Operation key adjustable horizontal and vertical	■	■	–
	Mechanical lock/24 VDC solenoid release	■	■	■
	Mechanical lock/110 VAC solenoid release	■	–	■
	Mechanical lock/230 VAC solenoid release	■	–	–
	24 VDC solenoid lock/mechanical release	■	■	■
	110 VAC solenoid lock mechanical release	■	–	–
	240 VAC solenoid lock mechanical release	■	–	–
	High temperature Sensor	–	–	–
	operates with G9SA, G9SB	■	■	■
	operates wit h G9SX	■	■	■
	operates with programmable safety units NE1A	■	■	■
Application	Door monitoring	■	■	■
	Door locking	■	■	■
Contact configuration	1NC/1NO	–	–	–
	1NC/1NO SL	–	–	–
	1NC/NO SL	–	–	–
	2NC	–	–	–
	2NC SL	–	–	–
	2NC/1NO	–	–	–
	2NC/1NO SL	–	–	–
	3NC	–	–	–
	3NC SL	–	–	–
	1NC/1NO (MBB contact)	–	–	–
	2NC/1NO (MBB contact)	–	–	–
	1NO/1NC	–	–	–
	2NO/1NC	–	–	–
	1NC/1NO SL + 1NC/1NO SL	■	■	–
	1NC/1NO SL + 2NC SL	■	■	–
	1NC/1NO SL + 1NC SL	–	–	■
	2NC SL + 1NC/1NO SL	■	■	–
	2NC/1NO SL + 1NC/1NO SL	■	–	–
	2NC/1NO SL + 2NC SL	■	■	–
	2NC SL + 2NC SL	–	■	–
	2NC SL + 1NC SL	–	–	■
	3NC SL + 1NC/1NO SL	■	■	–
	3NC SL + 2NC SL	■	■	–
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■ Standard – No/not available



Guard-lock safety door switch

The D4NL guard-lock safety door switches are available with four or five built-in contacts. When locked, they have a key holding force of up to 1300N. Mechanical lock/solenoid release types and vice versa set up the complete range in combination with various conduit types, e.g. M20.

- Safety door switch with electromagnetic lock or unlock mechanism
- Models with four or five built-in contacts
- Strong key holding force: 1300N
- For standard loads and micro loads
- Keys are compatible with D4GL and D4NS

Ordering information

Switches (with approved direct opening contacts)

For 110V and 230V version ask your local Omron representative

Lock and release types	Contact configuration	Conduit opening	Order code
Mechanical lock solenoid release	1NC/1NO + 1NC/1NO	M20	D4NL-4AFA-B
	1NC/1NO + 2NC	M20	D4NL-4BFA-B
	2NC + 1NC/1NO	M20	D4NL-4CFA-B
	2NC + 2NC	M20	D4NL-4DFA-B
	2NC/1NO + 1NC/1NO	M20	D4NL-4EFA-B
	2NC/1NO + 2NC	M20	D4NL-4FFA-B
	3NC + 1NC/1NO	M20	D4NL-4GFA-B
	3NC + 2NC	M20	D4NL-4HFA-B

Lock and release types	Contact configuration	Conduit opening	Order code
Solenoid lock mechanical release	1NC/1NO + 1NC/1NO	M20	D4NL-4AFG-B
	1NC/1NO + 2NC	M20	D4NL-4BFG-B
	2NC + 1NC/1NO	M20	D4NL-4CFG-B
	2NC + 2NC	M20	D4NL-4DFG-B
	2NC/1NO + 1NC/1NO	M20	D4NL-4EFG-B
	2NC/1NO + 2NC	M20	D4NL-4FFG-B
	3NC + 1NC/1NO	M20	D4NL-4GFG-B
	3NC + 2NC	M20	D4NL-4HFG-B

Note: - Conduit sizes of G1/2 and Pg 13,5 are also available.
- Solenoid: 24 VDC, Orange LED: 10 to 115 VAC/VDC

Operation keys (order separately)

Type		Order code
Horizontal mounting		D4DS-K1
Vertical mounting		D4DS-K2

Type		Order code
Adjustable mounting (horizontal)		D4DS-K3
Adjustable mounting (horizontal/vertical)		D4DS-K5

Specifications

Degree of protection		IP67 (EN60947-5-1) (This applies for the switch only. The degree of protection for the key hole is IP00.)
Durability[*1]	**Mechanical**	1,000,000 operations min.
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC
Operating speed		0.05 to 0.5 m/s
Operating frequency		30 operations/minute max.
Rated frequency		50/60 Hz
Contact gap		2x2 mm min
Direct opening force [*2]		60 N min. (EN60947-5-1)
Direct opening travel [*2]		10 mm min. (EN60947-5-1)
Holding force		1,300 N min.
Minimum applicable load		Resistive load of 1 mA at 5 VDC (N-level reference value)
Thermal current (I_{th})		10 A (EN60947-5-1)
Conditional short-circuit current		100 A (EN60947-5-1)
Pollution degree (operating environment)		3 (EN60947-5-1)
Protection against electric shock		Class II (double insulation)
Ambient temperature		Operating: -10°C to 55°C (with no icing or condensation)

[*1] The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40 to 70%. For more details, consult your Omron representative.
[*2] These figures are minimum requirements for safe operation.

Note: The above values are initial values.



Guard-lock safety door switch

The D4GL guard-lock safety door switches are available with four or five built-in contacts. When locked, they have a key holding force of up to 1000 N. Mechanical lock/solenoid release types and vice versa set up the complete range in combination with various conduit types, e.g. M20.

- Slim safety door switch with electromagnetic lock or unlock mechanism
- Models with four or five built-in contacts
- Strong key holding force: 1000 N
- For standard loads and micro loads
- Keys are compatible with D4NL and D4NS

Ordering information

Switches (with approved direct opening contacts)

Lock and release types	Contact configuration	Conduit size	Order code
Mechanical lock solenoid release	1NC/1NO + 1NC/1NO	M20	D4GL-4AFA-A
	1NC/1NO + 2NC	M20	D4GL-4BFA-A
	2NC + 1NC/1NO	M20	D4GL-4CFA-A
	2NC + 2NC	M20	D4GL-4DFA-A
	2NC/1NO + 1NC/1NO	M20	D4GL-4EFA-A
	2NC/1NO + 2NC	M20	D4GL-4FFA-A
	3NC + 1NC/1NO	M20	D4GL-4GFA-A
	3NC + 2NC	M20	D4GL-4HFA-A

Lock and release types	Contact configuration	Conduit size	Order code
Solenoid lock mechanical release	1NC/1NO + 1NC/1NO	M20	D4GL-4AFG-A
	1NC/1NO + 2NC	M20	D4GL-4BFG-A
	2NC + 1NC/1NO	M20	D4GL-4CFG-A
	2NC + 2NC	M20	D4GL-4DFG-A
	2NC/1NO + 1NC/1NO	M20	D4GL-4EFG-A
	2NC/1NO + 2NC	M20	D4GL-4FFG-A
	3NC + 1NC/1NO	M20	D4GL-4GFG-A
	3NC + 2NC	M20	D4GL-4HFG-A

Note: - conduit sizes of G1/2 and Pg13,5 are also available.
- solenoid: 24 VDC, orange/green LED: 24 VDC

Operation keys (order separately)

Type		Order code
Horizontal mounting		D4DS-K1
Vertical mounting		D4DS-K2

Type		Order code
Adjustable mounting (horizontal)		D4DS-K3
Adjustable mounting (horizontal/vertical)		D4DS-K5

Specifications

Degree of protection		IP67 (EN60947-5-1) (This applies for the switch only. The degree of protection for the key hole is IP00.)
Durability *1	**Mechanical**	1,000,000 operations min.
	Electrical	500,000 operations min. for a resistive load of 4 mA at 24 VDC; 150,000 operations min. for a resistive load of 1 A at 125 VAC in 2 circuits and 4 mA at 24 VDC in 2 circuits
Operating speed		0.05 to 0.5 m/s
Operating frequency		30 operations/minute max.
Rated frequency		50/60 Hz
Contact gap		2x2 mm min.
Direct opening force *2		60 N min. (EN60947-5-1)
Direct opening travel *3		10 mm min. (EN60947-5-1)
Holding force		1,000 N min.
Minimum applicable load		Resistive load of 4 mA at 24 VDC (N-level reference value)
Thermal current (I_{th})		2.5 A (EN60947-5-1)
Conditional short-circuit current		100 A (EN60947-5-1)
Pollution degree (operating environment)		3 (EN60947-5-1)
Protection against electric shock		Class II (double insulation)
Ambient temperature		Operating: -10°C to 55°C with no icing

*1 The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40 to 70%. For more details, consult your Omron representative.
*2 These figures are minimum requirements for safe operation.
*3 These figures are minimum requirements for safe operation.

Note: The above values are initial values.



Guard-lock safety door switch with metal housing

The D4BL guard-lock safety door switches are available with three built-in contacts. They are mechanically locked when the key is inserted and have a solenoid release. An auxiliary release key ensures easy maintenance and unlocks the door in case of power failure.

- Automatic mechanical lock
- Auxiliary release key for easy maintenance
- Tough aluminium die-cast body
- Horizontal and vertical conduit opening
- Head direction can easily be changed

Ordering information

Switches

Lock method	Conduit size	Voltage for solenoid	Without indicator 1NC/1NO+ 1NC (slow-action)	With LED indicator 1NC/1NO+ 1NC (slow-action)	Without indicator 2NC+ 1NC (slow-action)	With LED indicator 2NC+ 1NC (slow-action)
Mechanical lock	PG13.5	24 VDC	D4BL-1CRA	D4BL-1CRA-A	D4BL-1DRA	D4BL-1DRA-A
		110 VAC	D4BL-1CRB	D4BL-1CRB-A	D4BL-1DRB	D4BL-1DRB-A
	M20	24 VDC	D4BL-4CRA	D4BL-4CRA-A	D4BL-4DRA	D4BL-4DRA-A
		110 VAC	D4BL-4CRB	D4BL-4CRB-A	–	–
Solenoid lock	Pg 13.5	24 VDC	D4BL-1CRG	D4BL-1CRG-A	D4BL-1DRG	D4BL-1DRG-A
	M20	24 VDC	–	D4BL-4CRG-A	–	–

Operation keys (order separately)

Type		Order code
Horizontal mounting		D4BL-K1
Vertical mounting		D4BL-K2

Type		Order code
Adjustable mounting (horizontal)		D4BL-K3

Specifications

Degree of protection	IP67 (EN60947-5-1)
Durability[*1]	Mechanical: 1,000,000 operations min. Electrical: 500,000 operations min. (10 A resistive load at 250 VAC)
Operating speed	0.05 to 0.5 m/s
Operating frequency	30 operations/min max.
Rated frequency	50/60 Hz
Operating characteristics	Direct opening force: 19.61 N min. (EN60947-5-1) Direct opening travel: 20 mm min. (EN60947-5-1) All stroke: 23 mm min.
Holding force	700 N min. (GS-ET-19)
Thermal current (I_{th})	10 A (EN60947-5-1)
Pollution degree (operating environment)	3 (EN60947-5-1)
Protection against electric shock	Class I (with ground terminal)
Ambient temperature	Operating: -10 to 55°C (with no icing)

[*1] The durability is for an ambient temperature of 5 to 35°C and an ambient humidity of 40 to 70%.

Note: The above values are initial values.

Solenoid coil characteristics

Item	24 VDC mechanical lock models	110 VAC mechanical lock models	24 VAC solenoid lock models
Rated operating voltage	24 VDC $^{+10\%}/_{-15\%}$ (100% ED)	110 VAC ±10% (50/60 Hz)	24 VDC $^{+10\%}/_{-15\%}$ (100% ED)
Current consumption	Approx. 300 mA	Approx. 98 mA	Approx. 300 mA

Indicator characteristics

Item	LED
Rated voltage	10 to 115 VAC/VDC
Current leakage	Approx. 1 mA
Colour (LED)	Orange, green



Safety door switch with plastic housing

The D4NS line-up includes three-contact models with 2NC/1NC and 3NC contact forms in addition to the previous contact forms, 1NC/1NO and 2NC. Models with M12 connectors and conduit opening, such as M20, are also available.

- Line-up with three contacts: 2NC/1NC and 3NC contact forms
- Line-up with two contacts 1NC/1NO and 2NC
- M12 connector types available
- Standardised gold-clad contacts for high contact reliability
- Applicable for standard loads and micro loads

Ordering information

Switches (with approved direct opening contacts)

Type	Contact configuration		Conduit opening/connector	Order code
1-conduit	Slow-action	1NC/1NO	M20	D4NS-4AF
		2NC	M20	D4NS-4BF
		2NC/1NO	M20	D4NS-4CF
		3NC	M20	D4NS-4DF
	Slow-action MBB contact	1NC/1NO	M20	D4NS-4EF
		2NC/1NO	M20	D4NS-4FF
2-conduit	Slow-action	1NC/1NO	M20	D4NS-8AF
		2NC	M20	D4NS-8BF
		2NC/1NO	M20	D4NS-8CF
	Slow-action MBB contact	1NC/1NO	M20	D4NS-8EF
	Slow-action MBB contact	2NC/1NO	M20	D4NS-8FF
1-conduit, with connector	Slow-action	1NC/1NO	M12 connector	D4NS-9AF
		2NC	M12 connector	D4NS-9BF
	Slow-action MBB contact	1NC/1NO	M12 connector	D4NS-9EF

Note: Additionally conduit sizes G1/2, 1/2-14NPT and Pg13,5 are available.

Operation keys (order separately)

Type		Order code
Horizontal mounting		D4DS-K1
Vertical mounting		D4DS-K2

Type		Order code
Adjustable mounting (horizontal)		D4DS-K3
Adjustable mounting (horizontal/vertical)		D4DS-K5

Specifications

Degree of protection		IP67 (EN60947-5-1) (This applies for the switch only. The degree of protection for the key hole is IP00.)
Durability *1	**Mechanical**	1,000,000 operations min.
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC 300,000 operations min. for a resistive load of 10 A at 250 VAC
Operating speed		0.05 to 0.5 m/s
Operating frequency		30 operations/minute max.
Direct opening force *2		60 N min.
Direct opening travel *2		10 mm min.
Minimum applicable load		Resistive load of 1 mA at 5 VDC (N-level reference value)
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		3 (EN60947-5-1)
Contact gap		2×2 mm min
Conditional short-circuit current		100 A (EN60947-5-1)
Rated open thermal current (I_{th})		10 A (EN60947-5-1)
Ambient temperature		Operating: -30°C to 70°C with no icing

*1 The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40 to 70%. For more details, consult your Omron representative.
*2 These figures are minimum requirements for safe operation.

Note: The above values are initial values.



Safety door switch with metal housing

The D4BS line-up includes two-contact models with 1NC/1NO and 2NC in a robust metal housing. 1 or 3 conduit openings, such as M20 or PG13,5 are available.

- Robust metal housing
- Line-up with two contacts: 1NC/1NO and 2NC
- Standardised gold-clad contacts for high contact reliability
- Applicable for standard loads and micro loads

Ordering information

Switches

Type	Mounting direction	Conduit size	Order code	
			1NC/1NO (slow-action)	2NC (slow-action)
1-conduit	Front-side mounting	Pg13.5	D4BS-15FS	D4BS-1AFS
		M20	D4BS-45FS	D4BS-4AFS
3-conduit		Pg13.5	D4BS-55FS	D4BS-5AFS
		M20	D4BS-85FS	D4BS-8AFS

Operation keys (order separately)

Type		Order code
Horizontal mounting		D4BS-K1
Vertical mounting		D4BS-K2
Adjustable mounting (horizontal)		D4BS-K3

Specifications

Degree of protection[*1]	IP67 (EN60947-5-1)
Durability[*2]	Mechanical: 1,000,000 operations min. Electrical: 500,000 operations min. (10 A at 250 VAC, resistive load)
Operating speed	0.1 m/s to 0.5 m/s
Operating frequency	30 operations/min max.
Rated frequency	50/60 Hz
Contact gap	2×2 mm min.
Direct opening force[*3]	19.61 N min. (EN60947-5-1)
Direct opening travel[*3]	20 mm min. (EN60947-5-1)
Full stroke	23 mm min.
Conventional enclosed thermal current (I_{th})	20 A (EN60947-5-1)
Conditional short-circuit current	100 A (EN60947-5-1)
Pollution degree (operating environment)	3 (EN60947-5-1)
Protection against electric shock	Class I (with ground terminal)
Ambient temperature	Operating: -40 to 80°C (with no icing)

*1 Although the switch box is protected from dust, oil, or water penetration, do not use the D4BS in places where dust, oil, water, or chemicals may penetrate through the key hole on the head, otherwise switch damage or malfunctioning may occur.
*2 The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40 to 70%. Contact your Omron sales representative for more detailed information on other operating environments.
*3 These figures are minimum requirements for safe operation.

Note: The above values are initial values.



Non-contact coded switches for monitoring the status of guarding doors

Non-contact switches monitor the status of guarding doors. LED for easy diagnosis and stainless steel housing for high hygiene demands in the food industry are available

- Operates with all Omron safety controllers
- Operates behind stainless steel fittings
- Non-contact – no abrasion – no particles
- Screw-hole covers support hygienic design (NMPC)
- Conforms to safety categories up to 4 acc. EN 954-1, PDF-M acc. EN60947-5-3 and PLe acc. EN ISO13849-1

Ordering Information

Elongated Sensors

Cable Connection	Contact Configuration	Order code
2 m pre-wired	2NC	F3S-TGR-NLPC-20-02
5 m pre-wired	2NC	F3S-TGR-NLPC-20-05
10 pre-wired	2NC	F3S-TGR-NLPC-20-10
M12, 8-pin	2NC	F3S-TGR-NLPC-20-M1J8
2 m pre-wired	2NC/1NO	F3S-TGR-NLPC-21-02
5 m pre-wired	2NC/1NO	F3S-TGR-NLPC-21-05
10 pre-wired	2NC/1NO	F3S-TGR-NLPC-21-10
M12, 8-pin	2NC/1NO	F3S-TGR-NLPC-21-M1J8

Small Sensor

Cable Connection	Contact Configuration	Order code
2 m pre-wired	2NC	F3S-TGR-NSMC-20-02
5 m pre-wired	2NC	F3S-TGR-NSMC-20-05
10 pre-wired	2NC	F3S-TGR-NSMC-20-10
M12, 8-pin	2NC	F3S-TGR-NSMC-20-M1J8
2 m pre-wired	2NC/1NO	F3S-TGR-NSMC-21-02
5 m pre-wired	2NC/1NO	F3S-TGR-NSMC-21-05
10 pre-wired	2NC/1NO	F3S-TGR-NSMC-21-10
M12, 8-pin	2NC/1NO	F3S-TGR-NSMC-21-M1J8

Miniature Sensors

Cable Connection	Contact Configuration	Order code
2m pre-wired	2NC	F3S-TGR-NMPC-20-02
5m pre-wired	2NC	F3S-TGR-NMPC-20-05
10m pre-wired	2NC	F3S-TGR-NMPC-20-10
M12, 8-pin	2NC	F3S-TGR-NMPC-20-M1J8
2m pre-wired	2NC/1NO	F3S-TGR-NMPC-21-02
5m pre-wired	2NC/1NO	F3S-TGR-NMPC-21-05
10m pre-wired	2NC/1NO	F3S-TGR-NMPC-21-10
M12, 8-pin	2NC/1NO	F3S-TGR-NMPC-21-M1J8

Specifications

Mechanical Data

Item	Model	Elongated Sensor	Small Sensor	Miniature Sensor
Operating distance	OFF ➔ ON (Sao)	12 mm Close		8 mm Close
	ON ➔ OFF (Sar)	17 mm Open		12 mm Open
Actuator approach speed	Min. Max.	4 mm/s 1000 mm/s		
Operating temperature	–	-25°C to +80°C	-25°C to +105°C	-25°C to +80°C
Enclosure protection	Flying lead M12 connector	IP 67		
Material	–	Black Polycarbonate	Stainless steel 316	Black Polyester

Electrical Data

Item		Model	Elongated Sensor	Small sensor	Miniature Sensor
Power supply		–	24 VDC ±15%		
Power consumption		Max.	50 mA		
Switching current		Min.	10 mA, 10 VDC		
Rated loads	NC contacts NO contact	Max.	100 mA, 24 VDC 100 mA, 24 VDC		
Output type		–	Electronic output (potential-free optocoupler output)		

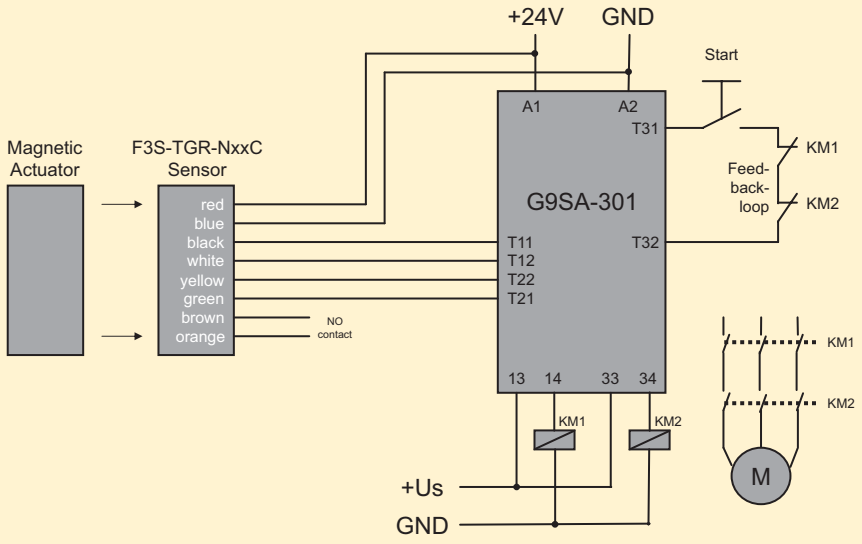
Approved Standards

EN standards certified by TÜV Rheinland
EN 954-1, EN ISO13849-1
EN 60204-1
EN/IEC 60947-5-3
UL 508, CSA C22.2
BS 5304
EN 1088-1 conformance

Wiring examples (Single head connection up to category 4 acc. EN954-1)

G9SA

Single Sensor Application with G9SA-301
(up to Safety Category 4 acc. EN954-1)





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- Conforms to safety categories up to 4 acc. EN 954-1, PDF-M acc. EN60947-5-3 and PLe acc. EN ISO13849-1

Ordering Information

Elongated Sensors

Cable Connection	Contact Configuration	Order code
2 m pre-wired	2NC	F3S-TGR-NLPR-20-02
5 m pre-wired	2NC	F3S-TGR-NLPR-20-05
10 pre-wired	2NC	F3S-TGR-NLPR-20-10
M12, 8-pin	2NC	F3S-TGR-NLPR-20-M1J8
2 m pre-wired	2NC/1NO	F3S-TGR-NLPR-21-02
5 m pre-wired	2NC/1NO	F3S-TGR-NLPR-21-05
10 pre-wired	2NC/1NO	F3S-TGR-NLPR-21-10
M12, 8-pin	2NC/1NO	F3S-TGR-NLPR-21-M1J8

Small Sensor

Cable Connection	Contact Configuration	Order code
2 m pre-wired	2NC	F3S-TGR-NSMR-20-02
5 m pre-wired	2NC	F3S-TGR-NSMR-20-05
10 pre-wired	2NC	F3S-TGR-NSMR-20-10
M12, 8-pin	2NC	F3S-TGR-NSMR-20-M1J8
2 m pre-wired	2NC/1NO	F3S-TGR-NSMR-21-02
5 m pre-wired	2NC/1NO	F3S-TGR-NSMR-21-05
10 pre-wired	2NC/1NO	F3S-TGR-NSMR-21-10
M12, 8-pin	2NC/1NO	F3S-TGR-NSMR-21-M1J8

Miniature Sensors

Cable Connection	Contact Configuration	Order code
2m pre-wired	2NC	F3S-TGR-NMPR-20-02
5m pre-wired	2NC	F3S-TGR-NMPR-20-05
10m pre-wired	2NC	F3S-TGR-NMPR-20-10
M12, 8-pin	2NC	F3S-TGR-NMPR-20-M1J8
2m pre-wired	2NC/1NO	F3S-TGR-NMPR-21-02
5m pre-wired	2NC/1NO	F3S-TGR-NMPR-21-05
10m pre-wired	2NC/1NO	F3S-TGR-NMPR-21-10
M12, 8-pin	2NC/1NO	F3S-TGR-NMPR-21-M1J8

Specifications

Mechanical Data

Item	Model	Elongated Sensor	Small Sensor	Miniature Sensor
Operating distance	OFF → ON (Sao)	10 mm Close		12 mm Close
	ON → OFF (Sar)	22 mm Open		20 mm Open
Actuator approach speed	Min. Max.	4 mm/s 1000 mm/s		
Operating temperature	–	-25°C to +80°C	-25°C to +105°C	-25°C to +80°C
Enclosure protection	Flying lead M12 connector	IP 67		
Material	–	Black Polycarbonate	Stainless steel 316	Black Polyester

Electrical Data

Item		Model	Elongated Sensor	Small Sensor	Miniature Sensor
Contact release time		Max.	2 ms		
Initial contact resistance		Max.	50 mΩ		500 mΩ
Switching current		Min.	1 mA, 10 VDC		10 mA, 10 VDC
Rated loads	NC contacts NO contact	Max.	1 A, 250 VAC 0.2 A, 24 VDC		0.5 A, 250 VAC 0.2 A, 24 VDC

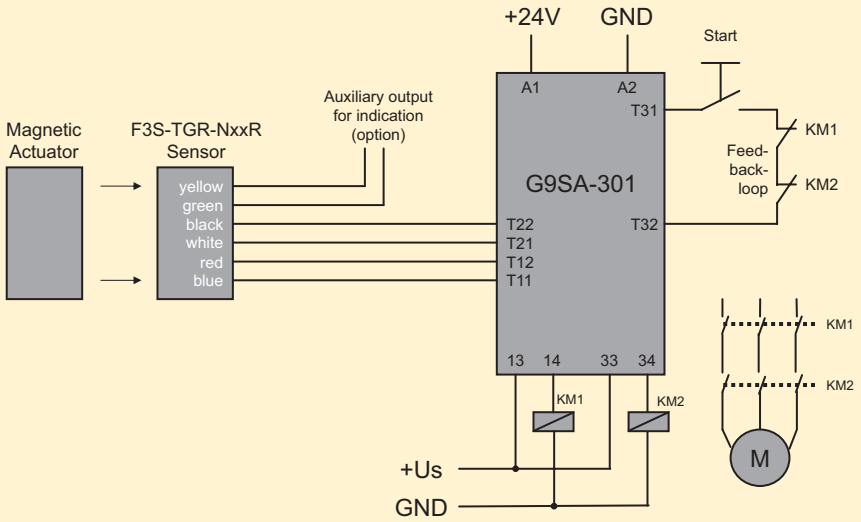
Approved Standards

EN standards certified by TÜV Rheinland
EN 954-1, EN ISO13849-1
EN 60204-1
EN/IEC 60947-5-3
UL 508, CSA C22.2
BS 5304
EN 1088-1 conformance

Wiring examples (Single head connection up to category 4 acc. EN954-1)

G9SA

Single Sensor Application with G9SA-301
(up to Safety Category 4 acc. EN954-1)

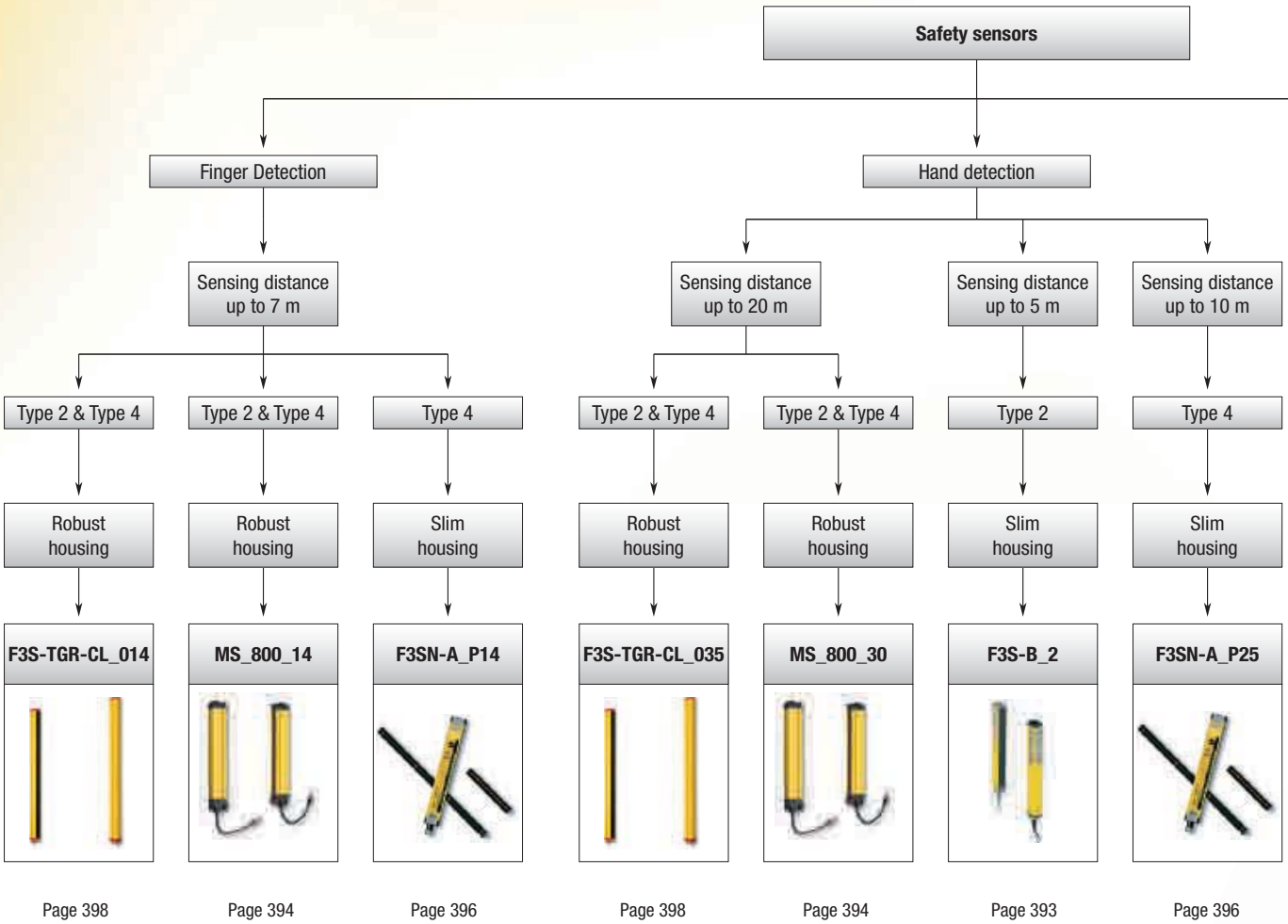


PROTECT OPERATORS AND PRODUCTION

Simplicity without limitations

Safety sensors are the first choice in safeguarding workplaces where people and machines cooperate. Built-in intelligence stops the machine in conditions that are dangerous for the worker. Our All-In-One concept for safety light curtains provides simplicity in mounting, configuring, daily use and maintenance.

- Finger- and Hand protection models
- Easy configuration via built in DIP-switches for simple setup.
- Easy mounting and common wiring for all types for simple design and installation





Human body detection and Muting applications

Sensing distance up to 5 m	Sensing distance up to 10 m	Sensing distance up to 12 m active/passive system		Sensing distance up to 50 m	
Type 2	Type 2	Type 2	Type 4	Type 2	Type 4
Slim housing	M18 housing	Robust housing	Robust housing	Robust housing	Robust housing
F3S-B_5 F3S-B_7	**E3FS + Controller**	**F3S-TGR-CL2-K_C**	**F3S-TGR-CL4-K_C**	**F3S-TGR-CL2-K_**	**F3S-TGR-CL4-K_**
					
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Selection table

		Safety Sensors			
					
	Model	**MS2800 & MS4800**	**F3S-TGR-CL**	**F3SN-A**	**F3S-B**
Selection criteria	**Safety category**	Category 2&4	Category 2&4	Category 4	Category 2
	Safety Integrity Level (IEC 61508)	SIL 3	–	–	–
	Protective height	280 to 2120 mm	150 to 2400 mm	189 to 1,807 mm	300 to 1650 mm
	Resolution	14, 30 mm	14, 35 mm	14, 25, 40, 70 mm	30, 55, 80 mm
	Beam pitch	10, 20 mm	7.5, 18 mm	9, 15, 30, 60 mm	25, 50, 70 mm
	Reaction time	14 to 59 ms	14 to 103 ms	10 to 15.5 ms	20 to 45 ms
	Temperature range	-10 to 55°C	-10 to 55°C	-10 to 55°C	-10 to 55°C
	IP class	IP65	IP65	IP65	IP65
Features	**Blanking function**	internal	internal	internal	option
	Muting function	option	internal	–	–
	EDM function	internal	internal	internal	internal
	Interlock function	internal	internal	internal	internal
	Series connection	option	option	option	option
	Mounting kits	option	option	option	option
	Parameter setting	internal DIP switch	internal DIP switch	option (Console)	option (PC)
	External control unit	–	–	–	–
Application	**Finger protection**	■	■	■	–
	Hand protection	■	■	■	■
	Arm protection	■	■	■	■
	Body protection	■	■	■	■
	Presence detection	■	■	■	■
	Muting application	–	■	–	–
	Blanking application	■	■	■	■
Supply voltage	**24 VDC**	■	■	■	■
In- and Outputs	**Safety outputs**	2 PNP OSSD transistor outputs	2 PNP OSSD transistor outputs	2 PNP OSSD transistor outputs	2 PNP OSSD transistor outputs
	Auxiliary output	1 PNP (non safety)	–	2 PNP (non safety)	1 PNP (non safety)
	Test input	■	■	■	■
	EDM input	■	■	■	■
	Reset input	■	■	■	■
	Muting sensor input	–	■	–	–
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		Safety Sensors		
				
Selection criteria	Model	E3FS + F3SP-U3P	F3S-TGR-CL_-K_	F3S-TGR-CL_-K_C
	Safety category	Category 2	Category 2 and 4	Category 2 and 4
	Safety Integrity Level (IEC 61508)	–	–	–
	Protective height	–	500 to 1.200 mm	500 to 1.200 mm
	Resolution	–	–	–
	Beam pitch	–	300 mm, 400 mm, 500 mm	300 mm, 400 mm, 500 mm
	Reaction time	32 ms	13 ms	13 ms
	Temperature range	-10 to 55°C	-10 to 55°C	-10 to 55°C
	IP class	IP67	IP65	IP65
Features	Blanking function	–	–	–
	Muting function	option	internal	internal
	EDM function	option	internal	internal
	Interlock function	option	internal	internal
	Series connection	–	–	–
	Mounting kits	■	option	option
	Parameter setting	–	internal DIP switch	internal DIP switch
	External control unit	■	–	–
Application	Finger protection	–	–	–
	Hand protection	–	–	–
	Arm protection	–	–	–
	Body protection	■	■	■
	Presence detection	–	–	–
	Muting application	■	■	■
	Blanking application	–	–	–
Supply voltage	24 VDC	■	■	■
In- and Outputs	Safety outputs	2 PNP OSSD transistor outputs	2 PNP OSSD transistor outputs	2 PNP OSSD transistor outputs
	Auxiliary output	–	–	–
	Test input	■	■	■
	EDM input	–	■	■
	Reset input	■	■	■
	Muting sensor input	■	■	■
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Category-2 safety light curtain

The F3S-B is a category-2 safety light curtain with resolutions of 30, 55 and 80 mm. An operating range of up to 5 m and protective heights from 300mm to 1,650 mm are provided with a very small dead zone.

- Sensing distance up to 5 m
- LEDs for easy alignment and diagnosis
- Series connection of two sensors is possible
- Category-2 sensor complying with EN 61496-1, EN 954-1 and EN ISO 13849-1

Ordering information

Optical resolution	No. of optical axes	Protective height	Order code
30 mm	12	300 mm	F3S-B122P
	18	450 mm	F3S-B182P
	24	600 mm	F3S-B242P
	30	750 mm	F3S-B302P
	36	900 mm	F3S-B362P
	42	1,050 mm	F3S-B422P
	48	1,200 mm	F3S-B482P
	54	1,350 mm	F3S-B542P
	60	1,500 mm	F3S-B602P
	66	1,650 mm	F3S-B662P
55 mm	6	300 mm	F3S-B065P
	9	450 mm	F3S-B095P
	12	600 mm	F3S-B125P
	15	750 mm	F3S-B155P
	18	900 mm	F3S-B185P

Optical resolution	No. of optical axes	Protective height	Order code
55 mm	21	1,050 mm	F3S-B215P
	24	1,200 mm	F3S-B245P
	27	1,350 mm	F3S-B275P
	30	1,500 mm	F3S-B305P
	33	1,650 mm	F3S-B335P
80 mm	4	300 mm	F3S-B047P
	6	450 mm	F3S-B067P
	8	600 mm	F3S-B087P
	10	750 mm	F3S-B107P
	12	900 mm	F3S-B127P
	14	1,050 mm	F3S-B147P
80 mm	16	1,200 mm	F3S-B167P
	18	1,350 mm	F3S-B187P
	20	1,500 mm	F3S-B207P
	22	1,650 mm	F3S-B227P

Specifications

Item	F3S-B___P *1 Stand-alone			F3S-BM___P__ *1 Master unit for series connection			F3S-BS___ *1 Slave unit for series connection		
Sensor type	Type 2 Safety Light Curtain								
Optical-axis pitch	25 mm	50 mm	75 mm	25 mm	50 mm	75 mm	25 mm	50 mm	75 mm
Optical resolution (Detection capability)	Non-transparent: In diameter								
	30 mm	55 mm	80 mm	30 mm	55 mm	80 mm	30 mm	55 mm	80 mm
Protective height	300/450/600/750/900/1,050/1,200/1,350/1,500/1,650 mm						300/450/600/750 mm		
Detection distance	0.3 to 5.0 m								
Response time	ON to OFF 20 ms to 45ms (stand-alone) ON to OFF 20 ms to 65ms (series connection)								
Supply voltage (Vs)	24 VDC ±20% (including 5 Vp-p ripple)								
Current consumption	400 mA max. (under no-load conditions)								
Light source	Infrared LED (880 nm wavelength).								
Effective aperture angle	Within ±5° for the emitter and receiver at a detection distance of at least 3 m according to IEC 61496-2								
Control output	Two PNP transistor outputs, load current 200 mA max.								
Instability output	PNP transistor output (non safety output)								
Protection circuit	Output short-circuit protection, power supply reverse connection protection								
External test function	Mode selection by connecting "External test input" line to: Active: 17 VDC to Vs, 10 mA max. duration time at least 15 ms Inactive: No connection or 0 to 2.5 VDC, 2 mA max.								
Relay monitoring function (optional)	Default inactive, selectable with F39-U1E								
Start interlock function (optional)	Default inactive, selectable with F39-U1E								
Blanking function (optional)	Default inactive, selectable with F39-U1E								
Connection method	For extension cable: 8 pins, M12 connector For series connection cable: 6 pins, M12 connector								
Ambient temperature	Operating: -10°C +55°C (with no icing or condensation)								
Degree of protection	IP65 (IEC60529)								
Size (cross section)	30x40 mm								

*1 For detailed type names and optical specifications, see „Type Naming Rule"



Category 4 / 2 safety light curtains

The MS4800 and MS2800 family of safety light curtains provide simplicity in mounting, configuring, daily use and maintenance by providing a:

- Sensing distance up to 20m for 30mm resolution and 7 m for 14mm resolution
- LED bar for easy alignment and diagnosis
- DIP-switch setup for Blanking, Muting and optical coding
- Category 4 / 2 sensor complying with EN 61496-1
- All-in-one M12 connection and mounting concept with robust housing
- Multi-cascadable up to 4 sets

Ordering information

MS2800 Safety Category 2

Connection features										
Standard Standalone operation	Standard				Master				Slave	
Master Series connection, Muting										
Slave Series connection only										
	MS2800S-				MS2800FS-				MS2800F-	
Function Set										
Basic Interlock, Restart, EDM, 2 optical channels, integrated alignment tool	Basic		Advanced		Basic		Advanced			
Advanced Muting, Blanking (fixed/floating)										
	MS2800S-EB-		MS2800S-EA-		MS2800FS-EB-		MS2800FS-EA-		MS2800F-E-	
Resolution	14 mm	30 mm	14 mm	30 mm	14 mm	30 mm	14 mm	30 mm	14 mm	30 mm
14 mm Finger protection	MS2800S-EB-014-	MS2800S-EB-030-	MS2800S-EA-014-	MS2800S-EA-030-	MS2800FS-EB-014-	MS2800FS-EB-030-	MS2800FS-EA-014-	MS2800FS-EA-030-	MS2800F-E-014-	MS2800F-E-030-
30 mm Hand protection										
Length										
240 mm … 2120 mm in	280 … 1800	280 … 2120	280 … 1800	280 … 2120	280 … 1800	280 … 2120	280 … 1800	280 … 2120	240 … 1280	280 … 2120
40 mm increments										

MS4800 Safety Category 4

Connection features										
Standard Stan-dalone operation	Standard				Master				Slave	
Master Series connection, Muting										
Slave Series connection only										
	MS4800S-				MS4800FS-				MS4800F-	
Function Set										
Basic In-terlock, Restart, EDM, 2 optical channels, integrated alignment tool	Basic		Advanced		Basic		Advanced			
Advanced Muting, Blanking (fixed/floating)										
	MS4800S-EB-		MS4800S-EA-		MS4800FS-EB-		MS4800FS-EA-		MS4800F-E-	
Resolution	14mm	30mm	14mm	30mm	14mm	30mm	14mm	30mm	14mm	30mm
14mm Finger protection	MS4800S-EB-014-	MS4800S-EB-030-	MS4800S-EA-014-	MS4800S-EA-030-	MS4800FS-EB-014-	MS4800FS-EB-030-	MS4800FS-EA-014-	MS4800FS-EA-030-	MS4800F-E-014-	MS4800F-E-030-
30mm Hand protection										
Length										
240mm … 2120mm in	280 ... 1800	280 ... 2120	280 ... 1800	280 ... 2120	280 ... 1800	280 ... 2120	280 ... 1800	280 ... 2120	240 ... 1280	280 ... 2120
40mm increments										

Examples

MS2800S-EB-030-1000
Standalone Operation
Basic function set
30mm resolution
1000mm protective height

MS4800FS-EA-014-1200
Series connection Model
Advanced function set
14mm resolution
1200mm protective height

MS4800F-E-014-600
Slave operation

14mm resolution
600mm protective height

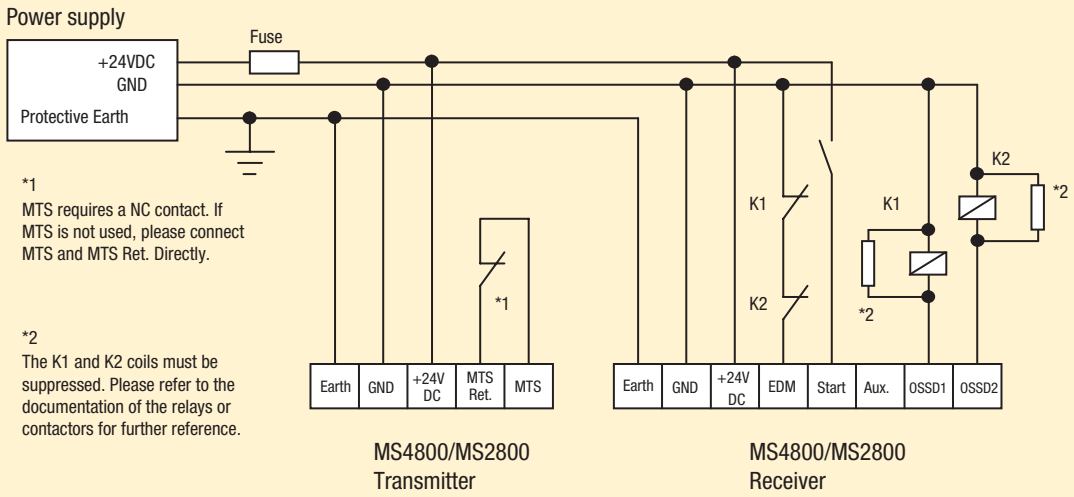
Specifications

Model	MS4800_-E_-___-____	MS2800_-E_-___-____
Sensor type	Type 4	Type2
Normal Operating range Reduced range (DIP-switch 6)	14 mm resolution: 0.3 - 7 m, 30 mm resolution: 0.3 - 20 m 14 mm resolution: 0.3 - 3 m, 30 mm resolution: 0.3 - 8 m	
Beam pitch	14 mm resolution: 10 mm; 30 mm resolution: 20 mm	
Protective height	14 mm resolution: 280 - 1800 mm; 30 mm resolution: 240 - 2120 mm	
Detection capability	14 mm resolution: 14 mm non-transparent; 30 mm resolution: 30 mm non-transparent	
Effective aperture angle (EAA)	Within ±2,5°	Within ±5,0°
	for the emitter and receiver at a detection distance of at least 3m according to IEC61496-2	
Light source	Infrared LED's (880 nm), Power Dissipation: 180 mW, Class 1 per EN60825-1	
Supply voltage (Vs)	24 VDC ±20%, according EN/IEC60204, able to cover a drop of voltage of at least 20 msec	
OSSD	Two safety related PNP transistor output, load current 625 mA max.*1, short circuit protection	
Auxiliary Output (non safety output)	One PNP output sourcing 100mA @ 24VDC. This output follows the OSSD's	
Output operation mode	OSSD output: Light-ON	
Test functions	Self-test (after power ON and during operation)	
Safety-related functions	All versions: Auto reset/interlock with manual reset, EDM (external device monitoring) Advanced versions only: fixed blanking, floating blanking, muting	
Response time	ON to OFF: 14 to 59 ms	
Ambient light intensity	Incandescent lamp: 3000 lx max. (light intensity on the receiver surface)	
Ambient temperature	Operating: -10°C to +55°C, storage: -25°C to +70°C (without icing or condensation)	
Degree of protection	IP65 (IEC60529)	
Connection method	Flexible cable with M 12 connection: receiver: 8 pins, transmitter: 5 pins	
Materials	Case: Polyurethane powder painted aluminium, cap: polycarbonate, front window: acrylic, mounting brackets: cold rolled steel	
Size (cross section)	39 x 50 mm	
Receiver indicator lights	Individual Beam Indicator (IBI), Interlock, Blanking active, RUN and STOP state, error codes	
Transmitter indicator lights	ON, OFF, failure	
AOPD (ESPE)	Type4 acc. IEC 61496-1	Type2 acc. IEC 61496-1
Suitable for safety control systems	Cat. 4 acc. EN954-1, PLc acc. EN ISO 13849-1	Cat. 2 acc. EN954-1, PLc acc. EN ISO 13849-1
Safety Integrity Level	SIL 3 according IEC 61508	
PFH	3,5 x 10^{-8}	

*1 Up to 12 m we recommend to use the F39-JMR cables, to use longer cables and a current of 625 mA the F39-JMR cables are necessary.

Connection example

Using a manual restart and an external device monitoring



MS4800/MS2800 Transmitter

MS4800/MS2800 Receiver

K1 and K2 forcibly guided relay's expected



Category-4 safety light curtain/ multi-beam safety sensor

The F3SN family is a category-4 safety light curtain with resolutions of 14, 25, 30 and 60 mm. An operating range of up to 10 m and protective heights from 189 to 1,822 mm are provided with no dead zone.

- Detection height = Sensor length
- Sensing distance up to 7 m (14 mm resolution) and 10 m for all other types
- LED bar for easy alignment and diagnosis
- Blanking function by using setup console
- Category-4 sensor complying with EN 61496-1

Ordering information

Safety light curtain

Minimum detection object	Sensing distance	Series connection, connector	Order code*1
14 mm dia. (finger protection)	0.2 to 7 m	No	F3SN-A____P14 F3SN-A____P14H
		Yes	F3SN-A____P14H-01
25 mm dia. (hand protection)	0.2 to 10 m	No	F3SN-A____P25
		Yes	F3SN-A____P25-01
40 mm dia. (for presence protection)	0.2 to 10 m	No	F3SN-A____P40
		Yes	F3SN-A____P40-01
70 mm dia. (for presence detection)	0.2 to 10 m	No	F3SN-A____P70
		Yes	F3SN-A____P70-01

*1 ____ in the model name indicates the detection width (mm).

List of safety light curtains

F3SN-A____P14, F3SN-A____P14-01, F3SN-A____P14H-01

Detection height	Number of optical axes	Order code
207	23	F3SN-A0207P14 (-01)
297	33	F3SN-A0297P14 (-01)
405	45	F3SN-A0405P14 (-01)
495	55	F3SN-A0495P14 (-01)
603	67	F3SN-A0603P14 (-01)
711	79	F3SN-A0711P14 (-01)
801	89	F3SN-A0801P14 (-01)
909	101	F3SN-A0909P14 (-01)
999	111	F3SN-A0999P14 (-01)
1,107	123	F3SN-A1107P14 (-01)
1,197	133	F3SN-A1197P14H(-01)
1,359	151	F3SN-A1359P14H(-01)
1,503	167	F3SN-A1503P14H(-01)
1,611	179	F3SN-A1611P14H(-01)

F3SN-A____P25, F3SN-A____P25-01

Detection height	Number of optical axes	Order code
307	19	F3SN-A0307P25 (-01)
457	29	F3SN-A0457P25 (-01)
607	39	F3SN-A0607P25 (-01)
907	59	F3SN-A0907P25 (-01)
1,057	69	F3SN-A1057P25 (-01)
1,207	79	F3SN-A1207P25 (-01)
1,357	89	F3SN-A1357P25 (-01)
1,507	99	F3SN-A1507P25 (-01)
1,657	109	F3SN-A1657P25 (-01)
1,807	119	F3SN-A1807P25 (-01)

Note: Highlighted products are preferred stock types, other detection heights are available.

Accessories (order separately)

Setting console

Order code	Accessories
F39-MC11	One branching connector, one connector cap, 2 m cable, instruction manual

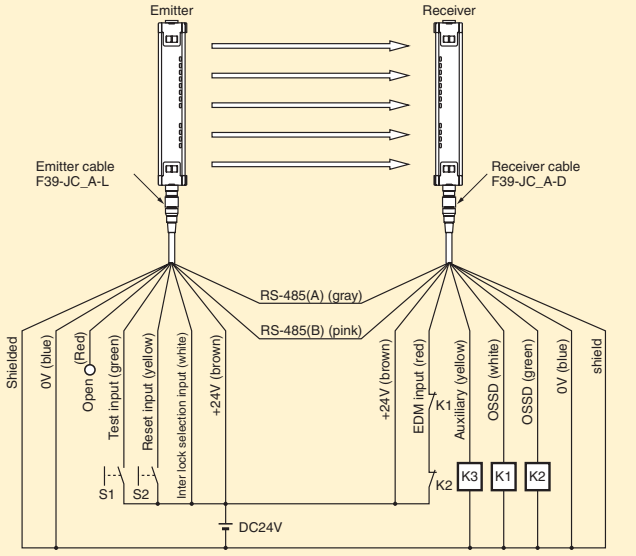
Specifications

Item	Stand-alone	F3SN-A____P14 *1 *3	F3SN-A____P25 *1	F3SN-A____P40 *1	F3SN-A____P70 *1
	Series connection	F3SN-A____P14-01 *1 *2 *3	F3SN-A____P25-01 *1	F3SN-A____P40-01 *1	F3SN-A____P70-01 *1
Sensor type		Type 4 Safety Light Curtain			
Operating range		0.2 to 7 m	0.2 to 10 m		
Beam pitch (P)		9 mm	15 mm	30 mm	60 mm
Protective height (PH)		189 to 1611 mm PH = n × P	217 to 1822 mm PH = (n – 1) × P + 37	217 to 1807 mm PH = (n – 1) × P + 37	277 to 1777 mm PH = (n – 1) × P + 37
Outermost beam gap		–			
Detection capability		Non-transparent: 14 mm in diameter	Non-transparent: 25 mm in diameter	Non-transparent: 40 mm in diameter	Non-transparent: 70 mm in diameter
Effective aperture angle (EAA)		Within ±2.5° for the emitter and receiver at a detection distance of at least 3 m according to IEC 61496-2			
Light source		Infrared LED (870 nm)			
Supply voltage (Vs)		24 VDC ±10% (ripple p-p 10% max.)			
OSSD		Two PNP transistor outputs, load current 300 mA max.			
Auxiliary output (non-safety output)		One PNP transistor output, load current 50 mA max.			
External indicator output (non-safety output) *4		One PNP transistor output, load current 40 mA max.			
Output operation mode		OSSD output: Light-ON Auxiliary output: Dark-ON (can be changed by the F39-MC11) External indicator output: Light-ON (can be changed by the F39-MC11) *4			
Input voltage		For test input, interlock selection input, reset input, and external relay monitor input voltages; ON voltage: 9 to 24 V (with a sink current of 3 mA max.), OFF voltage: 0 to 1.5 V or open			
Test functions		Self-test (after power ON, and during operation, one cycle during response time) External test (light emission stop function by test input)			
Safety-related functions		Auto reset/manual reset (interlock) *5 EDM (external device monitoring) Fixed blanking *6 Floating blanking *6			
Response time		ON to OFF: 10 to 15.5 ms max., 19,5 ms max. for 179 beams			
Ambient light intensity		Incandescent lamp: 3000 lx max. (light intensity on the receiver surface) Sunlight: 10000 lx max. (light intensity on the receiver surface)			
Ambient temperature		Operating: -10°C +55°C, storage: -30°C +70°C (with no icing or condensation)			
Degree of protection		IP65 (IEC60529)			
Connection method		M12 connector (8 pins)			
Materials		Case: Aluminium, cap: Zinc die-cast, optical cover: PMMA (acrylic resin)			
Size (cross section)		30x30 mm			

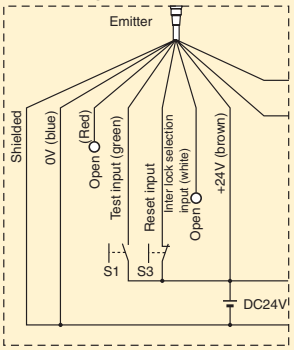
*1 The 4 digits in ____ in the model number represent the protective height. Use the formula given in the information on protective height specifications to calculate the height. For example, if the beam gap is 9 mm, and the No. of beams is 21, the protective height will be 9×21 = 189 mm. The model with this protective height is F3SN-A0189P14.
*2 F3SN-A____P14-01 is a customized model. Consult with your Omron representative when ordering this model.
*3 For sizes above 1,125 mm add „H“ after P14, e.g. F3SN-A1143P14H. Ask for supplemental manual.
*4 Models ending in -01 only.
*5 For the factory setting, the manual reset mode is set to the “start/restart” interlock. Using the F39-MC11 can select either the start interlock or the restart interlock.
*6 For the factory setting, the function is not set. It can be enabled with the F39-MC11.

Connection

Using a manual reset function and an external device monitoring function



When using a auto reset function



S1: External test switch
S2: Interlock/lockout reset switch
S3: Lock-out reset switch if the switch is not needed, connect to 24 VDC)
K1, K2: Relays for control of dangerous parts of machine.
K3: Load, PLC, etc. (for monitor)

Note: If you do not intend to use the external relay monitor, connect the auxiliary output that is set for dark: ON operation to the external relay monitor input, or use F39-MC11 to disable the external relay monitor function.



Multi-beam, finger- and hand protection safety sensor

The multi-beam sensors are available in Category 2 (PL c) and Category 4 (PL e) with integrated muting function. The finger- and hand protection models are available in Category 2 (PL c) and Category 4 (PL e) with integrated safety control functions.

- Type 2/Type 4 sensor complying with EN 61496-1
- Family concept in wiring and mounting

Multi-beam models

- Sensing distance up to 50 m
- DIP-switch setup for muting, pre-reset, interlock function and optical coding
- Muting function and muting lamp integrated

Finger- and hand protection models

- Sensing distance up to 0.2 m...6 m (14 mm) and 0.2 m...14 m (35 mm)
- DIP-switch setup for blanking, interlock function, muting and optical coding
- Floating blanking and Fixed blanking supported

Ordering information multi-beam safety sensor

Long-range active/active systems

F3S-TGR-CL2_-K_ (Type 2)

Number of optical axes	Sensing distance	Beam pitch	Feature set*1	Order code
2	0.5 m … 40 m	500	Advanced	F3S-TGR-CL2A-K2-500
2	0.5 m … 40 m	500	Basic	F3S-TGR-CL2B-K2-500
3	0.5 m … 40 m	400	Advanced	F3S-TGR-CL2A-K3-800
3	0.5 m … 40 m	400	Basic	F3S-TGR-CL2B-K3-800
4	0.5 m … 40 m	300	Advanced	F3S-TGR-CL2A-K4-900
4	0.5 m … 40 m	300	Basic	F3S-TGR-CL2B-K4-900
4	0.5 m … 40 m	400	Advanced	F3S-TGR-CL2A-K4-1200
4	0.5 m … 40 m	400	Basic	F3S-TGR-CL2B-K4-1200
2	25 m … 50 m	500	Advanced	F3S-TGR-CL2A-K2-500-LD
2	25 m … 50 m	500	Basic	F3S-TGR-CL2B-K2-500-LD
3	25 m … 50 m	400	Advanced	F3S-TGR-CL2A-K3-800-LD
3	25 m … 50 m	400	Basic	F3S-TGR-CL2B-K3-800-LD
4	25 m … 50 m	300	Advanced	F3S-TGR-CL2A-K4-900-LD
4	25 m … 50 m	300	Basic	F3S-TGR-CL2B-K4-900-LD
4	25 m … 50 m	400	Advanced	F3S-TGR-CL2A-K4-1200-LD
4	25 m … 50 m	400	Basic	F3S-TGR-CL2B-K4-1200-LD

F3S-TGR-CL4_-K_ (Type 4)

Number of optical axes	Sensing distance	Beam pitch	Feature set*1	Order code
2	0.5 m … 40 m	500	Advanced	F3S-TGR-CL4A-K2-500
2	0.5 m … 40 m	500	Basic	F3S-TGR-CL4B-K2-500
3	0.5 m … 40 m	400	Advanced	F3S-TGR-CL4A-K3-800
3	0.5 m … 40 m	400	Basic	F3S-TGR-CL4B-K3-800
4	0.5 m … 40 m	300	Advanced	F3S-TGR-CL4A-K4-900
4	0.5 m … 40 m	300	Basic	F3S-TGR-CL4B-K4-900
4	0.5 m … 40 m	400	Advanced	F3S-TGR-CL4A-K4-1200
4	0.5 m … 40 m	400	Basic	F3S-TGR-CL4B-K4-1200
2	25 m … 50 m	500	Advanced	F3S-TGR-CL4A-K2-500-LD
2	25 m … 50 m	500	Basic	F3S-TGR-CL4B-K2-500-LD
3	25 m … 50 m	400	Advanced	F3S-TGR-CL4A-K3-800-LD
3	25 m … 50 m	400	Basic	F3S-TGR-CL4B-K3-800-LD
4	25 m … 50 m	300	Advanced	F3S-TGR-CL4A-K4-900-LD
4	25 m … 50 m	300	Basic	F3S-TGR-CL4B-K4-900-LD
4	25 m … 50 m	400	Advanced	F3S-TGR-CL4A-K4-1200-LD
4	25 m … 50 m	400	Basic	F3S-TGR-CL4B-K4-1200-LD

Short-range active/passive systems

F3S-TGR-CL2_-K_C (Type 2)

Number of optical axes	Sensing distance	Beam pitch	Feature set*1	Order code
2	0.5 m … 12 m	500	Advanced	F3S-TGR-CL2A-K2C-500
2	0.5 m … 12 m	500	Basic	F3S-TGR-CL2B-K2C-500
3	0.5 m … 8 m	400	Advanced	F3S-TGR-CL2A-K3C-800
3	0.5 m … 8 m	400	Basic	F3S-TGR-CL2B-K3C-800
4	0.5 m … 7 m	300	Advanced	F3S-TGR-CL2A-K4C-900
4	0.5 m … 7 m	300	Basic	F3S-TGR-CL2B-K4C-900
4	0.5 m … 7 m	400	Advanced	F3S-TGR-CL2A-K4C-1200
4	0.5 m … 7 m	400	Basic	F3S-TGR-CL2B-K4C-1200

F3S-TGR-CL4_-K_C (Type 4)

Number of optical axes	Sensing distance	Beam pitch	Feature set*1	Order code
2	0.5 m … 12 m	500	Advanced	F3S-TGR-CL4A-K2C-500
2	0.5 m … 12 m	500	Basic	F3S-TGR-CL4B-K2C-500
3	0.5 m … 8 m	400	Advanced	F3S-TGR-CL4A-K3C-800
3	0.5 m … 8 m	400	Basic	F3S-TGR-CL4B-K3C-800
4	0.5 m … 7 m	300	Advanced	F3S-TGR-CL4A-K4C-900
4	0.5 m … 7 m	300	Basic	F3S-TGR-CL4B-K4C-900
4	0.5 m … 7 m	400	Advanced	F3S-TGR-CL4A-K4C-1200
4	0.5 m … 7 m	400	Basic	F3S-TGR-CL4B-K4C-1200

*1. Feature set: Basic: Manual/automatic restart, coding
Advanced: Basic + Muting + Pre-reset

Ordering information finger- and hand protection safety sensor

Safety category	Feature set*2	Resolution	Length	Order code
2	Basic	14 mm	150 mm…2400 mm	F3S-TGR-CL2B-014-
		35 mm		F3S-TGR-CL2B-035-
	Advanced	14 mm		F3S-TGR-CL2A-014-
		35 mm		F3S-TGR-CL2A-035-
4	Basic	14 mm		F3S-TGR-CL4B-014-
		35 mm		F3S-TGR-CL4B-035-
	Advanced	14 mm		F3S-TGR-CL4A-014-
		35 mm		F3S-TGR-CL4A-035-

*2. Feature set: Basic: Manual/automatic restart, coding
Advanced: Blanking functions + Muting + Pre-reset

Specifications

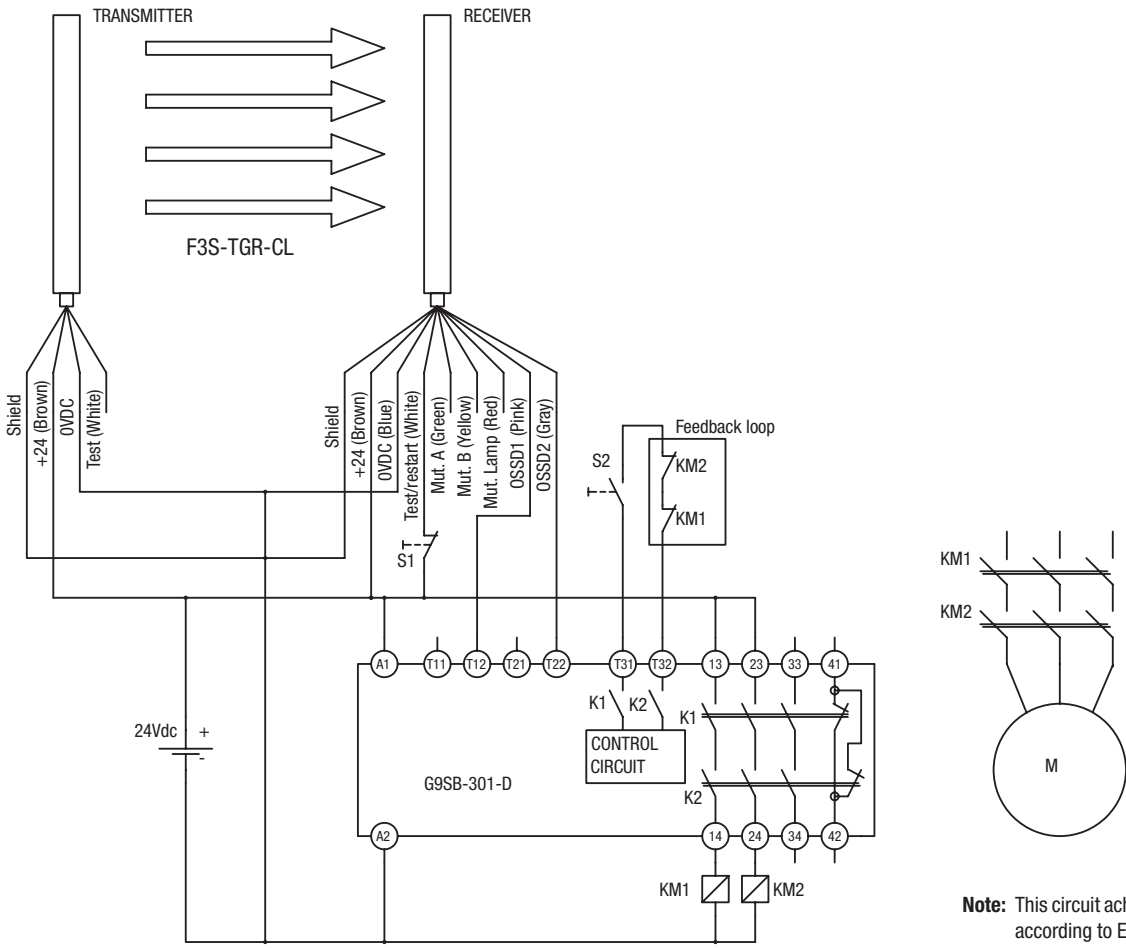
Multi-beam safety sensor

Item	F3S-TGR-CL2_-K_	F3S-TGR-CL4_-K_
Sensor Type	Type 2	Type 4
Operating range	F3S-TGR-CL__-K_ 0.5 m … 40 m F3S-TGR-CL__-K_-___-LD 25 m … 50 m F3S-TGR-CL__-K2C-500 0.5 m … 12 m F3S-TGR-CL__-K3C-800 0.5 m … 8 m F3S-TGR-CL__-K4C-____ 0.5 m … 7 m	
Beam pitch	F3S-TGR-CL__-K2_-500: 2 beams, 500 mm F3S-TGR-CL__-K3_-800: 3 beams, 400 mm F3S-TGR-CL__-K4_-900: 4 beams, 300 mm F3S-TGR-CL__-K4_-1200: 4 beams, 400 mm	
Effective aperture angle acc. EN 61496-2 (2006) for distances >3 m	Within ±5°	Within ±2.5°
Light source	Infrared LED (880 nm), Power dissipation <3 mW, Class 1 per EN 60825-1	
Supply Voltage	24 VDC±20%, according EN/IEC60204 able to cover a drop of voltage of at least 20 ms	
OSSD	2 PNP transistor outputs, load current 2x250 mA max	
Test functions	Self test (after power ON and during operation)	
Safety-related functions	All versions: Auto reset/ interlock with manual reset, EDM (external device monitoring) Advance version only: Muting and Pre-reset function	
Response time	< 13 ms	
Ambient temperature	Operating: -10°C…+55°C, Storage: -25°C…+70°C (no icing, no condensation)	
Degree of protection	IP 65 (IEC 60529)	
Materials	Case: Painted Aluminium, Front window: Acrylic Lexan, Cap: ABS, mounting brackets: cold rolled steel	
Size (cross section)	37x48 mm	
Suitable for safety control systems	Cat. 2 (EN954-1), PL c (EN ISO 13849-1)	Cat. 4 (EN954-1), PL e (EN ISO 13849-1)
MTTFd, DC	MTTFd = 450 years, DC = high, MTTR = 8 hours	
PFH, Proof test interval	PFHd = $2,5*10^{-9}$, Proof test interval: every 20 years	

Finger- and hand safety protection sensor

Item	F3S-TGR-CL2_-0__	F3S-TGR-CL4_-0__
Sensor Type	Type 2	Type 4
Operating range: short setting	F3S-TGR-CL__-014: 0.2 m… 3 m; F3S-TGR-CL__-035: 0.2 m… 7 m	
Operating range: long setting	F3S-TGR-CL__-014: 3 m… 6 m; F3S-TGR-CL__-035: 7 m…14 m	
Beam pitch (center)	14 mm resolution: 7.5 mm 35 mm resolution: 18 mm	
Detection capability	14 mm resolution: 14 mm non-transparent 35 mm resolution: 35 mm non-transparent	
Effective aperture angle acc. EN 61496-2 (2006) for distances < 3 m	Within ±5°	Within ±2.5°
Light source	Infrared LED (880 nm), Power dissipation <3 mW, Class 1 per EN 60825-1	
Supply Voltage	24 VDC±20%, according EN/IEC60204 able to cover a drop of voltage of at least 20 ms	
OSSD	2 PNP transistor outputs, load current 2x250 mA max	
Test functions	Self test (after power ON and during operation)	
Safety-related functions	All versions: Auto reset/ interlock with manual reset, EDM (external device monitoring) Advance version only: Blanking, Muting and Pre-reset function	
Response time	ON to OFF: 14 ms…103 ms	
Ambient temperature	Operating: -10°C…+55°C, Storage: -25°C…+70°C (no icing, no condensation)	
Degree of protection	IP 65 (IEC 60529)	
Materials	Case: Painted Aluminium, Front window: Acrylic Lexan, Cap: ABS, mounting brackets: cold rolled steel	
Size (cross section)	37x48 mm	
Suitable for safety control systems	Cat. 2 (EN954-1), PL c (EN ISO 13849-1)	Cat. 4 (EN954-1), PL e (EN ISO 13849-1)
MTTFd, DC	MTTFd = 450 years, DC = high, MTTR = 8 hours	
PFH, Proof test interval	PFHd = $2,5*10^{-9}$, Proof test interval: every 20 years	

F3S-TGR-CL and GSB-301-D in manual reset



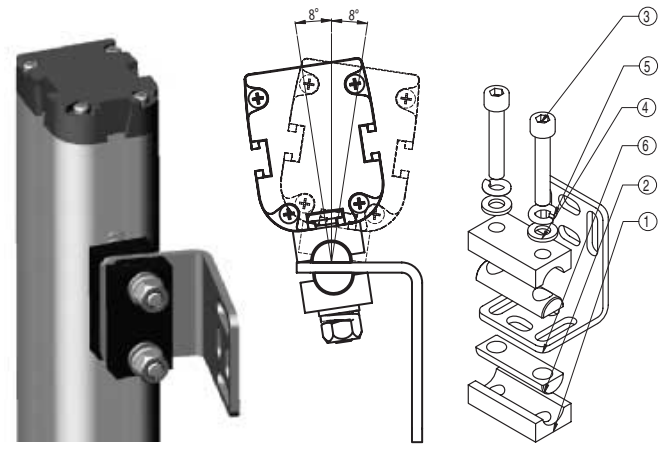
Note: This circuit achieves up to Safety Category 4 according to EN 954-1

Standard cables

Receiver Cables (M12-8pin, shielded, flying leads)	
F39-TGR-CVL-B-2-R	Receiver Cable, 2 m length
F39-TGR-CVL-B-5-R	Receiver Cable, 5 m length
F39-TGR-CVL-B-10-R	Receiver Cable, 10 m length
F39-TGR-CVL-B-15-R	Receiver Cable, 15 m length
F39-TGR-CVL-B-25-R	Receiver Cable, 25 m length

Transmitter Cables (M12-4pin, shielded, flying leads)	
F39-TGR-CVL-B-2-E	Transmitter Cable, 2 m length
F39-TGR-CVL-B-5-E	Transmitter Cable, 5 m length
F39-TGR-CVL-B-10-E	Transmitter Cable, 10 m length
F39-TGR-CVL-B-15-E	Transmitter Cable, 15 m length
F39-TGR-CVL-B-25-E	Transmitter Cable, 25 m length

Mounting bracket F39-TGR-ST-ADJ



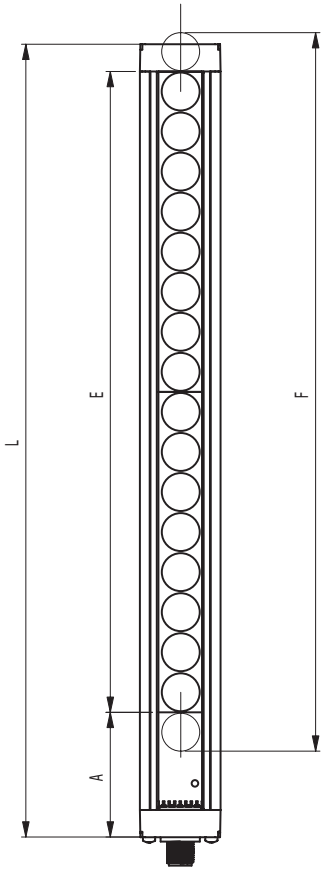
Wiring accessories (connectors and Y-connector cables)

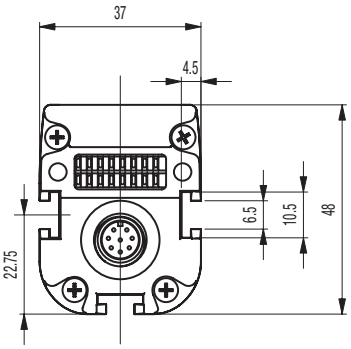
Type	
F39-TGR-CT-B-R	Connector M12, 8-pin, female for wiring
F39-TGR-CT-B-E	Connector M12, 4-pin, female for wiring
F39-TGR-CT-W-R	Connector M12, 8-pin, male for wiring
F39-TGR-CT-W-E	Connector M12, 4-pin, male for wiring
F39-TGR-CVL-D-B-5-R	Cable for Sensor system and muting lamp connection

Safety relay units

Family	Type Name	Configuration
G9SB	G9SB-200-D	DPST-NO
	G9SB-301-D	3PST-NO
G9SA	G9SA-301	3PST-NO
	G9SA-501	5PST-NO
	G9SA-321-T075	3PST-NO, Time del. 7.5 s
	G9SA-321-T15	3PST-NO, Time del. 15 s
	G9SA-321-T30	3PST-NO, Time del. 30 s
G9SX	G9SX-BC202-RT	2 Safe Outputs
	G9SX-BC202-RC	2 Safe Outputs
	G9SX-AD322-T15-RT	3 Safe Outputs, Time del. 15 s
	G9SX-AD322-T15-RC	3 Safe Outputs, Time del. 15 s
	G9SX-AD322-T150-RT	3 Safe Outputs, Time del. 150 s
	G9SX-AD322-T150-RC	3 Safe Outputs, Time del. 150 s
	G9SX-ADA222-T15-RT	2 Safe Outputs, Time del. 15 s
	G9SX-ADA222-T15-RC	2 Safe Outputs, Time del. 15 s
	G9SX-ADA222-T150-RT	2 Safe Outputs, Time del. 150 s
	G9SX-ADA222-T150-RC	2 Safe Outputs, Time del. 150 s
DeviceNet Safety	NE1A-SCPU01	16 In, 8 Out, Safety Master
	NE1A-SCPU02	40 In, 8 Out, Safety Master
Safety Controller	NE1A-SCPU01L	16 In, 8 Out
	NE1A-SCPU02L	40 In, 8 Out
Relay interface	F39-TGR-SB-R	Relay interface for Semiconductor OSSDs

Dimensions





L: Total length of the F3S-TGR-CL system
F: Protective height where an object equal or greater the resolution is detected
E: Detection zone
A: Dead zone without detection capability

Alternate T-slot mounting

F3S-TGR-CL system data with 14 mm resolution

Model number	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400
L [mm][	217	364	511	658	805	952	1099	1246	1393	1540	1687	1834	1981	2128	2275	2422
F [mm]	161	308	455	602	749	896	1043	1190	1337	1484	1631	1778	1925	2072	2219	2366
E [mm]	147	294	441	588	735	882	1029	1176	1323	1470	1617	1764	1911	2058	2205	2352
A [mm]	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
Weight [kg]	0.83 kg	1.39 kg	1.95 kg	2.51 kg	3.07 kg	3.63 kg	4.19 kg	4.75 kg	5.31 kg	5.87 kg	6.43 kg	7 kg	7.55 kg	8.11 kg	8.67 kg	9.24 kg

F3S-TGR-CL system data with 35 mm resolution

Model number	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400
L [mm][	217	364	511	658	805	952	1099	1246	1393	1540	1687	1834	1981	2128	2275	2422
F [mm]	182	329	476	623	770	917	1064	1211	1358	1505	1652	1799	1946	2093	2240	2387
E [mm]	147	294	441	588	735	882	1029	1176	1323	1470	1617	1764	1911	2058	2205	2352
A [mm]	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
Weight [kg]	0.83 kg	1.39 kg	1.95 kg	2.51 kg	3.07 kg	3.63 kg	4.19 kg	4.75 kg	5.31 kg	5.87 kg	6.43 kg	7 kg	7.55 kg	8.11 kg	8.67 kg	9.24 kg

F3S-TGR-CL-K system data

Model number	Weight	Dimensions			
		F [mm]	L [mm]	E [mm]	A [mm]
F3S-TGR-CL_-K2C-500	2.3 kg	518	682	500	59
F3S-TGR-CL_-K3C-800	3.2 kg	818	982	400	59
F3S-TGR-CL_-K4C-900	4.1 kg	918	1082	300	59
F3S-TGR-CL_-K4C-1200	4.9 kg	1218	1382	400	59
F3S-TGR-CL_-K2-500	2.3 kg	518	682	500	59
F3S-TGR-CL_-K3-800	3.2 kg	818	982	400	59
F3S-TGR-CL_-K4-900	4.1 kg	918	1082	300	59
F3S-TGR-CL_-K4-1200	4.9 kg	1218	1382	400	59
F3S-TGR-CL_-K2-500-LD	2.3 kg	518	682	500	59
F3S-TGR-CL_-K3-800-LD	3.2 kg	818	982	400	59
F3S-TGR-CL_-K4-900-LD	4.1 kg	918	1082	300	59
F3S-TGR-CL_-K4-1200-LD	4.9 kg	1218	1382	400	59



Single beam safety sensor in compact housing

The slender M18 sized E3FS is a category-2 safety single beam sensor with an operating range of up to 10 m. Plastic and metal housing, cable and M12 connector offer flexibility in application together with a control unit such as F3SP-U3P or F3SP-U5P.

- Sensing distance up to 10 m
- LEDs for easy alignment and diagnosis
- Cable and M12 plug categories
- Plastic and metal housing
- Category-2 sensor complying with EN 61496-1

Ordering information

Safety single beam sensors (Type 2)

Case material	Operation distance	Order code	
Plastic	0 to 10 m	Cable type	E3FS-10B4
		Plug type	E3FS-10B4-P1
Nickel Brass		Cable type	E3FS-10B4-M
		Plug type	E3FS-10B4-M1-M

Controller for safety single beam sensors

Sensors	Output contacts	Width	Order code
1 to 2 Safety single beam sensors	2 NO 2.5 A	22.5 mm	F3SP-U3P-TGR
1 to 4 Safety single beam sensors		45 mm	F3SP-U5P-TGR

Specifications

Sensors

Sensing method	Through-beam
Controller	F3SP-U3P-TGR, F3SP-U5P-TGR
Supply voltage (Vs)	24 VDC ± 10% (ripple p-p 10% max.)
Effective aperture angle (EAA)	±5° (at 3 m)
Current consumption	Emitter: 50 mA max. Receiver: 25 mA max.
Sensing distance	10 m
Standard sensing object	Opaque object: 11 mm min. in diameter
Response time	2.0 ms (E3FS only)
Control output	PNP transistor output, load current: 100 mA max.
Test input (emitter)	21.5 to 24 VDC: Emitter OFF (source current: 3 mA max.) Open or 0 to 2.5 V: Emitter ON (leakage current: 0.1 mA max.)
Ambient light intensity	Incandescent lamp: 3.000 lx max. (light intensity on the receiver surface) Sunlight: 10,000 lx max. (light intensity on the receiver surface)
Ambient temperature	Operating: -20°C +55°C, storage: -30°C +70°C (with no icing or condensation)
Degree of protection	IP67 (IEC 60529)
Light source	Infrared LED
Protection	Output short-circuit protection, reverse polarity protection

Controllers

Item	F3SP-U3P	F3SP-U5P
Number of sensors	1 to 2 safety single beam sensor	1 to 4 safety single beam sensor
Width	22.5 mm	45 mm
Muting input	2 Inputs	4 Inputs
Safety related function	Override function Muting lamp Connection Interlock system (automatic and manual reset)	
Power supply voltage	24 VDC ±10%	
Power consumption	420 mA max.	
Output contacts	2 NO 2.5 A (protected by fuse), 115 VAC max.	2 NO 2.5 A (protected by fuse), 250 VAC max.
Indicators	6 LED for status and diagnostics	
Degree of protection	IP20 (IEC 60529)	
Terminal	16 screw terminals, detachable blocks with '4pin'	32 screw terminals, detachable blocks with '4pin'
Response time	≤ 30 ms	
Ambient temperature	Operation: -10°C +55°C	
Housing material	Plastic; DIN rail mounting	



Safety light curtain controller with integrated muting function

The F3SP-U4P muting controller can handle up to two safety light curtains.
It has a 45 mm wide housing, two safety relay outputs with up to 2.5 A and additional functions such as muting-lamp monitoring and override function.

- Two independent muting functions with override
- Slim housing: 45 mm
- LEDs for status and diagnosis
- Detachable terminals
- Fully certified according to EN 61496-1

Ordering information

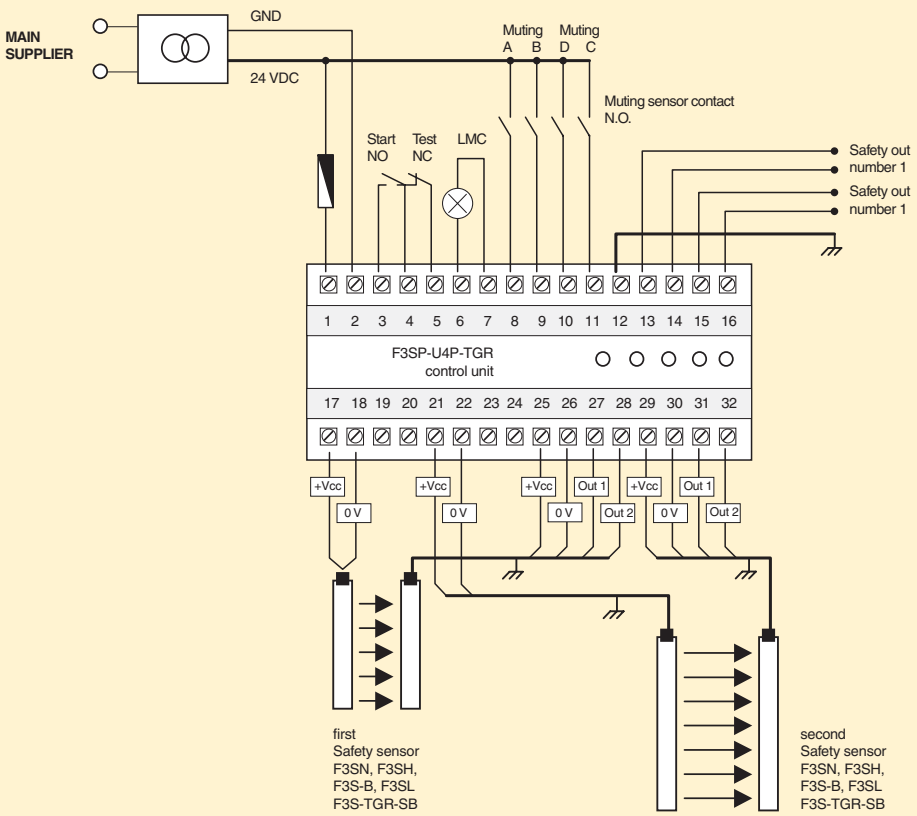
Description	Order code
Muting controller for safety light curtain F3S-B, F3SN and F3SH	F3SP-U4P-TGR

Specifications

Item	F3SP-U4P-TGR
Power supply voltage	24 VDC ±10%
Power consumption	420 mA max. (excl. SLC power consumption)
Output contacts	2 NO 2.5 A (protected by fuse)
Indicators	6 LEDs for status and diagnostics.
Degree of protection	IP20 (IEC 60529)
Terminal	32 screw terminals (1.5 mm²), detachable blocks with 4 screws each
Response time	≤ 30 ms
Ambient temperature	Operating: -10 °C + 55 °C
Housing material	Plastic, DIN rail mounting

Wiring example

Control unit F3SP-U4P-TGR in a mixed configuration that allows the use of several Omron safety light curtains and perimeter guards.

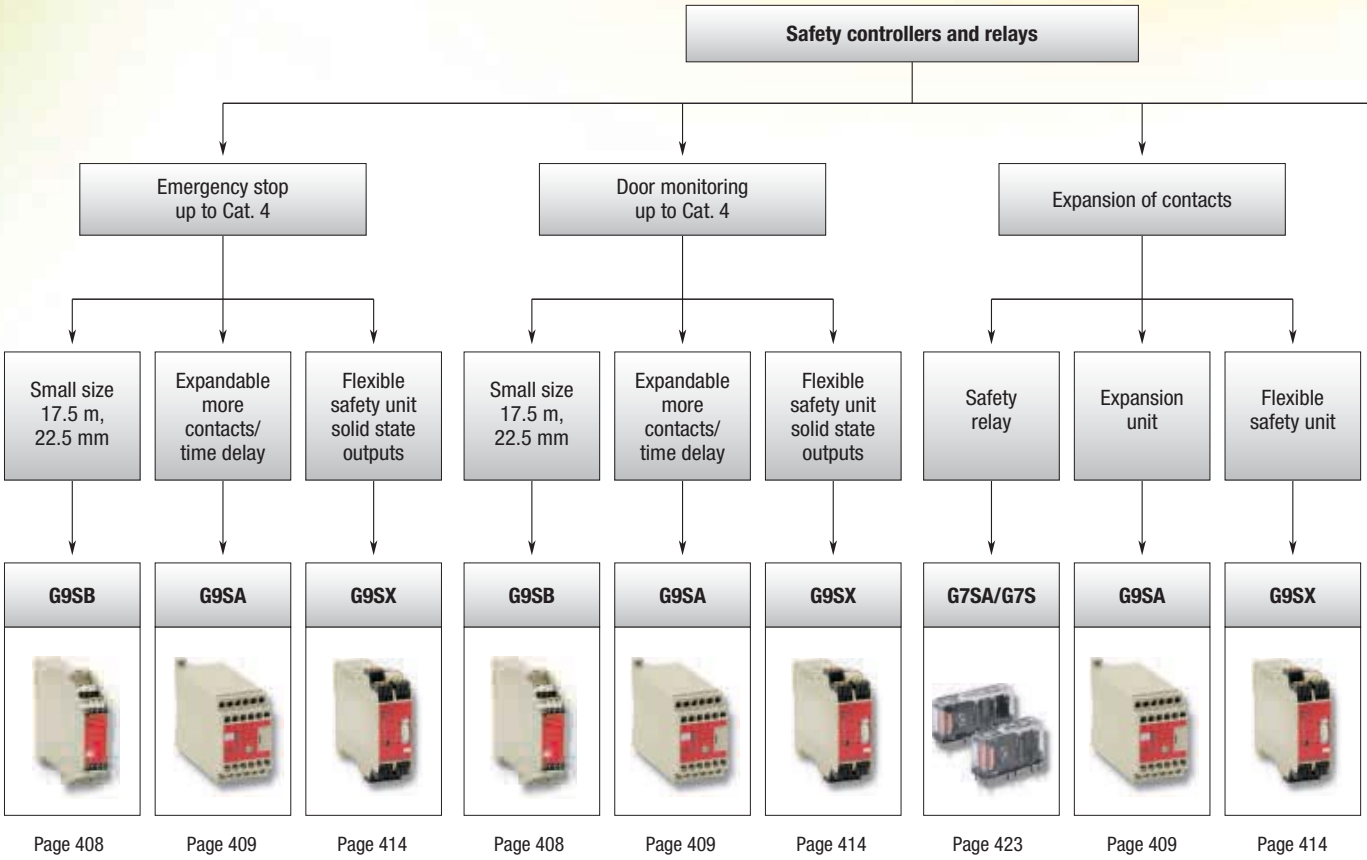


BREAK THROUGH BARRIERS IN SAFETY DESIGN

Our offer: Flexibility in safety control systems

Using one tool and operation concept, Omron safety controllers offer transparent standalone operation or scalability in safety networking applications for all sizes of machine control systems.

- IEC61508 (SIL3) and EN954-1/ISO13849-1 (Cat. 4) certification for future-proof design of the safety system
- Predefined function blocks for simple configuration and self-explanatory validation
- Equipped with DeviceNet slave function for transparent diagnosis information





- Dedicated safety function
  - Two-hand control unit type IIIC → **G9SA-TH**  Page 409
  - Monitoring of D40A non-contact switch → **G9SX-NS**  Page 410
  - Monitoring of enabling devices A4EG and guard switching → **G9SX-GS**  Page 412
  - Limited speed monitoring → **G9SX-LM**  Page 416
  - Stand still monitoring → **G9SX-SM**  Page 415
- Programmable safety controllers
  - Standalone operation, up to 40 inputs and 8 outputs → **NE_A-SCPU0_L**  Page 418
  - Safety network controllers → **NE1A-SCPU0_**  Page 420
  - Safety I/O terminals → **DST1**  Page 421

Selection table

		Safety relay units		Flexible safety unit	Safety relays
					
Selection criteria	Model	G9SA	G9SB	G9SX	G7SA
	Safety category (EN 954-1)	up to Category 4			–
	Safety integrity level (IEC 61508)	–	–	SIL 3	–
	Reaction time	max. 10 ms	max. 10 ms	15 ms	–
	DeviceNet safety Bus interface	–	–	–	–
	Standard DeviceNet Bus interface	–	–	–	–
	EDM function	■	■	■	–
	Interlock function	■	■	■	–
	Logical 'AND' connection	–	–	■	–
	Relay expansion units	■	–	■	–
	Housing	Plastic	Plastic	Plastic	Plastic
	Operating temperature	-25 to +55°C	-25 to +55°C	-10 to +55°C	-40 to +85°C
	Flux-tight	–	–	–	■
	Number of poles	–	–	–	4pole and 6pole
Features	Gold clad contacts	–	–	–	■
	Relay socket	–	–	–	■
	Detachable cage clamp terminals	–	–	■	–
	Screw terminals	■	■	■	–
	Safe timing functions	■	–	■	–
	USB-interface	–	–	–	–
	Programming software	–	–	–	–
Application	E-Stop application	■	■	■	–
	Door switch monitoring	■	■	■	–
	Safety light curtain monitoring	■	■	■	–
	EDM monitoring	■	■	■	–
	Interlock function	■	■	■	–
	Logic function blocks	–	–	–	–
	Safe ON delay timer	–	–	–	–
	Safe OFF delay timer	■	–	■	–
	Two-Hand control	■	–	–	–
	Manual/ automatic reset	■	■	■	–
	Non-contact switches monitoring	–	–	■	–
	Guard switching/ enabling function	–	–	■	–
	limited speed monitoring	–	–	■	–
	standstill monitoring	–	–	■	–
	General safety application	■	■	■	■
Supply voltage	24 VDC	■	■	■	■
	100 VAC to 240 VAC	■	–	–	–
In- and outputs	Safety inputs	■	■	■	–
	Test signal output	–	–	■	–
	Solid state safety outputs	–	–	■	–
	Safety relay outputs	3PST-NO, 5PST-NO	DPST-NO, 3PST-NO	■	–
	Auxiliary outputs	SPST-NC	SPST-NC	■	–
	4PST-NO + DPST-NC	–	–	–	■
	3PST-NO + 3PST-NC	–	–	–	■
	3PST-NO + SPST-NC	–	–	–	■
	DPST-NO + DPST-NC	–	–	–	■
	5PST-NO + SPST-NC	–	–	–	■
	Page	409	408	414	423

		Programmable safety system			
					
Selection criteria	Model	NE0A-SCPU01	NE1A-SCPU0_L	NE1A-SCPU0_	DST1
	Safety category (EN 954-1)	up to Category 4			
	Safety integrity level (IEC 61508)	SIL 3			
	Reaction time	dependent on safety application program			
	DeviceNet safety Bus interface	–	–	■	■
	Standard DeviceNet Bus interface	■	■	■	■
	EDM function	■	■	■	■
	Interlock function	■	■	■	■
	Logical 'AND' connection	–	–	–	–
	Relay expansion units	–	–	–	–
	Housing	Plastic	Plastic	Plastic	Plastic
	Operating temperature	-10 to +55°C	-10 to +55°C	-10 to +55°C	-10 to +55°C
	Flux-tight	–	–	–	–
	Number of poles	–	–	–	–
Features	Gold clad contacts	–	–	–	–
	Relay socket	–	–	–	–
	Detachable cage clamp terminals	■	■	■	■
	Screw terminals	–	–	–	–
	Safe timing functions	■	■	■	■
	USB-interface	■	■	■	–
	Programming software	■	■	■	–
Application	E-Stop application	■	■	■	■
	Door switch monitoring	■	■	■	■
	Safety light curtain monitoring	■	■	■	■
	EDM monitoring	■	■	■	■
	Interlock function	■	■	■	■
	Logic function blocks	■	■	■	■
	Safe ON delay timer	■	■	■	■
	Safe OFF delay timer	■	■	■	■
	Two-Hand control	■	■	■	■
	Manual/ automatic reset	■	■	■	■
	Non-contact switches monitoring	■	■	■	■
	Guard switching/ enabling function	■	■	■	■
	limited speed monitoring	–	–	–	■
	standstill monitoring	–	–	–	■
	General safety application	■	■	■	■
Supply voltage	24 VDC	■	■	■	■
	100 VAC to 240 VAC	–	–	–	–
In- and outputs	Safety inputs	■	■	■	■
	Test signal output	■	■	■	■
	Solid state safety outputs	■	■	■	■
	Safety relay outputs	–	–	–	■
	Auxiliary outputs	■	■	■	■
	4PST-NO + DPST-NC	–	–	–	–
	3PST-NO + 3PST-NC	–	–	–	–
	3PST-NO + SPST-NC	–	–	–	–
	DPST-NO + DPST-NC	–	–	–	–
	5PST-NO + SPST-NC	–	–	–	–
	Page	418	418	420	421

■ Standard – No/not available



Slim size safety unit

G9SB is a family of slender safety relay units, providing two safety contacts in a 17.5 mm and three safety contacts in a 22.5 mm wide housing.

- 17.5 mm and 22.5 mm wide housing
- 1- and 2-input channel units
- Manual and automatic reset units
- Certification up to category 4 according to EN954-1 depending on the application

Ordering information

Main contacts	Auxiliary contact	Number of input channels	Reset mode	Input type	Rated voltage	Category (EN954-1)	Size	Order code
DPST-NO 2 safety contacts	None	2 channels	Auto-reset	Inverse	24 VAC/VDC	4	17.5 mm	G9SB-2002-A
		1 channel or 2 channels		+ common				G9SB-200-B
		2 channels	Manual-reset	Inverse				G9SB-2002-C
		1 channel or 2 channels		+ common				G9SB-200-D
3PST-NO 3 safety contacts	SPST-NC	None (direct breaking)	Auto-reset	–	24 VDC	3	17.5 mm	G9SB-3010
		2 channels		Inverse	24 VAC/VDC	4	22.5 mm	G9SB-3012-A
		1 channel or 2 channels		+ common				G9SB-301-B
		2 channels	Manual-reset	Inverse				G9SB-3012-C
		1 channel or 2 channels		+ common				G9SB-301-D

Specifications

Power input

Item	G9SB-200_-_	G9SB-3010	G9SB-301_-_
Power supply voltage	24 VAC/VDC: 24 VAC, 50/60 Hz, or 24VDC 24 VDC: 24 VDC		
Operating voltage range	85 to 110% of rated power supply voltage		
Power consumption	1.4 VA/1.4 W max.	1.7 W max.	1.7 VA/1.7 W max.

Inputs

Item	G9SB-200_-_	G9SB-3010	G9SB-301_-_
Input current	25 mA max.	60 mA max. (See note.)	30 mA max.

Note: Indicates the current between terminals A1 and A2.

Contacts

Item	G9SB-200_-_	G9SB-3010	G9SB-301_-_
	Resistive load ($\cos\phi = 1$)		
Rated load	250 VAC, 5 A		
Rated carry current	5 A		

Characteristics

Item		G9SB-200_-_	G9SB-3010	G9SB-301_-_
Response time *1		10 ms max.		
Durability	Mechanical	5,000,000 operations min. (at approx. 7,200 operations/hr)		
	Electrical	100,000 operations min. (at approx. 1,800 operations/hr)		
Minimum permissible load (reference value)		5 VDC, 1 mA		
Ambient operating temperature		-25°C +55°C (with no icing or condensation)		

*1 The response time is the time it takes for the main contact to open after the input is turned OFF.



Expandable safety relay unit

The G9SA family offers a complete line-up of compact and expandable safety relay units. Modules with safe OFF-delay timing are available as well as a two-hand controller. Simple multiplication of safety contacts is possible by using the connection on the front.

- 45 mm wide housing, expansion units are 17.5 mm wide
- Safe OFF-delay timer
- Simple expansion connection
- Certification up to category 4 according to EN954-1 depending on the application

Ordering information

Emergency-stop units

Main contacts	Auxiliary contact	Number of input channels	Rated voltage	Category	Order code
3PST-NO	SPST-NC	1 channel or 2 channels possible	24 VAC/VDC	4	G9SA-301
			100 to 240 VAC		
5PST-NO	SPST-NC	1 channel or 2 channels possible	24 VAC/VDC		G9SA-501
			100 to 240 VAC		

Emergency-stop OFF-delay units

Main contacts	OFF-delay contacts	Auxiliary contact	Number of input channels	OFF-delay time	Rated voltage	Category	Order code
3PST-NO	DPST-NO	SPST-NC	1 channel or 2 channels possible	7.5 s	24 VAC/VDC	Main contacts: 4 OFF-delay contacts: 3	G9SA-321-T075
					100 to 240 VAC		
				15 s	24 VAC/VDC		G9SA-321-T15
					100 to 240 VAC		
				30 s	24 VAC/VDC		G9SA-321-T30
					100 to 240 VAC		

Two-hand controller

Main contacts	Auxiliary contact	Number of input channels	Rated voltage	Category	Order code
3PST-NO	SPST-NC	2 channels	24 VAC/VDC	4 (IIIc, EN574)	G9SA-TH301
			100 to 240 VAC		

Expansion unit

The expansion unit connects to a G9SA-301, G9SA-501, G9SA-321, or G9SA-TH301.

Main contacts	Auxiliary contact	Category	Order code
3PST-NO	SPST-NC	4	G9SA-EX301

Expansion units with OFF-delay outputs

The expansion unit connects to a G9SA-301, G9SA-501, G9SA-321, or G9SA-TH301.

Main contact form	Auxiliary contact	OFF-delay time	Category	Order code
3PST-NO	SPST-NC	7.5 s	3	G9SA-EX031-T075
		15 s		G9SA-EX031-T15
		30 s		G9SA-EX031-T30

Specifications

Power input

Item	G9SA-301/TH301 / G9SA-501 / G9SA-321-T_
Power supply voltage	24 VAC/VDC: 24 VAC, 50/60 Hz, or 24 VDC 100 to 240 VAC:100 to 240 VAC, 50/60 Hz
Operating voltage range	85 to 110% of rated power supply voltage

Inputs

Item	G9SA-301/321-T_/TH301	G9SA-501
Input current	40 mA max.	60 mA max.

Contacts

Item	G9SA-301/501/321-T_/TH301/EX301/EX031-T_
	Resistive load (cosϕ= 1)
Rated load	250 VAC, 5 A
Rated carry current	5 A

Characteristics

Item		G9SA-301/TH301 / G9SA-501/321-T_ / G9SA-EX301/EX031-T_
Operating time		30 ms max. (not including bounce time)
Response time *1		10 ms max. (not including bounce time)
Durability	Mechanical	5,000,000 operations min. (at approx. 7,200 operations/hr)
	Electrical	100,000 operations min. (at approx. 1,800 operations/hr)
Minimum permissible load (reference value)		5 VDC, 1 mA
Ambient temperature		Operating: -25 to 55°C (with no icing or condensation) Storage: -25 to 85°C (with no icing or condensation)

*1 The response time is the time it takes for the main contact to open after the input is turned OFF.



Compact non-contact door switch/ flexible safety unit

Electronic detection mechanism for better stability in non-contact door switch operation

- Stable operation reduces controller errors caused by unstable doors.
- Connect up to 30 non-contact door switches with LED indicators to one controller.
- Reversible switch provides flexibility in installation.
- Two colour LED indicator enables easier maintenance by identification of door status and cable disconnections.
- Safety category 3 (EN 954-1).

Ordering information

Non-contact door switches (Switch/Actuator)

Classification	Auxiliary outputs	Cable length	Order code
Standard models	Semiconductor outputs *1	2 m	D40A-1C2
		5 m	D40A-1C5

*1 PNP open-collector semiconductor output.
Note: Must be used in combination with a G9SX-NS_ non-contact door switch controller.

Non-contact door switch controllers (Controllers for D40A)

Safety outputs *1		Auxiliary outputs *2	Logical AND connection input	Logical AND connection output	Max. OFF delay time *3	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed *4							
2 (Semi-conductors)	0	2 (Semi-conductors)	1	1	–	24 VDC	Screw terminals	G9SX-NS202-RT
							Spring-cage terminals	G9SX-NS202-RC
	2 (Semi-conductors)				3.0 s		Screw terminals	G9SX-NSA222-T03-RT
							Spring-cage terminals	G9SX-NSA222-T03-RC

*1 P channel MOS FET transistor output
*2 PNP transistor output
*3 The OFF-delay time can be set in 16 steps as follows:
0/0.2/0.3/0.4/0.5/0.6/0.7/0.8/0.9/1.0/1.2/1.4/1.8/2.0/2.5/3.0 s
*4 The OFF-delayed output becomes an instantaneous output by setting the OFF-delay time to 0 s.

Specifications

Ratings/Characteristics of non-contact door switches

Item	Model	D40A-1C_
Operating characteristics *1	Operating distance OFF→ON	5 mm min.
	Operating distance ON→OFF	15 mm max.
	Differential travel (max.)	20% of operating distance
Ambient operating temperature		–10 to 55°C (no icing or condensation)
Vibration resistance		10 to 55 to 10 Hz (single amplitude: 0.75 mm, double amplitude: 1.5 mm)
Shock resistance		300 m/s^2 min.
Degree of protection		IP67
Material		PBT resin
Mounting method		M4 screws
Power consumption		0.6 W max.
Auxiliary outputs *2		24 VDC, 10 mA (PNP open-collector outputs)
LED indicators		Actuator not detected (red); actuator detected (yellow)
Connection cables		2 m, 5 m
Number of connectable switches		30 max. (wiring length: 100 m max.)

*1 This is the distance where the switch operates from OFF to ON when approaching and the distance where the switch operates from ON to OFF when separating when the switch and actuator target marks are on the same axis, and the sensing surfaces coincide.
*2 Turns ON when the actuator is approaching.

Ratings of non-contact door switch controllers

Power input

Item	G9SX-NS202-_	G9SX-NSA222-T03-_	G9SX-EX-_
Rated supply voltage	24 VDC		

Inputs

Item	G9SX-NS202-_/G9SX-NSA222-T03-_
Safety input *1	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: approx. 2.8 kΩ
Feedback/reset input	

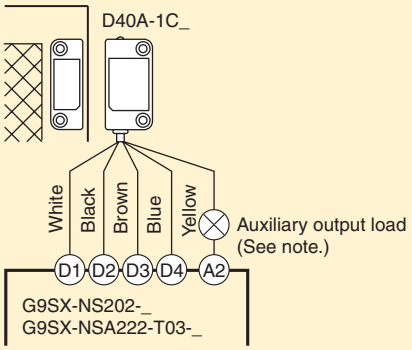
*1 Only applies to the G9SX-NSA222-T03-_. Refers to input other than that from the non-contact door switch.

Outputs

Item	G9SX-NS202-_/G9SX-NSA222-T03-_
Instantaneous safety output OFF-delayed safety output	P channel MOS FET transistor output Load current: 0.8 A DC max.
Auxiliary output	PNP transistor output Load current: 100 mA max.

Non-contact Door Switch and Non-contact Door Switch Controller Wiring

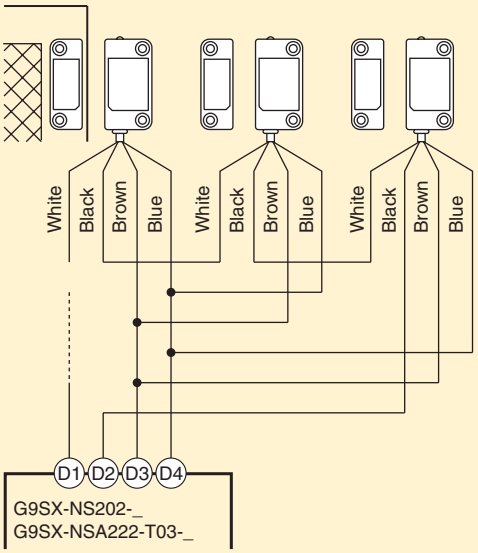
Example: Wiring a Single Switch



Note: The auxiliary output load current must be 10 mA max.

Example: Wiring Multiple Switches

Connect Up to 30 Non-contact Door Switches





Safety guard switching unit

The safety controller to support maintenance mode of machinery in the safe way.

- Two operation modes to support:
  - Auto switching for applications where machine and worker co-operate.
  - Manual switching for applications with limitation in operation like maintenance.
- Clear and transparent segmentation of safety functions by use of unique "AND"connection
- Clear LED diagnosis of all in- and output signals for easy maintenance
- Category 4 according to EN954-1 and SIL 3 according to EN 61508.

Ordering information

Enabling grip switches

Contact form			Order code
Enabling switch	Monitor switch	Pushbutton switch	
Two contacts	1NC (grip output)	None	A4EG-C000041
Two contacts	None	Emergency stop switch (2NC)	A4EG-BE2R041
Two contacts	None	Momentary operation switch (2NO)	A4EG-BM2B041

Safety Guard Switching Units

Safety outputs *1		Auxiliary outputs *2	Logical AND connection input	Logical AND connection output	Max. OFF delay time *3	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed *4							
2 (Semi-conductors)	2 (Semi-conductors)	6 (Semi-conductors)	1	1	15 s	24 VDC	Screw terminals	G9SX-GS226-T15-RT
							Spring-cage terminals	G9SX-GS226-T15-RC

*1 P channel MOS FET transistor output
*2 PNP transistor output
*3 The OFF-delay time can be set in 16 steps as follows:
T15: 0, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 1, 1.5, 2, 3, 4, 5, 7, 10 or 15 s
*4 The OFF-delayed output becomes an instantaneous output by setting the OFF-delay time to 0 s.

Specifications

Ratings of non-contact door switch controllers

Power input

Item	G9SX-GS226-T15-_	G9SX-EX-_
Rated supply voltage	24 VDC	

Inputs

Item	G9SX-GS226-T15-_
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: approx. 2.8 kΩ
Feedback/reset input	
Mode selector input	

Outputs

Item	G9SX-G9SX-GS226-T15-_
Instantaneous safety output OFF-delayed safety output	P channel MOS FET transistor output Load current: 0.8 A DC max.
Auxiliary output	PNP transistor output Load current: 100 mA max.
External indicator outputs	P channel MOS FET transistor outputs Connectable indicators • Incandescent lamp: 24 VDC, 3 W to 7 W • LED lamp: 10 to 300 mA DC

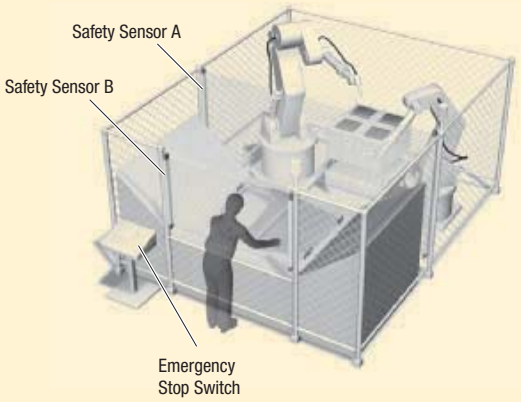
Application example

Automatic switching mode

Worker is loading and unloading the machine manually. When loading is finished, robot cycle is started manually by the worker. When robots return to their home position, loading cycle is selected automatically.

Loading Condition: Safety Sensor B is not active, Safety Sensor A is active because the robots are not allowed to move to the loading area while the worker loads the machine. So the worker is safe because Safety Sensor A is active.

Robot Work Condition: Safety Sensor B is active, Safety Sensor A is not active because the worker is not allowed to move to the loading area when the robots work. So the worker is safe because Safety Sensor B stops the machine if he moves to the loading area.



Manual switching mode

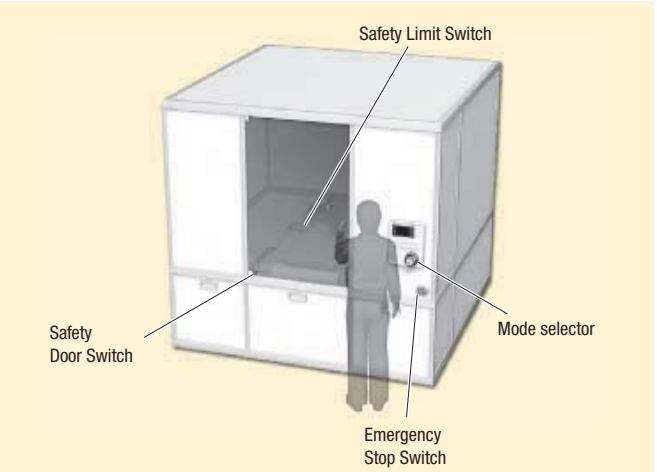
Worker has to do maintenance in this machine. During maintenance, it is necessary to move the machine in a limited way. The worker has to select automatic mode or manual mode manually by using the mode selector switch.

Operation steps:

1) Select Maintenance mode by using the mode selector
2) Open the door to do the maintenance while the machine is still able to operate in a limited way (monitoring of limited movement by using the safety limit switch).
3) Close the cover after finishing maintenance
4) Select Automatic mode by using the mode selector

E-Stop conditions:

a) open the door while not in maintenance mode
b) the machine actuates the limit switch (breaks the limit).
c) the Enabling grip switch A4EG is actuated to stop the machine in an emergency condition.





Flexible safety unit

G9SX family modules can be connected by a logical “AND” function to implement partial/global stopping of a machine. Solid-state outputs, detailed LED diagnosis and clever feedback signals help to keep maintenance easy. The line-up is completed by expansion units with safe timing functions.

- Clear and transparent segmentation of safety functions by use of unique "AND" connection
- Solid-state outputs for long life and relay outputs in extension box available
- Detailed LED indications enable easy diagnosis
- Clever feedback signals for easy maintenance
- Category-4 according to EN954-1 and SIL 3 according to EN 61508

Ordering information

Advanced unit

Safety outputs		Auxiliary outputs	No. of input channels	Max. OFF-delay time *1	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed						
3 P channel MOS-FET transistor output	2 P channel MOS-FET transistor output	2 PNP transistor outputs	1 or 2 channels	0 to 15 sec in 16 steps	24 VDC	Screw terminals	G9SX-AD322-T15-RT
						Cage clamp terminals	G9SX-AD322-T15-RC
2 P channel MOS-FET transistor output	2 P channel MOS-FET transistor output	2 PNP transistor outputs	1 or 2 channels	0 to 150 sec in 16 steps	24 VDC	Screw terminals	G9SX-AD-322-T150-RT
						Cage clamp terminals	G9SX-AD-322-T150-RC
				0 to 15 sec in 16 steps	24 VDC	Screw terminals	G9SX-ADA-222-T15-RT
						Cage clamp terminals	G9SX-ADA-222-T15-RC
				0 to 150 sec in 16 steps	24 VDC	Screw terminals	G9SX-ADA-222-T150-RT
						Cage clamp terminals	G9SX-ADA-222-T150-RC

*1 The OFF-delay time can be set in 16 steps as follows: T15: 0/0.2/0.3/0.4/0.5/0.6/0.7/1/1.5/2/3/4/5/7/10/15 s, T150: 0/10/20/30/40/50/60/70/80/90/100/110/120/130/140/150 s.

Basic unit

Safety outputs		Auxiliary outputs	No. of input channels	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed					
2 P channel MOS FET transistor output	–	2 PNP transistor output	1 or 2 channels	24 VDC	Screw terminals	G9SX-BC202-RT
					Cage clamp terminals	G9SX-BC202-RC

Expansion unit

Safety outputs		Auxiliary outputs	OFF-delay time	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed					
4 PST-NO (contact)	–	2 (solid state) PNP transistor outputs	–	24 VDC	Screw terminals	G9SX-EX401-RT
					Cage clamp terminals	G9SX-EX401-RC
–	4 PST-NO (contact)		Synchronized with G9S-X-AD - unit		Screw terminals	G9SX-EX041-T-RT
					Cage clamp terminals	G9SX-EX041-T-RC

Specifications

Power input

Item	G9SX-AD_	G9SX-BC202-_	G9SX-EX-_
Rated supply voltage	20.4 to 26.4 VDC (24 VDC -15% +10%)		

Inputs

Item	G9SX-AD_	G9SX-BC202-_
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: Approx. 2.8 kΩ	
Feedback/reset input		

Outputs

Item	G9SX-AD_	G9SX-BC202-_
Instantaneous safety output OFF-delayed safety output	P channel MOS FET transistor output Load current: Using 2 outputs or less: 1 A DC max. Using 3 outputs or more: 0.8 A DC max.	P channel MOS FET transistor output Load current: Using 1 output: 1 A DC max. Using 2 outputs: 0.8 A DC max.
Auxiliary output	PNP transistor output Load current: 100 mA max.	

Expansion unit

Item	G9SX-EX-_
Rated load	250 VAC, 3A/30 VDC, 3A (resistive load)
Rated carry current	3 A
Maximum switching voltage	250 VAC, 125 VDC

Characteristics

Item		G9SX-AD_	G9SX-BC202-_	G9SX-EX-_
Operating time (OFF to ON state)		50 ms max. (Safety input: ON) 100 ms max. (Logical AND connection input: ON)	50 ms max. (Safety input: ON)	30 ms max.
Response time (ON to OFF state)		15 ms max.		10 ms max.
Durability	Electrical	–		100,000 cycles min.
	Mechanical	–		5,000,000 cycles min.
Ambient temperature		-10°C +55°C (with no icing or condensation)		



Standstill monitoring unit

Safe Standstill monitoring unit based on Back-EMF operation for two- and three-phase systems.

- Ready to use – covering all standard applications without additional setup
- Easy integration in star and delta wiring
- Clear LED diagnosis of all in- and output signals for easy maintenance
- Applicable up to Safety Category 4 according to EN954-1

Ordering information

Safety standstill monitoring unit

Safety outputs *1 Instantaneous	Auxiliary outputs *1	Power input Rated supply voltage	Terminal block type	Order code
3 (Semi-conductors)	2 (Semi-conductors)	24 VDC	Screw terminals	G9SX-SM032-RT
			Spring-cage terminals	G9SX-SM032-RC

*1 PNP transistor output

Specifications

Ratings of non-contact door switch controllers

Power input

Item	G9SX-SM032-_
Rated supply voltage	24 VDC

Inputs

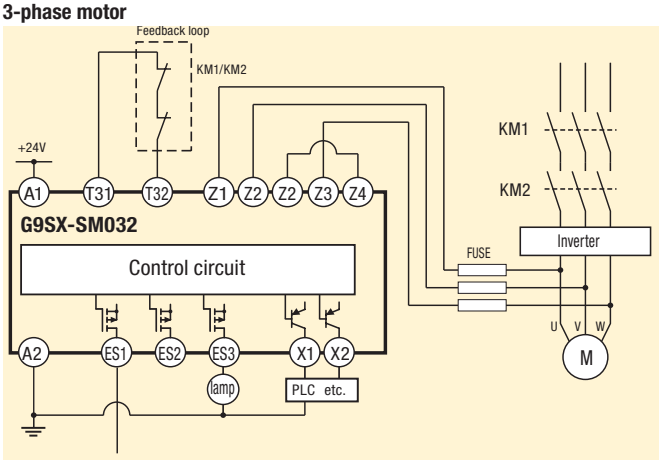
Item	G9SX-SM032-__
Input Voltage	Standstill detection input (Z1-Z2/Z3-Z4) AC 415 Vrms + 10% max.
Maximum power supply frequency for AC induction motor	60 Hz max.
Internal impedance	Standstill detection input: approx, 660 kΩ EDM input: approx. 2.8 kΩ

Outputs

Item	G9SX-SM032-_
Safety Standstill detection output	Sourcing output (PNP) Load current: 300 mA DC max.
Auxiliary output	Sourcing output (PNP) Load current: 100 mA DC max.

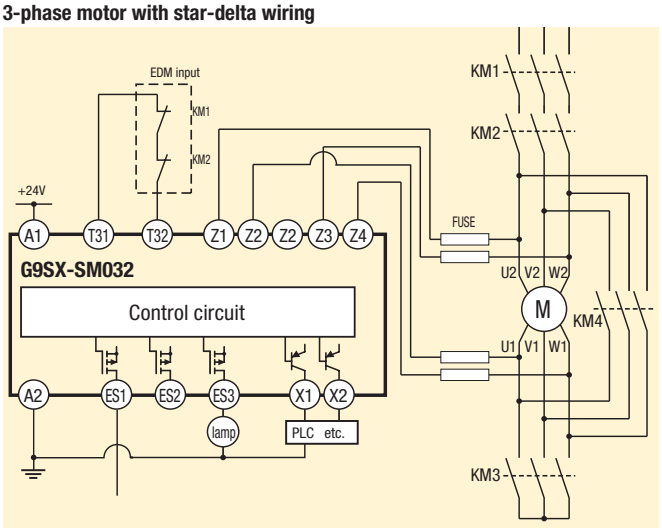
Application example

3-phase motor



Standstill detected

3-phase motor with star-delta wiring



Standstill detected



Limited speed monitoring unit

Safe Limited Speed monitoring unit for complete support of maintenance mode in machinery.

- Preset of limited speed frequency by using integrated preset switches
- Easy integration in G9SX systems by using unique logical "AND" connection
- Clear LED diagnosis of all in- and output signals for easy maintenance
- Applicable up to Safety Category 3 according to EN954-1 using Omron proximity sensors

Ordering information

Proximity sensors

Classification			Order code
Proximity sensor	Shielded	M8	E2E-X1R5F1
		M12	E2E-X2F1
		M18	E2E-X5F1
	Unshielded	M8	E2E-X2MF1
		M12	E2E-X5MF1
		M18	E2E-X10MF1

Safety standstill monitoring unit

Safety outputs *1 Instantaneous	Auxiliary outputs *2	Logical AND connection input	Rated voltage	Sensor power supply terminals	Terminal block type	Order code
4 (Semi-conductors)	4 (Semi-conductors)	1	24 VDC	2	Screw terminals	G9SX-LM224-F10-RT
					Spring-cage terminals	G9SX-LM224-F10-RC

*1 P channel MOS FET output
*2 PNP transistor output

Specifications

Ratings of non-contact door switch controllers

Power input

Item	G9SX-LM224-F10-_
Rated supply voltage	24 VDC

Inputs

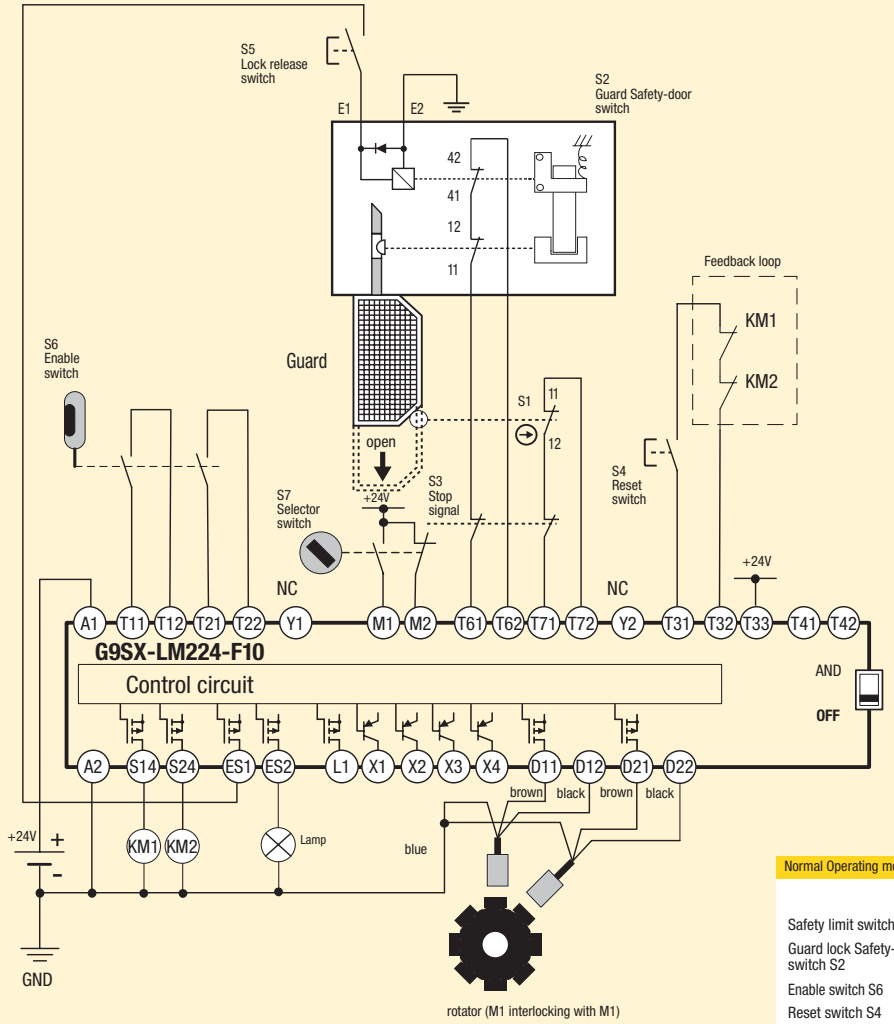
Item	G9SX-LM224-F10-_
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC Internal impedance: approx. 2.8 kΩ
Feedback/reset input	
Mode selector input	
Rotation detection input	Operating voltage 20.4 VDC to 26.4 VDC Internal impedance: approx. 2.8 kΩ Input frequency: 1 kHz max.

Outputs

Item	G9SX-LM224-F10-_
Safety solid state output	P channel MOS FET transistor output Load current: 0.8 A DC max.
Safety speed detection output	P channel MOS FET transistor output Load current: 0.3 A DC max.
External indicator output	PNP transistor output Load current: 100 mA max.

Application example

Safe limited speed



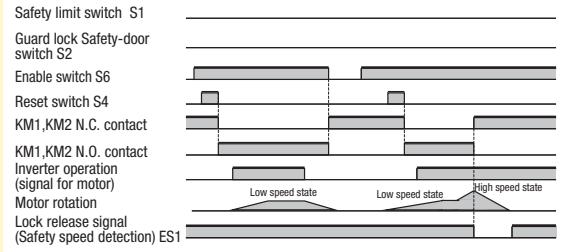
This example is corresponding to category 3 (EN954-1)

Devices	
S1	:Safety limit switch
S2	:Guard lock Safety-door switch
S3	:Stop signal
S4	:Reset switch
S5	:Lock release switch
S6	:Enable switch
S7	:Selector switch
KM1, KM2	:Contactor
M1	:3-phase motor

Normal Operating mode (M1:ON, M2:OFF) Timing chart



Maintenance mode (M1:OFF, M2:ON) Timing chart





Standalone controller

The NE0A and NE1A hosts the safety application program. All local safety based in- and outputs are monitored and controlled by the NE0A and the NE1A-L. It can be seamlessly integrated in a standard DeviceNet system.

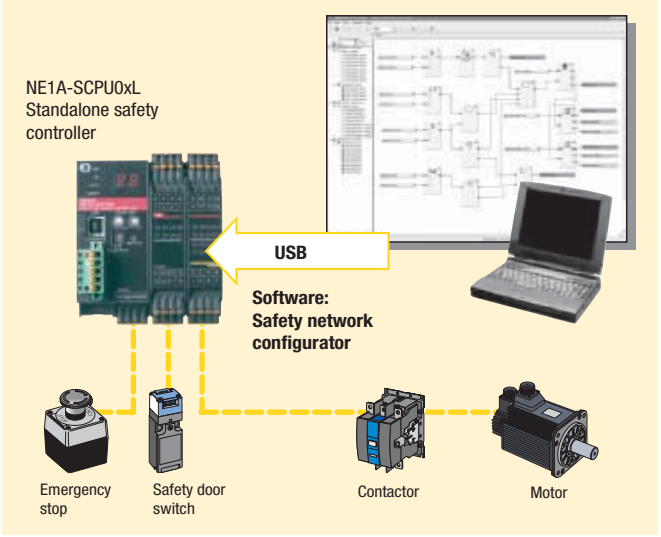
- Removable cage-clamp terminals for easy installation
- Predefined and certified function blocks for easy programming
- LED display and status LEDs for advanced diagnostics
- System status on DeviceNet for easy troubleshooting and predictive maintenance
- Portability of configuration to DeviceNet Safety Bus Systems for maximum scalability

Ordering information

Appearance	Appearance description	Order code
Standalone Safety Controller	12 PNP inputs 6 PNP outputs 2 test outputs removable cage clamp terminals	NE0A-SCPU01
	16 PNP inputs 8 PNP outputs 4 test outputs 254 function block programming removable cage clamp terminals	NE1A-SCPU01L
	40 PNP inputs 8 PNP outputs 8 test outputs 254 function block programming removable cage clamp terminals	NE1A-SCPU02L

Software

Appearance	Appearance description	Order code
Safety network configurator	Installation disk (CD-ROM) IBM PC/AT compatible Windows 2000 or XP (English version)	WS02-CFSC1-E



Stand-alone programmable controller

Programmable safety circuits

The standalone safety controller uses predefined logical function blocks to set up the safety system. Modifications of the safety system in the life cycle of a machine are done without tedious wiring.

Specifications

General specifications

DeviceNet communications power supply voltage		11 to 25 VDC (supplied from communications connector)
Unit power supply voltage		20.4 to 26.4 VDC (24 VDC -15% +10%)
I/O power supply voltage		
Consumption current	Communications power supply	24 VDC, 15 mA
	Internal circuit power supply	24 VDC, 230 mA
Mounting method		35-mm DIN track
Ambient operating temperature		-10°C +55°C
Ambient storage temperature		-40°C +70°C
Degree of protection		IP20 (IEC 60529)

Safety input specifications

Input type	Sinking inputs (PNP)
ON voltage	11 VDC min. between each input terminal and G1
OFF voltage	5 VDC max. between each input terminal and G1
OFF current	1 mA max.
Input current	4.5 mA

Safety output specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.5 A max. per output
Residual voltage	1.2 V max. between each output terminal and V2

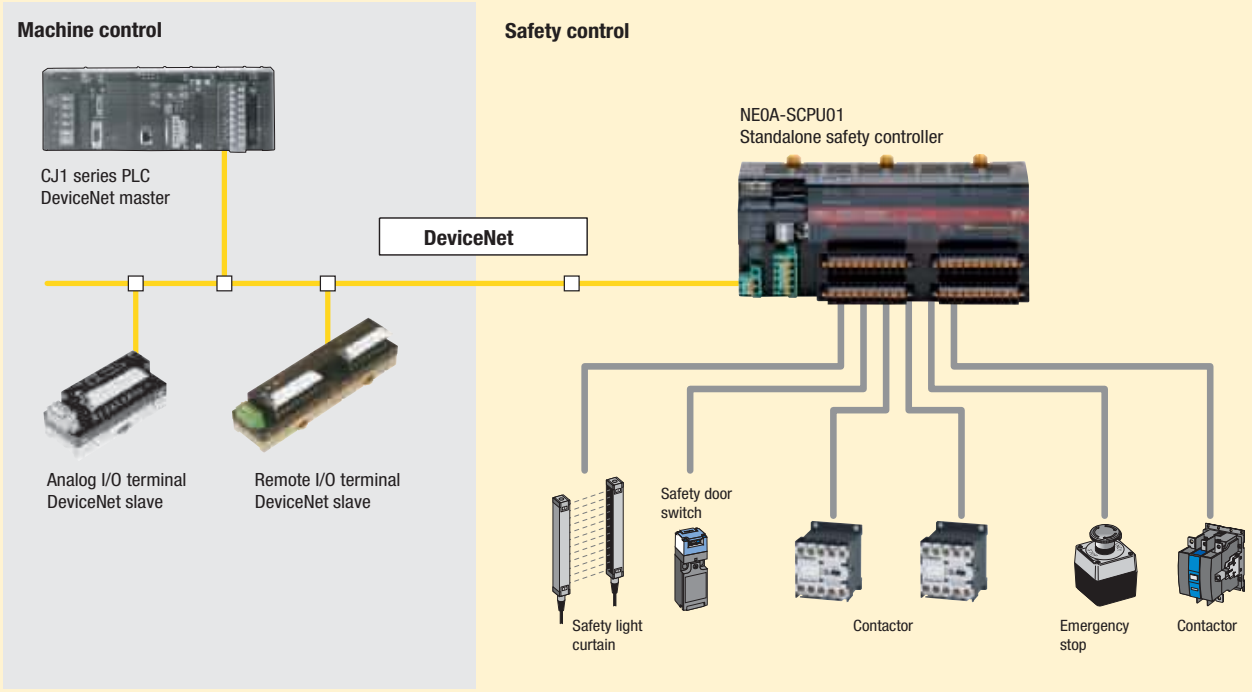
Test output specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.7 A max. per output (see note.)
Residual voltage	1.2 V max. between each output terminal and V1

Network integration

Safety - I/O-status becomes transparent

The standalone Safety Controller NE1AxL can be seamlessly integrated in a standard DeviceNet System.
Information of all safety in- and outputs on the standard control system ensure minimum downtime of the machine.





Safety network controller

The NE1A hosts the safety application program. All local and DeviceNet safety based in- and outputs are monitored and controlled by the NE1A. It manages up to 32 DeviceNet safety slaves and can be seamlessly integrated in a standard DeviceNet system.

- Removable cage-clamp terminals for easy installation
- Predefined and certified function blocks for easy programming
- LED display and status LEDs for advanced diagnostics
- System status on DeviceNet for easy troubleshooting and predictive maintenance
- Easy scalability through the addition of DeviceNet safety devices

Ordering information

Appearance	Appearance description	Interface	Order code
Safety network controller	16 PNP inputs 8 PNP outputs 4 test outputs 254 function block programming removable cage clamp terminals	USB and DeviceNet Safety	NE1A-SCPU01-V1
		Ethernet/IP and DeviceNet Safety	NE1A-SCPU01-EIP
	40 PNP inputs 8 PNP outputs 8 test outputs 254 function block programming removable cage clamp terminals	USB and DeviceNet Safety	NE1A-SCPU02
		Ethernet/IP and DeviceNet Safety	NE1A-SCPU02-EIP

Software

Appearance	Appearance description	Order code
Safety network configurator	Installation disk (CD-ROM) IBM PC/AT compatible Windows 2000 or XP (English version)	WS02-CFSC1-E

Accessories

Appearance	Appearance description	Order code
Network router	Ethernet/IP - DeviceNet router	NE1A-EDR01
Programming console	CF-Card slot to store configuration USB-Interface for maintenance Touchscreen for easy troubleshooting	NE1A-HDY

Specifications

General specifications

DeviceNet communications power supply voltage		**11 to 25 VDC (supplied from communications connector)**
Unit power supply voltage		20.4 to 26.4 VDC (24 VDC -15% +10%)
I/O power supply voltage		
Consumption current	**Communications power supply**	24 VDC, 15 mA
	Internal circuit power supply	24 VDC, 230 mA
Mounting method		35-mm DIN track
Ambient operating temperature		-10°C +55°C
Ambient storage temperature		-40°C +70°C
Degree of protection		IP20 (IEC 60529)

Safety input specifications

Input type	**Sinking inputs (PNP)**
ON voltage	11 VDC min. between each input terminal and G1
OFF voltage	5 VDC max. between each input terminal and G1
OFF current	1 mA max.
Input current	4.5 mA

Safety output specifications

Output type	**Sourcing outputs (PNP)**
Rated output current	0.5 A max. per output
Residual voltage	1.2 V max. between each output terminal and V2

Test output specifications

Output type	**Sourcing outputs (PNP)**
Rated output current	0.7 A max. per output (see note.)
Residual voltage	1.2 V max. between each output terminal and V1



DeviceNet safety I/O terminal block family

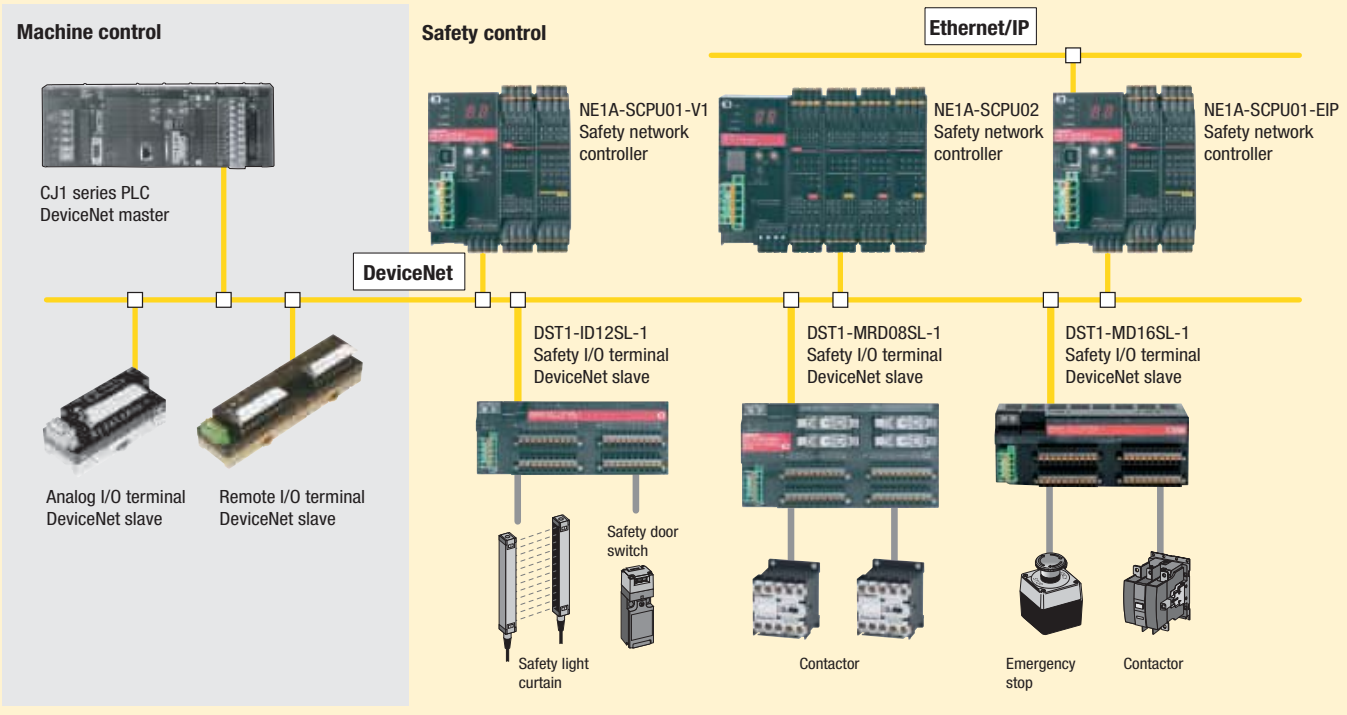
- Removable cage clamp terminals for easy installation
- up to 12 Inputs for safety signals
- 4 test pulse outputs to ensure crosstalk and short circuit detection
- up to 8 safety outputs (solid state or relay)
- Status LEDs for advanced diagnostics
- Mixed mode operation (safety and standard) for all in- and outputs

Ordering information

Safety network

Expand safety I/O through networks

Safety components distributed over many different installation locations required long and complicated wiring.
Replacing the wiring with a network between safety components greatly improves productivity.



Appearance	Appearance description	Order code
Input terminal	12 PNP inputs 4 Test outputs Removable cage clamp terminals	DST1-ID12SL-1
Mixed I/O terminal	8 PNP inputs 8 PNP outputs 4 Test outputs Removable cage clamp terminals	DST1-MD16SL-1
Mixed I/O terminal	4 PNP inputs 4 relay outputs (4×2-single pole) 4 Test outputs Removable cage clamp terminals	DST1-MRD08SL-1

Specifications

General specifications

DeviceNet communications power supply voltage		11 to 25 VDC (supplied from communications connector)
Unit power supply voltage		20.4 to 26.4 VDC (24 VDC -15% +10%)
I/O power supply voltage		
Consumption current	Communications power supply	DST1-ID12SL-1/MD16SL-1: 100 mA DST1-MRD08SL-1: 110 mA
Mounting method		35-mm DIN track
Ambient operating temperature		-10°C +55°C
Ambient storage temperature		-40°C +70°C
Degree of protection		IP20 (IEC 60529)
Weight		DST1-ID12SL-1/MD16SL-1: 420 g DST1-MRD08SL-1: 600 g

Safety input specifications

Input type	Sinking inputs (PNP)
ON voltage	11 VDC min. between each input terminal and G1
OFF voltage	5 VDC max. between each input terminal and G1
OFF current	1 mA max.
Input current	6 mA

Safety output specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.5 A max. per output
Residual voltage	1.2 V max. between each output terminal and V1

Test output specifications

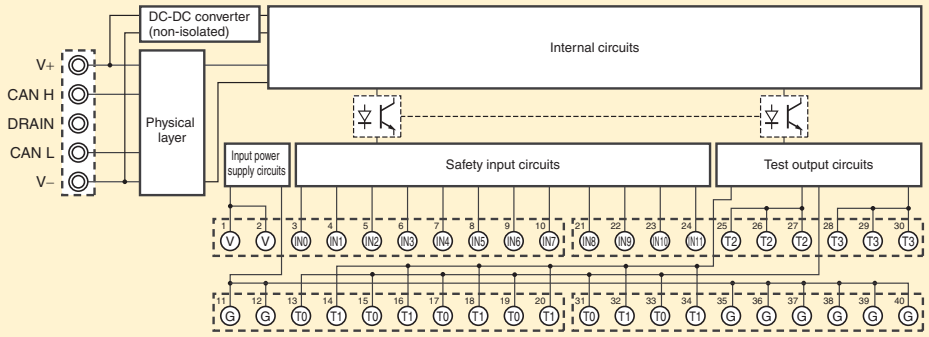
Output type	Sourcing outputs (PNP)
Rated output current	0.7 A max. per point
Residual voltage	1.2 V max. between each output terminal and V0

Safety output specifications for relay outputs

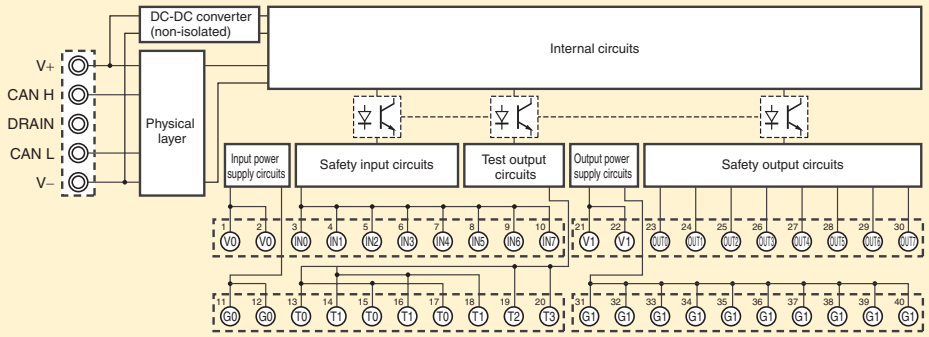
Relays	G7SA-2A2B, EN 50205 class A
Minimum applicable load	1 mA at 5 VDC
Rated load for a resistive load	240 VAC: 2 A, 30 VDC: 2 A
Rated load for an inductive load	2 A at 240 VAC (cosϕ= 0.3), 1 A at 24 VDC
Mechanical life expectancy	5,000,000 operations min. (switching frequency of 7,200 operations/h)
Electrical life expectancy	100,000 operations min. (at rated load and switching frequency of 1,800 operations/h)

Safety I/O terminals

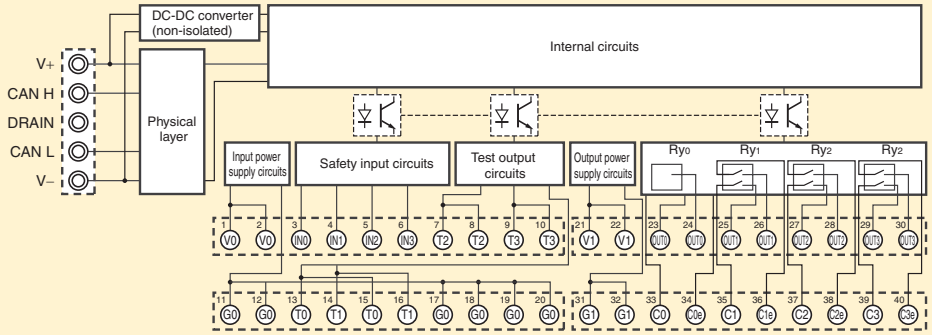
DST1-ID12SL-1



DST1-MD16SL-1



DST1-MRD08SL-1





Relays with forcibly guided contacts

The slim G7SA relay family with forcibly guided contacts is available as a four- or six-pole type in various contact combinations and offers reinforced insulation. Terminals are arranged for easy PCB layout. It can be soldered directly to a PCB or used together with the P7SA sockets.

- Forcibly guided contacts
- Conforms to EN 50205
- 6 A at 240 VAC and 6A at 24 VDC for resistive loads
- Reinforced insulation between inputs and outputs and poles
- 4- and 6-pole relays available

Ordering information

Relays with forcibly guided contacts

Type	Sealing	Poles	Contacts	Rated voltage	Order code
Standard	Flux-tight	4 poles	3PST-NO, SPST-NC	24 VDC*1	G7SA-3A1B
			DPST-NO, DPST-NC		G7SA-2A2B
		6 poles	5PST-NO, SPST-NC		G7SA-5A1B
			4PST-NO, DPST-NC		G7SA-4A2B
			3PST-NO, 3PST-NC		G7SA-3A3B

*1 12 VDC, 21 VDC, 48 VDC are available on request.

Sockets

Type		LED indicator	Poles	Rated voltage	Order code
Track-mounting	Track mounting and screw mounting possible	Yes	4 poles	24 VDC	P7SA-10F-ND
			6 poles		P7SA-14F-ND
Back-mounting	PCB terminals	No	4 poles	–	P7SA-10P
			6 poles		P7SA-14P

Specifications

Coil

Rated voltage	Rated current	Coil resistance	Must-operate voltage	Must-release voltage	Max. voltage	Power consumption
24 VDC	4 poles: 15 mA 6 poles: 20.8 mA	4 poles: 1,600 Ω 6 poles: 1,152 Ω	75% max. (V)	10% min. (V)	110% (V)	4 poles: Approx. 360 mW 6 poles: Approx. 500 mW

Note: Refer to datasheet for details

Contacts

Load	Resistive load (cosϕ = 1)
Rated load	6 A at 250 VAC, 6 A at 30 VDC
Rated carry current	6 A
Max. switching voltage	250 VAC, 125 VDC

Load	Resistive load (cosϕ = 1)
Max. switching current	6 A
Max. switching capacity (reference value)	1,500 VA, 180 W

Relays with forcibly guided contacts

Contact resistance		100 mΩ max. (The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.)
Operating time *1		20 ms max.
Response time *1		10 ms max. (The response time is the time it takes for the normally open contacts to open after the coil voltage is turned OFF.)
Release time *1		20 ms max.
Insulation resistance		100 MΩ min. (at 500 VDC) (The insulation resistance was measured with a 500 VDC megger at the same places that the dielectric strength was measured.)
Dielectric strength *2 *3		Between coil contacts/different poles: 4,000 VAC, 50/60 Hz for 1 min (2,500 VAC between poles 3-4 in 4-pole Relays or poles 3-5, 4-6, and 5-6 in 6-pole Relays.) Between contacts of same polarity: 1,500 VAC, 50/60 Hz for 1 min
Durability	Mechanical	10,000,000 operations min. (at approx. 36,000 operations/hr)
	Electrical	100,000 operations min. (at the rated load and approx. 1,800 operations/hr)
Min. permissible load *4		5 VDC, 1 mA (reference value)
Ambient temperature *5		Operating: -40 to 85°C (with no icing or condensation)
Ambient humidity		Operating: 35 to 85%
Approved standards		EN61810-1 (IEC61810-1), EN50205, UL508, CSA22.2 No. 14

*1 These times were measured at the rated voltage and an ambient temperature of 23°C. Contact bounce time is not included.
*2 Pole 3 refers to terminals 31-32 or 33-34, pole 4 refers to terminals 43-44, pole 5 refers to terminals 53-54, and pole 6 refers to terminals 63-64.
*3 When using a P7SA socket, the dielectric strength between coil contacts/different poles is 2,500 VAC, 50/60 Hz for 1 min.
*4 Min. permissible load is for a switching frequency of 300 operations/min.
*5 When operating at a temperature between 70°C and 85°C, reduce the rated carry current (6 A at 70°C or less) by 0.1 A for each degree above 70°C.

Note: The values listed above are initial values.

Reliability data of Omron components

Below tables show the reliability data of Omron components and give a reference to the relevant standard:

Emergency stop switches

Model name	B_{10d}	Remarks
A165E	100.000	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed
A22E	100.000	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed
ER5018*1	1.500.000	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed
ER6022*1	1.500.000	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed. Additionally valid for all XER and stainless steel models
ER1022*1	1.500.000	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed. Additionally valid for all XER models
ER1032*1	1.500.000	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed. Additionally valid for all XER models

*1 at 100 mA switching current.

Safety limit switches

Model name	B_{10d}	Remarks
D4B-_N*1	2.000.000	From table in annex C of EN ISO 13849-1
D4N*1	2.000.000	From table in annex C of EN ISO 13849-1
D4NH*1	2.000.000	From table in annex C of EN ISO 13849-1
D4N-_R*1	2.000.000	From table in annex C of EN ISO 13849-1
D4F*1	2.000.000	From table in annex C of EN ISO 13849-1

*1 If fault exclusion for direct opening action of NO and NC is possible.

Safety door switches

Model name	B_{10d}	PL	Category	$MTTF_d$	DC	Remarks
D4NL	2.000.000	n.a.	n.a.	n.a.	n.a.	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed
D4GL*1	2.000.000	n.a.	n.a.	n.a.	n.a.	From table in annex C of EN ISO 13849-1
D4BL*1	2.000.000	n.a.	n.a.	n.a.	n.a.	From table in annex C of EN ISO 13849-1
D4NS	2.000.000	n.a.	n.a.	n.a.	n.a.	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed
D4BS*1	2.000.000	n.a.	n.a.	n.a.	n.a.	From table in annex C of EN ISO 13849-1
F3S-TGR-N_C	3.300.000	e	4	470 years	n.a.	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed
F3S-TGR-N_R	3.300.000	e	4	470 years	n.a.	Adopted EN ISO 13849-1 Annex C, B_{10d} fixed
D40A + G9SX-NS	n.a.	d	3	100 years	95%	Adopted EN ISO 13849-1 Annex C, PL data fixed

*1 If fault exclusion for direct opening action is possible.

Safety sensors

Model name	B_{10d}	PL	Category	$MTTF_d$	DC	Remarks
F3SB	n.a.	c	2	PFH_d=3,59*10^{-8}		
F3SN-A	n.a.	e	4	100 years	98,8%	Adopted EN ISO 13849-1 Annex C, PL data fixed
MS2800E_	n.a.	c	2	51 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
MS4800E_	n.a.	e	4	51 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
F3S-TGR-CL2_	n.a.	c	2	450 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
F3S-TGR-CL4_	n.a.	e	4	450 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed

Safety control systems

Model name	B_{10d}	PL	Category	$MTTF_d$	DC	Remarks
G9SA-301	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SA-300-SC	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SB-series*1	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SB-3010	n.a.	d	3	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SX-BC	n.a.	e	4	100 years	97%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SX-AD	n.a.	e	4	100 years	97%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SX-ADA	n.a.	e	4	100 years	97%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SX-EX	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SX-SM	n.a.	e	4	100 years	98%	Adopted EN ISO 13849-1 Annex C, PL data fixed
G9SX-LM	n.a.	d	3	100 years	82%	Adopted EN ISO 13849-1 Annex C, PL data fixed
NE1A-SCPU01	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
NE1A-SCPU02	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
NE0A-SCPU01	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
DST1-ID12SL-1	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
DST1-MD16SL-1	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
DST1-MRD08SL-1	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed
DST1-XD0808SL-1	n.a.	e	4	100 years	99%	Adopted EN ISO 13849-1 Annex C, PL data fixed

*1 Except G9SB-3010.

Reliability data of Omron components

Positively guided relays

Model name	B_{10d}	Remarks
G7SA*1	400.000	According to IEC 61810-1, valid for DC13, Inductive load Ie
G7SA*1	400.000	According to IEC 61810-1, valid for DC13, Inductive load Ie/2
G7SA*1	400.000	According to IEC 61810-1, valid for DC13, Inductive load Ie/4
G7SA*1	400.000	According to IEC 61810-1, valid for AC15 load

*1 Refer to the load characteristic to select correct B_{10d} value.

Please check Omron on the Internet for updated information and SISTEMA library (March 15th, 2010):
http://industrial.omron.eu/safety

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We have been supplying quality components for more than half a century

The huge installed base of our easy-to-use control components, is proof of our experience.
Our control products with a display provide the clearest visibility and a perfect read-out.
Omron, your single source for all your control components needs.

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CELCIUXº – CONTROL AND CONNECTIVITY

CelciuXº – Multi Loop Temperature Controller

The CelciuX° is designed to handle complex temperature profiles thanks to Omron's unique Gradient Temperature Control (GTC) algorithm and to offer easy program-less communication with Omron and third-party PLCs and HMI. Above all, the CelciuX° incorporates all "simple to use" clever temperature control technology, like 2-PID, disturbance control and various ways of tuning.

- Interfaces to a wide range of industrial networks
- Reduced engineering due to program-less communications, Smart Active Parts and Function Block Libraries
- One unit handling various types of input, such as Pt, Thermocouple, mA, and V input

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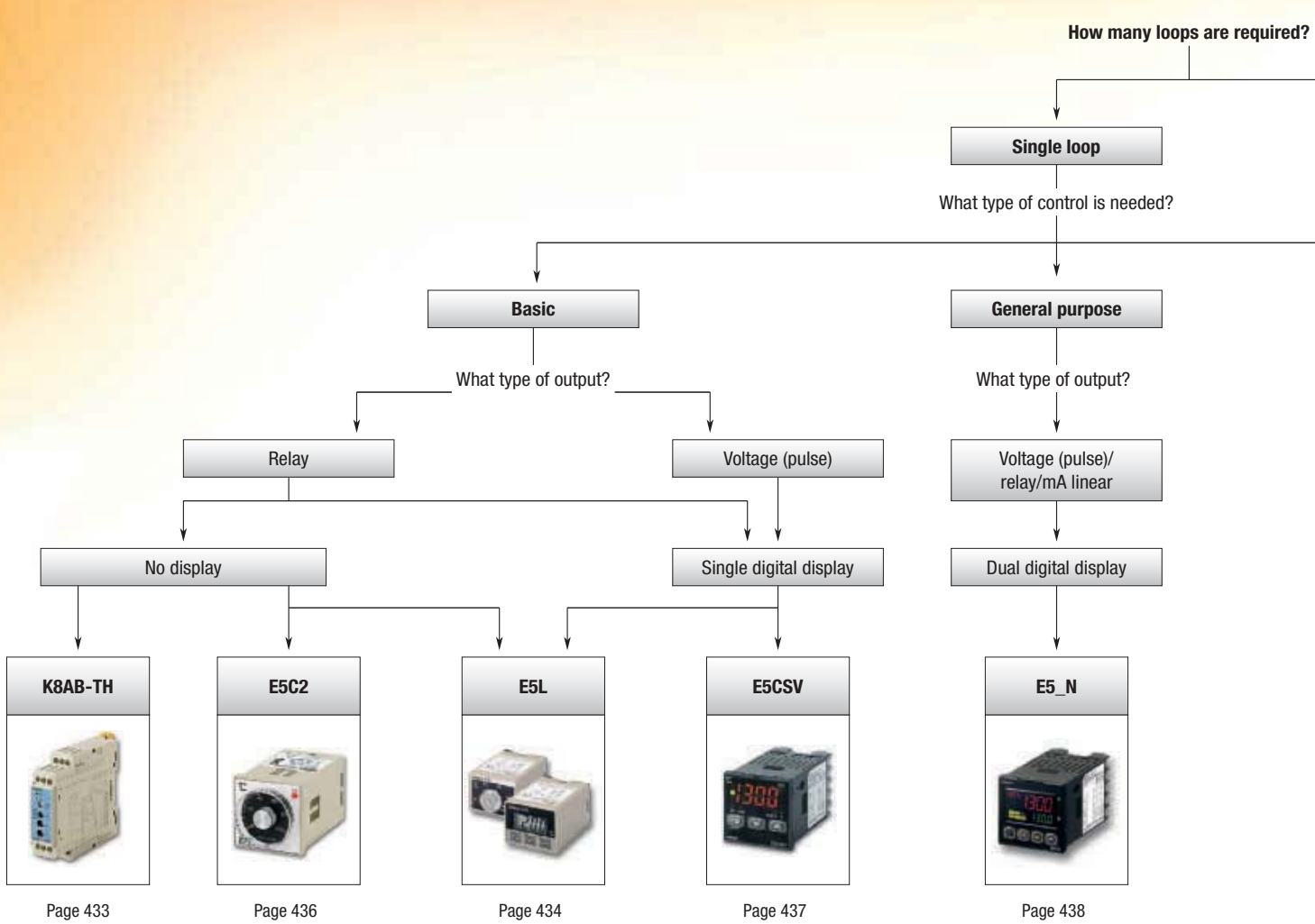




Multi-loop

What type of mounting is required?

Process

What type of output?

Voltage (pulse)/ relay/mA/Volt/SSR

Triple digital display

E5_N-H



Page 444

Process

Dual digital display

E5_K/E5_K-T



Page 441

Advanced

On-panel

Triple digital display

Standard

E5_R



Page 446

SV programmer

E5_R-T



Page 446

In-panel

CelciuX°



Page 442

Selection table

	Category	Alarm controller	Analogue/digital temperature controller	Analogue temperature controller	Compact digital temperature controller	Digital temperature controller		
Selection criteria								
	Model	K8AB-TH	E5L	E5C2	E5CSV	E5AN	E5EN	E5CN
	Type	Basic				General purpose		
	Panel	In-panel type		In- & on-panel type	On-panel type			
	Loops	–	Single loop					
	Size	22.5 mm wide	45x35 mm	1/16 DIN	1/16 DIN	1/4 DIN	1/8 DIN	1/16 DIN
Control mode	ON/OFF	■	■	■	■	■	■	■
	PID	–	–	■ *1	–	–	–	–
	2-PID *2	–	–	–	■	■	■	■
	Operation *3	–	H/C	H	H/C	H & C	H & C	H & C
	Valve Control *4	–	–	–	–	–	–	–
Features	Accuracy	±2%	±1°C	–	±0.5%	±0.3%	±0.3%	±0.3%
	Auto-tuning	–	–	–	■	■	■	■
	Self-tuning	–	–	–	■	■	■	■
	Transfer output	–	–	–	–	□	□	□
	Remote input	–	–	–	–	–	–	–
	Number of alarms	1	–	–	1	3	3	3
	Heater alarm	–	–	–	–	□ *5	□ *5	□ *5
	IP rating front panel	IP20	IP40	IP40	IP65	IP66	IP66	IP66
	Display	Rotary switch	SV dial 3 digit LCD	SV dial	Single 3.5 digit	Dual 4 digit (colour change)	Dual 4 digit (colour change)	Dual 4 digit (colour change)
Supply voltage	110/240 VAC	■	■	■	■	■	■	■
	24 VAC/VDC	□	–	–	□	□	□	□
Comms *6	RS-232	–	–	–	–	□	□	–
	RS-485	–	–	–	–	□	□	□
	Event IP	■	–	–	–	□	□	□
	QLP port *7	–	–	–	–	■	■	■
	DeviceNet	–	–	–	–	–	–	–
	Modbus	–	–	–	–	■	■	■
Control output	Relay	■	■	■	■	■	■	■
	SSR	–	–	–	–	–	–	–
	Voltage (pulse)	–	–	■	■	■	■	■
	Linear voltage	–	–	–	–	–	–	–
	Linear current	–	–	–	–	■	■	■
Input type – linear	mA	–	–	–	–	□	□	□
	mV	–	–	–	–	■	■	■
	V	–	–	–	–	□	□	□
Input type – thermocouple	K	■	–	■	■	■	■	■
	J	■	–	–	■	■	■	■
	T	■	–	–	■	■	■	■
	E	■	–	–	–	■	■	■
	L	–	–	■	■	■	■	■
	U	–	–	–	■	■	■	■
	N	–	–	–	■	■	■	■
	R	■	–	–	■	■	■	■
	S	■	–	–	–	■	■	■
	B	■	–	–	–	■	■	■
	W	–	–	–	–	■	■	■
	PLII	■	–	–	–	■	■	■
Input type – RTD	Pt100	■	–	■	■	■	■	■
	JPt100	–	–	–	■	■	■	■
	THE	–	sensor provided	■	□	–	–	–
	Page	433	434	436	437	438	438	438

*1 P only
*2 2-PID is Omron´s easy to use high performance PID algorithm
*3 H = heat, H/C = heat or cool, H & C = heat and/or cool
*4 Valve control = relay up and down

Digital temperature controller		Digital process controller					
							
E5GN	**CelciuX°**	**E5CN-H**	**E5EN-H/AN-H**	**E5_K(-T)**	**E5AR**	**E5ER**	**E5_R-T**
General purpose	Modular	Universal		Universal/Programmer	Advanced		SV Programmer
On-panel type	In-panel type	On-panel type					Same specifications as corresponding E5_R.
Single loop	Multi-loop	Single loop			Multi-loop		
1/32 DIN	31×96 mm	1/16 DIN	1/4, 1/8 DIN	1/4, 1/8, 1/16 DIN	1/4 DIN	1/8 DIN	
■	■	■	■	■	■	■	
–	–	–	–	–	–	–	
■	■	■	■	■	■	■	
H & C	H & C	H & C	H & C	H & C	H & C	H & C	
–	–	□	□	□ (not CK)	■	■	
±0.3%	±0.5%	±0.1%	±0.1%	±0.3%	±0.1%	±0.1%	
■	■	■	■	■	■	■	
■	■	■	■	■	–	–	
□	□	□	□	□	■	■	
–	–	–	■	□ (not CK)	■	■	
2	4	3	3	3	4	4	
□	□*5	□*5	□*5	□	–	–	
IP66	–	IP66	IP66	IP66	IP66	IP66	
Dual 4 digit (colour change)	LED	Dual 5 digit (colour change)	Triple 5 digit (colour change)	Dual 4 digit	Triple 5 digit	Triple 5 digit	
■	–	■	■	■	■	■	
□	■	□	□	–	□	□	
–	■	–	□	□	–	–	
□	■	□	□	□	□	□	
□	■	□	■	□	■	■	
■	■	■	■	■	■	■	
–	□	–	–	□ (E5EK)	□	□	
■	■	■	■	–	■	■	
■	–	–	■	■	■	■	
–	–	■	■	■	–	–	
■	■	■	■	■	■	■	
–	–	■	■	■	–	–	
–	■	■	■	■	■	■	
□	■	■	■	■	■	■	
■	■	■	■	–	–	–	
□	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	■	■	
■	■	■	■	■	–	–	
■	■	■	■	■	■	■	
■	■	■	■	■	–	–	
–	–	–	–	–	–	–	
438	442	444	444	441	446		

*5. Heater alarm = heater burnout & SSR failure detection
*6. PROFIBUS-DP communication option via PRT1-SCU11 for E5_N(-H), E5_R, CelciuX°. More information on Page 448
*7. QLP: Quick Link Port to connected TC to PC using the smart USB cable E58-CIFQ1



Protect your heating application

This temperature monitoring relay was designed specially for monitoring abnormal temperatures to prevent excessive temperature increase and to protect equipment. K8AB-TH provides temperature monitoring in slim design with a width of just 22.5 mm.

- Simple function settings using DIP switch
- Selectable alarm latch and SV setting protection
- Multi-input support for thermocouple or Pt100 sensor input
- Changeover relay: fail-safe selectable
- Alarm status identification with LED

Ordering information

Input type	Temperature setting range	Setting unit	Supply voltage	Size in mm (HxWxD)	Order code
Thermocouple/ Pt100	0 to 399°C/F	1°C/F	100 to 240 VAC	90x22.5x100	K8AB-TH11S AC100-240
			24 VAC/VDC		K8AB-TH11S AC/DC24
Thermocouple	0 to 1,800°C 0 to 3,200 °F *1	10°C/F	100 to 240 VAC		K8AB-TH12S AC100-240
			24 VAC/VDC		K8AB-TH12S AC/DC24

*1 Setting range depending on sensor type selected

Specifications

Item		100 to 240 VAC 50/60 Hz	24 VAC 50/60 Hz or 24 VDC
Allowable voltage range		85 to 110% of power supply voltage	
Power consumption		5 VA max.	2 W max. (24 VDC), 4 VA max. (24 VAC)
Sensor inputs	K8AB-TH11S	Thermocouple: K, J, T, E; platinum-resistance thermometer: Pt100	
	K8AB-TH12S	Thermocouple: K, J, T, E, B, R, S, PLII	
Output relay		One SPDT relay (3 A at 250 VAC, resistive load)	
External inputs (for latch setting)	Contact input	ON: 1 kΩ 2 max., OFF: 100 kΩ 2 min.	
	Non-contact input	ON residual voltage: 1.5 V max., OFF leakage current: 0.1 mA max.	
		Leakage current: Approx. 10 mA	
Setting method		Rotary switch setting (set of three switches)	
Indicators		Power (PWR): Green LED, relay output (ALM): Red LED	
Other functions		Alarm mode (upper limit/lower limit), output normally ON/OFF selection, output latch, setting protection, fail-safe operation selectable, temperature unit°C/°F	
Ambient operating temperature		-10 to 55°C (with no condensation or icing); for 3-year guarantee: -10 to 50°C	
Storage temperature		-25 to 65°C (with no condensation or icing)	
Setting accuracy		±2% of full scale	
Hysteresis width		2°C	
Output relay	Resistive load	3 A at 250 VAC (cosϕ = 1), 3 A at 30 VDC (L/R = 0 ms)	
	Inductive load	1 A at 250 VAC (cosϕ= 0.4), 1 A at 30 VDC (L/R = 7 ms)	
	Minimum load	10 mA at 5 VDC	
	Maximum contact voltage	250 VAC	
	Maximum contact current	3 A AC	
	Maximum switching capacity	1,500 VA	
	Mechanical life	10,000,000 operations	
	Electrical life	Make: 50,000 times, break: 30,000 times	
Sampling cycle		500 ms	
Weight		130 g	
Degree of protection		IP20	
Memory protection		Non-volatile memory (number or writes: 200,000)	
Safety standards	Approved standards	EN 61010-1	
	Application standards	EN 61326 and EN 61010-1 (pollution level 2, overvoltage category II)	
Crimp terminals		Two solid wires of 2.5 mm^2 or two ferrules of 1.5 mm^2 with insulation sleeves can be tightened together	
Case colour		Munsell 5Y8/1 (ivory)	
Case material		ABS resin (self-extinguishing resin)	
Mounting		Mounted to DIN-rail or with M4 screws	
Size in mm (HxWxD)		90x22.5x100	



Ideal for simple built-in control

This compact but powerful ON/OFF controller is provided with a sensor and is available in an analogue or digital version. Mounting is in-panel with a standard PTF14A-E socket.

- Available in 4 application specific ranges.
- Sensor provided to enable immediate usage.
- High capacity output of 10 A at 250 VAC for direct load switching.
- Simple operation and setting. Even simpler with digital model.

Ordering information

Model	Size	Type	Control Method	Control Output	Order code
E5L-A_	45×35 mm	Plug-in	ON/OFF operation	Relay	E5L-A-30-20
					E5L-A-0-50
					E5L-A-0-100
					E5L-A-100-200
E5L-C_	45×35 mm	Plug-in	ON/OFF operation	Relay	E5L-C-30-20
					E5L-C-0-100
					E5L-C-100-200

Options (Order separately)

Sockets	
Type	**Order code**
Front-connecting Socket	PTF14A
	PTF14A-E

Specifications

Ratings		
Item	**Model**	
	E5L-A_	**E5L-C_**
Power supply voltage	100 to 240 VAC, 50/60 Hz	
Operating voltage range	85% to 110% of the rated supply voltage	
Power consumption	Approx. 3 VA	
Inputs	Element-interchangeable thermistor	
Control method	ON/OFF control	
Control output	SPDT contacts, 250 VAC, 10 A, cosδ = 1 (resistive load)	SPST-NO contacts, 250 VAC, 10 A, cosδ = 1 (resistive load)
Setting method	Analogue setting	Digital settings using keys on front panel
Indication method	No display	LCD digital display (character height: 12 mm)
Other functions		Setting protection (key protection) Input shift Direct/reverse operation
Indication accuracy	–	±(1°C + 1 digit) max.*
Setting accuracy	–	±(1°C + 1 digit) max.*
Hysteresis	-30 to 20°C models: Approx. 0.5 to 2.5°C (variable) 0 to 50°C models: Approx. 0.5 to 4°C (variable) 0 to 100°C models: Approx. 0.5 to 4°C (variable) 100 to 200°C models: Approx. 0.7 to 4°C (variable)	1 to 9°C (in increments of 1°C)
Repeat accuracy	1% FS max	–
Minimum scale (standard scale)	-30 to 20°C models and 0 to 50°C models: 5°C 0 to 100°C models and 100 to 200°C models: 10°C	–
Influence of temperature	–	±([1% of PV or 2°C, whichever is greater]+ 1 digit) max.
Influence of voltage	–	
Sampling period	–	2 s
Insulation resistance	100 MW max. (at 500 VDC)	
Dielectric strength	2,300 VAC, 50/60 Hz for 1 min (between charged terminals and uncharged metallic parts, between power supply terminals and input terminals, between power supply terminals and output terminals, and between input terminals and output terminals)	
Vibration (malfunction)	Frequency of 10 to 55 Hz, 0.5-mm double amplitude for 10 min each in X, Y, and Z directions	
Vibration (destruction)	Frequency of 10 to 55 Hz, 0.75-mm double amplitude for 2 h each in X, Y, and Z directions	
Shock (malfunction)	147 m/s^2, 3 times each in 6 directions	100 m/s^2, 3 times each in 6 directions
Shock (destruction)	294 m/s^2, 3 times each in 6 directions	
Electrical life expectancy (control output relay)	100,000 operations min (at maximum applicable load)	
Memory protection	–	Non-volatile memory (100,000 write operations)
Weight (Thermostat)	Approx. 80 g (Thermostat only)	
Degree of protection	Front panel: IP40, Terminals: IP00	
Approved standards	–	
Conformed standards	EN 61010-1 (IEC 61010-1), Pollution Degree 2, Overvoltage Category II	
EMC Directives	EMI: EN61326-1 Radiated EMI: EN55011 Group 1 Class A Conducted EMI: EN55011 Group 1 Class A EMS: EN61326-1 Electrostatic discharge immunity: EN61000-4-2 Electromagnetic field strength immunity: EN61000-4-3 Burst noise immunity: EN61000-4-4 Conducted disturbance immunity: EN61000-4-6 Surge immunity: EN61000-4-5 Voltage dip and power interruption immunity: EN61000-4-11	

* The accuracy of the accessory thermistor is not included.



Easy-to-use, basic temperature controller with analogue dial setting

Omron's basic ON/OFF or PD controller features an analogue setting dial. This compact, low-cost controller has a setting accuracy of 2% of full scale. It incorporates a plug-in socket allowing for DIN-rail or flush mounting.

- Compact, cost-effective controller
- Control mode: ON/OFF or PD
- Control output: relay
- Power supply: 100-120 / 200-240VAC
- Thermocouple K: 0 to 1200°C, L: 0 to 400°C, Pt100: -50 to 200°C

Ordering information

Setting method	Indication method	Control mode	Output	Order code			
				Thermocouple		Platinum resistance thermometer Pt100	Thermistor THE
				K (CA) chromel vs. alumel	L (IC) iron vs. constantan		
Analogue setting	No indication	ON/OFF	Relay	E5C2-R20K	E5C2-R20L-D	E5C2-R20P-D	E5C2-R20G
		P	Relay	E5C2-R40K	E5C2-R40L-D	E5C2-R40P-D	

Note: Specify either 100/110/120 VAC or 200/220/240 VAC when ordering.

Input ranges	Thermocouple *1		Platinum resistance thermometer	Thermistor *2
	K (CA) chromel vs. alumel	L (IC) iron vs. constantan	Pt100	THE
°C	0 to 200 (5), 0 to 300 (10), 0 to 400 (10), 0 to 600 (20), 0 to 800 (20), 0 to 1,000 (25), 0 to 1,200 (25)	0 to 200 (5), 0 to 300 (10), 0 to 400 (10) 5 to 450 (10)	-50 to 50 (2), -20 to 80 (2), 0 to 50 (1), 0 to 100 (2), 0 to 200 (5), 0 to 300 (10), 0 to 400 (10)	-50 to 50 (2) (6 kΩ at 0°C), 0 to 100 (2) (6 kΩ at 0°C), 50 to 150 (2) (30 kΩ at 0°C)

*1 Values in ( ) are the minimum unit.
*2 Values in ( ) are the thermistor resistive value.

Accessories

Functions	Order code
Front connecting socket with finger protection	P2CF-08-E
Back connecting socket (for flush mounting)	P3G-08
Finger protection cover (for P3G-08)	Y92A-48G
Protective front cover (IP66)	Y92A-48B

Specifications

Supply voltage	100/110/120 VAC or 200/220/240 VAC, 50/60 Hz
Thermocouple input type	K, L (with sensor break detection)
RTD input type	Pt100, THE
Control mode	ON/OFF or P control
Setting method	analogue setting
Output	Relay, SPDT, 3 A at 250 VAC
Life expectancy	Electrical: 100,000 operations min.
Setting accuracy	±2% FS max.
Hysteresis	Approx. 0.5% FS (fixed)
Proportional band	3% FS (fixed)
Reset range	5 ±1% FS min.
Control period	20 s
IP Rating front panel	IP40 (IP66 cover available)
IP rating terminals	IP00
Ambient temperature	-10 to 55°C
Size in mm (HxWxD)	48x48x96



The easy way to perfect temperature control

This multi-range 1/16 DIN controller with alarm function offers field-selectable PID control or ON/OFF control. The large, single display shows process value, direction of deviation from set point, output and alarm status.

- All setting field configurable with switches
- Multi-input (Thermocouple/Pt100)
- Clearly visible 3.5 digit display with character height of 13.5 mm
- Control output: relay, voltage (for driving SSR)
- ON/OFF or 2-PID control with auto-tuning and self-tuning

Ordering information

Size in mm	Supply voltage	Number of alarm points	Control output	Order code
1/16 DIN 48Hx48Wx78D	100 to 240 VAC	1	Relay	E5CSV-R1T-500
			Voltage (for driving SSR)	E5CSV-Q1T-500
	24 VAC/VDC	1	Relay	E5CSV-R1TD-500
			Voltage (for driving SSR)	E5CSV-Q1TD-500

Note: Other models are available on request.

Accessories

Type	Order code
Hard protective cover	Y92A-48B

Specifications

Supply voltage		100 to 240 VAC, 50/60 Hz or 24 VAC/VDC (depending on model)
Operating voltage range		85 to 110% of rated supply voltage
Power consumption		5 VA
Sensor input		Multi-input (thermocouple/platinum resistance thermometer): K, J, L, T, U, N, R, Pt100, JPt100
Control output	**Relay output**	SPST-NO, 250 VAC, 3 A (resistive load)
	Voltage output (for driving SSR)	12 VDC, 21 mA (with short-circuit protection circuit)
Control method		ON/OFF or 2-PID (with auto-tune and self-tune)
Alarm output		SPST-NO, 250 VAC, 1 A (resistive load)
Setting method		Digital setting using front panel keys (functionality set-up with DIP switch)
Indication		7-segment digital display (character height: 13.5 mm) and deviation indicators
Ambient temperature		-10 to 55°C (with no condensation or icing)
Setting/indication accuracy		±0.5% of indication value or ±1 °C, whichever is greater ±1 digit max.
Hysteresis (for ON/OFF control)		0.2% FS (0.1% FS for multi-input (thermocouple/platinum resistance thermometer) models)
Proportional band (P)		1 to 999°C (automatic adjustment using AT/ST)
Integral time (I)		0 to 1,999 s (automatic adjustment using AT/ST)
Derivative time (D)		0 to 1,999 s (automatic adjustment using AT/ST)
Control period		2/20 s
Sampling period		500 ms
Electrical life expectancy		100,000 operations min. (relay output models)
Weight		Approx. 120 g (controller only)
Degree of protection		Front panel: Equivalent to IP66; rear case: IP20; terminals: IP00
Memory protection		EEPROM (non-volatile memory) (number of writes: 1,000,000)
Size in mm (HxWxD)		48x48x78



Compact and intelligent general purpose controllers

The E5_N general purpose line of temperature controllers is available in 4 standard DIN formats. They all feature a high intensity dual LCD display with a wide viewing angle. The whole series features 3 colour PV change for easy status recognition.

- Control mode: ON/OFF or 2-PID
- Control output: relay, hybrid relay, voltage (pulse) or linear current
- Power supply: 100/240 VAC or 24 VDC/VAC
- Easy PC connection for parameter cloning, setting and tuning
- Clear and intuitive set-up and operation

Ordering information

Type	Input	Output	Fixed option	Alarms	Order code	
					48x24 mm model (includes supply voltage indication)	
On-panel	temperature (TC/Pt/mV)	relay	–	1 relay	E5GN-R1T-C AC100-240	E5GN-R1TD-C AC/DC24
			RS-485 communication		E5GN-R103T-C-FLK AC100-240	E5GN-R103TD-C-FLK AC/DC24
			2 Event inputs		E5GN-R1BT-C AC100-240	E5GN-R1BTD-C AC/DC24
		voltage (pulse)	–		E5GN-Q1T-C AC100-240	E5GN-Q1TD-C AC/DC24
			RS-485 communication		E5GN-Q103T-C-FLK AC100-240	E5GN-Q103TD-C-FLK AC/DC24
			2 Event inputs		E5GN-Q1BT-C AC100-240	E5GN-Q1BTD-C AC/DC24
		current (linear)	–		E5GN-C1T-C AC100-240	E5GN-C1TD-C AC/DC24
			RS-485 communication		E5GN-C103T-C-FLK AC100-240	E5GN-C103TD-C-FLK AC100-240
			2 Event inputs		E5GN-C1BT-C AC100-240	E5GN-C1BTD-C AC/DC24
		relay	–	2 relay	E5GN-R2T-C AC100-240	E5GN-R2TD-C AC/DC24
			RS-485 communication		E5GN-R203T-C-FLK AC100-240	E5GN-R203TD-C-FLK AC100-240
			2 Event inputs		E5GN-R2BT-C AC100-240	E5GN-R2BTD-C AC/DC24
			Heater Alarm		E5GN-R2HT-C AC100-240	E5GN-R2HTD-C AC/DC24
		voltage (pulse)	–		E5GN-Q2T-C AC100-240	E5GN-Q2TD-C AC/DC24
			RS-485 communication		E5GN-Q203T-C-FLK AC100-240	E5GN-Q203TD-C-FLK AC/DC24
			2 Event inputs		E5GN-Q2BT-C AC100-240	E5GN-Q2BTD-C AC/DC24
			Heater Alarm		E5GN-Q2HT-C AC100-240	E5GN-Q2HTD-C AC/DC24
	analogue (mA/V)	relay	RS-485 communication	1 relay	E5GN-R103L-FLK AC100-240	E5GN-R103LD-FLK AC/DC24
		voltage (pulse)	RS-485 communication		E5GN-Q103L-FLK AC100-240	E5GN-Q103LD-FLK AC/DC24
		current (linear)	–		E5GN-C1L-C AC100-240	E5GN-C1LD-C AC/DC24

Type	Input	Output	Fixed option	Alarms	Order code	
					48x48 mm model (includes supply voltage indication)	
On-panel	temperature (TC/Pt/mV)	relay	–	2 relays	E5CN-R2MT-500 AC100-240	E5CN-R2MTD-500 AC/DC24
		voltage (pulse)			E5CN-Q2MT-500 AC100-240	E5CN-Q2MTD-500 AC/DC24
		linear current			E5CN-C2MT-500 AC100-240	E5CN-C2MTD-500 AC/DC24
		hybrid relay			E5CN-Y2MT-500 AC100-240	–
	analogue (mA/V)	relay			E5CN-R2ML-500 AC100-240	E5CN-R2MLD-500 AC/DC24
		voltage (pulse)			E5CN-Q2ML-500 AC100-240	E5CN-Q2MLD-500 AC/DC24
		linear current			E5CN-C2ML-500 AC100-240	E5CN-C2MLD-500 AC/DC24
		hybrid relay			E5CN-Y2ML-500 AC100-240	n/a
In-panel	temperature (TC/Pt/mV)	relay		2 relays	E5CN-R2TU AC100-240	E5CN-R2TDU AC/DC24
		voltage (pulse)			E5CN-Q2TU AC100-240	E5CN-Q2TDU AC/DC24
		linear current			E5CN-C2TU AC100-240	E5CN-C2TDU AC/DC24
	analogue (mA/V)	relay			E5CN-R2LU AC100-240	–
		voltage (pulse)			E5CN-Q2LU AC100-240	–
		linear current			E5CN-C2LU AC100-240	–

Note:- Output and Alarm Relays: 3 A/250 VAC, electrical life: 100,000 operations
- Output voltage (pulse): 12 V, 21 mA (ie. to drive solid state relays)
- Hybrid relay (long life relay) electrical life 1,000,000 operations
- Linear current: 0(4) to 20 mA
- Heater alarm / HA = heater burnout + SSR short detection + SSR overcurrent
- Voltage: Specify the power supply specifications (voltage) when ordering E5GN

Accessories

E5CN option boards

(One slot available in each instrument; do no fit in E5CN-U types)

Option			Order code
2 Event inputs	–	–	E53-CNBN2
	–	voltage (pulse)	E53-CNQBN2
	heater alarm	–	E53-CNHBN2
	–	power supply (12 VDC/20 mA)	E53-CNPBN2
RS-485 serial communications (CompowayF/ Modbus RTU)	–	–	E53-CN03N2
	–	voltage (pulse)	E53-CNQ03N2
	heater alarm	–	E53-CNH03N2
	3-phase HA	–	E53-CNHH03N2
	–	power supply (12 VDC/20 mA)	E53-CNP03N2
–	heater alarm	voltage (pulse)	E53-CNQHN2
	3-phase HA	voltage (pulse)	E53-CNQHHN2
	heater alarm	power supply (12 VDC/20 mA)	E53-CNPHN2

Note: Options with "N2" in the code, only fit in E5CN produced after January 2008 (marked N6 on the box)

E5CN series optional tools

Option		Order code
USB PC based configuration cable		E58-CIFQ1
PC based configuration and tuning software		CX-Thermo
PC based parameter cloning software (free)		ThermoMini
Standard 11 pin socket for E5CN-___U type		P2CF-11-E

Type	Input	Output	Fixed option	Alarms	Order code (includes supply voltage indication)	
					48x96 mm model	96x96 mm model
On-panel	temperature (TC/Pt/mV)	relay	–	3 relays	E5EN-R3MT-500-N AC100-240	E5AN-R3MT-500-N AC100-240
					E5EN-R3MTD-500-N AC/DC24	E5AN-R3MTD-500-N AC/DC24
			heater alarm		E5EN-R3HMT-500-N AC100-240	E5AN-R3HMT-500-N AC100-240
					E5EN-R3HMTD-500-N AC/DC24	E5AN-R3HMTD-500-N AC/DC24
			3-phase heater alarm		E5EN-R3HHMT-500-N AC100-240	E5AN-R3HHMT-500-N AC100-240
					E5EN-R3HHMTD-500-N AC/DC24	E5AN-R3HHMTD-500-N AC/DC24
			voltage (pulse)		E5EN-R3QMT-500-N AC100-240	E5AN-R3QMT-500-N AC100-240
			hybrid relay		E5EN-R3YMT-500-N AC100-240	E5AN-R3YMT-500-N AC100-240
			power supply		E5EN-R3PMT-500-N AC100-240	E5AN-R3PMT-500-N AC100-240
		voltage (pulse)	–		E5EN-Q3MT-500-N AC100-240	E5AN-Q3MT-500-N AC100-240
					E5EN-Q3MTD-500-N AC/DC24	E5AN-Q3MTD-500-N AC/DC24
			heater alarm		E5EN-Q3HMT-500-N AC100-240	E5AN-Q3HMT-500-N AC100-240
					E5EN-Q3HMTD-500-N AC/DC24	E5AN-Q3HMTD-500-N AC/DC24
			3-phase heater alarm		E5EN-Q3HHMT-500-N AC100-240	E5AN-Q3HHMT-500-N AC100-240
					E5EN-Q3HHMTD-500-N AC/DC24	E5AN-Q3HHMTD-500-N AC/DC24
			voltage (pulse)		E5EN-Q3QMT-500-N AC100-240	E5AN-Q3QMT-500-N AC100-240
			hybrid relay		E5EN-Q3YMT-500-N AC100-240	E5AN-Q3YMT-500-N AC100-240
			power supply		E5EN-Q3PMT-500-N AC100-240	E5AN-Q3PMT-500-N AC100-240
		linear current	–		E5EN-C3MT-500-N AC100-240	E5AN-C3MT-500-N AC100-240
					E5EN-C3MTD-500-N AC/DC24	E5AN-C3MTD-500-N AC/DC24
			voltage (pulse)		E5EN-C3QMT-500-N AC100-240	E5AN-C3QMT-500-N AC100-240
			hybrid relay		E5EN-C3YMT-500-N AC100-240	E5AN-C3YMT-500-N AC100-240
	analogue (mA/V)	relay	–		E5EN-R3ML-500-N AC100-240	E5AN-R3ML-500-N AC100-240
			heater alarm		E5EN-R3HML-500-N AC100-240	E5AN-R3HML-500-N AC100-240
		voltage (pulse)	–		E5EN-Q3ML-500-N AC100-240	E5AN-Q3ML-500-N AC100-240
			heater alarm		E5EN-Q3HML-500-N AC100-240	E5AN-Q3HML-500-N AC100-240
			hybrid relay		E5EN-Q3YML-500-N AC100-240	E5AN-Q3YML-500-N AC100-240
		linear current	–		E5EN-C3ML-500-N AC100-240	E5AN-C3ML-500-N AC100-240

Note: - Output and Alarm Relays: 3 A/250 VAC, electrical life: 100,000 operations
- Output voltage (pulse): 12 V, 21 mA (ie. to drive solid state relays)
- Hybrid relay (long life relay) electrical life 1,000,000 operations
- Linear current: 0(4) to 20 mA
- Heater alarm / HA = heater burnout + SSR short detection + SSR overcurrent

E5AN/-EN option boards

(one slot available in each instrument)

Option	Order code
RS-232C communications (CompoWay/F/Modbus)	E53-EN01
RS-485 communications (CompoWay/F/Modbus)	E53-EN03
event input	E53-AKB

E5AN/-EN series optional tools

Option		Order code
USB PC based configuration cable		E58-CIFQ1
PC based configuration and tuning software		CX-Thermo
PC based parameter cloning software (free)		ThermoMini

Specifications

Supply voltage	100 to 240 VAC 50/60 Hz or 24 VAC, 50/60Hz; 24 VDC
Heater alarm	yes, optional, choice of 1 or 3 phase
Thermocouple input type	K, J, T, E, L, U, N, R, S, B, W or PL II
RTD input type	Pt100, JPt100
Linear input type	mV or "T" models mA and V on "L" models
Control mode	ON/OFF, 2-PID (heat or heat/cool)
Accuracy	Thermocouple ± 0.3% (E5CN-U ± 1%) Platinum resistance ± 0.2% Analogue input ± 0.2% FS
Auto-tuning	yes, 40% and 100% MV output limit selection. When using Heat/Cool: automatic cool gain adjustment
Self-tuning	yes
RS-232C	Only for AN/-EN: Optional, Protocol CompowayF or Modbus freely selectable
RS-485	optional, CompowayF or Modbus selectable
Event input	optional
QLP port (USB connection PC)	yes
Ambient temperature	-10 to 55°C
IP Rating front panel	IP66
Sampling period	250 ms



Advanced compact digital process controllers

The E5_K series of advanced controllers provides standard models and models with programmer functionality. The modular structure of the series makes it very versatile. A number of tuning functions are provided, including auto-tuning, self-tuning and fuzzy self-tuning.

- Size in mm (HxWxD): 96x48x100/53x53x100/96x96x100
- Control mode: ON/OFF or PID
- Control output: relay, SSR, voltage or current
- Universal inputs (Pt100/Thermocouple/Volt/Milliampere)
- Supported by ThermoTools PC Software

Ordering information

Specification	Alarms	Order code		
		Standard model 48x48 mm	Programmer model 48x48 mm	Supply voltage
Base unit with terminal cover	1	E5CK-AA1-500	E5CK-TAA1-500	AC100-240
Specification	**Alarms**	**Standard model 48x96 mm**	**Programmer model 48x96 mm**	**Supply voltage**
Standard model with terminal cover	2	E5EK-AA2-500	E5EK-TAA2-500	AC100-240
Position-proportional model with terminal cover		E5EK-PRR2-500	E5EK-TPRR2-500	
Standard mode with terminal cover and DeviceNet		E5EK-AA2-DRT-500		
Specification	**Alarms**	**Standard model 96x96 mm**	**Programmer model 96x96 mm**	**Supply voltage**
Standard model with terminal cover	2	E5AK-AA2-500	E5AK-TAA2-500	AC100-240
Position-proportional model with terminal cover		E5AK-PRR2-500	E5AK-TPRR2-500	

Note: One output unit and One option unit can be mounted to each E5CK unit.
Note: Two output units and up to 3 option units can be mounted in each E5EK/E5AK base unit.

Option units

Model	Name	Specification	Order code
E5CK	Output units	Relay/relay	E53-R4R4
		Pulse (NPN)/relay	E53-Q4R4
		Pulse (PNP)/relay	E53-Q4HR4
		Linear (4 to 20 mA)/relay	E53-C4R4
		Linear (0 to 20 mA)/relay	E53-C4DR4
		Linear (0 to 10 V)/relay	E53-V44R4
		Pulse (NPN)/pulse (NPN)	E53-Q4Q4
		Pulse (PNP)/pulse (PNP)	E53-Q4HQ4H
	Option units	RS-232C	E53-CK01
		RS-485	E53-CK03
		Event input: 1 point	E53-CKB
		Transfer output (4 to 20 mA)	E53-CKF

Model	Name	Specification	Order code
E5AK E5EK	Output units	Relay	E53-R
		SSR	E53-S
		Pulse (NPN) 12 VDC	E53-Q
		Pulse (NPN) 24 VDC	E53-Q3
		Pulse (PNP) 24 VDC	E53-Q4
		Linear (4 to 20 mA)	E53-C3
		Linear (0 to 20 mA)	E53-C3D
		Linear (0 to 10 V)	E53-V34
		Linear (0 to 5 V)	E53-V35
	Option units	Event input	E53-AKB
		Communication (RS-232C)	E53-EN01
		Communication (RS-422)	E53-EN02
		Communication (RS-485)	E53-EN03
		Transfer output	E53-AKF

E5_K/E5_K-T optional tools

Option	Order code
PC based configuration and tuning software ThermoTools	ESTT-YB177-MV1S

Specifications

Heater burnout	Optional, CK: loop burnout
Thermocouple input type	K, J, T, E, L, U, N, R, S, B, W, PLII
RTD input type	Pt100, JPt100
Linear input type	mA, 0 to 50 mV
Control mode	2-PID or ON/OFF control
Accuracy	0.3% FS, 1 digit max.
Self-tuning	yes
Auto-tuning	yes
RS-485	optional
Event input	optional
Ambient temperature	-10 to 55°C
IP rating front panel	IP66
Sampling period	Temperature input: 250 ms Linear input: 100 ms



CelciuXº - Multi-Loop temperature control – Control and Connectivity

CelciuXº is designed to handle complex temperature profiles thanks to Omron's unique Gradient temperature Control (GTC) algorithm and to offer easy program-less communication with Omron and third-party PLCs and HMI. Above all, CelciuXº incorporates all "simple to use" clever temperature control technology, like 2-PID, disturbance control and various ways of tuning.

- Interfaces to a wide range of industrial networks
- Reduced engineering due to Program-less communications, Smart Active Parts and Function Block Libraries
- Available with screw terminals and screw-less clamp terminals
- One unit handling various types of input, such as Pt, Thermocouple, mA, and V input
- Gradient Temperature Control (GTC)

Ordering information

Type	Control points	Control outputs	Auxiliary outputs	Other functions	Terminal	Order code
Basic unit	2	2 voltage (puls)	2 transistor (NPN) *1	2 CT input *2 + 2 event input	M3 screws	EJ1N-TC2A-QNHB
Basic unit	2	2 voltage (puls)	2 transistor (NPN) *1	2 CT input *2 + 2 event input	Screw-less clamp	EJ1N-TC2B-QNHB
Basic unit	2	2 current	2 transistor (NPN) *1	2 event input	M3 screws	EJ1N-TC2A-CNB
Basic unit	2	2 current	2 transistor (NPN) *1	2 event input	Screw-less clamp	EJ1N-TC2B-CNB
Basic unit	4	4 voltage (puls)	–	–	M3 screws	EJ1N-TC4A-QQ
Basic unit	4	4 voltage (puls)	–	–	Screw-less clamp	EJ1N-TC4B-QQ
High function unit	–	–	4 transistor (NPN)	4 event input	M3 screws	EJ1N-HFUA-NFLK
High function unit	–	–	4 transistor (NPN)	4 event input	Screw-less clamp	EJ1N-HFUB-NFLK
DeviceNet unit	–	–	–	–	Screw connector	EJ1N-HFUB-DRT
End unit *3	–	–	2 transistor (NPN)	–	M3 screws	EJ1C-EDUA-NFLK
End unit *3	–	–	2 transistor (NPN)	–	Removable Connector	EJ1C-EDUC-NFLK

*1 For heating/cooling control applications, the auxiliary outputs on the 2-point models are used for cooling control. On the 4-point models, heating/cooling control can be performed for two input points only.
*2 When using the heater burnout alarm, purchase a Current Transformer (E54-CT1 or E54-CT3) separately.
*3 An End unit is always required for connection to a Basic unit or an HFU. An HFU cannot operate without a Basic unit.

Type	Control points	Control outputs	Auxiliary outputs	Other functions	Terminal	Order code
Basic unit	2 (GTC)	2 voltage (puls) *1	2 transistor (NPN)	2 CT input *2	M3 screws	EJ1G-TC2A-QNH
Basic unit	2 (GTC)	2 voltage (puls) *1	2 transistor (NPN)	2 CT input *2	Screw-less clamp	EJ1G-TC2B-QNH
Basic unit	4 (GTC)	4 voltage (puls) *1	–	–	M3 screws	EJ1G-TC4A-QQ
Basic unit	4 (GTC)	4 voltage (puls) *1	–	–	Screw-less clamp	EJ1G-TC4B-QQ
High function unit	– (GTC)	–	4 transistor (NPN)	–	M3 screws	EJ1G-HFUA-NFLK
High function unit	– (GTC)	–	4 transistor (NPN)	–	Screw-less clamp	EJ1G-HFUB-NFLK
End unit *3	–	–	2 transistor (NPN)	–	M3 screws	EJ1C-EDUA-NFLK
End unit *3	–	–	2 transistor (NPN)	–	Removable Connector	EJ1C-EDUC-NFLK

*1 Heating/cooling control is not supported for gradient temperature control.
*2 When using the heater burnout alarm, use a Current Transformer (E54-CT1 or E54-CT3) (sold separately).
*3 An End-unit (EDU) is always required to connect an HFU and or a Basic TC unit for Communications and Power supply. A GTC (Gradient Temperature Control) basic TC unit always requires a GTC HFU unit.

Accessories

Current transformer

Diameter	Order code
5.8 dia.	E54-CT1
12.0 dia.	E54-CT3

Communications and cables

Description	Order code
G3ZA connecting cable 5 meter	EJ1C-CBLA050
USB programming cable	E58-CIFQ1
PC based configuration and tuning software CX-Thermo	EST2-2C-MV4
PROFIBUS Gateway	PRT1-SCU11

Specifications

Item	Type	EJ1_-TC2	EJ1_-TC4
Power supply voltage		24 VDC	
Operating voltage range		85% to 110% of rated voltage	
Power consumption		4 W max. (at maximum load)	5 W max. (at maximum load)
Input (see note)*1		Thermocouple: K, J, T, E, L, U, N, R, S, B, W, PLII ES1B Infrared Thermosensor: 10 to 70°C, 60 to 120°C, 115 to 165°C, 140 to 260°C. Analogue input: 4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 5 V, 0 to 10 V Platinum resistance thermometer: Pt100, JPt100	
Input impedance		Current input: 150Ω max., voltage input: 1 MΩ min.	
Control outputs	Voltage output	Output voltage: 12 VDC ±15%, max. load current: 21 mA (PNP models with short-circuit protection circuit)	
	Transistor output	Max. operating voltage: 30 V, max. load current: 100 mA	–
	Current output	Current output range: 4 to 20 mA or 0 to 20 mA DC Load: 500 Ω max. (including transfer output) (Resolution: Approx: 2,800 for 4 to 20 mA DC, approx. 3,500 for 0 to 20 mA DC)	–
Event inputs	Input points	2	–
	Contact input	ON: 1 kΩ max., OFF. 100 kΩ min.	–
	Non-contact input	ON: Residual voltage: 1.5 V max., OFF: Leakage current: 0.1 mA max.	–
		Outflow current: approx. 4 mA per point	–
Number of input and control points		Input points: 2, control points: 2	Input points: 4, control points: 4
Setting method		Via communications	
Control method		ON/OFF control or 2-PID (with autotuning, selftuning, Heat & Cool autotuning and non-linear cool output selection)	
Other functions		Two-point input shift, digital input filter, remote SP, SP ramp, manual manipulated variable, manipulated variable limiter, interference overshoot adjustment, loop burnout alarm, RUN/STOP, banks, I/O allocations, etc.	
Alarm output		2 points via End unit	
Communication		RS-485, PROFIBUS, Modbus, DeviceNet	RS-485, PROFIBUS, Modbus, DeviceNet
Size in mm (WxHxD)		31x96x109	
Weight		180 g	
Ambient temperature range		Operating -10°C to 55°C, Storage -25°C to 65°C (with no icing or condensation)	
Ambient humidity range		Operating. 25% to 85% (with no condensation)	

*1 Inputs are fully multi-input. Therefore, platinum resistance thermometer, thermocouple, infrared thermosensor, and analogue input can be selected.



Universal compact digital process controllers

The E5_N-H series of process controllers take the proven concept of the general purpose E5_N series to a process level. Main features of the E5_N-H series are universal inputs, process outputs and options such as transfer output, remote set-point and setvalue programmer.

- Control mode: ON/OFF or 2-PID, Valve control on EN-H/AN-H
- Control output: relay, voltage (pulse), SSR, linear current and voltage
- Power supply: 100/240 VAC or 24 VDC/VAC
- Easy PC connection for parameter cloning, setting and tuning
- Clear and intuitive set-up and operation

Ordering information

Type	Input	Output	Fixed option	Alarms	Order code	
					48x48 mm model (includes supply voltage indication)	
On-panel	Universal TC/Pt/mV mA/V	Relay output	–	2 relays	E5CN-HR2M-500 AC100-240	E5CN-HR2MD-500 AC/DC24
		Voltage (pulse)			E5CN-HQ2M-500 AC100-240	E5CN-HQ2MD-500 AC/DC24
		Current output			E5CN-HC2M-500 AC100-240	E5CN-HC2MD-500 AC/DC24
		Linear voltage output			E5CN-HV2M-500 AC100-240	E5CN-HV2MD-500 AC/DC24

Note:
- Output and Alarm Relays: 3 A/250 VAC, electrical life: 100,000 operations
- Output voltage (pulse): 12 V, 21 mA (ie. to drive solid state relays)
- Linear current: 0(4) to 20 mA
- Linear voltage output: 0 to 10 V

Accessories

E5CN-H option boards

(One slot available in each instrument)

Option				Order code
Event inputs				E53-CNBN2
Event inputs	Control output 2 Voltage (for driving SSR)			E53-CNQBN2
Event inputs			Heater burnout/SSR failure/ Heater overcurrent detection	E53-CNHBN2
Event inputs		Transfer output		E53-CNBFN2
Communications RS-232C	Control output 2 Voltage (for driving SSR)			E53-CN01N2
Communications RS-232C				E53-CNQ01N2
Communications RS-232C			Heater burnout/SSR failure/ Heater overcurrent detection	E53-CNH01N2
Communications RS-485				E53-CN03N2
Communications RS-485	Control output 2 Voltage (for driving SSR)			E53-CNQO3N2
Communications RS-485			Heater burnout/SSR failure/ Heater overcurrent detection	E53-CNH03N2
Communications RS-485			3-phase heater burnout/SSR failure/ Heater overcurrent detection	E53-CNHH03N2
	Control output 2 Voltage (for driving SSR)	Transfer output		E53-CNQFN2
	Control output 2 Voltage (for driving SSR)		Heater burnout/SSR failure/ Heater overcurrent detection	E53-CNQHN2
	Control output 2 Voltage (for driving SSR)		3-phase heater burnout/SSR failure/ Heater overcurrent detection	E53-CNQHHN2

E5CN-H series optional tools

Option		Order code
USB PC based configuration cable		E58-CIFQ1
PC based configuration and tuning software	CX-Thermo	EST2-2C-MV4

Control method	Auxiliary output	Control output 1/2	Heater burnout	Optional function	Order code (includes supply voltage indication)	
				Transfer output	96x96 mm model	48x96 mm model
Basic	2 alarm relays	none fitted, 2 slots	1-phase		E5AN-HAA2HBM-500 AC100-240	E5EN-HAA2HBM-500 AC100-240
		none fitted, 2 slots	1-phase		E5AN-HAA2HBMD-500 AC/DC24	E5EN-HAA2HBMD-500 AC/DC24
		2 SSR output fitted	1-phase		E5AN-HSS2HBM-500 AC100-240	E5EN-HSS2HBM-500 AC100-240
		2 SSR output fitted	1-phase		E5AN-HSS2HBMD-500 AC/DC24	E5EN-HSS2HBMD-500 AC/DC24
		none fitted, 2 slots	3-phase	4 to 20 mA output	E5AN-HAA2HHBFM-500 AC100-240	E5EN-HAA2HHBFM-500 AC100-240
		none fitted, 2 slots	3-phase	4 to 20 mA output	E5AN-HAA2HHBFMD-500 AC/DC24	E5EN-HAA2HHBFMD-500 AC/DC24
		2 SSR output fitted	3-phase	4 to 20 mA output	E5AN-HSS2HHBFM-500 AC100-240	E5EN-HSS2HHBFM-500 AC100-240
		2 SSR output fitted	3-phase	4 to 20 mA output	E5AN-HSS2HHBFMD-500 AC/DC24	E5EN-HSS2HHBFMD-500 AC/DC24
	3 alarm relays	none fitted, 2 slots		4 to 20 mA output	E5AN-HAA3BFM-500 AC100-240	E5EN-HAA3BFM-500 AC100-240
		none fitted, 2 slots		4 to 20 mA output	E5AN-HAA3BFMD-500 AC/DC24	E5EN-HAA3BFMD-500 AC/DC24
		2 SSR output fitted		4 to 20 mA output	E5AN-HSS3BFM-500 AC100-240	E5EN-HSS3BFM-500 AC100-240
		2 SSR output fitted		4 to 20 mA output	E5AN-HSS3BFMD-500 AC/DC24	E5EN-HSS3BFMD-500 AC/DC24
Valve	2 alarm relays	2 relay output fitted			E5AN-HPRR2BM-500 AC100-240	E5EN-HPRR2BM-500 AC100-240
		2 relay output fitted			E5AN-HPRR2BMD-500 AC/DC24	E5EN-HPRR2BMD-500 AC/DC24
		2 relay output fitted		4 to 20 mA output	E5AN-HPRR2BFM-500 AC100-240	E5EN-HPRR2BFM-500 AC100-240
		2 relay output fitted		4 to 20 mA output	E5AN-HPRR2BFMD-500 AC/DC24	E5EN-HPRR2BFMD-500 AC/DC24

Note: - All E5EN-H/AN-H have 2 event inputs
- All E5EN-H/AN-H have Remote Setpoint 4 to 20 mA input

Specifications E5CN-H/EN-H/AN-H

Supply voltage	100 to 240 VAC 50/60 Hz or 24 VAC, 50/60Hz; 24 VDC
Sensor input	Thermocouple: K, J, T, E, L, U, N, R, S, B, W or PL II
	Platinum resistance thermometer: Pt100 or JPt100
	Current input: 4 to 20 mA or 0 to 20 mA
	Voltage input: 1 to 5 V, 0 to 5 V or 0 to 10 V
Control mode	ON/OFF, 2-PID and valve (PRR)
Accuracy	Thermocouple: (± 0.1% of indicated value or ±1°C, whichever is greater) ± digit max. *1 Platinum resistance thermometer: (± 0.1% of indicated value or ± 0.5°C, whichever is greater) ± 1 digit max. Analogue input: ± 0.1% FS ± 1 digit max.
Auto-tuning	yes, 40% and 100% MV output limit selection. When using Heat/Cool: automatic cool gain adjustment
Self-tuning	yes
RS-232C/RS-422/RS-485	optional, CompowayF or Modbus selectable
Event input	Optional (Standard 2 event input in EN-H/AN-H)
QLP port (USB connection PC)	yes
Ambient temperature	-10 to 55°C
IP Rating front panel	IP66
Sampling period	60 ms

E5AN-H/EN-H output option boards

(2 slots available in E5_N-HAA__-500 models:
SS models have 2 fixed SSR output modules)

Option	Order code
Relay	E53-RN
Voltage (pulse) PNP 12VDC	E53-QN
Voltage (pulse) NPN 12VDC	E53-Q3
Voltage (pulse) NPN 24VDC	E53-Q4
Linear 4 to 20 mA	E53-C3N
Linear 0 to 20 mA	E53-C3DN
Linear 0 to 10 V	E53-V34N
Linear 0 to 5 V	E53-V35N

E5AN-H/EN-H option boards

(one slot available in each instrument)

Option	Order code
RS-232C communications (CompoWay/F/Modbus)	E53-EN01
RS-422 communications (CompoWay/F/Modbus)	E53-EN02
RS-485 communications (CompoWay/F/Modbus)	E53-EN03
event input	E53-AKB

E5AN-H/EN-H series optional tools

Option		Order code
USB PC based configuration cable		E58-CIFQ1
PC based configuration and tuning software	CX-Thermo	EST2-2C-MV4



Fast, accurate and equipped for application specific needs

The E5_R series provides you with high accuracy inputs (0.01°C for Pt100) and a 50 ms sample and control cycle for all four loops. Its unique Disturbance Overshoot Reduction Adjustment ensures solid, robust control.

- Easy and clear read-out thanks to bright Liquid Crystal Display
- Exceptional versatility – multi-loop control, cascade control, and valve control
- Easy integration with DeviceNet, PROFIBUS or Modbus
- SV programmer optional, 32 programs with up to 256 segments

Ordering information

Functions	Loops	Input		Output		Comms	Order code		
		analogue	Event	Control	Alarm		96x96 mm	Supply voltage	
standard	1	1	2	2 QC+Q	4R	–	E5AR-Q4B	AC100-240	or DC/AC 24
standard	1	1	2	2 QC+Q	4R	RS-485	E5AR-Q43B-FLK	AC100-240	–
standard	1	1	6	2 QC+Q	4R	RS-485	E5AR-Q43DB-FLK	AC100-240	–
standard	1	1	6	4 QC+Q+C+C	4R	RS-485	E5AR-QC43DB-FLK	AC100-240	or DC/AC 24
standard	max 2	2	4	2 QC+Q	4R	RS-485	E5AR-Q43DW-FLK	AC100-240	–
standard	max 2	2	4	4 QC+Q+QC+Q	4R	RS-485	E5AR-QQ43DW-FLK	AC100-240	or DC/AC 24
standard	max 4	4	4	4 QC+Q+QC+Q	4R	RS-485	E5AR-QQ43DWW-FLK	AC100-240	–
standard	1	1	2	2 C+C	4R	–	E5AR-C4B	AC100-240	or DC/AC 24
standard	1	1	2	2 C+C	4R	RS-485	E5AR-C43B-FLK	AC100-240	–
standard	1	1	6	2 C+C	4R	RS-485	E5AR-C43DB-FLK	AC100-240	–
standard	max 2	2	4	2 C+C	4R	RS-485	E5AR-C43DW-FLK	AC100-240	–
standard	max 4	4	4	4 C+C+C+C	4R	RS-485	E5AR-CC43DWW-FLK	AC100-240	or DC/AC 24
valve	1	1 + pot	4	2 R+R	4R	–	E5AR-PR4DF	AC100-240	or DC/AC 24
valve	1	1 + pot	4	4 R+R+QC+Q	4R	RS-485	E5AR-PRQ43DF-FLK	AC100-240	or DC/AC 24
standard	1	1	2	2 QC+Q	4R	DeviceNet	E5AR-Q4B-DRT	AC100-240	or DC/AC 24
standard	1	1	2	4 QC+Q+C+C	4R	DeviceNet	E5AR-QC4B-DRT	AC100-240	or DC/AC 24
standard	max 2	2	–	4 QC+Q+QC+Q	4R	DeviceNet	E5AR-QQ4W-DRT	AC100-240	or DC/AC 24
standard	1	1	2	2 C+C	4R	DeviceNet	E5AR-C4B-DRT	AC100-240	or DC/AC 24
standard	max 4	4	–	4 C+C+C+C	4R	DeviceNet	E5AR-CC4WW-DRT	AC100-240	or DC/AC 24
valve	1	1 + pot	–	2 R+R	4R	DeviceNet	E5AR-PR4F-DRT	AC100-240	or DC/AC 24
valve	1	1 + pot	–	4 R+R+QC+Q	4R	DeviceNet	E5AR-PRQ4F-DRT	AC100-240	or DC/AC 24
SV programmer	1	1	2	2 QC+Q	4R	–	E5AR-TQ4B	AC100-240	or DC/AC 24
SV programmer	1	1	2	2 C+C	4R	–	E5AR-TC4B	AC100-240	or DC/AC 24
SV programmer	1	1	2	2 QC+Q	4R	RS-485	E5AR-TQ43B-FLK	AC100-240	–
SV programmer	1	1	2	2 C+C	4R	RS-485	E5AR-TC43B-FLK	AC100-240	–
SV programmer	1	1	10	2 QC+Q	10T	RS-485	E5AR-TQE3MB-FLK	AC100-240	–
SV programmer	1	1	10	2 C+C	10T	RS-485	E5AR-TCE3MB-FLK	AC100-240	–
SV programmer	1	1	10	4 QC+Q+C+C	10T	RS-485	E5AR-TQCE3MB-FLK	AC100-240	or DC/AC 24
SV programmer	max 2	2	4	2 QC+Q	4R	RS-485	E5AR-TQ43DW-FLK	AC100-240	–
SV programmer	max 2	2	4	2 C+C	4R	RS-485	E5AR-TC43DW-FLK	AC100-240	–
SV programmer	max 2	2	8	4 QC+Q+QC+Q	10T	RS-485	E5AR-TQQE3MW-FLK	AC100-240	or DC/AC 24
SV programmer	max 4	4	8	4 C+C+C+C	10T	RS-485	E5AR-TCCE3MWW-FLK	AC100-240	or DC/AC 24
SV programmer	max 4	4	8	4 QC+Q+QC+Q	10T	RS-485	E5AR-TQQE3MWW-FLK	AC100-240	–
SV programmer + valve	1	1 + pot	4	2 R+R	4R	–	E5AR-TPR4DF	AC100-240	or DC/AC 24
SV programmer + valve	1	1 + pot	8	4 R+R+QC+Q	10T	RS-485	E5AR-TPRQE3MF-FLK	AC100-240	or DC/AC 24

Note:- Voltage: Specify the power supply specifications (voltage) when ordering.

- Standard = heat and/or cool PID control, valve = valve positioning (relay up/down) (PRR)
- max 2 = 2 loops heat and/or cool or 1 loop cascade, ratio or remote SP
- max 4 = 4 loops heat and/or cool
- 1, 2 or 4 = number of analogue universal input 1 + pot = 1 universal and 1 slide wire feedback from valve
- QC = voltage (pulse) or current (switch), Q = voltage (pulse), C = current, 4R = 4 two pole relay, 2T = two transistor output NPN

Functions	Loops	Input		Output		Comms	Order code		
		analogue	Event	Control	Alarm		48x96 mm	Supply voltage	
standard	1	1	2	2 QC+Q	4R	–	E5ER-Q4B	AC100-240	or DC/AC 24
standard	1	1	2	2 QC+Q	4R	RS-485	E5ER-Q43B-FLK	AC100-240	–
standard	1	1	2	4 QC+Q+C+C	4R	RS-485	E5ER-QC43B-FLK	AC100-240	or DC/AC 24
standard	1	1	6	2 QC+Q	2T	RS-485	E5ER-QT3DB-FLK	AC100-240	–
standard	max 2	2	4	2 QC+Q	2T	RS-485	E5ER-QT3DW-FLK	AC100-240	or DC/AC 24
standard	1	1	2	2 C+C	4R	–	E5ER-C4B	AC100-240	or DC/AC 24
standard	1	1	2	2 C+C	4R	RS-485	E5ER-C43B-FLK	AC100-240	–
standard	1	1	6	2 C+C	2T	RS-485	E5ER-CT3DB-FLK	AC100-240	–
standard	max 2	2	4	2 C+C	2T	RS-485	E5ER-CT3DW-FLK	AC100-240	or DC/AC 24
valve	1	1 + pot	4	2 R+R	2T	–	E5ER-PRTDF	AC100-240	or DC/AC 24
valve	1	1 + pot	–	4 R+R+QC+Q	4R	RS-485	E5ER-PRQ43F-FLK	AC100-240	or DC/AC 24
standard	1	1	2	2 QC+Q	2T	DeviceNet	E5ER-QTB-DRT	AC100-240	or DC/AC 24
standard	max 2	2	–	2 QC+Q	2T	DeviceNet	E5ER-QTW-DRT	AC100-240	or DC/AC 24
standard	1	1	2	2 C+C	2T	DeviceNet	E5ER-CTB-DRT	AC100-240	or DC/AC 24
standard	max 2	2	–	2 C+C	2T	DeviceNet	E5ER-CTW-DRT	AC100-240	or DC/AC 24
valve	1	1 + pot	–	2 R+R	2T	DeviceNet	E5ER-PRTF-DRT	AC100-240	or DC/AC 24
SV programmer	1	1	2	2 QC+Q	4R	–	E5ER-TQ4B	AC100-240	or DC/AC 24
SV programmer	1	1	2	2 C+C	4R	–	E5ER-TC4B	AC100-240	or DC/AC 24
SV programmer	1	1	2	2 QC+Q	4R	RS-485	E5ER-TQC43B-FLK	AC100-240	or DC/AC 24
SV programmer	max 2	2	4	2 QC+Q	2T	RS-485	E5ER-TQT3DW-FLK	AC100-240	or DC/AC 24
SV programmer	max 2	2	4	2 C+C	2T	RS-485	E5ER-TCT3DW-FLK	AC100-240	or DC/AC 24
SV programmer + valve	1	1 + pot	4	2 R+R	2T	–	E5ER-TPRTDF	AC100-240	or DC/AC 24
SV programmer + valve	1	1 + pot	–	3 R+R + QC	4R	RS-485	E5ER-TPRQ43F-FLK	AC100-240	or DC/AC 24

Note:- Voltage: Specify the power supply specifications (voltage) when ordering.

- **Standard = heat and/or cool PID control, valve = valve positioning (relay up/down) (PRR)**
- max 2 = 2 loops heat and/or cool or 1 loop cascade, ratio or remote SP
- max 4 = 4 loops heat and/or cool
- 1, 2 or 4 = number of analogue universal input 1 + pot = 1 universal and 1 slide wire feedback from valve
- QC = voltage (pulse) or current (switch), Q = voltage (pulse), C = current, 4R = 4 two pole relay, 2T = two transistor output NPN

Accessories

Terminal covers	Order code
Terminal cover for E5AR	E53-COV14
Terminal cover for E5ER	E53-COV15

E5_R/E5_R-T optional tools

Option	Order code
PC based configuration and tuning software CX-Thermo	EST2-2C-MV4

Specifications

Thermocouple input type	K, J, T, E, L, U, N, R, S, B, W
RTD input type	Pt100
Linear input type	mA, V
Control mode	2-PID or ON/OFF control
Accuracy	±0.1% FS
Auto-tuning	yes
RS-485	optional
Event input	optional
Ambient temperature	-10 to 55°C
IP rating front panel	IP66
Sampling period	50 ms
Size in mm (HxWxD)	E5ER: 96x48x110 E5AR: 96x96x110



Omron's intelligent PROFIBUS and CompoWay/F gateway

This gateway supports all CompoWay/F equipped products, including temperature controllers, digital panel indicators, etc. It can also be used for connecting MCW151-E and E5_K series.

- Cost-effectively integrates basic instruments into a PROFIBUS network
- Requires no complex protocol conversion writing
- Has function blocks for drag-and-drop configuration
- Connects up to 15 instruments to a single PROFIBUS point

Ordering information

Name	Order code
PROFIBUS remote terminal serial communications unit	PRT1-SCU11

Supports all CompoWay/F equipped units, but has "drag-and-drop" function blocks for

- E5AN/E5EN/E5CN/E5GN
- E5ZN and CelciuX° (EJ1)
- E5AR/E5ER
- E5AK/E5EK
- R88-MCW151-E
- F7 varispeed drives
- V1000 inverters

Specifications

Storage temperature	-20 to +75°C
Ambient temperature	0 to 55°C
Ambient humidity	10 to 90% (non-condensing)
EMC compliance	EN 50081-2, EN 61131-2
Power supply	+24 VDC (+10%/-15%) Current consumption 80 mA (typical)
Weight	125 g (typical)
Communication interface	RS-485 based PROFIBUS-DP RS-422A Host link RS-485 CompoWay/F RS-232C Peripheral Port supporting connection to thermotools
Size in mm (HxWxD)	90x40x65

ES1B

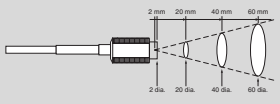


Achieve low-cost measurements with an infrared thermosensor

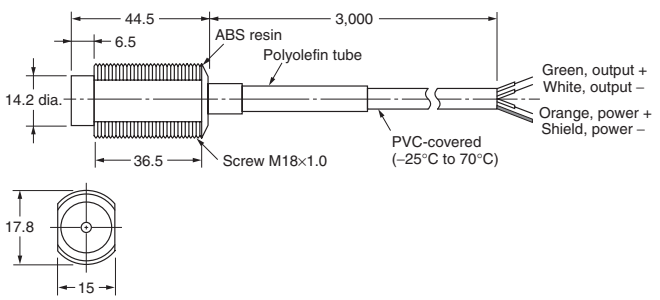
This infrared thermosensor provides an accurate, stable and cost-effective way to measure the temperature of objects. It behaves just like a standard K-type thermocouple, which enables it to operate with any temperature controller or alarm unit.

- Cost-effective infrared thermosensor
- Contactless, meaning no deterioration, unlike thermocouples
- 4 temperature ranges available: 10-70°C, 60-120°C, 115-165°C and 140-260°C
- Response speed 300 ms

Ordering information

Appearance and sensing characteristics	Specification	Order code
	10 to 70°C	ES1B 10-70C
	60 to 120°C	ES1B 60-120C
	115 to 165°C	ES1B 115-165C
	140 to 260°C	ES1B 140-260C

Dimensions (unit: mm)



Specifications

Power supply voltage		12/24 VDC
Current consumption		20 mA max.
Accuracy	**±5°C**	±2% PV or ±2°C, whichever is larger
	±10°C	±4% PV or ±4°C, whichever is larger
	±30°C	±6% PV or ±6°C, whichever is larger
	±40°C	±8% PV or ±8°C, whichever is larger
Reproducibility		±1% PV or ±1°C, whichever is larger
Temperature drift		0.4°C/°C max.
Receiver element		Thermopile
Response speed		Approximately 300 ms at response rate of 63%
Operating temperature		-25 to 70°C (with no icing or condensation)
Allowable ambient humidity		35 to 85%
Degree of protection		IP65
Size in mm		head: 17.8 dia.×44.5 (screw M18×1.0), cable 3,000



Achieve Superior Environmental Resistance and a Wide Measurement Range of 0 to 400°C.

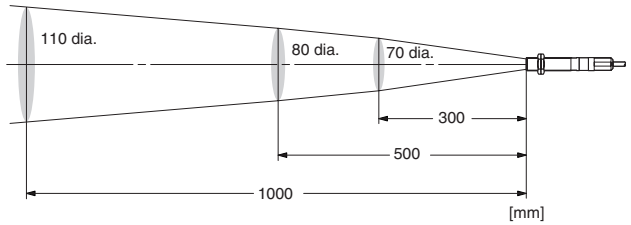
This gateway supports all CompoWay/F equipped products, including temperature controllers, digital panel indicators, etc. It can also be used for connecting MCW151-E and E5_K series.

- Flexible placement with slim cylindrical shape and long focus with a distance of 500 mm and area diameter of 80 mm.
- The SUS body and silicon lens resist ambient operating temperatures of up to 70×C and resist dust and water to the equivalent of IP67.
- Fast measurement with high-speed response of 100 ms/90%.
- Strong resistance to noise with output of 4 to 20 mA.

Ordering information

Specification (measuring temperature range)	Order code
0 to 400°C	ES1C-A40

Measurement Range

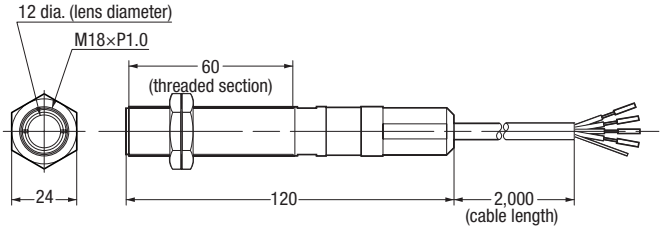


Note: The measurement range is the measurement diameter for an optical response of 90%. Make sure that the actual object to be measured is sufficiently larger than the measurement diameters in the above figure.

Ratings and Characteristics

Item / Model	ES1C
Power supply voltage	12 to 24 VDC
Operating voltage range	90% to 110% of rated voltage
Current consumption	70 mA max.
Measuring temperature range	0 to 400°C
Measurement accuracy	0 to 200°C: ±2°C, 201 to 400°C: ±1% (emissivity: 0.95)
Response time	100 ms/90%
Reproducibility	±1°C of reading value
Measurement wavelength	8 to 14 μm
Light-receiving element	Thermopile
Emissivity	0.95 fixed
Current output	4 to 20 mA DC, Load: 250 Ω max.
Ambient temperature range	Operating: 0 to 70°C, Storage: –20 to 70°C (with no icing or condensation)
Ambient humidity range	Operating and storage: 35% to 85%
Vibration resistance (destruction)	1.5-mm amplitude at 10 to 55 Hz for 2 hours each in the X, Y, and Z directions
Weight	180 g
Degree of protection	Equivalent to IP67

Dimensions (unit: mm)

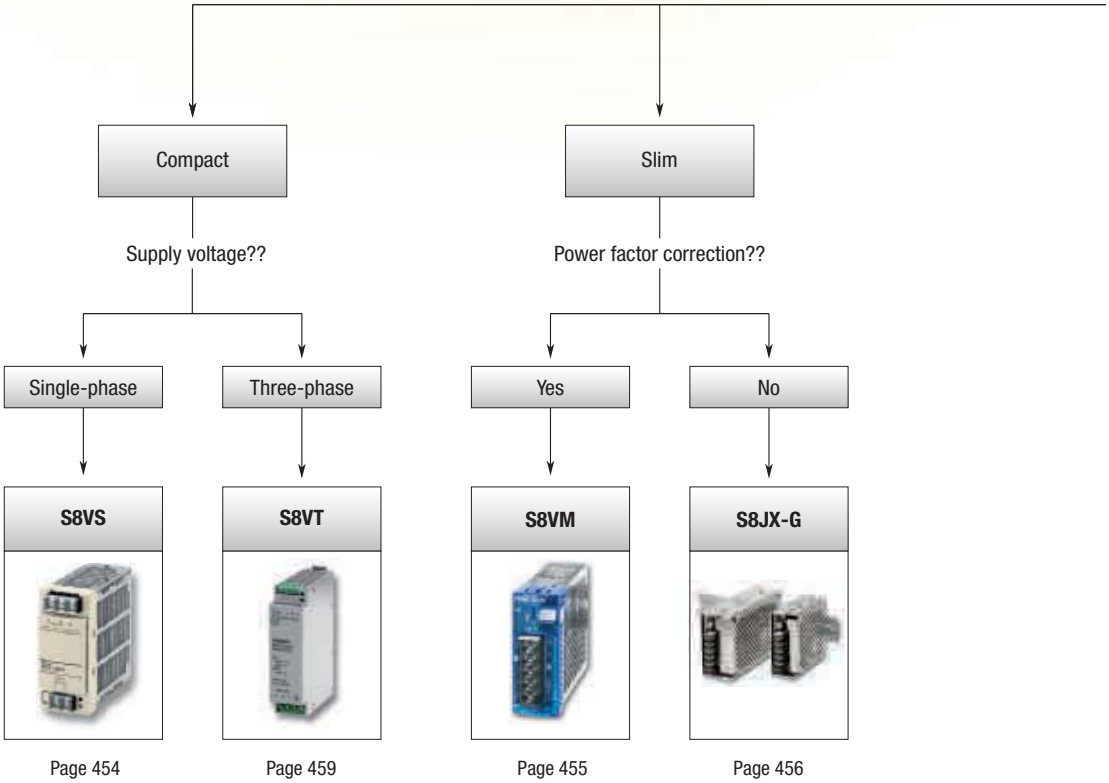


PREVENT YOUR SYSTEM FROM STOPPING

S8TS-DCBU-02 – Buffer block against momentary power failures

The buffer block prevents equipment stoppage, data loss and other problems resulting from momentary power failures. One S8TS-DCBU-02 buffer block provides a back-up time of 500 ms at an output current of 2.5 A. Can be wired to the 24 VDC output from any switch mode power supply

- Connects to both single-phase and three-phase 24 VDC power supplies
- Connects to an S8TS power supply via an S8T-BUS03 bus line connector
- Parallel connection up to 4 units to increase back-up time and capacity





Which type of power supply you are looking for?

- Modular → **S8TS**  Page 457
- DC back-up
  - S8TS DC battery back-up up to several minutes → **S8T-DCBU-01**  Page 458
  - S8TS buffer block momentary up to 500 ms → **S8T-DCBU-02**  Page 458

	Category	Compact Power Supplies		Slim Power Supplies						Modular		
Selection criteria												
	Model	S8VS	S8VT	S8VM		S8JX-G				S8TS		
	Phases	Single-phase										
	Rated voltage	100 to 240 VAC										
	Voltage	24 V	24 V	12 V	24 V	5 V	12 V	15 V	24 V	5 V	12 V	24 V
Power	3 W	–	–	–	–	–	–	–	–	–	–	–
	7.5 W	–	–	–	–	–	–	–	–	–	–	–
	10 W	–	–	–	–	–	–	–	–	–	–	–
	15 W	0.65 A	–	■ 1.3 A	■ 0.65 A	■ 3 A	■ 1.3 A	■ 1 A	■ 0.65 A	–	–	–
	25 W	–	–	–	–	–	–	–	–	■ 5 A	–	–
	30 W	1.3 A	–	■ 2.5 A	■ 1.3 A	–	–	–	–	–	■ 2.5 A	–
	35 W					■ 7 A	■ 3 A	■ 2.4 A	■ 1.5 A	–	■ 2.5 A	–
	50 W	–	–	■ 4.3 A	■ 2.2 A	■ 10 A	■ 4.2 A	–	■ 2.1 A	–	–	–
	60 W	■ 2.5 A	–	–	–	–	–	–	–	–	■ 5 A	■ 2.5 A
	90 W	–	–	–	–	–	–	–	–	–	■ 7.5 A	–
	100 W	–	–	■ 8.5 A	■ 4.5 A	■ 20 A	■ 8.5 A	–	■ 4.5 A	–	–	–
	120 W	■ 5 A	■ 5 A	–	–	–	–	–	–	–	■ 10 A	■ 5 A
	150 W	–	–	■ 12.5 A	■ 6.5 A	–	–	–	■ 6.5 A	–	–	–
	180 W	–	–	–	–	–	–	–	–	–	–	■ 7.5 A
	240 W	■ 10 A	■ 10 A	–	–	–	–	–	–	–	–	■ 10 A
	300 W	–	–	■ 27 A	■ 14 A	–	–	–	■ 14 A	–	–	–
	480 W	■ 20 A	■ 20 A	–	–	–	–	–	–	–	–	–
	600 W	–	–	■ 53 A	■ 27 A	–	–	–	■ 27 A	–	–	–
	960 W	–	■ 40 A	–	–	–	–	–	–	–	–	–
	1500 W	–	–	–	■ 70 A	–	–	–	–	–	–	–
Features	Conforms to EN61000-3-2	■ with PFC	■	■	■	–	–	–	–	■ with PFC	■ with PFC	■ with PFC
	DC back-up	–	–	–	–	–	–	–	–	□	□	□
	Capacitor back-up	□	□	–	–	–	–	–	–	–	–	□
	Undervoltage alarm	■	–	–	■	–	–	–	–	■	■	■
	Overvoltage protection	■	■	■	■	■	■	■	■	■	■	■
	Overload protection	■	■	■	■	■	■	■	■	■	■	■
	DIN-rail mounting	■	■	■	■	■	■	■	■	■	■	■
	Screw mounting (with bracket)	–	□ only 40 A	■	■	■	■	■	■	–	–	–
	EMI Class B	–	–	■	■	–	–	–	–	■	■	■
	UL Class 2	■ only 60 W	–	–	–	–	–	–	–	■	■	■
	N+1 redundancy	–	–	–	–	–	–	–	–	■	■	■
	Parallel operation	–	■	–	–	–	–	–	–	■	■	■
	Series operation	■	■	■	■	■	■	■	■	■	■	■
	Page	454	459	455		456				457		

■ Standard □ Available – No/not available



Compact power supply

The S8VS is our standard industrial din-rail mounted power supply. It is built to last forever. Up to 60 W we provide them into a plastic housing, from 120 W the S8VS is built in strong metal case. The full ranges provide a very good dimension/output power ratio to optimize panel space uses. The range covers 6 models at 24 VDC with wattage of 15, 30, 60, 120, 240 and 480 W. The 15 and 30 W are also available in 5 or 12 VDC output voltage. The range withstands high vibration and shocks. The S8VS are fan-less power supplies.

- Wide AC input range from 85 to 264 VAC
- Micro S8VS output power range 15 and 30 W at 5, 12 and 24 VDC
- Micro can mounted, standard din-rail, horizontal or facing horizontal any direction is okay
- S8VS models available from 60 to 480 W at 24 VDC, 4 models

Ordering information

Power	Output voltage	Output current	Under-voltage control	Size in mm (HxWxD)	Order code
15 W	5 VDC	2 A (10 W)	yes, red LED	85x22.5x96.4	S8VS-01505
	12 VDC	1.2 A			S8VS-01512
	24 VDC	0.65 A			S8VS-01524
30 W	5 VDC	4 A (20 W)	yes, red LED	85x22.5x96.4	S8VS-03005
	12 VDC	2.5 A			S8VS-03012
	24 VDC	1.3 A			S8VS-03024
60 W	24 VDC	2.5 A	no	95x40x108.3	S8VS-06024
120 W	24 VDC	5 A	no	115x50x121.3	S8VS-12024
240 W	24 VDC	10 A	no	115x100x125.3	S8VS-24024
480 W	24 VDC	20 A	no	115x150x127.2	S8VS-48024

Specifications

Specification		15 W	30 W	60 W	120 W	240 W	480 W
Efficiency		77% min. (24 V)	80% min. (24 V)	78% min.	80% min.	80% min.	83% min.
Power factor		–	–	–	0.95 min.	0.95 min.	0.95 min.
Input voltage		100 to 240 VAC (85 to 264 VAC), single-phase					
Output voltage	Voltage adjustment	±10 to ±15% (with V. ADJ) min.					
	Ripple	2% p-p max. (at rated input/output voltage)					
	Input variation	0.5% max. (at 85 to 264 VAC input, 100% load)					
	Temperature influence	0.05%/°C max.					
Overload protection		105 to 160% of rated load current, voltage drop, automatic reset					
Overvoltage protection		yes	yes	yes	yes	yes	yes
Input current	100 V	0.45 A max.	0.9 A max.	1.7 A max.	1.9 A max.	3.8 A max.	7.4 A max.
	200 V	0.25 A max.	0.6 A max.	1.0 A max.	1.1 A max.	2.0 A max.	3.9 A max.
	230 V	0.19 A (5 V: 0.14 A)	0.37 A (5 V: 0.27 A)	0.7 A typ.	0.6 A typ.	1.2 A typ.	2.4 A typ.
Output indicator		yes (green)	yes (green)	yes (green)	yes (green)	yes (green)	yes (green) LED
Weight		160 g	180 g	330 g	550 g	1,150 g	1,700 g max.
Operating temperature		-10 to 60°C	-10 to 60°C *1	-10 to 60°C, derating beyond 40°C, no icing or condensation			
Series operation		yes (24 V only)	yes	yes	yes	yes	yes

*1 For 30 W model 24 V: No derating, 12 & 5 V: Derating beyond 50°C.



Slim size S8VM power supplies

All models have the same height of only 84.5 mm. These ranges cover up-to 1,500 W. The output voltages are 5, 12, 15 or 24 VDC. In this series we have standard types and versions with two alarms up-to 150 W models: one for short dip in the 24 VDC supply, second one when the voltage gradually drops in time. The models form 300 W/600 W/1,500 W are equipped with an overload alarm function.

- Widest range in DC-output voltage (5 V, 12 V, 15 V & 24 V) & wattage (15 up-to 1,500 W)
- LED indication power ON
- Transistor output & LED indication under-voltage alarm 1 & 2 or Power failure
- All models can be Din-rail mounted (except 1,500W)
- EMI Class B, UL Class 1 division 2, SEMI-F47 (200VAC input)

Ordering information

Power ratings	Output voltage	Output current	Size in mm (HxWXD)	Order code		
				DIN-rail mounting	Undervoltage alarm type	
					Sinking (NPN)	Sourcing (PNP)
15 W	12 V	1.3 A	84.5x35.1x94.4	S8VM-01512CD	–	–
	24 V	0.65 A		S8VM-01524CD	S8VM-01524AD *1	
30 W	12 V	2.5 A	84.5x35.1x109.4	S8VM-03012CD	–	–
	24 V	1.3 A		S8VM-03024CD	S8VM-03024AD *1	
50 W	12 V	4.3 A	84.5x35.1x124.5	S8VM-05012CD	–	–
	24 V	2.2 A		S8VM-05024CD	S8VM-05024AD	S8VM-05024PD
100 W	12 V	8.5 A	84.5x36.6x164.5	S8VM-10012CD	–	–
	24 V	4.5 A		S8VM-10024CD	S8VM-10024AD	S8VM-10024PD
150 W	12 V	12.5 A	84.5x45.6x164.5	S8VM-15012CD	–	–
	24 V	6.5 A		S8VM-15024CD	S8VM-15024AD	S8VM-15024PD
Power ratings	**Output voltage**	**Output current**	**Size in mm (HxWXD)**	**Bottom mounting**	**DIN-rail adaptor**	**Power failure output**
300 W	12 V	27 A	84.5x62.5x188	S8VM-30012C	S82Y-VM30D	overload, overvoltage and overheat
	24 V	14 A		S8VM-30024C		
600 W	12 V	53 A	84.5x101.8x192	S8VM-60012C	S82Y-VM60D	
	24 V	27 A		S8VM-60024C		–
1,500 W	24 V	70 A	84.5x126.5x327	S8VM-15224C	–	–

*1 No output built-in.

Specifications

Item			15 W	30 W	50 W	100 W	150 W	300 W	600 W	1,500 W
Efficiency		12 V models	78% min.	79% min.	79% min.	81% min.	81% min.	78% min.	79% min.	–
		24 V models	80% min.	81% min.	80% min.	82% min.	83% min.	81% min.	81% min.	82% min.
Input voltage			100 to 240 VAC, (85 to 264 VAC), single phase							
Output	Voltage adjustment		-20% to 20% with V. ADJ min. (S8VM-_ _ _ 24A_ /P_: -10% to 20%)							
	Ripple	12 V models	1.5% (p-p) max.		1.5% (p-p) max.			2.0% (p-p) max.		–
		24 V models	1.0% (p-p) max.		0.75% (p-p) max.			1.25% (p-p) max.		1.25% (p-p) max.
	Input variation		0.4% max.							
	Temperature influence		0.02%/°C max.							
Overload protection			105% to 160% of rated load current, voltage drop, automatic reset							
Overvoltage protection			yes							
Output indicator			yes (green)							
Weight			180 g max.	220 g max.	290 g max.	460 g max.	530 g max.	1,100 g max.	1,700 g max.	3,800 g max.
Series operation			yes							
Remote sensing function			no	no	no	yes				



Slim & economic power supply

The S8JX-G is Omron's cost effective power supply delivering Omron's quality and reliability. The range of this Power Supply covers up to 600 W, the output voltages are 5, 12 or 24 VDC. The low profile and multiple mounting options help you reduce panel space. With a minimum life expectancy of 10 years and protection against over-voltage, over-current and short circuiting, the S8JX-G is as reliable as you may expect from Omron.

- Wide range in DC-output voltage (5 V, 12 V, 15 V & 24 V) & wattage (15 to 600 W)
- LED indication power ON
- Over-voltage, over-current, and short circuit protection
- Vibration resistance 4,5 g
- All models can be DIN-rail mounted
- Approvals: UL, cUL, UL508 Listed, CE, SEMI F47, VDE

Ordering information

Power	Output voltage	Output current	Size in mm (HxWxD)	Order code
15 W	5 V	3 A	91x40x90	S8JX-G01505CD
	12 V	1.3 A		S8JX-G01512CD
	15 V	1 A		S8JX-G01515CD
	24 V	0.65 A		S8JX-G01524CD
35 W	5 V	7 A	91x40x90	S8JX-G03505CD
	12 V	3 A		S8JX-G03512CD
	15 V	2.4 A		S8JX-G03515CD
	24 V	1.5 A		S8JX-G03524CD
50 W	5 V	10 A	92x40x100	S8JX-G05005CD
	12 V	4.2 A		S8JX-G05012CD
	24 V	2.1 A		S8JX-G05024CD
100 W	5 V	20 A	92x50x150	S8JX-G10005CD
	12 V	8.5 A		S8JX-G10012CD
	24 V	4.5 A		S8JX-G10024CD
150 W	24 V	6.5 A	92x50x150	S8JX-G15024CD
300 W	24 V	14 A	92x110x167	S8JX-G30024CD
600 W	24 V	27 A	92x150x160	S8JX-G60024C*1

*1 Additional accessory is required for DIN-rail mounting.

Specifications

Item		15 W	35 W	50 W	100 W	150 W	300 W	600 W
Efficiency	100 to 240 V input	68% min.	73% min.	76% min.	76% min.	86% min.	–	–
	100/200 V (Selected)	–	–	–	–	–	82% min.	80% min.
Input voltage		100 to 240 VAC (85 to 264 VAC) 100 to 370 VDC Note: This range is not applicable for the safety standards.					100 to 120 VAC (85 to 132 VAC) 200 to 240 VAC (170 to 264 VAC) (Switchable)	
Output	Voltage adjustment	-10% to 15% (with V. ADJ)						
	Ripple	2% (p-p) max.						
	Input variation	0.4% max.						
	Temperature influence	0.05%/°C max. (at rated input and output)					0.05%/°C max.	
Overload protection		105% to 160% of rated load current, voltage drop, intermittent, automatic reset					105% of rated load current, voltage drop, intermittent, automatic reset	105% of rated load current, Inverted L voltage drop, the circuit will be shut OFF when the overload exceeds 5 s.
Overvoltage protection		yes						
Output indicator		yes (green)						
Weight		250 g max.	250 g max.	300 g max.	550 g max.	600 g max.	1,600 g max.	2,500 g max.
Series operation		yes (For up to two Power Supplies; external diodes required.)						



Industrial use, modular power supply for multiple configurations

The S8TS is an expandable power supply; standard units can easily be snapped together in parallel to provide you with ultimate flexibility. Expandable up to 4 units, it can deliver a total power of 240W at 24VDC or a multi-output configuration.

- Improves system reliability by building up N+1 redundancy
- Standard unit; 60 W at 24 VDC, 30 W at 12 VDC and 25 W at 5 VDC
- Battery back-up unit protects against power outage (see accessories)
- Buffer unit protects against power glitches and outage (see accessories)
- EMI Class B, UL Class 2, UL Class 1 division 2

Ordering information

Basic block		Order code			
Output voltage	Output current	Screw terminal type		Connector terminal type	
		With bus line connectors*1	Without bus line connectors*2	With bus line connectors*1	Without bus line connectors*2
24 V	2.5 A	S8TS-06024-E1*3	S8TS-06024	S8TS-06024F-E1	S8TS-06024F
12 V	2.5 A	S8TS-03012-E1	S8TS-03012	S8TS-03012F-E1	S8TS-03012F
5 V	5 A	–	S8TS-02505	–	S8TS-02505F

*1 One S8T-BUS01 connector and one S8T-BUS02 connector are included as accessories.
*2 Bus line connectors can be ordered separately if necessary.
*3 Conforms to EMI class B with DC minus terminal ground.

Accessories

Bus line connector		
Type	Number of connectors	Order code
AC line + DC line bus (For parallel operation)	1 connector	S8T-BUS01
	10 connectors*1	S8T-BUS11
AC line bus (For series operation or isolated operation)	1 connector	S8T-BUS02
	10 connectors*2	S8T-BUS12

*1 One package contains 10 S8T-BUS01 connectors.
*2 One package contains 10 S8T-BUS02 connectors.

Specifications

Item		5 V models	24/12 V models	
		Single operation	Single operation	Parallel operation
Efficiency		62% min.	24 V models: 75%, 12 V models: 70% min.	
Power factor		0.8 min.	24 V models: 0.9 min., 12 V models: 0.8 min.	
Input voltage		100 to 240 VAC, (85 to 264 VAC), single-phase		
Output voltage	Voltage adjustment	5 V ±10% min.	24 V models: 22 to 28 V, 12 V models: 12 V ±10% min.	
	Ripple	2% (p-p) max.	2% (p-p) max.	2% (p-p) max.
	Input variation	0.5% max.	–	–
	Temperature influence	0.05%/°C max. (with rated input, 10 to 100% load)		
Overcurrent protection		105 to 125% of rated load current, inverted L drop, automatic reset		
Overvoltage protection		yes	yes	yes
Output indicator		yes (green)	yes (green)	yes (green)
Weight		450 g max.	450 g max.	450 g max.
Series operation		yes	yes	yes
Parallel operation		no	yes	yes
Size in mm (HxWxD)		120x43x120		



S8T-DCBU-01

The S8T-DCBU-01 battery backup block supplies 24 VDC for a fixed period of time during AC input outages to considerably improve system reliability.

- Supplies 24 VDC for a long period of time during AC input outages
- For system reliability improvement
- Block power supply basic block is connected by the bus line connector
- Simple system configuration
- Alarms indicated on main unit and via alarm signal output

Ordering information

Product	Input voltage	Output voltage	Output current			Order code
DC back-up block	24 to 28 VDC	24 V	3.7 A/8 A			S8T-DCBU-01
Battery holder	–	–	–			S82Y-TS01
Product	**Input voltage**	**Output voltage**	**Output current**	**Type**		**Order code**
Basic block (use together with the DC back-up block)	100 to 240 VAC	24 V	2.5 A	Screw terminal type	With bus line connectors	S8TS-06024-E1
					Without bus line connectors	S8TS-06024
				Connector terminal type	With bus line connectors	S8TS-06024F-E1
					Without bus line connectors	S8TS-06024F
Product	**Back-up time**	**Overcurrent protection operating point selector**				**Order code**
Battery	8 min./3.7 A	5.7 A (typ.)	–			LC-R122R2PG
	4 min./8.0 A	5.7 A (typ.)	11.7 A (typ.)			LC-R123R4PG

Note: The S8TS DC back-up block is for S8TS power supplies only.

Specifications

Item	Size in mm (HxWxD)
S8T-DCBU-01	120x43x130
Battery holder	82x185.7x222.25



S8T-DCBU-02

Prevents equipment stoppage, data loss and other problems resulting from momentary power failures. One S8T-DCBU-02 buffer block provides a back-up time of 500 ms at an output current of 2.5 A. Can be wired to the 24 VDC output from any switch mode power supply.

- Connects to all Omron power supplies: S8TS, S8VS, S82J, S82K, S8VM, S8PE
- Connects to both single-phase and three-phase power supplies
- Connects to an S8TS power supply via an S8T-BUS03 bus line connector
- Parallel connection up to 4 units to increase back-up time and capacity
- Complies with Semi F47-0200 standard

Ordering information

Input voltage	Output voltage (during back-up operation)	Output current	Order code
24 VDC (24 to 28 VDC)	22.5 V	2.5 A	S8T-DCBU-02

Accessories

Type	Number of connectors	Order code
DC bus line connector (for use with S8TS only)	1 connector	S8T-BUS03
	10 connectors	S8T-BUS13

Specifications

Item	Size in mm(HxWxD)
S8T-DCBU-02	120x43x120



Compact 3-phase input power supply

To make the compact power supply range complete we have our 3-phase S8VT series, which give you the best power to footprint ratio. The range exists of 4 models with wattage of 120, 240, 480 and 960 W all at 24 VDC. This version is constructed from a very robust metal housing and all models are din-rail mounting. The input range cover 3 phase voltage input from 340 to 576 VAC and single phase DC input from 480 to 810 VDC.

- 5, 10, 20 and 40A; 24VDC output
- 3-phase input (340-576VAC) or 1-phase 480 to 810 VDC
- Compact design with best footprint on the market
- UL60950 (CSA22.2-60950), UL508 listing (CSA22.2-14) and CE
- Parallel & serial operation possible (all models)

Ordering information

Power ratings	Output voltage	Output current	Size in mm (HxWxD)	Order code
120 W	24 V	5 A	125x45x130	S8VT-F12024E
240 W	24 V	10 A	170x45x130	S8VT-F24024E
480 W	24 V	20 A	170x100x130	S8VT-F48024E
960 W	24 V	40 A	170x195x130	S8VT-F96024E

Specifications

Item		5 A	10 A	20 A	40 A
Efficiency		88%	90%	91%	91%
Voltage range		340 to 576 VAC 3 AC resp, 480 to 810 VDC (1 phase)			
Output voltage	Voltage adjustment	22.5 to 26.4 VDC min.			
	Ripple	100 mV max.			
	Input variation	±0.5% max.			
	Temperature influence	Less than 0.05%/°C			
Overload protection		yes			
Overvoltage protection		yes			
Output indicator		yes (green)			
Weight		750 g	1.0 kg	1.8 kg	3.3 kg
Series operation		yes (for 2 units)			
Parallel operation		yes (for 2 units)			

WHEN TIMING ACCURACY MATTERS!

H5CX – The most complete digital timer

The H5CX series offers multiple-functions and -timing ranges for precise timing control, as well as real twin-timing and memory function. These and other added-value features ensure that the H5CX covers almost every possible user requirement in timers.

- 15 different time functions
- Three colour display value, red, orange or green
- Models with instantaneous contact outputs
- 0.001 s to 9999 h, 10 ranges

Motor timer

H2C



Page 469



Which type of timer is needed?

- **Analogue**
  - Which mounting method is required?
    - DIN-rail
      - Which size is required?
        - 17.5 mm → **H3DS**  Page 464
        - 22.5 mm → **H3DE**  Page 465
    - Plug/front
      - **H3YN**  Page 466
      - **H3CR**  Page 467
- **Digital**
  - Which size is required?
    - 48x24 mm → **H8GN timer/counter**  Page 477
    - 48x48 mm → **H5CX**  Page 468

Selection table

	Category		Analogue solid state timer										
Selection criteria													
	Model		H3DS-M	H3DS-S	H3DS-A	H3DS-F	H3DS-G	H3DS-X	H3DE-M	H3DE-S	H3DE-F	H3DE-G	H3DE-H
	Mounting		DIN-rail										
	Size		17.5 mm						22.5 mm				
	Type		Multi-functional			Twin timer	Star-delta	Two-wired	Multi-functional		Twin timer	Star-delta	Power OFF-delay
Contact configuration	Time limit		■	■	■	■	■	■	■	■	■	■	■
	Instantaneous		–	–	–	–	–	–	■	■	–	–	–
	Programmable contacts		–	–	–	–	–	–	■	■	–	–	–
	14 pins		–	–	–	–	–	–	–	–	–	–	–
	11 pins		–	–	–	–	–	–	–	–	–	–	–
	8 pins		–	–	–	–	–	–	–	–	–	–	–
	Screw terminals		■	■	■	■	■	■	■	■	■	■	■
	Screw-less clamp terminals		□	□	□	□	□	□	–	–	–	–	–
	Screw-less clamp sockets		–	–	–	–	–	–	–	–	–	–	–
Inputs	Voltage input		□	□	□	–	–	–	□	□	–	–	–
Outputs	Transistor		–	–	–	–	–	–	–	–	–	–	–
	Relay		■	■	■	■	■	–	■	■	■	■	■
	SCR		–	–	–	–	–	■	–	–	–	–	–
	Relay output type	SPDT	■	■	■	■	–	–	□	■	■	■ (2x)	■
		SPST-NO	–	–	–	–	■ (2x)	–	–	–	–	–	–
		DPDT	–	–	–	–	–	–	□	■	–	–	–
		4PDT	–	–	–	–	–	–	–	–	–	–	–
Features	Time range	Total time range	0.1 s to 120 h	1 s to 120 h	2 s to 120 h	0.1 s to 12 h	1 s to 120 s	0.1 s to 120 h	0.1 s to 120 h	0.1 s to 120 h	0.1 s to 12 h	1 s to 120 s	0.1 s to 120 s
		Number of sub ranges	7	7	7	6	2	7	8	8	8	2	2 (model dependent)
	Supply voltage		24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 12 VDC	24 to 230 VAC/DC	24 to 230 VAC/ DC	24 to 230 VAC/ DC	100 to 120 VAC, 200 to 230 VAC, 24 VAC/DC, 48 VAC/DC
	Number of operating modes		8	4	1	2	1	1	8	4	1	1	1
Functions	ON-delay		■	■	–	–	–	■	■	■	–	–	–
	Flicker OFF start		■	–	–	■	–	–	■	–	■	–	–
	Flicker ON start		■	■	–	■	–	–	■	■	■	–	–
	Signal ON-/OFF-delay		■	–	–	–	–	–	■	–	–	–	–
	Signal OFF-delay		■	–	–	–	–	–	■	–	–	–	■
	Interval (signal or power start)		■	■	–	–	–	–	■	■	–	–	–
	One-shot output (ON-delay)		■	■	–	–	–	–	■	■	–	–	–
	ON-delay (fixed)		–	–	■	–	–	–	–	–	–	■	–
	Independent ON/OFF time setting		–	–	–	–	–	–	–	–	–	–	–
	Star-delta		–	–	–	–	■	–	–	–	–	–	–
Re-marks	Transistor		–	–	–	–	–	■	–	–	–	–	–
	Page		464						465				

OMRON

	Category		Analogue solid state timer					Digital timer		Motor timer
Selection criteria										
	Model		H3YN	H3CR-A	H3CR-F	H3CR-G	H3CR-H	H5CX	H8GN	H2C
	Mounting		Socket/on panel							
	Size		21.5 mm	1/16 DIN					1/32 DIN	1/16 DIN
	Type		Miniature	Multi-functional	Twin timer	Star-delta	Power OFF-delay	Multi-functional	Preset counter/ timer	Motor timer
Contact configuration	Time limit		■	■	■	■	■	■	■	■
	Instantaneous		–	■	–	■	■	■	–	■
	Programmable contacts		–	–	–	–	–	■	■	–
	14 pins		■	–	–	–	–	–	–	–
	11 pins		–	□	□	□	□	□	–	□
	8 pins		■	□	□	□	□	□	–	□
	Screw terminals		–	–	–	–	–	□	■	□
	Screw-less clamp terminals		–	–	–	–	–	–	–	–
	Screw-less clamp sockets		□	–	–	–	–	–	–	–
Inputs	Voltage input		–	□	–	–	–	–	–	–
Outputs	Transistor		–	□	–	–	–	□	–	–
	Relay		■	□	■	■	■	□	■	■
	SCR		–	–	–	–	–	–	–	–
	Relay output type	SPDT	–	□	–	–	□	□	■	■
		SPST-NO	–	–	–	■ (2x)	–	–	–	–
		DPDT	□	□	■	–	□	–	–	–
		4PDT	□	–	–	–	–	–	–	–
Features	Time range	Total time range	0.1 s to 10 h (model dependent)	0.05 s to 300 h, 0.1 s to 600 h (model dependent)	0.05 s to 30 h or 1.2 s to 300 h (model dependent)	0.5 s to 120 s	0.05 s to 12 s, 1.2 s to 12 min	0.001 s to 9999 h (configurable)	0.000 s to 9999 h (configurable)	0.2 s to 30 h
		Number of sub ranges	2	9	14	4	4	10	9	15
	Supply voltage		24, 100 to 120, 200 to 230 VAC, 12, 24, 48, 100 to 110, 125 VDC	100 to 240 VAC, 100 to 125 VDC, 24 to 48 VAC, 12 to 48 VDC	100 to 240 VAC, 12 VDC, 24 VAC/DC, 48 to 125 VDC	100 to 120 VAC, 200 to 240 VAC	100 to 120 VAC, 200 to 240 VAC, 24 VAC/DC, 48 VDC, 100 to 125 VDC	100 to 240 VAC, 24 VAC, 12 to 24 VDC	24 VDC	24, 48, 100, 110, 115, 120, 200, 220, 240 VAC
	Number of operating modes		4	6 (model dependent)	–	1	1	15	6	2
Functions	ON-delay		■	□	–	–	–	■	■	■
	Flicker OFF start		■	□	■	–	–	■	■	–
	Flicker ON start		■	□	■	–	–	■	–	–
	Signal ON-/OFF-delay		–	□	–	–	–	■	–	–
	Signal OFF-delay		–	□	–	–	■	■	■	■
	Interval (signal or power start)		■	□	–	–	–	■	■	–
	One-shot output (ON-delay)		–	□	–	–	–	■	–	–
	ON-delay (fixed)		–	–	–	–	–	■	–	–
	Independent ON/OFF time setting		–	–	–	–	–	■	■	–
	Star-delta		–	–	–	■	–	–	–	–
Re-marks	Transistor		–	□	–	–	–	■	–	–
	Page		466	467				468	477	469

■ Standard □ Available – No/not available



DIN-rail mounted, standard 17.5 mm wide solid state timer range

This broad range of timers includes many functionalities and has a wide AC/DC power supply range. Models with screwless clamp connection available.

- 17.5 mm width, modular 45 mm
- DIN-rail mounting
- 24-48 VDC and 24-230 VAC
- 0.1 s to 120 h, 7 ranges

Ordering information

Type	Supply voltage	Control output	Time setting range	Operating modes	Order code	
					Screw terminal type	Screw-less clamp type
Multi-functional timer	24 to 230 VAC (50/60 Hz)/ 24 to 48 VDC	SPDT	0.1 s to120 h	ON-delay, flicker OFF start, flicker ON start, signal ON/OFF-delay, signal OFF-delay, interval, one-shot	H3DS-ML	H3DS-MLC
Standard timer				ON-delay, flicker ON start, interval, one-shot	H3DS-SL	H3DS-SLC
Single function timer				ON-delay	H3DS-AL	H3DS-ALC
Twin timer		Relay SPDT	0.1 s to 12 h	Flicker OFF start, flicker ON start	H3DS-FL	H3DS-FLC
Star-delta timer		2x Relay SPST-NO	1 s to 120 s	Star-delta	H3DS-GL	H3DS-GLC
Two-wired timer	24 to 230 VAC/VDC (50/60 Hz)	SCR output	0.1 s to 120 h	ON-delay	H3DS-XL	H3DS-XLC

Specifications

Terminal block	Screw terminal type: Clamps two 2.5 mm^2 max. bar terminals without sleeves Screw-less clamp type: Clamps two 1.5 mm^2 max. bar terminals without sleeves
Mounting method	DIN-rail mounting
Operating voltage range	85 to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.1 s, 0.5 s for H3DS-G
Reset voltage	2.4 VAC/VDC max., 1.0 VAC/VDC max. for H3DS-X
Voltage input	Max. permissible capacitance between input lines (terminals B1 and A2): 2,000 pF
	Load connectable in parallel with inputs (terminals B1 and A1)
	H-level: 20.4 to 253 VAC/20.4 to 52.8 VDC
	L-level: 0 to 2.4 VAC/VDC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$)
	5 A at 30 VDC with resistive load ($\cos\phi = 1$)
Ambient temperature	Operating: -10 to 55°C (with no icing)
	Storage: -25 to 65°C (with no icing)
Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2 s range)
Setting error	±10% ±50 ms max. of FS
Influence of voltage	±0.7% max. of FS (±0.7% ±10 ms max. at 1.2 s range)
Influence of temperature	±5% max. of FS (±5% ±10 ms max. at 1.2 s range)
Life expectancy (not H3DS-X)	Mechanical: 10 million operations min. (under no load at 1,800 operations/h)
	Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h)
Size in mm(HxWxD)	80x17.5x73



DIN-rail mounted, standard 22.5 mm wide solid state timer range

The H3DE series of timers provides a wide AC/DC power supply and time range to reduce the number of items.

- Size in mm (HxWxD): 79x22.5x100
- DIN-rail mounting
- 24-230VAC/VDC (except -H)
- Wide time setting range: 0.10 s - 120 h (except -H and -G), 8 ranges

Ordering information

Type	Supply voltage	Control output	Time setting range	Operating modes	Order code
Multi-functional standard timers	12 VDC	DPDT	0.1 s to 120 h	ON-delay, flicker OFF start, flicker ON start, signal ON/OFF-delay, signal OFF-delay, interval, one-shot	H3DE-M2 DC12 *1
	24 to 230 VAC/VDC	SPDT			H3DE-M1 AC/DC24-230
		DPDT			H3DE-M2 AC/DC24-230 *1
		SPDT		ON-delay, flicker ON start, interval, one-shot	H3DE-S1 AC/DC24-230
		DPDT			H3DE-S2 AC/DC24-230 *1
Twin timer		SPDT	0.1 s to 12 h	Flicker OFF start, flicker ON start	H3DE-F AC/DC24-230
Star-delta timer		2x SPDT	1 to 120 s	Star-delta	H3DE-G AC/DC24-230
Power OFF-delay timer	24 VAC/VDC	SPDT	1 to 120 s	Signal OFF-delay	H3DE-H AC/DC24 L
			0.1 to 12 s		H3DE-H AC/DC24 S
	48 VAC/VDC		1 to 120 s		H3DE-H AC/DC48 L
			0.1 to 12 s		H3DE-H AC/DC48 S
	100 to 120 VAC		1 to 120 s		H3DE-H AC100-120 L
			0.1 to 12 s		H3DE-H AC100-120 S
	200 to 230 VAC		1 to 120 s		H3DE-H AC200-230 L
			0.1 to 12 s		H3DE-H AC200-230 S

*1 One output can be set to instantaneous.

Specifications

Terminal block	Clamps two 2.5 mm^2 max. bar terminals without sleeves
Mounting method	DIN-rail mounting
Operating voltage range	85 to 110% of rated supply voltage
Power reset	Minimum power-off time: H3DE-M/S, H3DE-F: 0.1 s, H3DE-G: 0.5 s
Reset voltage	2.4 VAC/VDC max. (not for H3DE-H)
Voltage input (H3DE-M/-S)	Max. permissible capacitance between input lines (terminals B1 and A2): 2,000 pF
	Load connectable in parallel with inputs (terminals B1 and A2)
	H-level: 20.4 to 253 VAC/VDC, L-level: 0 to 2.4 VAC/VDC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$), 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
Ambient temperature	Operating: -10 to 55°C (with no icing), storage: -25 to 65°C (with no icing)
Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2 s range)
Setting error	±10% ±0.05 s max. of FS
Signal input time	50 ms min.
Influence of voltage	±0.5% max. of FS
Influence of temperature	±2% max. of FS
Contact material	AGNi+gold plating
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h)
	Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h)
Degree of protection	IP30 (terminal block: IP20)
Size in mm (HxWxD)	79x22.5x100



Miniature timer with multiple time ranges and multiple operating modes

H3YN features 4 multi-operating modes: ON-delay, interval, flicker ON start and flicker OFF start.

- Size in mm (HxWxD): 28x21.5x52.6
- Plug-in
- All supply voltages available
- 0.1 s to 10 h
- DPDT (5A) or 4PDT (3A)

Ordering information

Supply voltage	Functions	Time-limit contact	Order code	
			Short-time range model (0.1 s to 10 min)	Long-time range model (0.1 min to 10 h)
12 VDC	ON-delay Interval Flicker ON Flicker OFF	DPDT	H3YN-2 12DC	H3YN-21 12DC
24 VAC			H3YN-2 24AC	H3YN-21 24AC
24 VDC			H3YN-2 24DC	H3YN-21 24DC
100 to 120 VAC			H3YN-2 100-120AC	H3YN-21 100-120AC
200 to 230 VAC			H3YN-2 200-230AC	H3YN-21 200-230AC
12 VDC		4PDT	H3YN-4 12DC	H3YN-41 12DC
24 VAC			H3YN-4 24AC	H3YN-41 24AC
24 VDC			H3YN-4 24DC	H3YN-41 24DC
100 to 120 VAC			H3YN-4 100-120AC	H3YN-41 100-120AC
200 to 230 VAC			H3YN-4 200-230AC	H3YN-41 200-230AC

Accessories

Connecting socket

Timer	DIN-rail mounting/ front-connecting socket	Back-connecting socket
		PCB terminal
H3YN-2/-21	PYF08A, PYF08A-N, PYF08A-E	PY08-02
H3YN-4/-41	PYF14A, PYF14A-N, PYF14A-E	PY14-02

Hold-down clips

Applicable socket	Order code
PYF08A, PYF08A-N, PYF08A-E, PYF14A, PYF14A-N, PYF14A-E	Y92H-3 (pair)
PY08, PY08-02, PY14-02	Y92H-4

Specifications

Item	H3YN-2/-4	H3YN-21/-41
Time ranges	0.1 s to 10 min (1 s, 10 s, 1 min, or 10 min max. selectable)	0.1 min to 10 h (1 min, 10 min, 1 h, or 10 h max. selectable)
Rated supply voltage	24, 100 to 120, 200 to 230 VAC (50/60 Hz) 12, 24, 48, 100 to 110, 125 VDC	
Pin type	Plug-in	
Operating mode	ON-delay, interval, flicker OFF start, or flicker ON start (selectable with DIP switch)	
Operating voltage range	85 to 110% of rated supply voltage (12 VDC: 90 to 110% of rated supply voltage)	
Reset voltage	10% min. of rated supply voltage	
Control outputs	DPDT: 5 A at 250 VAC, resistive load ($\cos\phi = 1$), 4PDT: 3 A at 250 VAC, resistive load ($\cos\phi = 1$)	
Accuracy of operating time	±1% FS max. (1 s range: ±1% ±10 ms max.)	
Setting error	±10% ±50 ms FS max.	
Reset time	Min. power-opening time: 0.1 s max. (including halfway reset)	
Influence of voltage	±2% FS max.	
Influence of temperature	±2% FS max.	
Ambient temperature	Operating: -10 to 50°C (with no icing), storage: -25 to 65°C (with no icing)	
Degree of protection	IP40	
Size in mm (HxWxD)	28x21.5x52.6	



DIN 48x48 mm multi-functional timer series

This elaborate range of solid state timers provides you with a multi-functional timer, twin timer, star-delta timer and a power OFF-delay timer.

- 48x48 mm front-panel/plug-in
- High-/low-voltage models (except -H and -G)
- 0.05 s to 300 h (except -H and -G)
- DPDT, 5A at 250VAC
- Transistor 100mA at 30VDC

Ordering information

Output	Number of pins	Supply voltage	Time range	Operating mode	Order code
Relay DPDT	11	100 to 240 VAC/100 to 125 VDC	0.05 s to 300 h	ON-delay, flicker OFF start, flicker ON start, signal ON/ OFF-delay, signal OFF-delay, interval	H3CR-A 100-240AC/100-125DC
		24 to 48 VAC/12 to 48 VDC			H3CR-A 24-48AC/12-48DC
Transistor		24 to 48 VAC/12 to 48 VDC	0.05 s to 300 h		H3CR-AS 24-48AC/12-48DC
Relay DPDT	8	100 to 240 VAC/100 to 125 VDC	0.05 s to 300 h	ON-delay, flicker ON start, interval, one-shot	H3CR-A8 100-240AC/100-125DC
		24 to 48 VAC/12 to 48 VDC			H3CR-A8 24-48AC/12-48DC
Transistor		24 to 48 VAC/12 to 48 VDC	0.05 s to 300 h		H3CR-A8S 24-48AC/12-48DC
Relay SPDT		100 to 240 VAC/100 to 125 VDC			H3CR-A8E 100-240AC/100-125DC
		24 to 48 VAC/VDC			H3CR-A8E 24-48AC/DC
Relay DPDT	11	100 to 240 VAC	0.05 s to 30 h	Flicker OFF start	H3CR-F 100-240AC
		24 VAC/VDC			H3CR-F 24AC/DC
	8	100 to 240 VAC			H3CR-F8 100-240AC
		24 VAC/VDC			H3CR-F8 24AC/DC
	11	100 to 240 VAC	0.05 s to 30 h	Flicker ON start	H3CR-FN 100-240AC
		24 VAC/VDC			H3CR-FN 24AC/DC
	8	100 to 240 VAC			H3CR-F8N 100-240AC
		24 VAC/VDC			H3CR-F8N 24AC/DC
Time-limit contact and instantaneous contact		100 to 120 VAC		Star-delta	H3CR-G8EL 100-120AC
		200 to 240 VAC			H3CR-G8EL 200-240AC
DPDT	8	100 to 120 VAC	0.05 to 12 s	Power OFF-delay	H3CR-H8LS 100-120AC
		200 to 240 VAC			H3CR-H8LS 200-240AC
		24 VAC/VDC			H3CR-H8LS 24AC/DC
		100 to 120 VAC	0.05 to 12 m		H3CR-H8LM 100-120AC
		200 to 240 VAC			H3CR-H8LM 200-240AC
		24 VAC/VDC			H3CR-H8LM 24AC/DC

Accessories

Name/specifications		Order code
Flush-mounting adapter		Y92F-30
Protective cover		Y92A-48B
Front connecting socket	8-pin, finger-safe type, DIN-rail	P2CF-08-E
Front connecting socket	11-pin, finger-safe type, DIN-rail	P2CF-11-E
Back connecting socket	8-pin	P3G-08
	11-pin	P3GA-11

Name/specifications		Order code
Time setting ring	Setting a specific time	Y92S-27
	Limiting the setting range	Y92S-28
Panel cover	Light grey (5Y7/1)	Y92P-48GL
	Black (N1.5)	Y92P-48GB

Specifications

Accuracy of operating time		±0.2% FS max. (±0.2% ±10 ms max. in a range of 1.2 s)
Influence of voltage		±0.2% FS max. (±0.2% ±10 ms max. in a range of 1.2 s)
Influence of temperature		±1% FS max. (±1% ±10 ms max. in a range of 1.2 s)
Ambient temperature		Operating: -10 to 55°C (with no icing), storage: -25 to 65°C (with no icing)
Life expectancy	**Mechanical:**	20,000,000 operations min. (under no load at 1,800 operations/h)
	Electrical:	100,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h)
Size in mm (HxWxD)		48x48x66.6 (H3CR-A, -F), 48x48x78 (H3CR-G, -H)
Setting error		±5% FS ±50 ms
Degree of protection		IP40 (panel surface)
Weight		Approx. 90 g



The most complete digital standard timer on the market

H5CX offers you the most complete series of products on the market today. Based on extensive customer research, these new timers have been designed with value added features that users both need and appreciate.

- Size in mm (HxWxD): 48x48x59 to 78 mm
- Three colour display value, red, green or orange
- Models with Instantaneous Contact Outputs
- 0.001 s to 9999 h, 10 ranges
- Input NPN, PNP and contact

Ordering information

Output type	Supply voltage	Functions	External connection	Size in mm (HxWxD)	Inputs	Order code
Contact output	100 to 240 VAC	A: Signal ON-delay A-1: Signal ON-delay 2 A-2: Power ON-delay 1 A-3: Power ON-delay 2 b: Repeat cycle 1 b-1: Repeat cycle 2 d: Signal OFF-delay E: Interval F: Cumulative Z: ON/OFF-duty adjustable flicker toff: Twin timer OFF start ton: Twin timer ON start	Screw terminals	48x48x84	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-A-N
	12 to 24 VDC/24 VAC			48x48x65		H5CX-AD-N
Transistor output	100 to 240 VAC			48x48x84		H5CX-AS-N
	12 to 24 VDC/24 VAC			48x48x65		H5CX-ASD-N
Contact output	100 to 240 VAC		11-pin socket	48x48x69.7	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-A11-N
	12 to 24 VDC/24 VAC					H5CX-A11D-N
Transistor output	100 to 240 VAC					H5CX-A11S-N
	12 to 24 VDC/24 VAC					H5CX-A11SD-N
Contact output	100 to 240 VAC		8-pin socket	48x48x69.7	Signal, Reset (NPN inputs)	H5CX-L8-N
	12 to 24 VDC/24 VAC					H5CX-L8D-N
Transistor output	100 to 240 VAC					H5CX-L8S-N
	12 to 24 VDC/24 VAC					H5CX-L8SD-N
Contact output Models with instantaneous contact outputs	100 to 240 VAC	A-2: Power ON-delay 1 b: Repeat cycle 1 E: Interval Z: ON/OFF-duty adjustable flicker toff: Twin timer OFF start 1 ton: Twin timer ON start 1			–	H5CX-L8E-N
	12 to 24 VDC/24 VAC					H5CX-L8ED-N
Transistor output	12 to 24 VDC	A: Signal ON-delay 1 F: Cumulative	Screw terminals	48x48x65	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-BWSD-N

Accessories

Name		Order code
Flush-mounting adapter		Y92F-30
Waterproof packing		Y92S-29
Front-connecting socket	8-pin, finger safe type	P2CF-08-E
	11-pin, finger safe type	P2CF-11-E
Back-connecting socket	8-pin	P3G-08
	11-pin	P3GA-11
Hard cover		Y92A-48
Soft cover		Y92A-48F1

Specifications

Item	H5CX-A_	H5CX-A11_	H5CX-L8_
Display	7-segment, negative transmissive LCD		
	Present value: 12 mm high characters		
	red, orange or green (programmable)	red	
	Set value: 6 mm high characters, green		
Digits	4 digits		
Total time range	0.001 s to 9,999 h (configurable)		
Timer mode	Elapsed time (Up), remaining time (Down) (selectable)		
Input signals	Signal, reset, gate		Signal, reset
Key protection	Yes		
Memory backup	EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min.		
Ambient temperature	Operating: -10 to 55°C (no icing or condensation), side-by-side mounting: -10 to 50°C		
Case colour	Black (N1.5)		



DIN-sized (48x48) motor timer with variable time ranges

This motor timer series provides you with many features, such as ON-delay, time indicator, moving pointer and synchronous motor. Moreover, the LED indicator shows the time operation, time range and the rated voltage.

- DIN-sized 48x48mm
- Front-panel/plug-in/DIN-rail
- All supply voltages available
- 0.2 s to 30 h
- SPDT, 6A at 250VAC

Ordering information

Operation/resetting system	Internal connection	Terminal	Time-limit contact	Instantaneous contact	Time range code	Order code
Time-limit operation/ electric resetting	Separate motor and clutch connection	11-pin socket	SPDT	SPDT	1.25 s to 30 h in 5 ranges	H2C-RSA 110AC
						H2C-RSA 220AC
						H2C-RSA 24AC
					0.2 s to 6 h in 5 ranges	H2C-RSB 110AC
						H2C-RSB 220AC
						H2C-RSB 24AC
					0.5 s to 12 h in 5 ranges	H2C-RSC 110AC
						H2C-RSC 220AC
						H2C-RSC 24AC
Time-limit operation/ self-resetting	Separate motor and clutch connection	11-pin socket	SPDT	SPDT	1.25 s to 30 h in 5 ranges	H2C-SA 110AC
						H2C-SA 220AC
						H2C-SA 24AC
					0.2 s to 6 h in 5 ranges	H2C-SB 110AC
						H2C-SB 220AC
						H2C-SB 24AC
					0.5 s to 12 h in 5 ranges	H2C-SC 110AC
						H2C-SC 220AC
						H2C-SC 24AC

Note: Other voltages available on request

Accessories

Name/specifications		Order code
DIN-rail mounting/ front-connecting socket	8-pin, finger safe type	P2CF-08-E
	11-pin, finger safe type	P2CF-11-E
Back-connecting socket	8-pin, screw terminal	P3G-08
	11-pin	P3GA-11

Name/specifications		Order code
Hold-down clip (pair)	For PL08 and PL11 sockets	**Y92H-1**
	For PF085A socket	**Y92H-2**
Flush mounting adapter		Y92F-30
Time setting ring		**Y92A-Y1**

Specifications

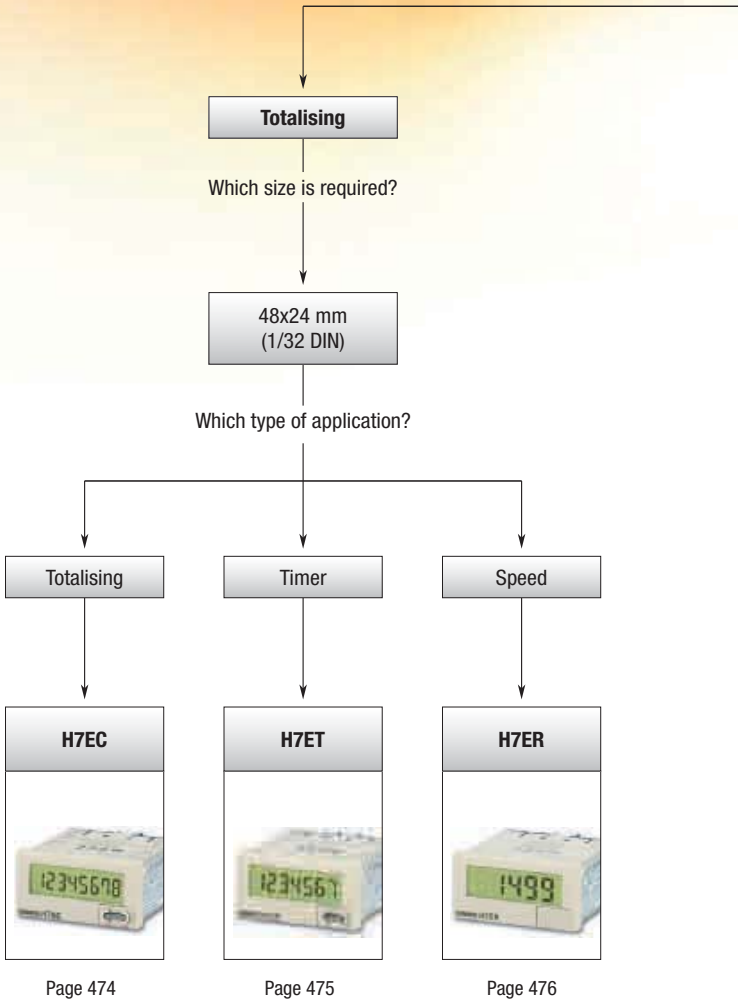
Operating voltage range	85 to 110% of rated supply voltage
Reset voltage	10% max. of rated supply voltage
Reset time	Min. power-opening time: 0.5 s, min. pulse width: 0.5 s
Control outputs	6 A at 250 VAC, resistive load ($\cos\phi = 1$)
Mounting method	Flush mounting (except for H2C-F/-FR models), surface-mounting, DIN-rail mounting
Life expectancy	Mechanical: 10,000,000 operations min.
	Electrical: 500,000 operations min.
Motor life expectancy	20,000 h
Accuracy of operating time	±0.5% FS max. (±1% max. at 0.2 to 6 s for the time range code B or at 0.5 to 12 s for the time range code C)
Setting error	±2% FS max.
Reset time	0.5 s max.
Influence of voltage	±1% FS max.
Influence of temperature	±2% FS max.
Ambient temperature	Operating: -10 to 50°C
Case colour	Light grey (Munsell 5Y7/1)
Degree of protection	IP40 (panel surface)
Size in mm (HxWxD)	48x48x77.5

MULTI-FUNCTIONAL PRESET COUNTER

H7CX – Designed with value added features

The H7CX series offers the ultimate in versatility and intuitive programming.

- 7 basic functions in one
- Switching colour on threshold, green, orange & red
- Twin counter mode
- 12 different outputs modes
- Display 6 digits from -100 K +1 up to 1 M -1





What is the type of counting application?

Pre-set counter time count

Which size is required?

48x24 mm (1/32 DIN)

48x48 mm (1/16 DIN)

Cam positioner

Which size is required?

96x96 mm (1/4 DIN)

H8GN counter/timer



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H7CX



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H8PS



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Selection table

	Category	Self-powered total	Self-powered timer	Self-powered tachometer
Selection criteria				
	Model	H7EC	H7ET	H7ER
	Display	LCD		
	Size	1/32 DIN		
Outputs	Control outputs	–	–	–
	5 stage	–	–	–
	Total	■	■	–
	Time	–	■	–
	Preset	–	–	–
	Batch	–	–	–
	Dual	–	–	–
	Tachometer	■	–	■
Inputs	Control inputs	No-voltage, PNP/NPN, DC-voltage, AC/DC multi-voltage	No-voltage, PNP/NPN, DC-voltage, AC/DC multi-voltage	No-voltage, PNP/NPN
Features	Dual operation	–	–	–
	Number of digits	8	7	4 or 5
	NPN/PNP switch	■	■	■
	Back-lit	□	□	□
	External reset	■	■	–
	Manual reset	■	■	–
	Number of banks	–	–	–
	Built-in sensor power supply	–	–	–
	IP rating	IP66	IP66	IP66
Terminals	Screw terminals	■	■	■
	PCB terminals	–	–	–
	11-pin socket	–	–	–
Supply voltage	100 to 240 VAC	–	–	–
	12 to 24 VDC	–	–	–
	24 VDC	□	□	□
	Comms	–	–	–
Functions	Up	■	■	–
	Down	–	–	–
	Up/down	–	–	–
	Reversible	–	–	–
	Speed	0 to 30 Hz or 0 to 1 kHz	–	1 or 10 kHz
	Counting range	0 to 99999999	0.0 h to 999999.9 h <--> 0.0 h to 3999 d 23.9 h or 0 s to 999 h 59 min 59 s <--> 0.0 min to 9999 h 59.9 min	1000 s^{-1} or 1000 min^{-1}; 1000 s^{-1} or 1000 min^{-1} <--> 10000 min^{-1}
Colour	Beige	■	■	■
	Black	■	■	■
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	Counter type	Pre-set counter/timer	Pre-set counter	Cam positioner
Selection criteria				
	Model	H8GN	H7CX	H8PS
	Display	LCD negative transmissive		LCD negative transmissive
	Size	1/32 DIN	1/16 DIN	1/4 DIN
Outputs	Control outputs	1 relay (SPDT)	1 relay (SPDT), transistor	NPN or PNP, cam outputs 8/16/32, run out, tachometer
	5 stage	■	□	–
	Total	■	□	–
	Time	■	–	–
	Preset	■	□	–
	Batch	■	□	–
	Dual	■	□	–
	Tachometer	–	□	–
Inputs	Control inputs	No-voltage	No-voltage, PNP/NPN	Encoder
Features	Dual operation	■	■	□
	Number of digits	PV: 4, SV: 4	PV: 4, SV: 4 or PV: 6, SV: 6	7
	NPN/PNP switch	–	■	–
	Back-lit	–	■	■
	External reset	■	■	–
	Manual reset	■	■	8 (16- and 32-output models only)
	Number of banks	4	–	–
	Built-in sensor power supply	–	■	–
	IP rating	IP66	IP66	IP40
Terminals	Screw terminals	■	■	■
	PCB terminals	–	–	■
	11-pin socket	–	□	–
Supply voltage	100 to 240 VAC	–	■	–
	12 to 24 VDC	–	■	–
	24 VDC	■	–	■
	Comms	□	–	–
Functions	Up	■	■	–
	Down	■	■	–
	Up/down	–	■	–
	Reversible	■	■	–
	Speed	0 to 30 Hz or 0 to 5 kHz	0 to 30 Hz or 0 to 5 kHz	–
	Counting range	-999 to 9999	-99999 to 999999	–
Colour	Beige	–	–	■
	Black	■	■	–
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■ Standard □ Available – No/not available



Self-powered LCD totaliser

The H7E series is available with large display with 8.6 mm character height. It includes models with backlight for improved visibility in dimly lit places. The H7E family includes total counters, time counters, tachometers and PCB mounted counters.

- Size in mm (HxWxD): 24x48x55.5, 1/32 DIN size housing
- 8 digits, 8.6 mm character height
- Black or light-grey housing
- Dual input speed: 30 Hz <-> 1 kHz
- Short body: all models have a depth of 48.5 mm

Ordering information

Count input	Max. counting speed	Display	Order code	
			Light grey body	Black body
No-voltage	30 Hz <-> 1 kHz (switchable)	7-segment LCD	H7EC-N	H7EC-N-B
PNP/NPN universal DC voltage input	30 Hz <-> 1 kHz (switchable)	7-segment LCD	H7EC-NV	H7EC-NV-B
		7-segment LCD with backlight	H7EC-NV-H	H7EC-NV-BH
AC/DC multi-voltage input	20 Hz	7-segment LCD	H7EC-NFV	H7EC-NFV-B

Specifications

Item	H7EC-NV-_/H7EC-NV-_H	H7EC-NFV-_	H7EC-N-_
Operating mode	Up type		
Mounting method	Flush mounting		
External connections	Screw terminals, optional wire-wrap terminals		
Number of digits	8		
Display	7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm)		
Max. counting speed	30 Hz/1 kHz	20 Hz	30 Hz/1 kHz
Case colour	Light grey or black (-B models)		
Attachment	Waterproof packing, flush mounting bracket		
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (only for backlight) No-backlight model: Not required (powered by built-in battery)	Not required (powered by built-in battery)	
Count input	High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (input impedance: Approx. 4.7 kΩ)	High (logic) level: 24 to 240 VAC/VDC, 50/60 Hz Low (logic) level: 0 to 2.4 VAC/VDC, 50/60 Hz	No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.
Reset input		No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.	
Minimum signal width	20 Hz: 25 ms, 30 Hz: 16.7 ms, 1 KHz: 0.5 ms		
Reset system	External reset and manual reset: Minimum signal width of 20 ms		
Ambient temperature	Operating: -10 to 55°C (with no condensation or icing), storage: -25 to 65°C (with no condensation or icing)		
Degree of protection	Front-panel: IP66, NEMA4, terminal block: IP20		
Battery life (reference)	7 years min. with continuous input at 25°C (lithium battery)		
Size in mm (HxWxD)	24x48x55.5		



Self-powered time counter

The H7E series is available with large display with 8.6mm character height. It includes models with backlight for improved visibility in dimly lit places. The H7E family includes total counters, time counters, tachometers and PCB mounted counters.

- Size in mm (HxWxD) 24x48x55.5, 1/32 DIN size housing
- 7 digits, 8.6mm character height
- Black or light-grey housing
- Dual time range 999999.9 h <-> 3999 d 23.9 h or 999 h 59 m 59 s <-> 9999 h 59.9m

Ordering information

Timer input	Display	Order code			
		Time range 999999.9h <-> 3999d23.9h (switchable)		Time range 999h59m59s <-> 9999h59.9m	
		Light grey body	Black body	Light grey body	Black body
No-voltage input	7-segment LCD	H7ET-N	H7ET-N-B	H7ET-N1	H7ET-N1-B
PNP/NPN universal DC voltage input	7-segment LCD	H7ET-NV	H7ET-NV-B	H7ET-NV1	H7ET-NV1-B
	7-segment LCD with backlight	H7ET-NV-H	H7ET-NV-BH	H7ET-NV1-H	H7ET-NV1-BH
AC/DC multi-voltage input	7-segment LCD	H7ET-NFV	H7ET-NFV-B	H7ET-NFV1	H7ET-NFV1-B

Specifications

Item	H7ET-NV_-_/H7ET-NV_-_H	H7ET-NFV_-_	H7ET-N_-_
Operating mode	Accumulating		
Mounting method	Flush mounting		
External connections	Screw terminals		
Display	7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm)		
Number of digits	7		
Case colour	Light grey or black (-B models)		
Attachment	Waterproof packing, flush mounting bracket, time unit labels		
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (for backlight) No-backlight model: Not required (powered by built-in battery)	Not required (powered by built-in battery)	
Timer input	High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (Input impedance: Approx. 4.7 kΩ)	High (logic) level: 24 to 240 VAC/VDC, 50/60 Hz Low (logic) level: 0 to 2.4 VAC/VDC, 50/60 Hz	No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.
Reset input		No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.	
Minimum pulse width	1 s		
Reset system	External reset and manual reset: Minimum signal width of 20 ms		
Ambient temperature	Operating: -10 to 55°C (with no condensation or icing), storage: -25 to 65°C (with no condensation or icing)		
Time accuracy	±100 ppm (25°C)		
Degree of protection	Front-panel: IP66, NEMA4 with waterproof packing, terminal block: IP20		
Battery life (reference)	10 years min. with continuous input at 25°C (lithium battery)		
Size in mm (HxWxD)	24x48x55.5		



Self-powered tachometer

The H7E series is available with large display with 8.6mm character height. It includes models with backlight for improved visibility in dimly lit places. The H7E family includes total counters, time counters, tachometers and PCB mounted counters.

- Size in mm (HxWxD) 24x48x53.5, 1/32 DIN size housing
- 5 digits, 8.6mm character height
- Black or light-grey housing
- Dual revolution display

Ordering information

Count input	Display	Order code			
		Max. revolutions displayed (applicable encoder resolution)			
		1,000 s^{-1} (1 pulse/rev.) 1,000 min^{-1} (60 pulse/rev.)		1,000.0 s^{-1} (10 pulse/rev) 1,000.0 min^{-1} (600 pulse/rev) <-> 10,000 min^{-1} (60 pulse/rev) (switchable)	
		Light grey body	Black body	Light grey body	Black body
No-voltage input	7-segment LCD	H7ER-N	H7ER-N-B		
PNP/NPN universal DC voltage input	7-segment LCD	H7ER-NV	H7ER-NV-B	H7ER-NV1	H7ER-NV1-B
	7-segment LCD with backlight	H7ER-NV-H	H7ER-NV-BH	H7ER-NV1-H	H7ER-NV1-BH

Specifications

Item	H7ER-NV1-_/H7ER-NV1-_H	H7ER-NV-_/H7ER-NV-_H	H7ER-N-_
Operating mode	Up type		
Mounting method	Flush mounting		
External connections	Screw terminals, wire-wrap terminals		
Display	7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm)		
Number of digits	5	4	
Max. revolutions displayed	1,000.0 s^{-1} (when encoder resolution of 10 pulse/rev is used) 1,000.0 min^{-1} (when encoder resolution of 600 pulse/rev is used) <-> 10,000 min^{-1} (when encoder resolution of 60 pulse/rev is used) (switchable with switch)	1,000 s^{-1} (when encoder resolution of 1 pulse/rev is used) 1,000 min^{-1} (when encoder resolution of 60 pulse/rev is used)	
Attachment	Waterproof packing, flush mounting bracket, revolution unit labels		
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (for backlight lit) No-backlight model: Not required (powered by built-in battery)		Not required (powered by built-in battery)
Count input	High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (Input impedance: Approx. 4.7 kΩ)		No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.
Max. counting speed	10 kHz	1 kHz	
Minimum signal width	10 kHz: 0.05 ms, 1 kHz: 0.5 ms		
Ambient temperature	Operating: -10 to 55°C (with no condensation or icing), storage: -25 to 65°C (with no condensation or icing)		
Degree of protection	Front-panel: IP66, NEMA4 with waterproof packing, terminal block: IP20		
Battery life (reference)	7 years min. with continuous input at 25°C (lithium battery)		
Size in mm (HxWxD)	24x48x53.5		



World's smallest compact preset counter/timer

The H8GN is a 1/32 DIN timer and counter in one. It is simple to switch between the timer and counter functions. During operation it is also possible to switch the display to monitor the totalising count value in 8 digits. Many sophisticated functions come as standard with H8GN.

- Size in mm (HxWxD) 24x48x83, 1/32 DIN size housing
- 8 digit display, 4 value and 4 set value
- Front mounting
- -999 to 9999
- 24 VDC

Ordering information

Functions		Supply voltage	Output	Order code	
				Communications	
Counter	Timer			No communications	RS-485
Counter: Up/down/reversible, 4 digits, N, F, C or K output modes Total counter: 8 digits	A: ON-delay B: Flicker D: Signal OFF-delay E: Interval F: Accumulative Z: ON/OFF-duty adjustable flicker	24 VDC	Contact output (SPDT)	H8GN-AD	H8GN-AD-FLK

Specifications

Rated supply voltage		24 VDC
Operating voltage range		85 to 110% of rated supply voltage
Power consumption		1.5 W max. (for max. DC load) (inrush current: 15 A max.)
Mounting method		Flush-mounting
External connections		Screw terminals (M3 screws)
Terminal screw tightening torque		0.5 Nm max.
Attachment		Waterproof packing, flush-mounting bracket
Display		7-segment, negative transmissive LCD; time display (h, min, s); CMW, OUT, RST, TOTAL Present value (red, 7 mm high characters); set value (green, 3.4 mm high characters)
Digits		PV: 4 digits, SV: 4 digits, when total count value is displayed: 8 digits (zeros suppressed)
Memory backup		EEPROM (non-volatile memory) (number of writes: 100,000 times)
Counter	Maximum counting speed	30 Hz or 5 kHz
	Counting range	-999 to 9,999
	Input modes	Increment, decrement, individual, quadrature inputs
Timer	Timer modes	Elapsed time (up), remaining time (down)
Inputs	Input signals	For counter: CP1, CP2, and reset For timer: Start, gate, and reset
	Input method	No-voltage input (contact short-circuit and open input) Short-circuit (ON) impedance: 1 kΩ max. (approx. 2 mA runoff current at 0 Ω) Short-circuit (ON) residual voltage: 2 VDC max. Open (OFF) impedance: 100 kΩ min. Applied voltage: 30 VDC max.
	Start, reset, gate	Minimum input signal width: 1 or 20 ms (selectable)
	Power reset	Minimum power-opening time: 0.5 s
Control output		SPDT contact output: 3 A at 250 VAC/30 VDC, resistive load ($\cos\phi = 1$)
Minimum applied load		10 mA at 5 VDC (failure level: P, reference value)
Reset system		External, manual, and power supply resets (for timer in A, B, D, E, or Z modes)
Sensor waiting time		260 ms max. (inputs cannot be received during sensor wait time if control outputs are turned OFF)
Timer function	Accuracy of operating time and setting error (including temperature and voltage effects)	Signal start: ±0.03% ±30 ms max. Power-ON start: ±0.03% ±50 ms max.
Ambient temperature	Operating storage	-10 to 55°C (with no icing or condensation)
		-25 to 65°C (with no icing or condensation)
Case colour		Rear section: Grey smoke; front section: N1.5 (black)
Degree of protection		Panel surface: IP66 and NEMA Type 4X (indoors); rear case: IP20, terminal block: IP20
Size in mm (HxWxD)		24x48x83



The most complete digital standard counter on the market

H7CX offers you the most complete series of products on the market today. Based on extensive customer research, these new counters have been designed with value added features that users both need and appreciate.

- Size in mm (HxWxD) 48x48x59 to 78mm 1/16 DIN size housing
- Three colour display value, red, green or orange
- Twin counter mode
- 6 digit model -99,999 to 999,999, set value -99,999 to 999,999 or 0 to 999,999
- Input contact, NPN or PNP

Ordering information

Type	External connection	Sensor power supply	Supply voltage	Output type	Digits	Size in mm (HxWxD)	Order code
1-stage counter 1-stage counter with total counter 2-stage counter 1-stage counter with batch counter Dual counter (addition/subtraction) Tachometer Twin counter	Screw terminal	12 VDC	100 to 240 VAC	Contact and transistor output	6	48x48x84	H7CX-AU-N
			12 to 24 VDC/24 VAC				H7CX-AUD1-N
				Transistor output (2x)			H7CX-AUSD1-N
			100 to 240 VAC	Contact output (2x)			H7CX-AW-N
			12 to 24 VDC/24 VAC				H7CX-AWD1-N
1-stage counter 1-stage counter with total counter	11-pin socket	12 VDC	100 to 240 VAC	Contact output		48x48x69.7	H7CX-A11-N
			12 to 24 VDC/24 VAC				H7CX-A11D1-N
			100 to 240 VAC	Transistor output			H7CX-A11S-N
			12 to 24 VDC/24 VAC				H7CX-A11SD1-N
	Screw terminal		100 to 240 VAC	Contact output		48x48x84	H7CX-A-N
			100 to 240 VAC	Transistor output			H7CX-AS-N

Accessories

Name		Order code
Flush-mounting adapter		Y92F-30
Waterproof packing		Y92S-29
DIN-rail mounting/front-connecting socket	11-pin, finger safe type	P2CF-11-E
Back-connecting socket	11-pin	P3GA-11
	Finger safe terminal cover for P3GA-11	Y92A-48G
Hard cover		Y92A-48
Soft cover		Y92A-48F1

Specifications

Display	7-segment, negative transmissive LCD
Digits	6-digits: -99,999 to 999,999, SV range: -99999 to 999999 or 0 to 999999
Max. counting speed	30 Hz or 5 kHz (selectable, ON/OFF ratio 1:1)
Input modes	Increment, decrement, increment/decrement (UP/DOWN A (command input), UP/DOWN B (individual inputs), or UP/DOWN C (quadrature inputs))
Control output	Contact output: 3 A at 250 VAC/30 VDC, resistive load ($\cos\phi = 1$) Minimum applied load: 10 mA at 5 VDC Transistor output:NPN open collector, 100 mA at 30 VDC Residual voltage: 1.5 VDC max. (approx. 1V) Leakage current: 0.1 mA max.
Key protection	Yes
Decimal point adjustment	Yes (rightmost 3 digits)
Sensor waiting time	290 ms max.
Memory backup	EEPROM (overwrites: 100,000 times min.) stores data 10 years min.
Ambient temperature	Operating: -10 to 55°C (-10 to 50°C when mounted side by side)
Case colour	Black (N1.5) (Optional Front Panels are available to change the Front Panel colour to light gray or white.)
Life expectancy	Mechanical: 10,000,000 operations min.
	Electrical: 100,000 operations min. (3 A at 250 VAC, resistive load)
Degree of protection	Panel surface: IP66, NEMA 4 (indoors), and UL Type 4X (indoors)



Compact, easy-to-use cam positioner

The H8PS provides high speed operation at 1,600 r/min and high-precision settings to 0.5° ensuring widespread application. H8PS features a highly visible display with back-lit negative transmissive LCD. Advance angle compensation function compensates for output delays.

- 96 to 121.2Hx96Wx60.6 to 67.5D mm
- Front-panel / DIN-rail
- 24 VDC
- 8-, 16- and 32-outputs
- NPN/PNP 100 mA at 30 VDC

Ordering information

Number of outputs	Mounting method	Output configuration	Bank function	Size in mm (HxWxD)	Order code
8-outputs	Flush-mounting	NPN transistor output	No	96x96x67.5	H8PS-8B
		PNP transistor output			H8PS-8BP
	Front-mounting/DIN-rail mounting	NPN transistor output		96x96x60.6	H8PS-8BF
		PNP transistor output			H8PS-8BFP
16-outputs	Flush-mounting	NPN transistor output	Yes	96x96x67.5	H8PS-16B
		PNP transistor output			H8PS-16BP
	Front-mounting/DIN-rail mounting	NPN transistor output		121.2x96x60.6	H8PS-16BF
		PNP transistor output			H8PS-16BFP
32-outputs	Flush-mounting	NPN transistor output		96x96x67.5	H8PS-32B
		PNP transistor output			H8PS-32BP
	Front-mounting/DIN-rail mounting	NPN transistor output		121.2x96x60.6	H8PS-32BF
		PNP transistor output			H8PS-32BFP

Encoders

Type	Resolution	Cable length	Order code
Economy	256	2 m	E6CP-AG5C-C 256 2M
Standard	256	1 m	E6C3-AG5C-C 256 1M
		2 m	E6C3-AG5C-C 256 2M
	360		E6C3-AG5C-C 360 2M
	720		E6C3-AG5C-C 720 2M
Rigid	256	2 m	E6F-AG5C-C 256 2M
	360		E6F-AG5C-C 360 2M
	720		E6F-AG5C-C 720 2M

Accessories

Name	Specification	Order code
Discrete wire output cable	2 m	Y92S-41-200
Connector-type output cable	2 m	E5ZE-CBL200
Support software	CD-ROM	H8PS-SOFT-V1
USB cable	A miniB, 2 m	Y92S-40
Parallel input adapter	Two units can operate in parallel	Y92C-30
Protective cover		Y92A-96B
Watertight cover		Y92A-96N
DIN-rail mounting base		Y92F-91

Encoder accessories

Name	Specification	Order code
Shaft coupling for the E6CP	Axis: 6 mm dia.	E69-C06B
Shaft coupling for the E6C3	Axis: 8 mm dia.	E69-C08B
Shaft coupling for the E6F	Axis: 10 mm dia.	E69-C10B
Extension cable	5 m (same for E6CP, E6C3, and E6F)	E69-DF5

Specifications

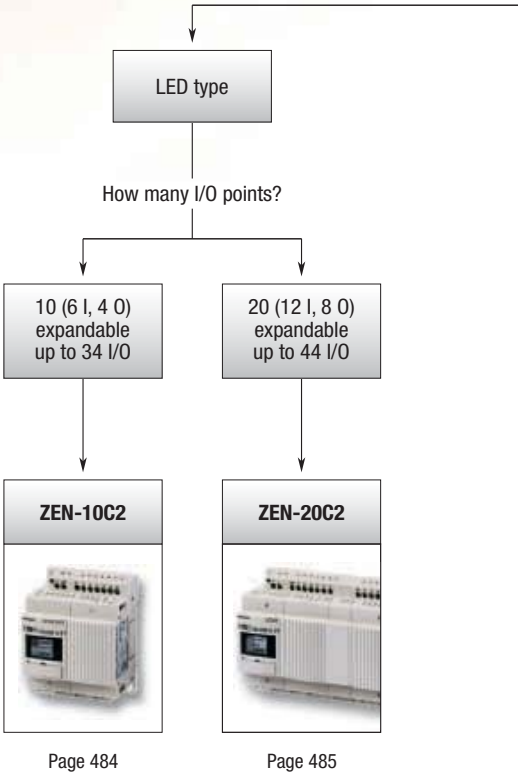
Rated supply voltage			24 VDC
Inputs	Encoder input		8-output models: None; 16-/32-output models: Bank inputs 1/2/4, origin input, start input
	External inputs	Input signals	8-output models: None; 16-/32-output models: Bank inputs 1/2/4, origin input, start input
		Input type	No voltage inputs: ON impedance: 1 kΩ max. (leakage current: Approx. 2 mA at 0 Ω) ON residual voltage: 2 V max., OFF impedance: 100 kΩ min., applied voltage: 30 VDC max. Minimum input signal width: 20 ms
Number of banks			8 banks (for 16-/32-output models only)
Display method			7-segment, negative transmissive LCD (main display: 11 mm (red), sub-display: 5.5 mm (green))
Memory backup method			EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min.
Ambient operating temperature			-10 to 55°C (with no icing or condensation)
Storage temperature			-25 to 65°C (with no icing or condensation)
Ambient humidity			25 to 85%
Degree of protection			Panel surface: IP40, rear case: IP20
Case colour			Light grey (Munsell 5Y7/1)

FLEXIBLE AUTOMATION EXPANDED

ZEN-C4 – More flexibility with RS-485 communication

Our range is extended with a communication model. Now you have the possibility to connect several ZEN in a network environment. This will enhance the ZEN series to solve even more applications.

- RS-485 communication
- To connect up to 32 units
- Easy CompoWayF protocol





What functionality is required?

Display type with buttons, calendar and clock

How many I/O points?

10 (6 I, 4 O) expandable up to 34 I/O

ZEN-10C1



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20 (12 I, 8 O) expandable up to 44 I/O

ZEN-20C1



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10 (6 I, 4 O) fixed I/O

ZEN-10C3



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20 (12 I, 8 O) fixed I/O

ZEN-20C3



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10 (6 I, 4 O) expandable up to 33 I/O with communication

ZEN-10C4



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Expansion unit

How many extra I/O points?

8 I/O (4 I, 4 O)

ZEN-8E



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Model	**ZEN-10C**	**ZEN-20C**		
Type	CPU unit	CPU unit		
Features C1	With LCD Display, program/control buttons, calendar and real-time clock	With LCD display, program/control buttons, calendar and real-time clock		
Features C2	With LED indication Logic control Programming by software	With LED indication Logic control Programming by software		
Features C3	Same as C1 but not expandable.	Same as C1 but not expandable.		
Features C4	Same as C1 but instead of one output relay you get RS-485 communication.	–		
Features Starter kits	Complete set with C1 CPU including software, cable and manual	–		
Number of I / O points	10 expandable up to 34 I/O (C4 up to 33 I/O)	20 expandable up to 44 I/O		
Inputs	6	12		
Inputs/power supply	100 to 240 VAC or 12 to 24 VDC	100 to 240 VAC or 12 to 24 VDC		
Outputs	4 relays (C4 = 3 relays) or 4 transistors	8 relays or 8 transistors		
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– No/not available



Flexible automation

The ZEN-10C offers simple logic control in a choice of four CPU units. Expansion is possible on three of these CPU's of up to 34 I/O whereas the fourth (C3 Units) is fixed at 10 I/O. All DC models have analogue input and a high-speed counter input up to 150 Hz.

- DC input/supply units have analogue input + high speed counter
- The ZEN-10C4 has RS-485 communication
- Expansion available with relay output or transistor output
- ZEN-Kits the best choice to start!

Ordering information

Name	Number of I/O points	Inputs (I)/ power supply		Outputs (Q)		Type	LCD, buttons (B), calendar and clock	Analogue input/ comparators (A)	8-digit counter (F)/ comparators (G)	No. of bits 16	No. of bits 8	Size in mm (HxWxD)	Order code
CPU units	10 Expandable up to 34 I/O	6	100 to 240 VAC	4	Relays	LCD	yes	–	–	Work bits (M) Holding bits (H) Timers (T) Counters (C) Weekly timers (@) LCD display (D) Timer/counter comparator (P)	Holding timers (#) Button input (B)	90x70x56	ZEN-10C1AR-A-V2
						LED	–	–	–				ZEN-10C2AR-A-V2
			12 to 24 VDC			LCD	yes	yes / 4	yes / 4				ZEN-10C1DR-D-V2
						LED	–	yes / 4	yes / 4				ZEN-10C2DR-D-V2
					Transis-tors	LCD	yes	yes / 4	yes / 4				ZEN-10C1DT-D-V2
						LED	–	yes / 4	yes / 4				ZEN-10C2DT-D-V2
	Fixed I/O		100 to 240 VAC		Relays	LCD	yes	–	yes / 4				ZEN-10C3AR-A-V2
			12 to 24 VDC			LCD	yes	yes / 4	yes / 4				ZEN-10C3DR-D-V2
	10 Expandable up to 33 I/O		100 to 240 VAC	3		LCD/ Comm.	yes	–	yes / 4				ZEN-10C4AR-A-V2
			12 to 24 VDC				yes	yes / 4	yes / 4				ZEN-10C4DR-D-V2
ZEN kit		Set containing CPU unit (ZEN-10C1AR-A-V2), connecting cable, ZEN support software and manual.											ZEN-KIT01-EV4
		Set containing CPU unit (ZEN-10C1DR-D-V2), connecting cable, ZEN support software and manual.											ZEN-KIT02-EV4

Specifications

Item	Specifications	
	ZEN-10C_AR-A-V2	ZEN-10C_D_-D-V2
Power supply voltage	100 to 240 VAC, 50/60 Hz	12 to 24 VDC (DC ripple rate: 5%)
Rated power supply voltage	85 to 264 VAC	10.8 to 28.8 VDC
Power consumption	9 VA max.	4 W max.
Inrush current	3 A max.	30 A max.
Ambient temperature	0°C to 55°C (-25°C to 55°C for ZEN-10C2 models (LED))	
Ambient storage	-20°C to 55°C (-40°C to 75°C for ZEN-10C2 models (LED))	
Control method	Stored program control	
I/O control method	Cyclic scan	
Programming language	Ladder diagram	
Program capacity	96 lines (3 input conditions and 1 output per line)	
LCD display	12 characters x 4 lines, with backlight (LCD-type CPU unit only)	
Operation keys	8 (4 cursor keys and 4 operation keys) (LCD-type CPU unit only)	
Super-capacitor holding time	2 days min. (25°C)	
Battery life (ZEN-BAT01)	10 years min. (25°C)	
Calendar & Clock function	Accuracy: ± 15 s/month (at 25°C)	

Accessories

Name	Description	Order code
Memory Cassette	EEPROM (for data security and copying)	ZEN-ME01
Battery unit	Battery (keeps time, date and bit values for 10 years at 25°C)	ZEN-BAT01
Connecting Cable	For the programming software, RS-232C cable, 9-way `D' connector for PC	ZEN-CIF01
USB-Serial conversion cable	USB-Serial conversion cable (to be used in combination with ZEN-CIF01)	CS1W-CIF31
ZEN support software	Runs on Windows ME, 2000, XP, NT4.0 Service Pack 3, Vista	ZEN-SOFT01-V4



Extended flexible automation

Ideal for small-scale control applications, the ZEN-20C provides an economical alternative to discrete timers, counters and general purpose relays. With 12 Inputs and 8 relay or transistor Outputs, and expansion possibilities of up to 44 I/O on C1 and C2 models, the ZEN-20C offers extended flexibility, with features such as calendar and real time clock functionality.

- ZEN-20C1/C2 expandable up to 44 I/Os
- ZEN DC units have analogue input 0-10 VDC
- DC models have as well high speed counter 150 Hz
- Expansion available with relay output or transistor output

Ordering information

Name	Number of I/O points	Inputs (I)/ power supply		Outputs (Q)		Type	LCD, buttons (B), calendar and clock	Analogue input/ comparators (A)	8-digit counter (F)/ comparators (G)	No. of bits 16	No. of bits 8	Size in mm (HxWxD)	Order code
CPU units	20	12	100 to 240 VAC	8	Relays	LCD	yes	–	–	Work bits (M) Holding bits (H) Timers (T) Counters (C) Weekly timers (@) LCD display (D) Timer/counter comparator (P)	Holding timers (#) Button input (B)	90x122.5 x56	ZEN-20C1AR-A-V2
	Expandable up to 44 I/O					LED	–	–	–				ZEN-20C2AR-A-V2
			12 to 24 VDC			LCD	yes	yes / 4	yes / 4				ZEN-20C1DR-D-V2
						LED	–	yes / 4	yes / 4				ZEN-20C1DR-D-V2
					Transis-tors	LCD	yes	yes / 4	yes / 4				ZEN-20C1DT-D-V2
						LED	–	yes / 4	yes / 4				ZEN-20C2DT-D-V2
	Fixed I/O		100 to 240 VAC		Relays	LCD	yes	–	yes / 4				ZEN-20C3AR-A-V2
			12 to 24 VDC			LCD	yes	yes / 4	yes / 4				ZEN-20C3DR-D-V2

Specifications

Item	Specifications	
	ZEN-20C_AR-A-V2	ZEN-20C_D_-D-V2
Power supply voltage	100 to 240 VAC, 50/60 Hz	12 to 24 VDC (DC ripple rate: 5%)
Rated power supply voltage	85 to 264 VAC	10.8 to 28.8 VDC
Power consumption	11 VA max.	5 W max.
Inrush current	4 A max.	30 A max.
Ambient temperature	0°C to 55°C (-25°C to 55°C for ZEN-20C2 models (LED))	
Ambient storage	-20°C to 55°C (-40°C to 75°C for ZEN-20C2 models (LED))	
Control method	Stored program control	
I/O control method	Cyclic scan	
Programming language	Ladder diagram	
Program capacity	96 lines (3 input conditions and 1 output per line)	
LCD display	12 characters x 4 lines, with backlight (LCD-type CPU unit only)	
Operation keys	8 (4 cursor keys and 4 operation keys) (LCD-type CPU unit only)	
Super-capacitor holding time	2 days min. (25°C)	
Battery life (ZEN-BAT01)	10 years min. (25°C)	
Calendar & Clock function	Accuracy: ± 15 s/month (at 25°C) if applicable	

Accessories

Name	Description	Order code
Memory Cassette	EEPROM (for data security and copying)	ZEN-ME01
Battery unit	Battery (keeps time, date and bit values for 10 years at 25°C)	ZEN-BAT01
Connecting Cable	For the programming software, RS-232C cable, 9-way `D' connector for PC	ZEN-CIF01
USB-Serial conversion cable	USB-Serial conversion cable (to be used in combination with ZEN-CIF01)	CS1W-CIF31
ZEN support software	Runs on Windows ME, 2000, XP, NT4.0 Service Pack 3, Vista	ZEN-SOFT01-V4



ZEN Expansion units

To enlarge your ZEN application we provide three different expansion units in only 35 mm width ZEN housing. All expansion units have standard 4 inputs and 4 outputs. You can add maximum 3 expansion units to one CPU.

- 4 inputs, 100 to 240VAC or 12 to 24VDC
- 4 outputs, either relays or transistors (only DC models)
- DIN-rail mounting
- Size in mm (HxWxD): 90x35x56

Ordering information

Name	Number of I/O points	Inputs (X)/ power supply		Outputs (Y)		Size in mm (HxWxD)	Order code
Expansion I/O units	8	4	100 to 240 VAC	4	Relays	90x35x56	ZEN-8E1AR
			12 to 24 VDC				ZEN-8E1DR
					Transistors		ZEN-8E1DT

Specifications

Item	Specifications	
	ZEN-8E1AR	ZEN-8E1D_
Power supply voltage	100 to 240 VAC, 50/60 Hz	12 to 24 VDC (DC ripple rate: 5% max.)
Rated power supply voltage	85 to 264 VAC	10.8 to 28.8 VDC
Power consumption	4 VA max.	2 W max.
Inrush current	1.5 A max.	15 A max.
Ambient temperature	0°C to 55°C (-25°C to 55°C for ZEN-10C2 models (LED))	
Ambient storage	-20°C to 55°C (-40°C to 75°C for ZEN-10C2 models (LED))	



ZEN Power Supply

The ZEN Power Supply has the same compact housing as our 10 I/O CPU units. With a current/wattage output of 1.3 A/30 W it covers enough power to supply the DC ZEN itself and the eventually used sensors. If needed parallel operation is possible.

- Output voltage 24 VDC
- Output current 1.3 A
- Capacity 30 W
- Allows parallel operation
- Size in mm (HxWxD): 90x70x56

Ordering information

Power rating	Inputs voltage	Output current	Order code
30 W	100 to 240 VAC	1.3 A	ZEN-PA03024

Specifications

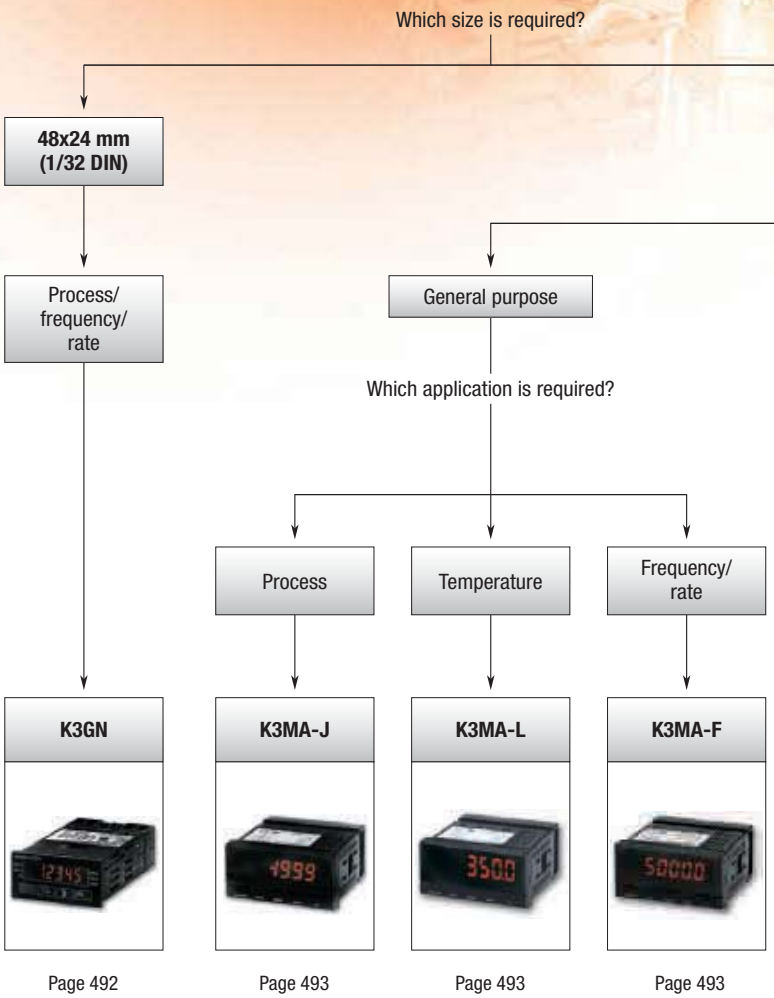
Item	Specifications	
Power rating	30 W	
Efficiency	80% min. (24 V)	
Input voltage	100 to 240 VAC (85 to 264 VAC), single-phase	
Output voltage	Voltage adjustment	±10% to ±15% (with V. ADJ) min. of rate output voltage
	Ripple	2% (p-p) max. (-25°C to -10°C: 4% max.)
	Input variation	0.5% max.
	Temperature	0.05% / °C max.
Overload protection	105% to 135% of rated load current, inverted L drop, intermittent	
Overvoltage protection	yes	
Input Current	100 V	0.8 A max.
	200 V	0.45 A max.
Output indicator	yes (green)	
Weight	240 g max.	
Operating temperature	-10°C to 60°C	
Parallel operation	yes (2 units max.)	

LOOKING FOR PERFECT MEASURING & READ-OUT?

K3HB-V – For perfect weighing

With our K3HB series we cover a wide range of applications. One of them is the weighing indicator which performs perfect measurement in any weighing application. The instrument can be equipped with a load-cell power supply of 10 V/100 mA. Several option boards for communication, contact output boards or event inputs are also available. On top of these you can get direct DeviceNet communication.

- High speed sampling 20 ms
- Equipped with position meter
- Two colour display for easy recognition





96x48 mm (1/8 DIN)

Advanced

Which application is required?

Process	Temperature	Weighing	Linear sensor	Rotary pulse	Time interval	Up/down counting pulse
K3HB-X	**K3HB-H**	**K3HB-V**	**K3HB-S**	**K3HB-R**	**K3HB-P**	**K3HB-C**
						
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Selection table

	Category	Multifunctional digital panel indicator	Process indicator	Temperature indicator	Frequency/rate indicator	Process indicator
Selection criteria						
	Model	K3GN	K3MA-J	K3MA-L	K3MA-F	K3HB-X
	Size	1/32 DIN	1/8 DIN			
Features	Colour change display	■	■	■	■	■
	Number of digits	5	5	4	5	5
	Leading zero suppression	■	■	■	■	■
	Forced zero function	■	■	■	■	■
	Min./max. hold function	■	■	■	■	■
	Average processing	■	■	■	■	■
	User selectable inputs	■	■	■	■	■
	Start-up compensating time	■	–	–	■	–
	Key protection	■	■	■	■	■
	Decimal point position setting	■	■	■	■	■
	Accuracy	±0.1% of full scale	±0.1% of full scale	±0.1% of full scale	±0.1% of full scale	±0.1% of full scale (DC voltage & DC current), ±0.5% of full scale (AC voltage & AC current)
	Input range	0 to 20 mA, 4 to 20 mA or 0 to 5 V, 1 to 5 V, -5 to 5 V, -10 to 10 V or 0 to 30 Hz or 0 to 5 kHz	0 to 20 mA, 4 to 20 mA or 0 to 5 V, 1 to 5 V, -5 to 5 V, -10 to 10 V	Pt100, JPt100 or thermocouple K, J, T, E, L, U, N, R, S, B	0 to 30 Hz or 0 to 5 kHz	0.000 to 10.000 A, 0.0000 to 19.999 mA, -199.99 to 199.99 mA, 4.000 to 20.000 mA, 0.0 to 400.0 V, 0.0000 to 1.999 V, -199.99 to 199.99 V, 1.0000 to 5.0000 V
	Sample rate	250 ms	250 ms	500 ms	–	20 ms
	Features	Remote/local processing, parameter initialisation, programmable output configuration, process value hold	Teaching, comparative output pattern selection, parameter initialisation, programmable output configuration, process value hold	Programmable output configuration, process value hold	Teaching, comparative output pattern selection, programmable output configuration, process value hold	Scaling, teaching, averaging, output hysteresis, output OFF-delay, output test, bank selection, reset, comparative output
	Sensor power supply	–	–	–	■	□
Front protection	IP rating	IP66	IP66	IP66	IP66	IP66
	Supply voltage	24 VDC	24 VAC/VDC or 100 to 240 VAC	24 VAC/VDC or 100 to 240 VAC	24 VAC/VDC or 100 to 240 VAC	100 to 240 VAC or 24 VAC/VDC
Inputs	NPN	■	–	■	■	□
	PNP	■	–	■	■	□
	Temperature	–	–	–	–	–
	Contact	–	–	–	■	–
	Voltage pulse	–	–	–	■	–
	Load cell	–	–	–	–	–
	DC voltage	■	■	■	–	□
	DC current	■	■	–	–	□
	AC voltage	–	–	–	–	□
	AC current	–	–	–	–	□
Outputs	Relay	■	■	■	■	□
	NPN	■	–	–	–	□
	PNP	■	–	–	–	□
	Linear	–	–	–	–	□
	BCD	–	–	–	–	–
	Comms	■	–	–	–	□
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Temperature indicator	Weighing indicator	Linear sensor indicator	Up/down counting pulse indicator	Time interval indicator	Rotary pulse indicator
					
K3HB-H	**K3HB-V**	**K3HB-S**	**K3HB-C**	**K3HB-P**	**K3HB-R**
1/8 DIN				–	–
■	■	■	■	■	■
5	5	5	5	5	5
■	■	■	■	■	■
■	■	■	■	■	■
■	■	■	■	■	■
■	■	■	■	■	■
■	■	■	■	■	■
–	–	–	–	–	■
■	■	■	■	■	■
■	■	■	■	■	■
Thermocouple: ±0.3% of full scale, Pt-100: ±0.2% of full scale	±0.1% of full scale	One input: ±0.1% of full scale, two inputs: ±0.2% of full scale		±0.08% rgd ±1 digit	±0.006% rgd ±1 digit ±0.02% rgd ±1 digit
Pt100, thermocouple K, J, T, E, L, U, N, R, S, B, W	0.00 to 199.99 mV, 0.000 to 19.999 mV, 100.00 mV, 199.99 mV	0 to 20 mA, 4 to 20 mA, 0 to 5 V, -5 to 5 V, -10 to 10 V	No voltage contact: 30 Hz, voltage pulse: 50 kHz, open collector: 50 kHz	No voltage contact: 30 Hz, voltage pulse: 50 kHz, open collector: 50 kHz	No voltage contact: 30 Hz, voltage pulse: 50 kHz, open collector: 50 kHz
20 ms	20 ms	0.5 ms	–	–	–
Scaling, teaching, averaging, output hysteresis, output OFF-delay, output test, bank selection, reset, comparative output	Scaling, teaching, averaging, output hysteresis, output OFF-delay, output test, bank selection, reset, comparative output	Scaling, 2-input calculation, teaching, averaging, output hysteresis, output OFF-delay, output test, bank selection, reset, comparative output	Scaling, measurement operation selection, output hysteresis, output OFF-delay, output test, display value selection, display colour selection, key protection, bank selection, display refresh period, maximum/minimum hold, reset	Scaling, measurement operation selection, output hysteresis, output OFF-delay, output test, teaching, display value selection, display colour selection, key protection, bank selection, display refresh period, maximum/minimum hold, reset	Scaling, measurement operation selection, averaging, previous average value comparison, output hysteresis, output OFF-delay, output test, teaching, display value selection, display colour selection, key protection, bank selection, display refresh period, maximum /minimum hold, reset
□	□	□	□	□	□
IP66	IP66	IP66	IP66	IP66	IP66
100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC
□	□	□	■	■	■
□	□	□	■	■	■
■	–	–	–	–	–
–	–	–	–	–	–
–	–	–	■	■	■
–	■	–	–	–	–
–	–	■	–	–	–
–	–	■	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
□	□	□	□	□	□
□	□	□	□	□	□
□	□	□	□	□	□
□	□	□	□	□	□
–	–	–	□	□	□
□	□	□	□	□	□
494			496		

■ Standard □ Available – No/not available



Compact and intelligent digital panel meter

The K3GN is able to cover a wide variety of applications with its 3 main functions: process meter, RPM processor/tachometer and digital data display for PC/PLC. Configuration is easy and the design is advanced and compact.

- Process indicator DC voltage/current
- RPM process/tachometer
- Digital data display for PC/PLC
- Very compact 1/32 DIN housing: Size in mm (HxWxD): 24x48x83mm
- 5-digit display with programmable display colour, in red or green

Ordering information

Input type	Supply voltage	Output	Order code	
			No communications	RS-485
DC voltage/current, NPN	24 VDC	Dual relays (SPST-NO)	K3GN-NDC 24 DC	K3GN-NDC-FLK 24 DC
		Three NPN open collector	K3GN-NDT1 24 DC	K3GN-NDT1-FLK 24 DC
DC voltage/current, PNP		Dual relays (SPST-NO)	K3GN-PDC 24 DC	K3GN-PDC-FLK 24 DC
		Three PNP open collector	K3GN-PDT2 24 DC	K3GN-PDT2-FLK 24 DC

Specifications

Supply voltage	24 VDC
Operating voltage range	85 to 110% of the rated supply voltage
Power consumption	2.5 W max. (at max. DC load with all indicators lit)
Ambient temperature	Operating: -10 to 55°C (with no condensation or icing) Storage: -25 to 65°C (with no condensation or icing)
Display refresh period	Sampling period (sampling times multiplied by number of averaging times if average processing is selected)
Max. displayed digits	5 digits (-19999 to 99999)
Display	7-segment digital display, character height: 7.0 mm
Polarity display	"-" is displayed automatically with a negative input signal
Zero display	Leading zeros are not displayed
Scaling function	Programmable with front-panel key inputs (range of display: -19999 to 99999). The decimal point position can be set as desired.
External controls	HOLD: (measurement value held)
	ZERO: (forced-zero)
Hysteresis setting	Programmable with front-panel key inputs (0001 to 9999)
Other functions	Programmable colour display Selectable output operating action Teaching set values Average processing (simple average) Lockout configuration Communications writing control (communications output models only)
Output	Relays: 2 SPST-NO Transistors: 3 NPN open collector 3 PNP open collector
	Combinations: Communications output (RS-485) + relay outputs Communications output (RS-485) + transistor outputs Communications output (RS-485) + transistor outputs (3 PNP open collector)
Communications	Communications function: RS-485
Delay in comparative outputs (transistor outputs)	750 ms max.
Degree of protection	Front-panel: NEMA4X for indoor use (equivalent to IP66) Rear case: IEC standard IP20 Terminals: IEC standard IP20
Memory protection	Non-volatile memory (EEPROM) (possible to rewrite 100,000 times)
Size in mm (HxWxD)	24x48x80



Highly visible LCD display with 2 colour (red and green) LEDs

The K3MA series comes with a process meter, a frequency/rate meter and a temperature meter of either 100 to 240 VAC or 24 VAC/VDC. All are equipped with the same quality display and have the same short depth of 80 mm.

- 1/8 DIN size housing
- Highly visible, negative transmissive backlit LCD display
- 14.2 mm high characters
- 5 digits (-19,999 to 99,999), K3MA-L: 4 digits
- Front-panel IP66

Ordering information

Indicator	Supply voltage	Input type & ranges	Output	Order code
Process meter	100 to 240 VAC	DC voltage: 0 to 5 V, 1 to 5 V, -5 to 5 V, -10 to 10 V DC current: 0 to 20 mA, 4 to 20 mA	2 relay contact outputs (SPST-NO)	K3MA-J-A2 100-240VAC
	24 VAC/VDC		2 relay contact outputs (SPST-NO)	K3MA-J-A2 24VAC/VDC
Temperature meter	100 to 240 VAC	Platinum-resistance thermometer: Pt100, JPt100 or thermocouple K, J, T, E, L, U, N, R, S, B	1 relay contact output (SPDT)	K3MA-L-C 100-240VAC
	24 VAC/VDC		1 relay contact output (SPDT)	K3MA-L-C 24VAC/VDC
Frequency/rate meter	100 to 240 VAC	Rotary pulse: No voltage: 0.05 to 30.00 Hz; open collector: 0.1 to 5000.0 Hz	2 relay contact outputs (SPST-NO)	K3MA-F-A2 100-240VAC
	24 VAC/VDC		2 relay contact outputs (SPST-NO)	K3MA-F-A2 24VAC/VDC

Accessories

Type	Order code
Splash-proof soft cover	K32-49SC
Hard cover	K32-49HC

Specifications

Item	100-240 VAC models	24 VAC/VDC models
Supply voltage	100 to 240 VAC	24 VAC (50/60 Hz), 24 VDC
Operating voltage range	85 to 110% of the rated supply voltage	
Power consumption (under maximum load)	6 VA max.	4.5 VA max. (24 VAC) 4.5 W max. (24 VDC)
Ambient temperature	Operating: -10 to 55°C (with no condensation or icing) Storage: -25 to 65°C (with no condensation or icing)	
Weight	Approx. 200 g	
Display	7-segment digital display, character height: 14.2 mm	
Polarity display	"-" is displayed automatically with a negative input signal	
Zero display	Leading zeros are not displayed	
Hold function	Max. hold (maximum value), min. hold (minimum value)	
Hysteresis setting	Programmable with front-panel key inputs (0001 to 9,999)	
Delay in comparative outputs	1 s max.	
Degree of protection	Front-panel: NEMA4X for indoor use (equivalent to IP66) Rear case: IEC standard IP20 Terminals: IEC standard IP00 + finger protection (VDE 0106/100)	
Memory protection	Non-volatile memory (EEPROM) (possible to rewrite 100,000 times)	
Size in mm (HxWxD)	48x96x80	



Process, temperature, weighing and linear sensor indicators

These indicators with analogue input feature a clear and easy-to-use colour change display. All models are equipped with an IP66 housing. K3HB series is high speed, with a sample rate of 50 Hz, and even 2,000 Hz for K3HB-S

- Position meter indication for easy monitoring
- Optional DeviceNet, RS-232C, RS-485
- Double display, with 5 digits, in two colours
- 1/8 DIN size housing

Ordering information

Type of indicator	Input sensor type and range	Supply voltage	Order code
Process indicator K3HB-X	AC current input, from 0.000 to 10.000 A, 0.0000 to 19.999 mA	100 to 240 VAC	K3HB-XAA 100-240VAC
		24 VAC/VDC	K3HB-XAA 24VAC/VDC
	DC current input, from ±199.99 mA, to 4.000 to 20.000 mA	100 to 240 VAC	K3HB-XAD 100-240VAC
		24 VAC/VDC	K3HB-XAD 24VAC/VDC
	AC voltage input, from 0.0 to 400.0 V to 0.0000 to 1.999 V	100 to 240 VAC	K3HB-XVA 100-240VAC
		24 VAC/VDC	K3HB-XVA 24VAC/VDC
	DC voltage input, from ±199.99 V to 1.0000 to 5.0000 V	100 to 240 VAC	K3HB-XVD 100-240VAC
		24 VAC/VDC	K3HB-XVD 24VAC/VDC
Temperature indicator K3HB-H	Temperature input Pt100, thermocouple K, J, T, E, L, U, N, R, S, B, W	100 to 240 VAC	K3HB-HTA 100-240VAC
		24 VAC/VDC	K3HB-HTA 24VAC/VDC
Weighing indicator K3HB-V	Load cell input (DC low voltage input), 0.00 to 199.99 mV, 0.000 to 19.999 mV, 100.00 mV, 199.999 mV	100 to 240 VAC	K3HB-VLC 100-240 VAC
		24 VAC/VDC	K3HB-VLC 24VAC/VDC
Linear sensor indicator K3HB-S	DC process input, 0 to 5 V, 1 to 5 V, -5 to 5 V, -10 to 10 V, 0 to 20 mA, 4 to 20 mA	24 VAC/VDC	K3HB-SSD AC/DC24
		100 to 240 VAC	K3HB-SSD AC100-240

Option boards

Sensor power supply/output boards

Slot	Output		Sensor power supply	Communications	Applicable indicator types	Order code
B	Relay	PASS: SPDT	12 VDC ±10%, 80 mA	–	K3HB-X, -H, -S	K33-CPA *1
	Linear current	DC0(4) - 20 mA		–	K3HB-X, -H, -S	K33-L1 A *2
	Linear voltage	DC0(1) - 5 V, 0 to 10 V		–	K3HB-X, -H, -S	K33-L2A *2
	–	–		–	K3HB-X, -H, -S	K33-A *2
	–	–		RS-232C	K3HB-X, -H, -S	K33-FLK1 A *2
	–	–		RS-485	K3HB-X, -H, -S	K33-FLK3A *2
	Relay	PASS: SPDT	10 VDC ±5%, 100 mA	–	K3HB-V	K33-CPB *1
	Linear current	DC0(4) - 20 mA		–	K3HB-V	K33-L1B *2
	Linear voltage	DC0(1) - 5 V, 0 to 10 V		–	K3HB-V	K33-L2B *2
	–	–		–	K3HB-V	K33-B *2
	–	–		RS-232C	K3HB-V	K33-FLK1B *2
	–	–		RS-485	K3HB-V	K33-FLK3B *2

Relay/transistor output boards

Slot	Output		Communications	Order code
C	Relay	H/L: SPDT each	–	K34-C1
		HH/H/LL/L: SPST-NO each	–	K34-C2
	Transistor	NPN open collector: HH/H/PASS/L/LL	–	K34-T1
		PNP open collector: HH/H/PASS/L/LL	–	K34-T2
	–	–	DeviceNet	K34-DRT *2

Event input boards

Slot	Input type	Number of points	Communications	Order code
D	NPN open collector	5	M3 terminal blocks	K35-1
		8	10-pin MIL connector	K35-2
	PNP open collector	5	M3 terminal blocks	K35-3
		8	10-pin MIL connector	K35-4

*1 CPA/CPB can be combined with relay outputs only.
*2 Only one of the following can be used by each digital indicator: RS-232C/RS-485 communications, a linear output, or DeviceNet communications. K3HB has got three slots for option boards: Slot B, slot C and slot D.

Accessories

Type	Order code
Special cable (for event inputs with 8-pin connector)	K32-DICN

Specifications

Power supply voltage			100 to 240 VAC (50/60 Hz), 24 VAC/VDC, DeviceNet power supply: 24 VDC
Allowable power supply voltage range			85 to 110% of the rated power supply voltage, DeviceNet power supply: 11 to 25 VDC
Power consumption			100 to 240 V: 18 VA max. (max. load), 24 VAC/DC: 11 VA/7 W max. (max. load)
Display method			Negative LCD (backlit LED) display 7-segment digital display (character height: PV: 14.2 mm (green/red); SV: 4.9 mm (green))
Ambient operating temperature			-10 to 55°C (with no icing or condensation)
Display range			-19,999 to 99,999
Weight			Approx. 300 g (base unit only)
Degree of protection		Front-panel	Conforms to NEMA 4X for indoor use (equivalent to IP66)
		Rear case	IP20
		Terminals	IP00 + finger protection (VDE0106/100)
Memory protection			EEPROM (non-volatile memory), number of rewrites: 100,000
Event input ratings		Contact	ON: 1 kΩ max., OFF: 100 kΩ min.
		No-contact	ON residual voltage: 2 V max., OFF leakage current: 0.1 mA max., load current: 4 mA max. Maximum applied voltage: 30 VDC max.
Output ratings	**Transistor output**	Maximum load voltage	24 VDC
		Maximum load current	50 mA
		Leakage current	100 μA max.
	Contact output (resistive load)	Rated load	5 A at 250 VAC, 5 A at 30 VDC
		Rated through current	5 A
		Mechanical life expectancy	5,000,000 operations
		Electrical life expectancy	100,000 operations
	Linear output	Allowable load impedance	500 Ω max. (mA); 5 kΩ min. (V)
		Resolution	Approx. 10,000
		Output error	±0.5% FS
Size in mm (HxWxD)			48x96x100



Rotary pulse, timer interval and up/down counting pulse indicators

These indicators with analogue input feature a clear and easy-to-use colour change display. All models are equipped with an IP66 housing. K3HB-R and -C are high-speed, with a sample rate up to 50 kHz.

- Position meter indication for easy monitoring
- Optional DeviceNet, RS-232C, RS-485
- Double display, with 5 digits, in two colours
- 1/8 DIN size housing

Ordering information

Type of indicator	Input ranges	Supply voltage	Input sensor	Order code
Rotary pulse indicator K3HB-R	No voltage contact: 30 Hz max. Voltage pulse: 50 kHz max. Open collector: 50 kHz max.	100 to 240 VAC	NPN input/voltage pulse	K3HB-RNB 100-240VAC
		24 VAC/VDC		K3HB-RNB 24VAC/VDC
		100 to 240 VAC	PNP input	K3HB-RPB 100-240VAC
		24 VAC/VDC		K3HB-RPB 24VAC/VDC
		100 to 240 VAC	NPN	K3HB-PNB 100-240VAC
		100 to 240 VAC	PNP	K3HB-PPB 100-240VAC
Timer interval indicator K3HB-P		24 VAC/VDC	PNP	K3HB-PPB 24VAC/VDC
		100 to 240 VAC	NPN	K3HB-CNB 100-240VAC
Up/down counting pulse indicator K3HB-C		24 VAC/VDC	NPN	K3HB-CNB 24VAC/VDC
		24 VAC/VDC	PNP	K3HB-CPB 24VAC/VDC

Option boards

Sensor power supply/output boards

Slot	Output		Sensor power supply	Communications	Order code
B	Relay	PASS: SPDT	12 VDC ±10%, 80 mA	–	K33-CPA *1
	Linear current	DC0(4) - 20 mA		–	K33-L1 A *2
	Linear voltage	DC0(1) - 5 V, 0 to 10 V		–	K33-L2A *2
	–	–		–	K33-A *2
	–	–		RS-232C	K33-FLK1 A *2
	–	–		RS-485	K33-FLK3A *2

Relay/transistor output boards

Slot	Output		Communications	Order code
C	Relay	H/L: SPDT each	–	K34-C1
		HH/H/LL/L: SPST-NO each	–	K34-C2
	Transistor	NPN open collector: HH/H/PASS/L/LL	–	K34-T1
		PNP open collector: HH/H/PASS/L/LL	–	K34-T2
	–		**DeviceNet**	K34-DRT *2
	BCD + transistor	**NPN open collector: HH/H/PASS/L/LL**	–	K34-BCD

Event input boards

Slot	Input type	Number of points	Communications	Order code
D	NPN open collector	5	M3 terminal blocks	K35-1
		8	10-pin MIL connector	K35-2
	PNP open collector	5	M3 terminal blocks	K35-3
		8	10-pin MIL connector	K35-4

*1 CPA can be combined with relay outputs only.
*2 Only one of the following can be used by each digital indicator: RS-232C/RS-485 communications, a linear output, or DeviceNet communications. K3HB has got three slots for option boards: Slot B, slot C and slot D.

Accessories

Type	Order code
Special cable (for event inputs with 8-pin connector)	K32-DICN
Special BCD output cable	K32-BCD

Specifications

Power supply voltage			100 to 240 VAC (50/60 Hz), 24 VAC/VDC, DeviceNet power supply: 24 VDC
Allowable power supply voltage range			85 to 110% of the rated power supply voltage, DeviceNet power supply: 11 to 25 VDC
Power consumption			100 to 240 V: 18 VA max. (max. load), 24 VAC/DC: 11 VA/7 W max. (max. load)
Display method			Negative LCD (backlit LED) display 7-segment digital display (character height: PV: 14.2 mm (green/red); SV: 4.9 mm (green))
Ambient operating temperature			-10 to 55°C (with no icing or condensation)
Display range			-19,999 to 99,999
Weight			Approx. 300 g (base unit only)
Degree of protection		Front-panel	Conforms to NEMA 4X for indoor use (equivalent to IP66)
		Rear case	IP20
		Terminals	IP00 + finger protection (VDE0106/100)
Memory protection			EEPROM (non-volatile memory), number of rewrites: 100,000
Event input ratings		Contact	ON: 1 kΩ max., OFF: 100 kΩ min.
		No-contact	ON residual voltage: 2 V max., OFF leakage current: 0.1 mA max., load current: 4 mA max. Maximum applied voltage: 30 VDC max.
Output ratings	**Transistor output**	Maximum load voltage	24 VDC
		Maximum load current	50 mA
		Leakage current	100 μA max.
	Contact output (resistive load)	Rated load	5 A at 250 VAC, 5 A at 30 VDC
		Rated through current	5 A
		Mechanical life expectancy	5,000,000 operations
		Electrical life expectancy	100,000 operations
	Linear output	Allowable load impedance	500 Ω max. (mA); 5 kΩ min. (V)
		Resolution	Approx. 10,000
		Output error	±0.5% FS
Size in mm (HxWxD)			48x96x100

WHEN RELIABLE SWITCHING MATTERS

The switching solution for all your applications!

Wherever mechanical, operator or electrical driven switching needs to be performed we offer a wide range of solutions. For example: for high frequency switching applications the best solution is with our solid state relays. Furthermore, we offer monitoring relays, which on threshold conditions, take the proper switching action.

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With the G2RV-SL500 series only 2 steps are required to achieve a reliable connection between wire and terminal. Just remove the isolation and push in the wire. Cross bars make your life even easier, as they can be tailored by breaking pins away to meet your configuration requirements.

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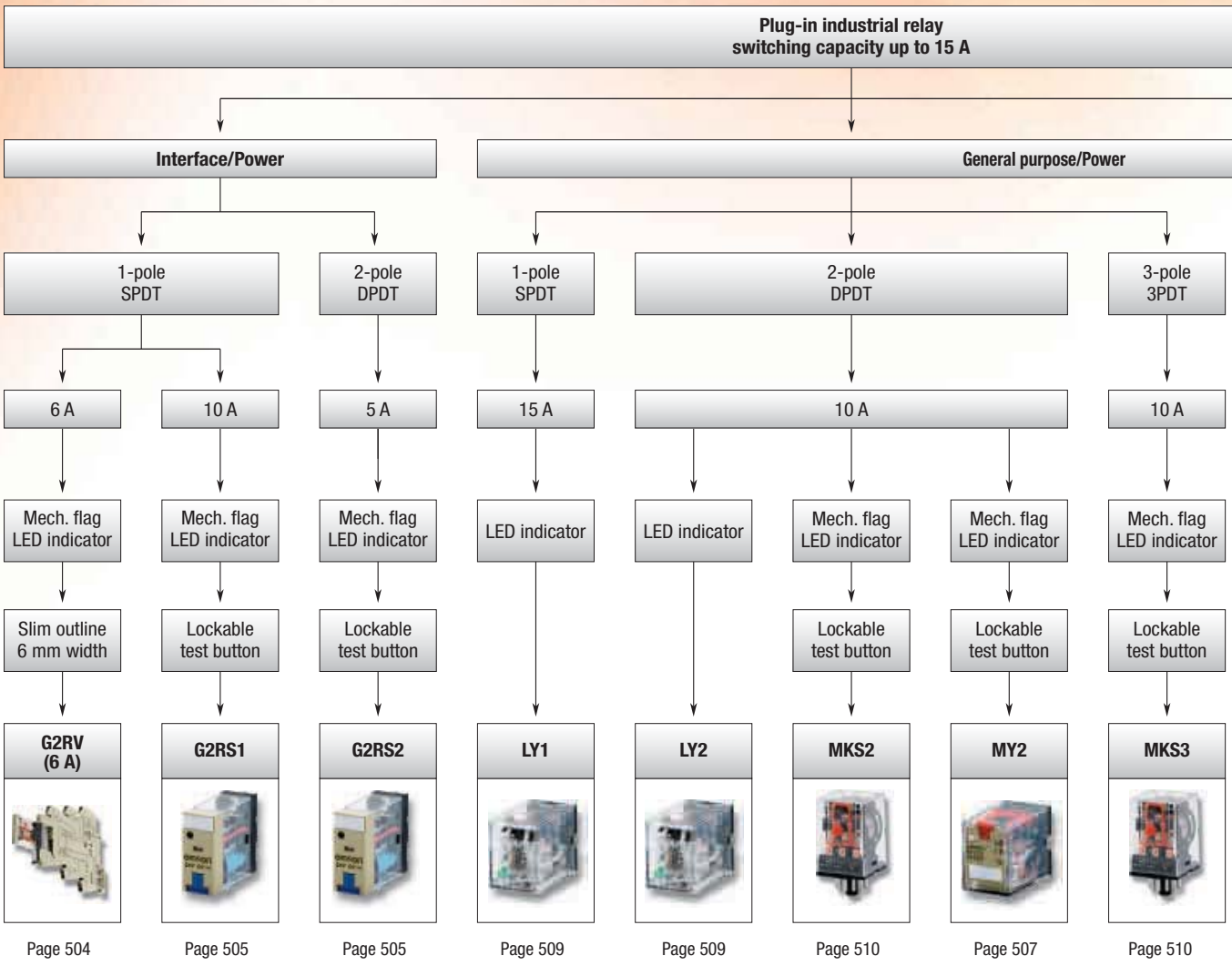

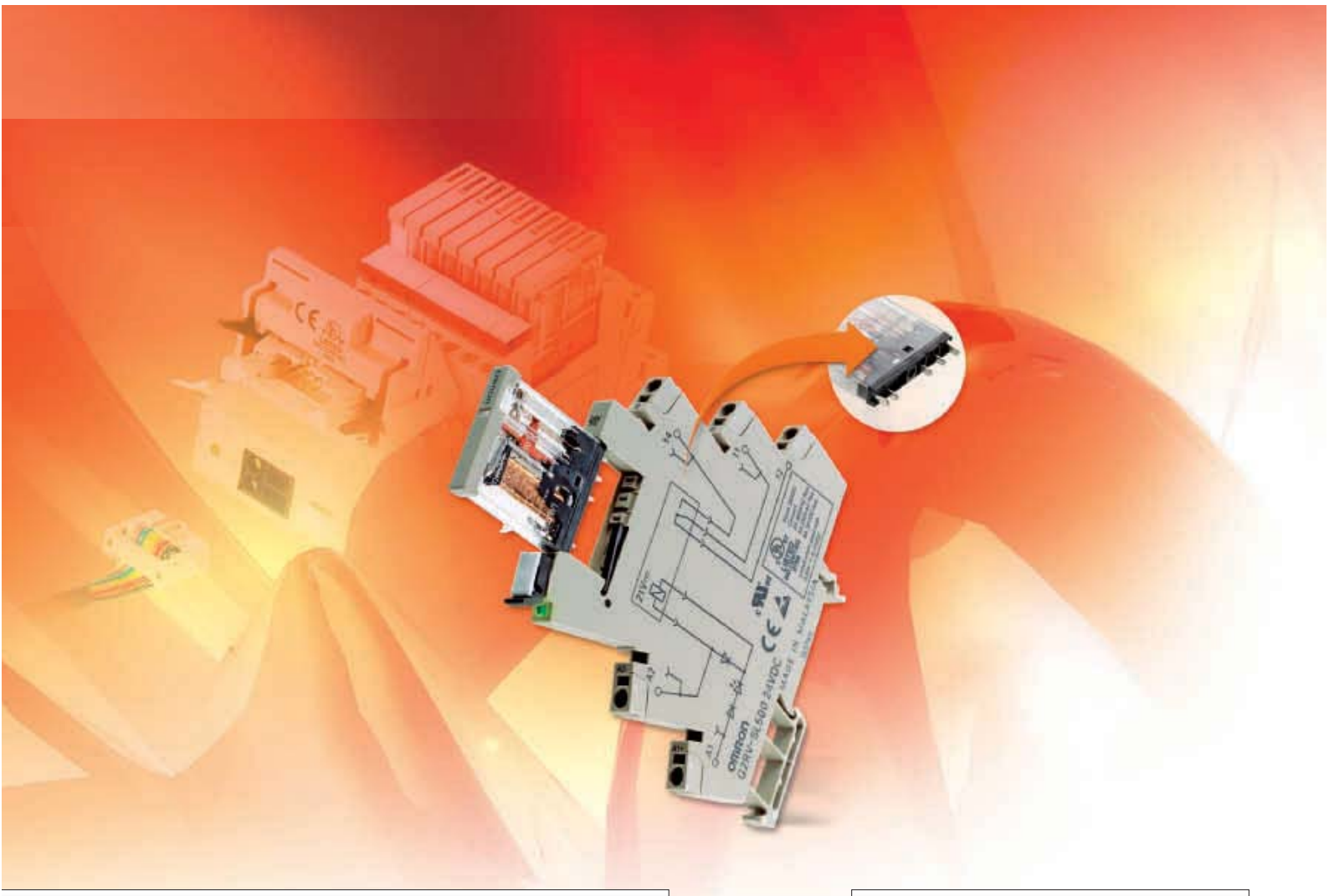

DC-switching

3-pole 3PDT

4-pole 4PDT

SPST-NO, SPST-NO/ SPST-NC

10 A

10 A

5 A

10 A

LED indicator

LED indicator

Mech. flag LED indicator

Operation indicators

Lockable test button

Lockable test button

LY3



LY4



MY4



MKS(X)



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High power relays up to 40 A

1/2-pole SPST/DPDT

4-pole, 4PST-NO 3PST-NO/SPST-NC DPST-NO/DPST-NC

30 A

25 A

40 A

Momentary test button

Mirror contact

G7L



G7J



G7Z



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Selection table

	Category	Interface/Power			General purpose/Power		
							
Selection criteria	Family	G2RV	G2RS		MY		
	1-pole	■	■	–	–	–	–
	2-pole	–	–	■	■	–	–
	3-pole	–	–	–	–	–	–
	4-pole	–	–	–	–	■	■
	Contact configuration	SPDT	SPDT	DPDT	DPDT	4PDT	4PDT bifurcated
	Contact material	AgSnIn	AgSnIn	AgSnIn	Ag	AgNi + Au	AgNi + Au
	Max. switching Current	6 A	10 A	5 A	10 A	5 A	5 A
	Min. switching Current	10 mA at 5 VDC	100 mA at 5 VDC	10 mA at 5 VDC	1 mA at 5 VDC	1 mA at 1 VDC	0.1 mA at 1 VDC
	Gold clad/plate	–	□	□	–	■	■
	Width max. (Relay only)	5.2 mm	13.0 mm	13.0 mm	21.5 mm	21.5 mm	21.5 mm
Features	LED indication	■	□	□	□	□	□
	Mechanical flag	■	■	■	■	■	■
	Momentary testbutton	–	–	–	–	–	–
	Momentary/ Lockable testbutton	–	□	□	□	□	□
	Label	□	□	□	□	□	□
	Diode (DC coil)	■	□	□	□	□	□
	Varistor (AC coil)	–	–	–	–	–	–
	CR network (AC coil)	■	–	–	□	□	□
Wiring to socket	Screw	□	□	□	□	□	□
	Box clamp	□	–	–	□	□	□
	Screw-less clamp	□	□	□	□	□	□
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	Category	High power relays								
										
Selection criteria	Family	G7J				G7L		G7Z		
	1-pole	–	–	–	–	■	–	–	–	–
	2-pole	–	–	–	–	–	■	–	–	–
	3-pole	–	–	–	–	–	–	–	–	–
	4-pole	■	■	■	■	–	–	■	■	■
	Contact configuration	4PST-NO	4PST-NO	3PST-NO/ SPST-NC	DPST-NO/ DPST-NC	SPST-NO	DPST-NO	4PST-NO	3PST-NO/ SPST-NC	DPST-NO/ DPST-NC
	Max. switching current	25 A	25 A	25 A	25 A	30 A	25 A	40 A	40 A	40 A
	Min. permissible load	100 mA at 24 VDC	100 mA at 24 VDC	100 mA at 24 VDC	100 mA at 24 VDC	100 mA at 5 VDC	100 mA at 5 VDC	2 A at 24 VDC	2 A at 24 VDC	2 A at 24 VDC
	Auxilary contact block Mirror contact	–	–	–	–	–	–	■	■	■
	Momentary testbutton	–	–	–	–	□	□	–	–	–
Relay terminals	Screw	□	□	□	□	□	□	□	□	□
	Quick-connect	□	□	□	□	□	□	–	–	–
	PCB terminals	□	□	□	□	□	□	–	–	–
Mounting	Screw	–	–	–	–	–	–	□	□	□
	DIN rail	–	–	–	–	–	–	□	□	□
	Clip (screw)	□	□	□	□	□	□	–	–	–
	Flange (screw)	□	□	□	□	□	□	–	–	–
	DIN rail (adapter)	–	–	–	–	□	□	–	–	–
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	Category	General purpose/Power								
										
	Family	LY					MKS		MKS(X)	
Selection criteria	1-pole	■	–	–	–	–	–	–	■	–
	2-pole	–	■	■	–	–	■	–	–	■
	3-pole	–	–	–	■	–	–	■	–	–
	4-pole	–	–	–	–	■	–	–	–	–
	Contact configuration	SPDT	DPDT	DPDT bifurcated	3PDT	4PDT	DPDT	3PDT	SPST-NO	SPST-NO/ SPST-NC
	Contact material	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn
	Max. switching Current	15 A	10 A	7 A	10 A	10 A	10 A	10 A	10 A, 220 VDC; 15 A, 250 VAC	5 A, 220 VDC; 15 A, 250 VAC
	Min. switching Current	100 mA at 5 VDC	100 mA at 5 VDC	10 mA at 5 VDC	100 mA at 5 VDC	100 mA at 5 VDC	10 mA at 1 VDC	10 mA at 1 VDC	10 mA at 24 VDC	10 mA at 24 VDC
	Gold clad/plate	–	□	■	–	–	–	–	–	–
	Width max. (Relay only)	21.5 mm	21.5 mm	21.5 mm	31.5 mm	41.5 mm	34.5 mm	34.5 mm	34.5 mm	34.5 mm
Features	LED indication	□	□	□	□	□	□	□	□	□
	Mechanical flag	–	–	–	–	–	■	■	–	–
	Momentary testbutton	–	–	–	–	–	–	–	–	–
	Momentary/ Lockable testbutton	–	–	–	–	–	□	□	□	□
	Label	–	–	–	–	–	□	□	–	–
	Diode (DC coil)	□	□	□	□	□	□	□	Optional for socket	Optional for socket
	Varistor (AC coil)	–	–	–	–	–	□	□	–	–
	CR network (AC coil)	–	□	□	–	–	–	–	–	–
Wiring to socket	Screw	□	□	□	□	□	□	□	□	□
	Box clamp	–	–	–	–	–	□	□	–	–
	Screw-less clamp	–	–	–	–	–	–	–	–	–
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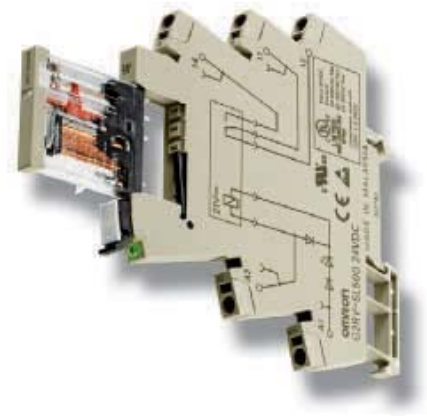
■ Standard □ Available – No/not available



Non-bendable! First 6 mm relay with strong mechanical pins

Drawing on years of experience, G2RV industrial slim relays have been added to the product portfolio. With a width of 6 mm, they offer significant space saving without compromising relay reliability or features. Push-in terminals and a full range of accessories are available for simplifying wiring and saving time

- Large plug-in pins – excellent connection
- LED / mechanical flag – check operation
- Transparent housing – check condition
- Slim outline – space saving
- Push-in / accessories – simple wiring

Ordering information

Input voltage	Order code	
	Screw terminals	Push-in terminals
12 VDC	G2RV-SL700-12 VDC	G2RV-SL500-12 VDC
24 VDC	G2RV-SL700-24 VDC	G2RV-SL500-24 VDC
24 VAC/VDC	G2RV-SL700-24 VAC/VDC	G2RV-SL500-24 VAC/VDC
48 VAC/VDC	G2RV-SL700-48 VAC/VDC	G2RV-SL500-48 VAC /VDC
110 VAC	G2RV-SL700-110 VAC	G2RV-SL500-110 VAC
230 VAC	G2RV-SL700-230 VAC	G2RV-SL500-230 VAC

Accessories

Type	Description	Order code
Cross bar	2-pole	P2RVM-020_
Cross bar	3-pole	P2RVM-030_
Cross bar	4-pole	P2RVM-040_
Cross bar	10-pole	P2RVM-100_
Cross bar	20-pole	P2RVM-200_
PLC interface	Connect 8 relays and PLC output	P2RVC-8-O-F
Label	Plastic, for mounting on socket	R99-15 for G2RV
Label (Sticker)	Paper for mounting on socket or relay	R99-16 for G2RV
Separating plate	Provides isolation between adjacent relays to achieve 400 V isolation	P2RV-S
Relay only	Maintenance part for G2RV-SL-series 12 VDC	G2RV-1-S DC11
Relay only	Maintenance part for G2RV-SL-series 24 VDC and 24 VAC/VDC	G2RV-1-S DC21
Relay only	Maintenance part for G2RV-SL-series 48 VAC/VDC and 110, 230 VAC	G2RV-1-S DC48

Note: _Select colour: R=Red, S=Blue, B=Black

Specifications

Coil ratings

Contact form	SPDT
Input voltage	DC 12, 24, AC/DC 24, 48, AC 110, 230
Rated load	6 A at 250 VAC 6 A at 30 VDC
Max. switching voltage	400 VAC
Max. switching current	6 A
Max. switching power	1500 VA / 180 W
Min. permissible load	10 mA at 5 VDC
Mechanical durability	5 Million operations
Electrical durability (rated load)	100 K operations (typical)
Dielectric strength	4 kV
Ambient temperature	-40 to 55°C
Approved standards	CE, VDE, cULus
Size in mm (HxWxD)	92.7x106.3x6.2 (push-in type) & 97.4x106.3x6.2 (screw type)



Plug-in relay with enhanced features covers a wide range of applications

G2RS series, which comes as standard with mechanical indicator and nameplate covers a wide range interface applications.
Optionally available with gold clad contacts and diode, whilst the socket and crossbar range are offering a maximum of flexibility during installation.

- SPDT type 10A / DPDT type 5 A
- Mechanical Flag, led indicator and momentary / lockable testbutton optional
- Transparent housing
- Screwless clamp terminal sockets available
- Space saving – 16 mm width (including sockets)

Ordering information

Contact form	Diode	LED indicator	Test button	Gold clad 3 µm	Order code		
					(___ = coil voltage + AC/DC)	Common coil voltages *1	
						DC	AC
SPDT (1-pole)	no	no	no	no	G2R-1-S___(S)	24	230
		yes			G2R-1-SN___(S)	12, 24	24, 110, 230
			yes		G2R-1-SNI___(S)	12, 24	12, 24, 110, 230
				yes	G2R-1-SNI-AP3___(S)	–	230
	yes		no	no	G2R-1-SND___(S)	12, 24	–
			yes		G2R-1-SNDI___(S)	24	–
				yes	G2R-1-SNDI-AP3___(S)	24	–
DPDT (2-pole)	no	no	no	no	G2R-2-S___(S)	24	24, 110, 240
		yes			G2R-2-SN___(S)	12, 24, 48	24, 110, 230
				yes	G2R-2-SN-AP3___(S)	24	–
			yes	no	G2R-2-SNI___(S)	12, 24	12, 24, 110, 230
				yes	G2R-2-SNI-AP3___(S)	–	230
	yes	no	no	no	G2R-2-SD___(S)	–	–
		yes			G2R-2-SND___(S)	12, 24	–
				yes	G2R-2-SND-AP3___(S)	24	–
			yes	no	G2R-2-SNDI___(S)	12, 24	–
				yes	G2R-2-SNDI-AP3___(S)	24	–

*1 Other coil voltages available. Please see specifications.

Sockets & accessories

For type	Order code						
	DIN rail						PCB
	Screwless clamp					Screw	Soldering
	Socket	Clip	Cross bar AC type	Cross bar DC type	Name plate	Socket	Socket
G2R-1-S	P2RF-05-S	P2CM-S	P2RM-SR	P2RM-SB	R99-11	P2RF-05-E	P2R-05P
G2R-2-S	P2RF-08-S	P2CM-S	P2RM-SR	P2RM-SB	R99-11	P2RF-08-E	P2R-08P

Specifications

Coil ratings

Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
		% of rated voltage			
AC	24 V, 110 V, 120 V, 230 V, 240 V	80% max.	30% max.	110%	0.9 VA (60 Hz)
DC	6 V, 12 V, 24 V, 48 V	70% max.	15% max.	110%	0.53 W

Contact ratings

Number of poles	1-pole		2-pole	
Load	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)
Rated load	10 A at 250 VAC 10 A at 30 VDC	7.5 A at 250 VAC 5 A at 30 VDC	5 A at 250 VAC 5 A at 30 VDC	2 A at 250 VAC 3 A at 30 VDC
Rated carry current	10 A		5 A	
Max. switching voltage	440 VAC, 125 VDC		380 VAC, 125 VDC	
Max. switching current	10 A		5 A	
Max. switching power	2,500 VA, 300 W	1,875 VA, 150 W	1,250 VA, 150 W	500 VA, 90 W
Failure rate (reference value)	100 mA at 5 VDC		10 mA at 5 VDC	
Mechanical life	AC: 10,000,000 operations min., DC: 20,000,000 operations min.			
Electrical life	100,000 operations min.			

Technical data

Item	1-pole	2-pole
Contact material	AgSnIn	
Operating time	15 ms max.	15 ms max.
Release time	AC: 10 ms max., DC: 5 ms max.	AC: 15 ms max., DC: 10 ms max.
Dielectric strength	5,000 VAC (coil-contact)	5,000 VAC (coil-contact)
Ambient temperature	Operating: -40 to 70°C (no icing or condensation)	
Size in mm (HxWxD)	35.5x13x29	



Versatile plug-in relay that sets the standard

Over 500 million pieces of this mini power relay have been manufactured since introduction and successfully been used in many different applications. Bifurcated contacts optionally are available to achieve reliable low current switching during the entire electrical life. Full range of sockets covering mounting by screw, box clamp and screw less clamp method.

- DPDT type 10 A / 4PDT type 5 A
- Mechanical flag, led indicator and momentary / lockable testbutton optional
- Transparent housing
- Low power switching (1 mA at 5 VDC) / Bifurcated 4PDT (0.1 mA at 1 VDC)
- Screwless clamp terminal sockets available

Ordering information

Contact form	Diode	LED indicator	Lockable test button	Order code (___ = coil voltage + AC/DC)			
				Standard coil polarity	Reversed coil polarity	Common coil voltages *1	
						DC	AC
DPDT	no	no	no	MY2___(S)	–	12, 24	12, 24, 48/50, 110/120, 220/240
DPDT		yes		MY2N___(S)	–	12, 24	24, 110/120, 220/240
DPDT	yes			MY2N-D2___(S)	–	24	–
DPDT	no		yes	MY2IN___S)	–	12, 24, 48	12, 24, 110/120, 220/240
DPDT				–	MY2IN1___(S)	12, 24	–
DPDT	yes			MY2IN-D2___(S)	–	24	–
DPDT				–	MY2IN1-D2___(S)	24	–
4PDT	no	no	no	MY4___(S)	–	12, 24, 48, 100/110, 125	12, 24, 48/50, 110/120, 220/240
4PDT		yes		MY4N___(S)	–	12, 24, 48, 100/110	24, 110/120, 220/240
4PDT	yes			MY4N-D2___(S)	–	12, 24	–
4PDT	no		yes	MY4IN___(S)	–	12, 24, 48	12, 24, 48/50, 110/120, 220/240
4PDT				–	MY4IN1___(S)	12, 24, 48	–
4PDT	yes			MY4IN-D2___(S)	–	24	–
4PDT				–	MY4IN1-D2___(S)	24, 48	–

*1 Other coil voltages available. Please see specifications.

Note: - MY4 also available with bifurcated contacts => example MY4Z
- MY2 and MY4 AC 110/120, 220/240 types also available with suppression => example MY4N-CR

Sockets & accessories

Input terminals separated from output terminals

	Order code								
	Screw-less clamp					Box clamp			
For type	Socket	Clip	Cross bar AC type	Cross bar DC type	Name plate	Socket	Metal spring clip	Plastic holding clip	Label
MY2	PYF08S	PYCM-08S	PYDM-08SR	PYDM-08SB	R99-11	PYF14-ESS	PYC-0	PYC-35	PYCTR1
MY4	PYF14S	PYCM-14S	PYDM-14SR	PYDM-14SB	R99-11	PYF14-ESS	PYC-0	PYC-35	PYCTR1

Combined input/output terminals

	Order code						
	Screw terminal			Box clamp			
Order code	Socket	Clip (set = 2 pcs)	Clip for MY2IN (set = 2 pcs)	Socket	Metal spring clip	Plastic holding clip	Label
MY2	PYF08A-N	PYC-A1	PYC-E1	PYF14-ESN	PYC-0	PYC-35	PYCTR1
MY4	PYF14A-N	PYC-A1		PYF14-ESN	PYC-0	PYC-35	PYCTR1

Specifications

Coil ratings

Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
		% of rated voltage			
AC	6 V, 12 V, 24 V, 48/50 V	80% max	30% min.	110%	1.0 to 1.2 VA (60 Hz)
	110/120 V, 220/240 V				0.9 to 1.1 VA (60 Hz)
DC	6 V, 12 V, 24 V, 48 V, 100/110 V		10% min.		0.9 W

Contact ratings

Item	2-pole		4-pole		4-pole (bifurcated)	
	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)
Rated load	5 A at 250 VAC	2 A at 250 VAC	3 A at 250 VAC	0.8 A at 250 VAC	3 A at 250 VAC	0.8 A at 250 VAC
	5 A at 30 VDC	2 A at 30 VDC	3 A at 30 VDC	1.5 A at 30 VDC	3 A at 30 VDC	1.5 A at 30 VDC
Rated carry current	10 A		5 A			
Max. switching voltage	250 VAC, 125 VDC		250 VAC, 125 VDC			
Max. switching current	10 A		5 A			
Max. switching power	2,500 VA, 300 W	1,250 VA, 300 W	1,250 VA, 150 W	500 VA, 150 W	1,250 VA, 150 W	500 VA, 150 W
Failure rate (reference value)	5 VDC at 1 mA		1 VDC at 1 mA		1 VDC at 100 µA	
Mechanical life	AC: 50,000,000 operations min., DC: 100,000,000 operations min.				20,000,000 operations min.	
Electrical life	500,000 operations min.		200,000 operations min.		100,000 operations min.	

Technical data

Item	2-pole	4-pole
Contact Material:	Ag	AgNi + Au
Operating time	20 ms max.	
Release time	20 ms max.	
Dielectric strength	2,000 VAC	
Ambient temperature	Operating: -55 to 70°C (no icing)	
Size in mm (HxWxD)	28x21.5x36	



Miniature 15 A power relay

LY-series comes in SPDT, DPDT, 3PDT and 4PDT types covering depending on number of poles 10 or even 15A rated load. Bifurcated contacts available for DPDT configuration only, whilst the optional Diodes for DC and CR circuit for AC coils are available for all plug-in types.

- SPDT type 15 A / DPDT, 3PDT and 4PDT type 10 A
- Led indicator optional
- Transparent housing
- Suppression by optional Built-in Diodes (DC only) or CR network (AC-types)
- DIN rail mounting by socket. PCB and Flange mounting available

Ordering information

Contact form	LED indicator	Diode	Terminals			Order code *1 (___ = coil voltage + AC/DC)	Common coil voltages *2	
			Plug-in/solder	PCB	Upper-mounting plug-in/solder		DC	AC
SPDT (1 pole)	no	no	yes	no	no	LY1___	24	–
SPDT (1 pole)	yes	yes				LY1N-D2___	24	–
DPDT (2 pole)	no	no				LY2___	12, 24, 100/110	24, 100/110, 110/120, 220/240
DPDT (2 pole)			no		yes	LY2F___	–	220/240
DPDT (2 pole)	yes	yes	yes		no	LY2N-D2___	24	–
3PDT (3 pole)	no	no				LY3___	24	–
4PDT (4 pole)						LY4___	12, 24, 100/110, 125	24, 100/110, 230
4PDT (4 pole)	yes	yes				LY4N-D2___	24	–

*1 For other options like CR suppression, please see specifications.
*2 Other coil voltages available. Please see specifications.

Sockets & accessories

	Order code			
	DIN rail		PCB	
	Screw		Soldering	
For type	Socket	Clip (set = 2 pcs)	Socket	Clip (set = 2 pcs.)
LY1/LY2	PTF08A-E	PYC-A1	PT08-0	PYC-P
LY2 CR-type	PTF08A-E	Y92H-3	PT08-0	PYC-1
LY3	PTF11A-E	PYC-A1	PT11-0	PYC-P
LY4	PTF14A-E	PYC-A1	PT14-0	PYC-P

Specifications

Coil ratings

Poles	Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
			% of rated voltage			
1 or 2	AC	6 V, 12 V, 24 V, 50 V	80% max.	30% min.	110%	1.0 to 1.2 VA (60 Hz)
		100/110 V, 110/120 V, 200/220 V, 220/240 V				0.9 to 1 VA (60 Hz)
	DC	6 V, 12 V, 24 V, 48 V, 100/110 V		10% min.		0.9 W
3	AC	6 V, 12 V, 24 V, 50 V, 100/110 V, 200/220 V	80% max.	30% min.	110%	1.6 to 2.0 VA (60 Hz)
	DC	6 V, 12 V, 24 V, 48 V, 100/110 V		10% min		1.4 W
4	AC	6 V, 12 V, 24 V, 50 V, 100/110 V, 200/220 V	80% max.	30% min.	110%	1.95 to 2.5 VA (60 Hz)
	DC	6 V, 12 V, 24 V, 48 V, 100/110 V		10% min		1.5 W

Technical data

Contact material	AgSnIn
Operating time	25 ms max.
Release time	25 ms max.
Dielectric strength	1,000 VAC
Ambient temperature *1	-25 to 70°C

*1 See datasheet for more details.

Contact ratings

Relay	Single contact 1-pole		Single contact 2-, 3- or 4-pole		Bifurcated contacts 2-pole	
Load	Resistive load ($\cos\varphi$ = 1)	Inductive load ($\cos\varphi$ = 0.4; L/R = 7)	Resistive load ($\cos\varphi$ = 1)	Inductive load ($\cos\varphi$ = 0.4; L/R = 7)	Resistive load ($\cos\varphi$ = 1)	Inductive load ($\cos\varphi$ = 0.4; L/R = 7)
Rated load	110 VAC at 15 A	110 VAC at 10 A	110 VAC at 10 A	110 VAC at 7.5 A	110 VAC at 5 A	110 VAC at 4 A
	24 VDC at 15 A	24 VDC at 7 A	24 VDC at 10 A	24 VDC at 5 A	24 VDC at 5 A	24 VDC at 4 A
Rated carry current	15 A		10 A		7 A	
Max. switching voltage	250 VAC, 125 VDC		250 VAC, 125 VDC		250 VAC, 125 VDC	
Max. switching current	15 A		10 A		7 A	
Max. switching power	1,700 VA	1,100 VA	1,100 VA	825 VA	550 VA	440 VA
	360 W	170 W	240 W	120 W	120 W	100 W
Failure rate (reference value)	100 mA at 5 VDC		100 mA at 5 VDC		10 mA at 5 VDC	
Mechanical life	AC: 50,000,000 operations min., DC: 100,000,000 operations min.					
Electrical life	1-, 3-, 4-pole: 200,000 operations min., 2-pole: 500,000 operations min.					



Exceptionally reliable general purpose relay with 8 or 11 plug-in pins for round sockets

MK relay breaks compared to its size relatively large currents. The AgSnIn contacts ensure long electrical lifetime (min. 100,000 operations). Wide switching range from 10 mA at 1 VDC upto 10 A at 250 VAC.

- 8-pin DPDT and 11-pin 3PDT contact types
- Switching current up to 10 A
- Lockable test button for easy testing
- Temperature rating from -40°C up to 60°C

Ordering information

Contact form	Mechanical indicator & lockable test button	LED indicator	Diode	Order code *1 (___ = coil voltage + AC/DC)	Common coil voltages *2	
					DC	AC
DPDT (2-pole)	yes	no	no	MKS2PI	12, 24, 110	24, 110, 230
		yes		MKS2PIN	24	24, 230
3PDT (3-pole)		no		MKS3PI-5	12, 24, 48, 110	12, 24, 110, 230
			yes	MKS3PI-D-5	24	N/A
		yes	no	MKS3PIN-5	12, 24	24, 110, 230
			yes	MKS3PIN-D-5	24	N/A

*1 Many various terminal arrangements possible, please see specifications.
*2 Other coil voltages available. Please see specifications.

Sockets & accessories

	Order code			
	DIN rail			
	Screw		Box clamp	
For type	Socket	Clip (set= 2 pcs.)	Socket	
MKS2	PF083A-E	PFC-A1	-	PF083A-D
MKS3	PF113A-E	PFC-A1	PF113A-N	PF113A-D

Specifications

Coil ratings

Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
		% of rated voltage			
AC	6 V, 12 V, 24 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V	80% max.	30% min.	110%	2.3 VA (60 Hz)
					2.7 VA (50 Hz)
DC	6 V, 12 V, 24 V, 48 V, 100 V, 110 V		15% min.		1.4 W

Contact ratings

Load	2- or 3-pole	
	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)
Contact material	AgSnIn	
Rated load	NO: 10 A at 250 VAC NC: 5 A at 30 VDC	7 A at 250 VAC
Rated carry current	10 A	
Max. switching voltage	250 VAC, 250 VDC	–
Max. switching current	10 A	
Max. switching power	2,500 VA/ 300 W	1,250 VA/150 W
Mechanical life	5,000,000 operations min.	
Electrical life	100.000 operations min.	

Technical data

Operating time	AC: 20 ms max., DC: 30 ms max.
Release time	20 ms max. (40 ms max. for built-in Diode relays)
Dielectric strength	2,500 VAC (coil-contact)
Ambient temperature	Operating: -40 to 60°C (with no icing or condensation)
Size in mm (HxWxD)	34.5x34.5x53.3



Power relay that can switch 220 VDC, 10 A (resistive load)

The MK-S(X) is the smallest relay in the world that can switch 220 VDC 10 A resistive load. Applications in loads are encountered.

- Suitable for DC-switching
- DC load switching up to 10 A; 220 VDC (resistive load)
- AC load models are capable of switching up to 15 A; 250 VAC (resistive load)
- SPST-NO/SPST-NC contact form enables contact welding detection
- Lockable test button for easy testing

Ordering information

Models for DC loads

Contact form	LED indicator & lockable test button	Order code (___ = coil voltage + AC/DC)	Common coil voltages *1	
			DC	AC
SPST-NO (1-pole)	yes	MKS1XTIN-10	12, 24, 48, 110, 220	24, 110, 230
SPST-NO/SPST-NC (2-pole)	yes	MKS2XTIN-11	12, 24, 48, 110, 220	24, 110, 230

*1 Other coil voltages available. Please see specifications.

Models for AC loads

Contact form	LED indicator & lockable test button	Order code (___ = coil voltage + AC/DC)	Common coil voltages *1	
			DC	AC
SPST-NO (1-pole)	yes	MKS1TIN-10	12, 24, 48	24, 110, 230
SPST-NO/SPST-NC (2-pole)	yes	MKS2TIN-11	12, 24, 48	24, 110, 230

*1 Other coil voltages available. Please see specifications.

Sockets & accessories

Order code				
DIN rail			PCB	
Screw			Soldering	
Socket		Clip (set= 2 pcs.)	Socket	Clip (set= 2 pcs.)
No built-in diode	Built-in diode			
P7MF-06	P7MF-06-D	PYC-A2	P7M-06P	PYC-A2

Specifications

Coil ratings

Rated voltage	Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
	% of rated voltage			
AC: 24 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V	80% max.	30% min. (60 Hz)	110%	2.3 VA (60 Hz)
		25% min. (50 Hz)		2.7 VA (50 Hz)
DC: 12 V, 24 V, 48 V, 110 V, 220 V		15% min.		1.5 W

Contact ratings

Model		Models for DC Loads						Models for AC Loads	
		MKS1XT(I)(N)-10			MKS2XT(I)(N)-11			MKS1T(I)(N)-10	MKS2T(I)(N)-11
Contact form		SPST-NO			SPST-NO/SPST-NC			SPST-NO	SPST-NO/SPST-NC
Load		Resistive load	Inductive load L/R = 7 ms	Inductive load DC13 class	Resistive load	Inductive load L/R = 7 ms	Inductive load DC13 class	Resistive load	Resistive load
Contact configuration	NO	Double-break			Double-break			Double-break	Double-break
	NC	–			Single-break			–	Single-break
Contact material		AgSnIn			AgSnIn			AgSnIn	AgSnIn
Rated load	NO	10 A, 220 VDC	5 A, 220 VDC	0.4 A, 220 VDC	5 A, 220 VDC	3 A, 220 VDC	0.2 A, 220 VDC	15 A, 250 VAC	15 A, 250 VAC
	NC	–			2 A, 220 VDC	0.3 A, 220 VDC	0.1 A, 220 VDC	–	5 A, 250 VAC
Rated carry current	NO	10 A			5 A			15 A	15 A
	NC	–			2 A			–	5 A
Max. switching voltage	NO	220 VDC			220 VDC			250 VAC	250 VAC
	NC	–						–	
Max. switching current	NO	10 A			5 A			15 A	15 A
	NC	–			2 A			–	5 A
Max. switching capacity (reference value)	NO	2,200 W	–	–	1,100 W	–	–	3,750 VA	3,750 VA
	NC	–			440 W	–	–	–	1,250 VA

Note: These values apply to a switching frequency of 30 times per minute for DC Load models and 20 times per minute for AC Load models.

Technical data

Operating time	AC: 20 ms max., DC: 30 ms max.
Release time	20 ms max.
Dielectric strength	2,500 VAC (coil-contact)
Ambient temperature	Operating: -40 to 60°C (with no icing or condensation)
Size in mm (HxWxD)	34.5x34.5x52.1
Mechanical endurance	1,000,000 operations min. (at 18,000 operations/hr)
Electrical endurance[*1]	100.000 operations min. (at rated load and maximum switching frequency)

[*1] Measured at an ambient temperature of 23°C



High capacity, high dielectric strength 4 pole power relay

G7J series developed for switching resistive, inductive as well as motor loads. No contact chattering for momentary voltage drops up to 50% of rated voltage. High dielectric strength (4KV) between coil and contacts as well as between different polarity contacts.

- 25 A Rated current
- 4PST-NO, 3PST-NO / SPST-NC or DPST-NO / DPST-NC
- Bifurcated contacts optional
- Terminals: Screw, Quick-connect or PCB pins
- Mounting by insertion into a clip or just by screws (flange type)

Ordering information

Contact form	Mounting		Terminal			Order code *1 (___ = coil voltage + AC/DC)	Common coil voltages *2	
	PCB	W-bracket mounting	PCB	Quick-connect	Screw		DC	AC
4PST-NO	yes	no	yes	no	no	G7J-4A-P___	12, 24	200/240
	no	yes	no		yes	G7J-4A-B___	24	–
				yes	no	G7J-4A-T___	12, 24	200/240
3PST-NO/SPST-NC	yes	no	yes	no		G7J-3A1B-P___	24	–
	no	yes	no		yes	G7J-3A1B-B___	24	–
DPST-NO/SPST-NC				yes	no	G7J-3A1B-T___	24	200/240
DPST-NO/DPST-NC	yes	no	yes	no		G7J-2A2B-P___	24	–

*1 For other options like bifurcated contacts, please see specifications.
*2 Other coil voltages available. Please see specifications.

Accessories

For type	Order code
	W-bracket
G7J Screw terminal type	R99-04 for G5F
G7J Quick Connect type	

Specifications

Coil ratings

Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
		% of rated voltage			
AC	24, 50, 100 to 120, 200 to 240	75% max.	15% min.	110%	1.8 to 2.6 VA
DC	6, 12, 24, 48, 100		10% min.		2.0 W

Contact ratings

Item	4-pole		
	Resistive load cosφ = 1	Inductive load cosφ = 0.4	Resistive load
Rated load	NO: 25 A at 220 VAC (24 A at 230 VAC) NC: 8 A at 220 VAC (7.5 A at 230 VAC)		NO: 25 A at 30 VDC NC: 8 A at 30 VDC
Rated carry current	NO: 25 A (1 A), NC: 8 A (1 A)		
Max. switching voltage	250 VAC		125 VDC
Max. switching current	NO: 25 A (1 A), NC: 8 A (1 A)		
Mechanical life	1,000,000 operations min.		
Electrical life	100,000 operations min.		

Note: Values between () indicate bifurcated contact specification.

Technical data

Contact material	Ag alloy
Operating time	50 ms max.
Release time	50 ms max.
Dielectric strength	4,000 VAC
Ambient temperature	Operating: -25 to 60°C (no icing)



High capacity, high dielectric strength 1 or 2 pole general purpose power relay

G7L fits many applications from motor driver and power supply switching in office equipment to switching controller for air-conditioning compressor. No contact chattering for momentary voltage drops up to 50% of rated voltage. G7L series can be mounted on DIN-rail by using separate adaptor, whilst relay is connected by screw or quick-connect terminals.

- SPST-NO – 30 A
- DPST-NO – 25 A
- Wide input range AC coils 100-120, 200-240 V at either 50 or 60 Hz
- Terminals: Screw, Quick-connect or PCB pins
- Mounting by insertion into a clip, by screws (flange type) or by DIN-rail adaptor

Ordering information

Contact form	Mounting					Terminals			Order code*1 (___ = Coil Voltage + AC/DC)	Common Coil Voltages *2	
	PCB	DIN-rail front connecting socket	DIN Rail adaptor	Flange (screw)	E-bracket mounting	PCB	Quick-connect	Screw		DC	AC
SPST-NO	no	yes	yes	no	yes	no	yes	no	G7L-1A-T___	24	100/120, 200/240
DPST-NO									G7L-2A-T___	12, 24	24, 100/120, 200/240
SPST-NO		no	no	yes	no				G7L-1A-TUB___	–	100/120, 200/240
DPST-NO									G7L-2A-TUB___	24	24, 200/240
							no	yes	G7L-2A-BUB___	–	200/240
	yes			no		yes		no	G7L-2A-P___	24	–

*1 For other options like bifurcated contacts, please see specifications.
*2 Other coil voltages available. Please see specifications.

Accessories

For type	Order code			
	DIN-rail front connecting socket	DIN Rail adaptor	E-Bracket mounting	Coverplate electric shock protection
G7J Screw terminal type	–	P7LF-D	R99-07G7L	P7LF-C
G7J Quick Connect type	P7LF-06	P7LF-D	R99-07G7L	–

Specifications

Coil Ratings

Rated voltage		Rated current	Coil resistance	Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
AC (~)	12 V	142 mA	–	75% max.of rated voltage	15% min. of rated voltage	110% of rated voltage	1.7 to 2.5 VA (60 Hz)
	24 V	71 mA	–				
	50 V	34 mA	–				
	100 to 120 V	17.0 to 20.4 mA	–	74 V	18 V	132 V	
	200 to 240 V	8.5 to 10.2 mA	–	150 V	36 V	264 V	
DC (=)	6 V	317 mA	18.9 Ohm	75% max. of rated voltage	15% min. of rated voltage	110% of rated voltage	1.9 W
	12 V	158 mA	75 Ohm				
	24 V	79 mA	303 Ohm				
	48 V	40 mA	1220 Ohm				
	100 V	19 mA	5260 Ohm				

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of ±15%/20% for AC rated current and ±15% for DC coil resistance.
2. Performance characteristic data are measured at a coil temperature of 23°C.
3. ~ indicates AC and = indicates DC (IEC417 publications).

Contact Ratings

Model	G7L-1A-TJ/G7L-1A-BJ		G7L-2A-TJ/G7L-2A-BJ		G7L-1A-P/G7L-2A-P	
	Resistive load (cos φ = 1)	Inductive load (cos φ = 0.4)	Resistive load (cos φ = 1)	Inductive load (cos φ = 4.4)	Resistive load (cos φ = 1)	Inductive load (cos φ = 4.4)
Rated load	30 A, 220 VAC (~)	25 A, 220 VAX (~)	25 A, 220 VAC (~)		20 A, 220 VAC (~)	
Rated carry current	30 A		25 A		20 A	
Max. switching voltage	250 VAC (~)					
Max. switching current	30 A		25 A		20 A	
Max. switching power	6,600 VAC (~)	5,500 VAC (~)	5,500 VAC (~)		4,400 VAC (~)	
Failure rate*1 (reference value)	100 mA, 5 VDC (=)					

*1 P level: $\lambda 60 = 0.1 \times 10^{-6}$/operation



Compact 160 Amp Power Relay

G7Z series provides a compact, cost efficient solution for applications such as inverters, UPS, solar and fuel-cell battery circuits. Relay in combination with auxiliary contact block meets EN 60947-4-1. Coil ratings are available in 12 and 24 VDC. Power consumption is less than 4 watts.

- Switching current 160 A (40 A rating / 4-pole / IEC-AC1)
- Switching voltage 440 VAC
- Safety function with mirror contacts in various configurations
- Power consumption less than 4 Watts
- Low Switching Noise (70 dB)

Ordering information

Relay with Auxiliary Contact Block (for Screw Terminals)

Contact configuration		Rated voltage	Order code
Relay	Auxiliary contact block		
4PST-NO	DPST-NO	12, 24 VDC	G7Z-4A-20Z
	SPST-NO/SPST-NC		G7Z-4A-11Z
	DPST-NC		G7Z-4A-02Z
3PST-NO/SPST-NC	DPST-NO		G7Z-3A1B-20Z
	SPST-NO/SPST-NC		G7Z-3A1B-11Z
	DPST-NC		G7Z-3A1B-02Z
DPST-NO/DPST-NC	DPST-NO		G7Z-2A2B-20Z
	SPST-NO/SPST-NC		G7Z-2A2B-11Z
	DPST-NC		G7Z-2A2B-02Z

Specifications

Coil ratings

Rated voltage	Rated current	Coil resistance	Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
			% of rated voltage			
12 VDC	333 mA	39 Ω	75% max.	10% min.	110%	Approx. 3.7 W
24 VDC	154 mA	156 Ω				

Note: - Rated current and coil resistance were measured at a coil temperature of 23°C with coil resistance of ±15%.

- Operating characteristics were measured at a coil temperature of 23°C.
- The maximum allowable voltage is the maximum value of the fluctuation range for the Relay coil operating power supply and was measured at an ambient temperature of 23°C.

Contact Ratings - Relay

Item		G7Z-4A-_Z, G7Z-3A1B-_Z, G7Z-2A2B-_Z		
		Resistive load	Inductive load cos phi = 0.3	Resistive load L/R = 1 ms
Contact structure		Double break		
Contact material		Ag alloy		
Rated load	NO	40 A at 440 VAC	22 A at 440 VAC	5 A at 110 VDC
	NC	25 A at 440 VAC	10 A at 440 VAC	5 A at 110 VDC
Rated carry current	NO	40 A	22 A	5 A
	NC	25 A	10 A	5 A
Maximum contact voltage		480 VAC		125 VDC
Maximum contact current	NO	40 A		
	NC	25 A		
Maximum switching capacity	NO	17,600 VA	9,680 VA	550 W
	NC	11,000 VA	4,400 VA	550 W
Failure rate P value (reference value)		2 A at 24 VDC		

Note: The ratings for the auxiliary contact block mounted on the G7Z are the same as those for the G73Z auxiliary contact block.

Contact Ratings - Auxiliary Contact Block

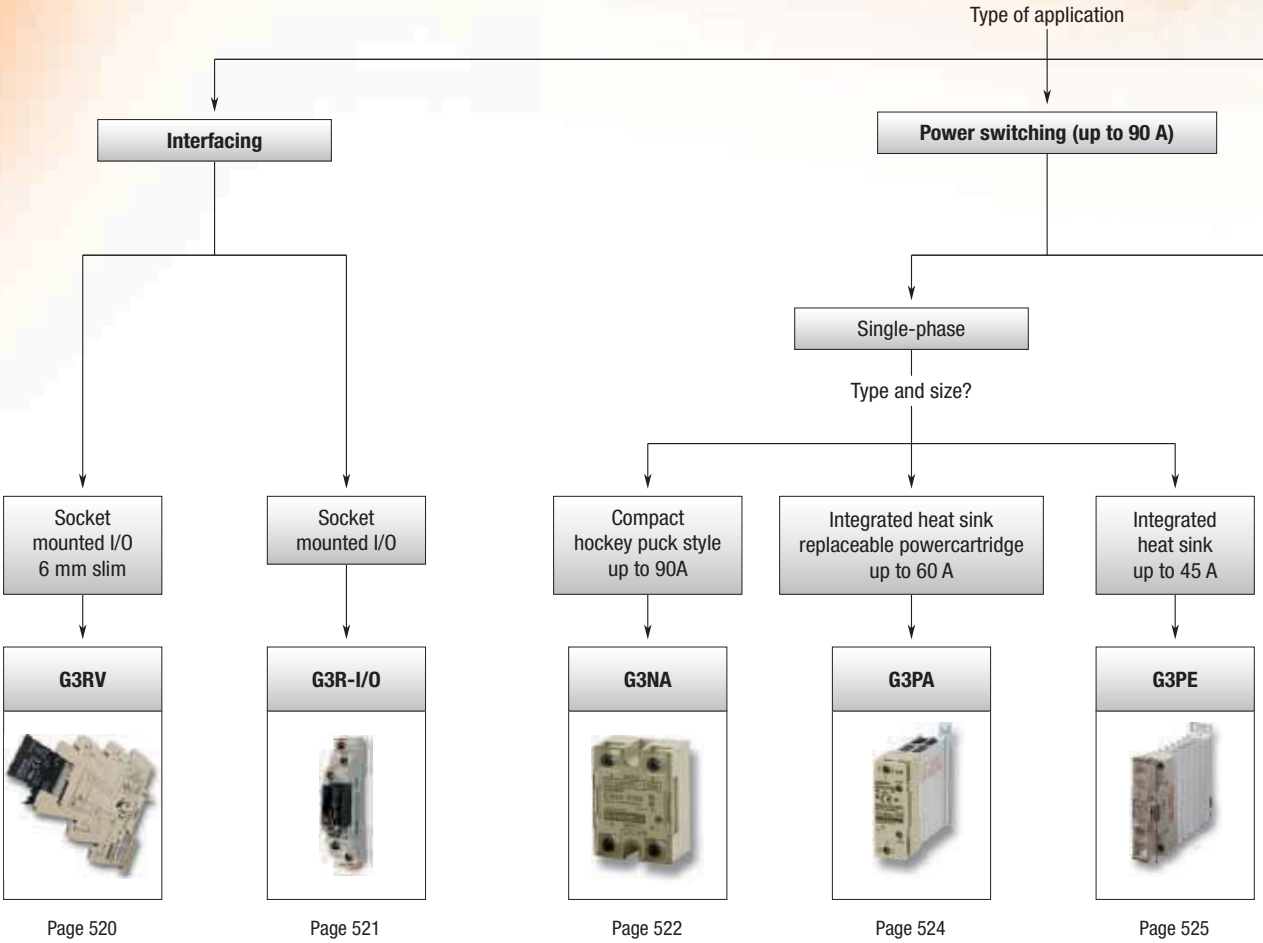
Item	G7Z-4A-_Z, G7Z-3A1B-_Z, G7Z-2A2B-_Z		
	Resistive load	Inductive load cos phi = 0.3	Resistive load L/R = 1 ms
Contact structure	Double break		
Contact material	Au clad + Ag		
Rated load	1 A at 440 VAC	0.5 A at 440 VAC	5 A at 110 VDC
Rated carry current	1 A		
Maximum contact voltage	480 VAC		125 VDC
Maximum contact current	1 A		
Maximum switching capacity	440 VA	220 VA	110 W
Failure rate P value (reference value)	1 mA at 5 VDC		

COMPACT SOLID STATE RELAYS

G3_ series – Reliable interfacing and power switching

With a wide variety of output currents and voltages, our control-panel mounted types of power switching SSRs are available with (G3PE) and without (G3NA) built-in heat-sink. The compact SSRs for I/O Interfacing G3RV & G3R offer high-speed models (G3R).

- Industrial 6 mm 'slim' SSR which is G2RV compatible (G3RV)
- G2RS compatible high-speed interface solutions (G3R-I/O)
- G3NA with 5-90 A output current, G3PB up to 45 A
- Output voltages up to 480 VAC / 200 VDC available on G3NA
- Effectively absorbing of external surge thanks to the built-in varistor





Power controlling

- **Three-phase**
  - Integrated heat sink up to 45 A
    - **G3PE**



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- **Single phase**
  - Integrated heat sink up to 60 A
    - **G3PW**



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- **Multi channel up to 8 solid state relays**
  - **G3ZA**



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Selection table

	Category	Control panel mounting type			
Selection criteria					
	Model	G3RV	G3R-I/O		G3NA
	Type of load	Output module	Input Module	Output Module	Normal resistors Middle and long wave IR heater Transformers and inductors
	1-phase control	–	–	–	■
	2-phase control	–	–	–	–
	3-phase control	–	–	–	–
	Function	Signal switching	Signal switching	Signal switching	Heater control, motor control
	Max. current rating	2 A (AC); 3 A (DC)	100 mA	2 A	90 A
Load voltage/ current [VAC]	24 to 240	–	–	–	■
	100 to 240	■	–	■	–
	200 to 480	–	–	–	■
Load voltage/ current [VDC]	5 to 200	3 to 26.4	4 to 32	■	■
Input voltages [VDC or VAC]	5 to 24 VDC	–	■	■	■
	12 to 24 VDC	12 VDC ±10%; 24 VDC ±10%	■	–	–
	24 VAC	■ 24 VAC/DC ±10%	–	–	–
	100 to 120 VAC	■ 110 VAC ±10%	■	–	■
	200 to 240 VAC	■ 230 VAC ±10%	■	–	■
	Analogue input	–	–	–	–
Features	Built-in heat sink	–	–	–	–
	Zero-cross	□	–	□	■
	Built-in varistor	–	–	–	■
	LED operation indicator	■	■	■	■
	Protective cover	NA	NA	NA	■
	3-phase loads via 3 single-phase SSRs	NA	NA	NA	■
	Replaceable power cartridge	–	–	–	–
	Alarm output	NA	NA	NA	–
	Built-in failure detection	NA	NA	NA	–
	SSR open circuits detection	NA	NA	NA	–
	SSR short circuits detection	NA	NA	NA	–
Mounting	DIN-rail	■	–	–	■
	Screw	–	–	–	■
	Mounting socket	■	■	■	
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Control panel mounting type			Power regulator	
				
G3PA	**G3PE**	**G3PE**	**G3PW**	**G3ZA**
Normal resistors Middle and long wave IR heater Transformers and inductors	Normal resistors Middle and long wave IR heater	Normal resistors	Alloy heater Pure metal heater, nonmetal heater (Constant-current models recommended.)	Depends on the SSR used Distributes loop/control output levels (mV%) to SSRs
■	■	–	■	Depends on the SSR used
–	–	■	–	Depends on the SSR used
–	–	■	–	Depends on the SSR used
Heater control	Heater control	Heater control	Single-phase power control	Intelligent power control
60 A	45 A	45 A	60 A	Depends on the SSR used
■	–	–	–	–
–	■	■	■	■
■	■	■	–	■ 400 to 480
–	–	–	–	–
■	–	–	–	–
■	■	■	–	–
■	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	4 to 20 mA DC, 1 to 5 VDC	–
■	■	□	■	–
■	□	■	□	–
■	–	–	–	–
■	■	■	■	■
■	■	■	■	–
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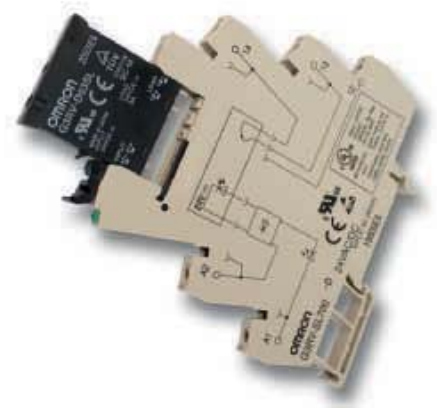
■ Standard □ Available – No/not available



The World's First Industrial Slim Relay

- G2RV compatible
- LED indicator built in SSR
- Push-in terminals and accessories for easy wiring

Ordering information

Zero cross function	Input				Must operate voltage	Must release voltage	Output			Type of connection	Order code
	Rated voltage (operating voltage)	Rated current					Rated load voltage (load voltage range)	Load current	Inrush current		
		AC		DC							
		50 Hz	60Hz								
-	24 VAC/DC (21.6 to 26.4 VAC/DC)	10.7 mA	11.1 mA	4.3 mA	21.6 V	1 V	5 to 24 VDC (3 to 26.4 VDC)	100 µA to 3 A	30 A (60 Hz, 1 cycle)	Screw	G3RV-SL700-D AC/DC24
-	24 VAC/DC (21.6 to 26.4 VAC/DC)	10.7 mA	11.1 mA	4.3 mA	21.6 V	1 V	5 to 24 VDC (3 to 26.4 VDC)	100 µA to 3 A	30 A (60 Hz, 1 cycle)	Push-in	G3RV-SL500-D AC/DC24
Yes	24 VAC/DC (21.6 to 26.4 VAC/DC)	20 mA	21 mA	11 mA	21.6 V	1 V	100 to 240 VAC (75 to 264 VAC)	0.1 A to 2 A	30 A (60 Hz, 1 cycle)	Screw	G3RV-SL700-A AC/DC24
Yes	24 VAC/DC (21.6 to 26.4 VAC/DC)	20 mA	21 mA	11 mA	21.6 V	1 V	100 to 240 VAC (75 to 264 VAC)	0.1 A to 2 A	30 A (60 Hz, 1 cycle)	Push-in	G3RV-SL500-A AC/DC24
-	230 VAC (207 to 253 VAC)	6.8 mA	8.1 mA	-	207 V	1 V	5 to 24 VDC (3 to 26.4 VDC)	100 µA to 3 A	30 A (60 Hz, 1 cycle)	Screw	G3RV-SL700-D AC230
-	230 VAC (207 to 253 VAC)	6.8 mA	8.1 mA	-	207 V	1 V	5 to 24 VDC (3 to 26.4 VDC)	100 µA to 3 A	30 A (60 Hz, 1 cycle)	Push-in	G3RV-SL500-D AC230

Note: Ratings at an ambient temperature of 25°C

Accessories

Type	Description	Order code
Cross bar	2-pole	P2RVM-020_
Cross bar	3-pole	P2RVM-030_
Cross bar	4-pole	P2RVM-040_
Cross bar	10-pole	P2RVM-100_
Cross bar	20-pole	P2RVM-200_
PLC interface	Connect 8 relays and PLC output	P2RVC-8-O-F
Label	Plastic, for mounting on socket	R99-15 for G2RV
Label (Sticker)	Paper for mounting on socket or relay	R99-16 for G2RV
Separating plate	Provides isolation between adjacent relays to achieve 400 V isolation	P2RV-S

Note: _ Select colour: R=Red, S=Blue, B=Black

Specifications

Order code		G3RV-SL700/500-A	G3RV-SL700/500-D
Isolation		Triac	Mosfet
Output ON voltage drop		1.6 V rms max.	0.9 V max.
Leakage current		5 mA max. (at 200 VAC 50/60 Hz)	10 µA max. (at 24 VDC)
Operating indicator		Yes	
Ambient temperature	Storage	-30~+100°C (with no icing or condensation)	
	Operating	-30~+55°C (with no icing or condensation)	



Compact SSR for I/O interface with high dielectric strength requirements

High-speed models with optimum input ratings for a variety of sensors are available, as well as input and output modules that can be used instead of the G2RS. Use a coupler conforming to VDE 0884 and assuring an I/O dielectric strength of 4,000V.

- 1.5 and 2A output current
- 5 to 200VDC/100 to 240VAC output voltages
- Compatible with G2RS electromechanical relays
- DIN-rail mounting via sockets
- Operation indicator to confirm input

Ordering information

Input module

Response speed	Input				Output			
	Rated voltage (operating voltage)	Input current	Must operate voltage	Must release voltage	Logic level supply voltage	Logic level supply current	Size in mm (HxWxD)	Order code
–	100 to 240 VAC (60 to 264 VAC)	15 mA max.	60 VAC max.	20 VAC min.	4 to 32 VDC	0.1 to 100 mA	29x13x28 (90.5x16x61 in combination with P2RF-05-E mounting socket)	G3R-IAZR1SN-UTU
High-speed (1 kHz)	5 VDC (4 to 6 VDC)	8 mA max.	4 VDC max.	1 VDC min.				G3R-IDZR1SN-UTU
	12 to 24 VDC (6.6 to 32 VDC)		6.6 VDC max.	3.6 VDC min.				
Low-speed (10 Hz)	5 VDC (4 to 6 VDC)		4 VDC max.	1 VDC min.				G3R-IDZR1SN-1-UTU
	12 to 24 VDC (6.6 to 32 VDC)		6.6 VDC max.	3.6 VDC min.				

Note: Ratings at an ambient temperature of 25°C

Output module

Zero cross function	Input				Output				
	Rated voltage (operating voltage)	Input current	Must operate voltage	Must release voltage	Rated load voltage (load voltage range)	Load current*1	Inrush current	Size in mm (HxWxD)	Order code
Yes	5 to 24 VDC (4 to 32 VDC)	15 mA max.	4 VDC max.	1 VDC min.	100 to 240 VAC (75 to 264 VAC)	0.05 to 2 A	30 A (60 Hz, 1 cycle)	29x13x28 (90.5x16x61 in combination with P2RF-05-E mounting socket)	G3R-OA202SZN-UTU
No									G3R-OA202SLN-UTU
–		8 mA max.			5 to 48 VDC (4 to 60 VDC)	0.01 to 2 A	8 A (10 ms)		G3R-ODX02SN-UTU
–					48 to 200 VDC (40 to 200 VDC)	0.01 to 1.5 A	8 A (10 ms)		G3R-OD201SN-UTU

Note: Ratings at an ambient temperature of 25°C
*1 The minimum current value is measured at 10°C min.

Socket & accessories

Order code						
DIN rail						PCB
Screwless clamp					Screw	Soldering
Socket	Clip	Cross bar AC type	Cross bar DC type	Name plate	Socket	Socket
P2RF-05-S	P2CM-S	P2RM-SR	P2RM-SB	R99-11	P2RF-05-E	P2R-05P

Specifications

	Input module			Output module			
Order code	G3R-IAZR1SN-UTU	G3R-IDZR1SN-UTU	G3R-IDZR1SN-1-UTU	G3R-OA202SZN-UTU	G3R-OA202SLN-UTU	G3R-ODX02SN-UTU	G3R-OD201SN-UTU
Isolation	Photocoupler			Phototriac		Photocoupler	
Operate time	20 ms max.	0.1 ms max.	15 ms max.	1/2 of load power source cycle + 1 ms max.	1 ms max.	1 ms max.	1 ms max.
Release time	20 ms max.	0.1 ms max.	15 ms max.	1/2 of load power source cycle + 1 ms max.		2 ms max.	2 ms max.
Response frequency	10 Hz	1 kHz	10 Hz	20 Hz	20 Hz	100 Hz	100 Hz
Output ON voltage drop	1.6 V max.	1.6 V max.	1.6 V max.	1.6 V max.	1.6 V max.	1.6 V max.	2.5 V max.
Leakage current	5 μA max.	5 μA max.	5 μA max.	1.5 mA max.	1.5 mA max.	1 mA max.	1 mA max.
Operation indicator	Yes						
Ambient temperature	Operating: -30 to 80°C (with no icing)						



Hockey puck style SSR with 5-90 A output currents

All models feature the same compact dimensions to provide a uniform mounting pitch. A built-in varistor effectively absorbs external surges. The operation indicator enables monitoring operation.

- 5-90 A output current
- 24-480 VAC/5-200VDC output voltages
- Built-in varistor
- Operation indicator (red LED)
- Protective cover for greater safety

Ordering information

Applicable output load		Zero cross function	Isolation	Rated input voltage	Must operate voltage	Must release voltage	Load current with/without heatsink at 40 °C	Order code
24 to 240 VAC	5 A	Yes	Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 5 A/0.1 to 3 A	G3NA-205B-UTU DC5-24
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.		G3NA-205B-UTU AC100-120
				200 to 240 VAC	150 VAC max.	40 VAC min.		G3NA-205B-UTU AC200-240
	10 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 10 A/0.1 to 4 A	G3NA-210B-UTU DC5-24
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.		G3NA-210B-UTU AC100-120
				200 to 240 VAC	150 VAC max.	40 VAC min.		G3NA-210B-UTU AC200-240
	20 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 20 A/0.1 to 4 A	G3NA-220B-UTU DC5-24
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.		G3NA-220B-UTU AC100-120
				200 to 240 VAC	150 VAC max.	40 VAC min.		G3NA-220B-UTU AC200-240
	40 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 40 A/0.1 to 6 A	G3NA-240B-UTU DC5-24
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.		G3NA-240B-UTU AC100-120
				200 to 240 VAC	150 VAC max.	40 VAC min.		G3NA-240B-UTU AC200-240
	50 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 50 A/0.1 to 6 A	G3NA-250B-UTU DC5-24
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.		G3NA-250B-UTU AC100-120
				200 to 240 VAC	150 VAC max.	40 VAC min.		G3NA-250B-UTU AC200-240
	75 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	1 to 75 A/1 to 7 A	G3NA-275B-UTU DC5-24
			Photocoupler	100 to 240 VAC				G3NA-275B-UTU AC100-240
	90 A		Phototriac	5 to 24 VDC			1 to 90 A/1 to 7 A	G3NA-290B-UTU DC5-24
			Photocoupler	100 to 240 VAC				G3NA-290B-UTU AC100-240
5 to 200 VDC	10 A	No	Photocoupler	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 10 A/0.1 to 4 A	G3NA-D210B-UTU DC5-24
				100 to 240 VAC	75 VAC max.	20 VAC min.		G3NA-D210B-UTU AC100-240
200 to 480 VAC	10 A	Yes		5 to 24 VDC	4 VDC max.	1 VDC min.	0.2 to 10 A/0.2 to 4 A	G3NA-410B-UTU DC5-24
				100 to 240 VAC	75 VAC max.	20 VAC min.		G3NA-410B-UTU AC100-240
	25 A			5 to 24 VDC	4 VDC max.	1 VDC min.	0.2 to 20 A/0.2 to 4 A	G3NA-425B-UTU DC5-24
				100 to 240 VAC	75 VAC max.	20 VAC min.		G3NA-425B-UTU AC100-240
	50 A			5 to 24 VDC	4 VDC max.	1 VDC min.	0.2 to 40 A/0.2 to 6 A	G3NA-450B-UTU DC5-24
				100 to 240 VAC	75 VAC max.	20 VAC min.		G3NA-450B-UTU AC100-240
	75 A			5 to 24 VDC	75 VAC max.	20 VAC min.	1 to 75 A/1 to 7 A	G3NA-475B-UTU DC5-24
				100 to 240 VAC				G3NA-475B-UTU AC100-240
	90 A			5 to 24 VDC			1 to 90 A/1 to 7 A	G3NA-490B-UTU DC5-24
				100 to 240 VAC				G3NA-490B-UTU AC100-240

Accessories

Name	Applicable SSRs	Order code
One-touch mounting plates	–	R99-12 FOR G3NA
Mounting bracket	G3NA-240B-UTU	R99-11 FOR G3NA
Slim models enabling DIN-rail mounting	G3NA-205B-UTU, G3NA-210B-UTU, G3NA-D210B-UTU, G3NA-410B-UTU	Y92B-N50
	G3NA-225B-UTU, G3NA-440B-UTU	Y92B-N100
	G3NA-240B-UTU, G3NA-440B-UTU	Y92B-N150
Slim models enabling DIN-rail mounting	G3NA-450B-UTU	Y92B-P250
	G3NA-275B-UTU, G3NA-290B-UTU, G3NA-475B-UTU, G3NA-490B-UTU	Y92B-P250NF
Low-cost models	G3NA-205B-UTU, G3NA-210B-UTU, G3NA-D210B-UTU, G3NA-220B-UTU, G3NA-410B-UTU, G3NA-425B-UTU	Y92B-A100
	G3NA-240B-UTU, G3NA-440B-UTU	Y92B-A150N
	G3NA-450B-UTU	Y92B-A250

Specifications

Operating voltage range	5 to 24 VDC: 4 to 32 VDC 100 to 120 VAC: 75 to 132 VAC 200 to 240 VAC: 150 to 264 VAC
Output ON voltage drop	G3NA-2: 1.6 V (RMS) max. G3NA-4: 1.8 V (RMS) max. G3NA-D2: 1.5 V max.
Leakage current	5 mA (100 V)/10 mA (200 V) G3NA-D2: 5 mA max. (200 VDC)
Load voltage range	200 to 480 VAC: 180 to 528 VAC 24 to 240 VAC: 19 to 264 VAC 5 to 200 VDC: 4 to 220 VDC
Ambient temperature	Operating: -30 to 80°C
Operate & release time	1/2 of load power source cycle + 1 ms max. (DC input) 1/2 of load power source cycle + 1 ms max. (DC input)
G3NA-D2	1 ms max. (DC input; release 5 ms), 30 ms max. (AC input)
Size in mm (HxWxD)	58x43x27



Solid State Relays with exchangeable power cartridge

Optimum design of the heat sink has contributed to the downsizing of this product. The power element cartridges of G3PA are easily replaceable for easy maintenance. G3PA can be mounted on a DIN-rail or using screws.

- 10-60 A output current
- 24-480 VAC output voltages
- Applicable with 3-phase loads
- Replaceable power element cartridges
- All features can be delivered with or without heat sink

Ordering information

Rated output load		Zero cross function	Rated input voltage	Rated voltage	Operating voltage range	Input current impedance	Voltage level		Size in mm (HxWxD)	Order code
							Must operate voltage	Must release voltage		
24 to 240 VAC	10 A	Yes	5 to 24 VDC	5 to 24 VDC	4 to 30 VDC	7 mA max.	4 VDC max.	1 VDC min.	100x27x100	G3PA-210B-VD DC5-24
	20 A								100x37x100	G3PA-220B-VD DC5-24
	40 A								100x47x100	G3PA-240B-VD DC5-24
	60 A								100x110x100	G3PA-260B-VD DC5-24
	10 A		24 VAC	24 VAC	19.2 to 26.4 VAC	1.4 kΩ ±20%	19.2 VAC max.	4.8 VAC min.	100x27x100	G3PA-210B-VD AC24
	20 A								100x37x100	G3PA-220B-VD AC24
	40 A								100x47x100	G3PA-240B-VD AC24
	60 A								100x110x100	G3PA-260B-VD AC24
180 to 400 VAC	20 A		12 to 24 VDC	12 to 24 VDC	9.6 to 30 VDC	7 mA max.	9.2 VDC max.	1 VDC min.	100x37x100	G3PA-420B-VD DC12-24
	30 A								100x47x100	G3PA-430B-VD DC12-24
200 to 480 VAC	20 A								100x37x100	G3PA-420B-VD-2 DC12-24
	30 A								100x47x100	G3PA-430B-VD-2 DC12-24
	50 A								100x110x100	G3PA-450B-VD-2 DC12-24

Accessories

Replacement parts: Power device cartridges

Load voltage range	Carry current	Applicable SSR	Order code
19 to 264 VAC	10 A	G3PA-210B-VD DC5-24	G32A-A10-VD DC5-24
		G3PA-210B-VD AC24	G32A-A10-VD AC24
	20 A	G3PA-220B-VD DC5-24	G32A-A20-VD DC5-24
		G3PA-220B-VD AC24	G32A-A20-VD AC24
	40 A	G3PA-240B-VD DC5-24	G32A-A40-VD DC5-24
		G3PA-240B-VD AC24	G32A-A40-VD AC24
	60 A	G3PA-260B-VD DC5-24	G32A-A60-VD DC5-24
		G3PA-260B-VD AC24	G32A-A60-VD AC24
150 to 440 VAC	20 A	G3PA-420B-VD DC12-24	G32A-A420-VD DC12-24
	30 A	G3PA-430B-VD DC12-24	G32A-A430-VD DC12-24
180 to 528 VAC	20 A	G3PA-420B-VD-2 DC12-24	G32A-A420-VD-2 DC12-24
	30 A	G3PA-430B-VD-2 DC12-24	G32A-A430-VD-2 DC12-24
	50 A	G3PA-450B-VD-2 DC12-24	G32A-A450-VD-2 DC12-24

G32A-D__ enables 2 line switching of 3 phase configurations

Current flow	Applicable SSR	Order code
10 A	G3PA-210B-VD, G3PA-210BL-VD, G3PA-220B-VD, G3PA-220BL-VD, G3PA-420B-VD, G3PA-420B-VD-2	G32A-D20
20 A		
30 A	G3PA-430B-VD, G3PA-430B-VD-2, G3PA-240B-VD, G3PA-240BL-VD	G32A-D40
40 A		

Specifications

Isolation	Phototriac coupler
Indicator	Yes
Ambient temperature	Operating: -30 to 80°C
Load voltage range	200 to 480 VAC: 180 to 528 VAC 24 to 240 VAC: 19 to 264 VAC 180 to 400 VAC: 150 to 440 VAC
Output ON drop	1.6 V (RMS) max.
Operate time	0.5 of load power source cycle + 1 ms max. (DC input, -B models) 1.5 of load power source cycle + 1 ms max. (AC input) 1 ms max. (-BL models)
Release time	0.5 of load power source cycle + 1 ms max. (DC input) 1.5 of load power source cycle + 1 ms max. (AC input)



Omron's G3PE compact industrial SSR with outstanding surge endurance

The G3PE features an original surge-pass circuit that gives outstanding surge endurance and protects the semiconductor device against voltages in excess of 30 kV.

- Single and three phase, 15-45 A output current
- 100-240 VAC and 200-480 VAC output voltages
- Models available without zero cross
- Improved surge dielectric strength for output circuits
- Terminal cover with finger protection
- Mount to DIN track or with screws

Ordering information

Phases	Rated voltage (operating voltage)	Rated output load	Permissible I^2t (half 60 Hz wave)	Applicable heater capacity AC1: resistive load)	Size in mm (HxWxD)	Number of poles	Order code
1	100 to 240 VAC (75 to 264 VAC)	15 A (at 40°C)	121 A^2s	3 kW (at 200 VAC)	100x22.5x100	1	G3PE-215B DC12-24
		25 A (at 40°C)	260 A^2s	5 kW (at 200 VAC)		1	G3PE-225B DC12-24
		35 A	1,260 A^2s	7 kW (at 200 VAC)	100x44.5x100	1	G3PE-235B DC12-24
		45 A		9 kW (at 200 VAC)		1	G3PE-245B DC12-24
	200 to 480 VAC (180 to 528 VAC)	15 A (at 40°C)	128 A^2s	6 kW (at 400 VAC)	100x22.5x100	1	G3PE-515B DC12-24
		25 A (at 40°C)	1,350 A^2s	10 kW (at 400 VAC)		1	G3PE-525B DC12-24
		35 A		14 kW (at 400 VAC)	100x44.5x100	1	G3PE-535B DC12-24
		45 A	6,600 A^2s	18 kW (at 400 VAC)		1	G3PE-545B DC12-24
3	200 to 480 VAC (180 to 528 VAC)	15 A (at 40°C)	260 A^2s	12.5 kW (at 480 VAC)	100x80x155	3	G3PE-515B-3N DC12-24
						2	G3PE-515B-2N DC12-24
		25 A (at 40°C)		20.7 kW (at 480 VAC)	120x80x155	3	G3PE-525B-3N DC12-24
					100x80x155	2	G3PE-525B-2N DC12-24
		35 A	1,260 A^2s	29 kW (at 480 VAC)	140x80x155	3	G3PE-535B-3N DC12-24
					120x80x155	2	G3PE-535B-2N DC12-24
		45 A		37.4 kW (at 480 VAC)	140x110x155	3	G3PE-545B-3N DC12-24
					140x80x155	2	G3PE-545B-2N DC12-24

Specifications

Rated input voltage	12 to 24 VDC
Operating voltage range	9.6 to 30 VDC
Rated input current (impedance)	7 mA max. (zero cross models); 15 mA max. (models without zero cross)
Zero cross function	Yes
Must operate voltage	9.6 VDC max.
Must release voltage	1 VDC min.
Isolation method	Phototriac coupler
Operation indicator	Yes (yellow)
Load voltage range	200 to 480 VAC models: 180 to 528 VAC 100 to 240 VAC models: 75 to 264 VAC
Operate time	1/2 of load power source cycle +1 ms max.
Release time	1/2 of load power source cycle +1 ms max.
Leakage current	10 mA (at 200 VAC)
Ambient temperature	Operating: -30 to 80°C



Thyristor type single-phase power controller that enables precise temperature control

Compact and the possibility for side-by-side mounting for multiple units are the basics for this new generation of power controllers. Process value can be easily monitored via the 7-segment display on the front panel.

- Precise heater burnout detection
- Phase control or optimum cycle control
- RS-485 communications to set manipulated variables and monitor load current
- Total runtime monitoring
- Application with various loads: constant load resistance, variable load resistance

Ordering information

Applicable output load		Type	Contact terminal block	Heater burnout detection	Communications	Order code
100 to 240 VAC	20 A	Standard	Screwless clamp terminal block	No	No	G3PW-A220EU-C
	45 A					G3PW-A245EU-C
	60 A					G3PW-A260EU-C
	20 A	Constant current		Yes	Yes	G3PW-A220EC-C-FLK
	45 A					G3PW-A245EC-C-FLK
	60 A					G3PW-A260EC-C-FLK
	20 A	Standard	Terminal block with small slotted screws	No	No	G3PW-A220EU-S
	45 A					G3PW-A245EU-S
	60 A					G3PW-A260EU-S
	20 A	Constant current		Yes	Yes	G3PW-A220EC-S-FLK
	45 A					G3PW-A245EC-S-FLK
	60 A					G3PW-A260EC-S-FLK

Accessories (Order separately)

Name	Resistive value	Display	Model
External Variable Resistor	2 kΩ	202	G32X-V2K

Specifications

Order code			Standard Models	Constant-current Models
			G3PW-A2__EU-_	G3PW-A2__EC-__-FLK
Control method			Analogue input: Phase control or optimum cycle control Voltage ON/OFF input: ON/OFF control	
Maximum load capacity			Phase control: Linear (resistive) load, transformer primary-side control (flux density: 1.25 T max.)	
			Optimum cycle control: Linear (resistive) load (Transformer primaryside control is not supported.)	
Output mode	Analogue input	Phase control	Proportional to phase angle (same as G3PX), proportional to square voltage, proportional to voltage	Proportional to phase angle (same as G3PX), proportional to square voltage, proportional to voltage, constant-current control
		Optimum cycle control	Optimum cycle control (Output is switched to 100% or 0% each half cycle.)	
	Voltage ON/OFF input	ON/OFF control	Proportional to voltage control	



Multi-channel power controller for smarter SSR usage

The G3ZA receives manipulated variables generated by control loops or manual settings via a simple-to-wire RS-485. It regulates the heater power with high precision by driving up to eight standard SSRs. Moreover, the offset control reduces peak power in the supply net.

- Multi-channel power controller
- Controls up to eight standard solid state relays
- Easy integration with PLC
- Compact size
- Available with heater alarms (four channels) or without (eight channels)

Ordering information

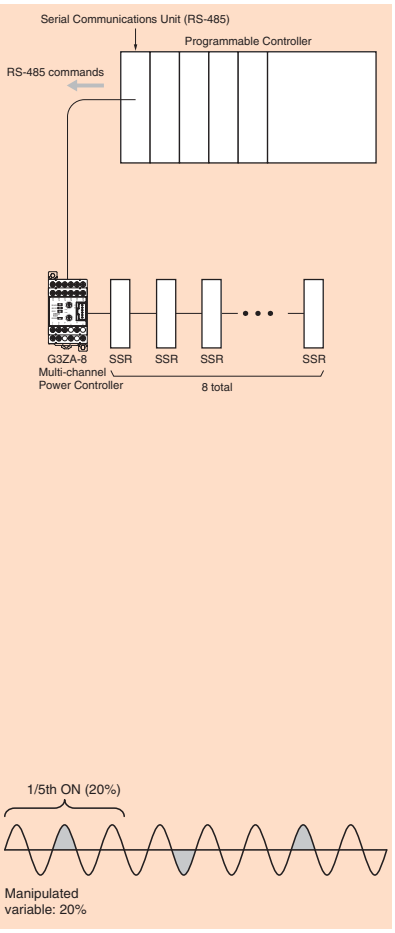
Name	Number of control channels	Heater alarm	Load power supply voltage	Order code
Multi-channel power controller	4	Supported	100 to 240 VAC	G3ZA-4H203-FLK-UTU
			400 to 480 VAC	G3ZA-4H403-FLK-UTU
	8	Not supported	100 to 240 VAC	G3ZA-8A203-FLK-UTU
			400 to 480 VAC	G3ZA-8A403-FLK-UTU

Accessories

Name	Hole diameter	Order code
Current transformer (CT)	5.8 dia.	E54-CT1
	12.0 dia.	E54-CT3

Specifications

Item	Load power supply voltage range	
	100 to 240 VAC	400 to 480 VAC
Power supply voltage	100 to 240 VAC (50/60 Hz)	
Operating voltage range	85 to 264 VAC	
Power consumption	16 VA max.	
Load power supply voltage	100 to 240 VAC	400 to 480 VAC
Load power supply voltage range	75 to 264 VAC	340 to 528 VAC
Manipulated variable input	0.0 to 100.0% (via RS-485 communications)	
Current transformer input	Single-phase AC, 0 to 50 A (primary current of CT)	
Trigger output	One voltage output for each channel, 12 VDC ±15%, max. load current: 21 mA (with built-in short-circuit protection circuit)	
Alarm output	NPN open collector, one output Max. applicable voltage: 30 VDC Max. load current: 50 mA Residual voltage: 1.5 V max. Leakage current: 0.4 mA max.	
Indications	LED indicators	
Ambient operating temperature	-10 to 55°C (with no icing or condensation)	
Ambient operating humidity	25 to 85%	
Storage temperature	-25 to 65°C (with no icing or condensation)	
Performance		
Current indication accuracy	±3 A (for models with heater burnout detection)	
Insulation resistance	100 MΩ min. (at 500 VDC) between primary and secondary	
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min between primary and secondary	
Vibration resistance	Vibration frequency: 10 to 55 Hz, acceleration: 50 m/s^2 in X, Y, and Z directions	
Shock resistance	300 m/s^2 three times each in six directions along three axes	
Weight	Approx. 200 g (including terminal cover)	
Degree of protection	IP20	
Memory protection	EEPROM (non-volatile memory) (number of writes: 100,000)	
Installation environment	Overvoltage category III, pollution degree 2 (according to IEC 60664-1)	
Approved standards	UL508 (Listing), CSA22.2 No. 14 EN50178 EN61000-6-4 (EN55011: 1998, A1: 1999 Class A, Group 1) EN61000-6-2: 2001	
Size in mm (HxWxD)	76x45x111	



Optimum cycle control

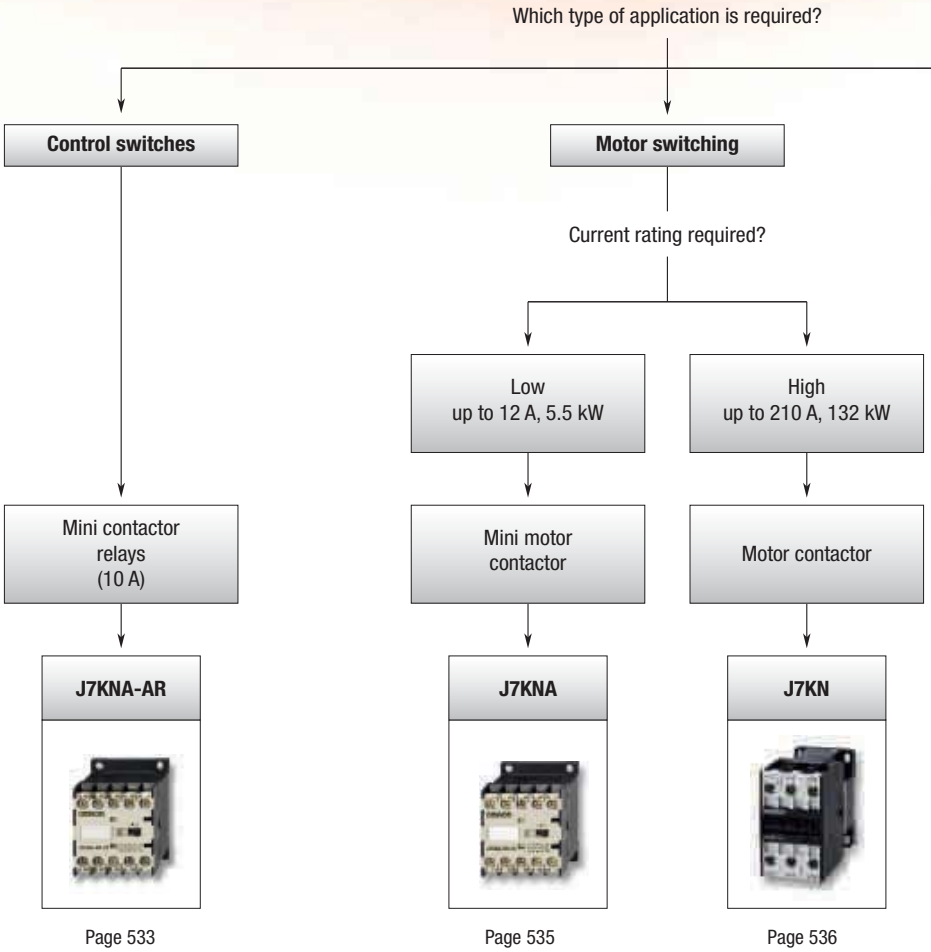
- Optimum cycle control is performed by driving SSRs according to load power detection and trigger signals. (Zero-cross SSRs are used.)
- Noise is suppressed while ensure high-speed response by turning outputs ON and OFF each half cycle to achieve high-precision temperature control.

DIRECT CONTROL DC CONTACTOR

J7KNG – Low-power consumption DC contactors

Now it is possible to control contactors directly from a PLC with electronic output.
Our new J7KNG models consume only 3 W inrush/sealed power up to 22 A contactors and 4 W inrush/sealed power up to 40 A contactors!

- Low inrush & sealed control circuits
- Control terminals on both sides
- Wide range up to 22 A with built-in auxiliary contact and up to 40 A





Motor protection

Which kind of protection is needed?

Protection with fuse	Fuseless
Thermal overload relays (0.12 to 220 A)	Motor protection circuit breakers (0.12 to 220 A)
J7TKN	**J7MN**
	
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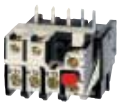
Selection table

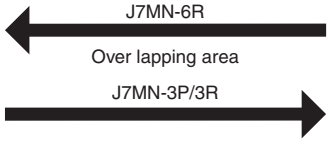
MPCB	Category		Motor protection circuit breaker				
			 				
	Type		J7MN-3P/3R				
	Setting range current		0.16 - 32 A				
	Number of ranges		16				
	Auxiliary contact external		front 1 NO and 1 NC or 2 NO, side 1 NO and NC or 2 NO or 2 NC				
	Page		540				

Contactors	Category		Contactors				
							
	Type		J7KNA-AR	J7KNA-09/12	J7KN(G)-10	J7KN(G)-14	J7KN(G)-18	J7KN(G)-22
	Maximum power AC3-380/415 V		–	4 kW or 5 kW	4 kW	5.5 kW	7.5 kW	11 kW
	Rated current AC3-380/415 V		10 A th	9/12 A	10 A	14 A	18 A	22 A
	Main contacts		4 in 4 configurations	3 or 4	3 or 4			
	Auxiliary contacts	Included	–	1	1 NO or 1 NC			
		External	4 in different combinations		4 contacts [1]			
	Page		533	535	536		536	

Thermal overload	Category		Thermal overload		
					
	Type		J7TKN-A	J7TKN-B	
	Setting range D.O.L.		0.12 - 14 A	0.12 - 32 A	
	Number of ranges		13	16	
	Auxiliary contacts included		1 NO and 1 NC	1 NO and 1 NC	
	Page		538	538	

*1 Using J7KN-*D double wiring coils 1 aux. less

Motor protection circuit breaker







	J7MN-6R	J7MN-9R
	26 - 63 A	63 - 100 A
	5	4
front 1 NO and 1 NC or 2 NO, side 1 NO and NC or 2 NO or 2 NC		
	540	

Contactors









J7KN(G)-24	J7KN(G)-32	J7KN(G)-40	J7KN-50	J7KN-62	J7KN-74	J7KN-85	J7KN-110
11 kW	15 kW	18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW
24 A	32 A	40 A	50 A	62 A	74 A	85 A	110 A
3			3			3	
–			–			2 NO and 2 NC	
front and side 8-contacts [*1]			front and side 8-contacts [*1]			–	
536			536			536	

Thermal overload







J7TKN-C	J7TKN-D	J7TKN-E
28 - 42 A	40 - 74 A	60 - 120 A
1	3	2
1 NO and 1 NC	1 NO and 1 NC	1 NO and 1 NC
538	538	538

*1 Using J7KN-*D double wiring coils 1 aux. less

Selection table

MPCB	Category	Motor protection circuit breaker		
	Type			
	Setting range current			
	Number of ranges			
	Auxiliary contact external			
	Page			

Contactors	Category	Contactors		
				
	Type	J7KN-151	J7KN-176	J7KN-200
	Maximum power AC3-380/415 V	75 kW	90 kW	110 kW
	Rated current AC3-380/415 V	150 A	175 A	200 A
	Main contacts	3 or 4		3
	Auxiliary contacts Included	–		2 NO and 1 NC
	Auxiliary contacts External	front and side 8-contacts [1]		2 NO and 2 NC
	Page	536		

Thermal overload	Category	Thermal overload	
			
	Type	J7TKN-E	J7TKN-F
	Setting range D.O.L.	60 - 120 A	100 - 220 A
	Number of ranges	2	2
	Auxiliary contacts included	1 NO and 1 NC	1 NO and 1 NC
	Page	538	



Main mini contactor relay, 4-pole

Three basic units can be combined with different additional auxiliary contacts. 4-pole, 6-pole and 8-pole versions in different configurations are possible as well as different coil voltages (AC and DC). Accessories such as suppressors are available.

- Mirror contacts
- Screw fixing and snap fitting (35 mm DIN-rail)
- Rated current = 10 A (I_{th})
- Suitable for electronic devices (DIN 19240)
- Finger proof (BGV A2)

Ordering information

Operation	Contacts		Distinctive number according to DIN EN 50011	Ratings		Thermal rated current	Order code	Coil voltage *1, replace ___ with:				
	NO	NC		AC15 230 V A	400 V A	I_{th}, A						
4-pole, with screw terminals								VAC			VDC	
AC	4	0	40 E	3	2	10	J7KNA-AR-40___	24	110	230	–	–
	3	1	31 E	3	2	10	J7KNA-AR-31 ___	24	110	230	–	–
	2	2	22 E	3	2	10	J7KNA-AR-22 ___	24	110	230	–	–
DC solenoid	4	0	40 E	3	2	10	J7KNA-AR-40 ___	–	–	–	24D	110D
	3	1	31 E	3	2	10	J7KNA-AR-31 ___	–	–	–	24D	110D
	2	2	22 E	3	2	10	J7KNA-AR-22 ___	–	–	–	24D	110D
DC solenoid with diode	4	0	40 E	3	2	10	J7KNA-AR-40 ____	–	–	–	24VS	–
	3	1	31 E	3	2	10	J7KNA-AR-31 ____	–	–	–	24VS	–
	2	2	22 E	3	2	10	J7KNA-AR-22 ____	–	–	–	24VS	–

*1 Other coil voltages available on request

Accessories

Contacts		Ratings		Thermal rated current	Order code
NO	NC	AC15 230 V A	400 V A	I_{th}, A	
1	1	3	2	10	J73KN-A-11
0	2	3	2	10	J73KN-A-02
4	0	3	2	10	J73KN-A-40
2	2	3	2	10	J73KN-A-22
0	4	3	2	10	J73KN-A-04

Specifications

Suffix to contactor type e.g. J7KNA-09-10-24	Voltage marking at the coil for		Rated control voltage U_s range for			
	50 Hz	60 Hz	50 Hz		60 Hz	
	V	V	min. V	max. V	min. V	max. V
24	24	24	22	24	24	24
110	110 to 115	120 to 125	110	115	120	125
230	220 to 230	240	220	230	240	250
Size in mm (HxWxD)	57.5x45x49					



Motor contactors from 4 to 5.5 kW for normal duty switching

This modular system consists of main contactors and additional contact blocks. The basic units can be combined with auxiliary contacts (top mounting). Reversed versions, including integrated mechanical interlock, are available as well as 3-main-pole and 4-main-pole versions.

- 4 kW and 5.5 kW versions are available
- Different coil voltages (AC and DC)
- Mini and normal-size versions are available
- The contactors can be mounted with screw fixing and snap fitting on a DIN-rail
- All components are finger proof

Ordering information

Operation	Poles	Rating AC2, AC3			Rated current		Auxiliary contact		Overload relay	Size in mm (HxWxD)	Order code	Coil voltage *1, replace ___ with:				
		380 V 400 V 415 V kW	500 V kW	660 V 690 V kW	AC3 400 V A	AC1 690 V A	NO	NC				VAC				VDC
AC/DC solenoid	3	4	4	4	9	20	1	0	J7TKN-A	57.5x45x49	J7KNA-09-10_ _ _	24	110	230	400	24D
							0	1	J7TKN-A		J7KNA-09-01_ _ _	24	110	230	400	24D
		5.5	5.5	5.5	12	20	1	0	J7TKN-A		J7KNA-12-10_ _ _	24	110	230	400	24D
							0	1	J7TKN-A		J7KNA-12-01_ _ _	24	110	230	400	24D
	4	4	4	4	9	20	0	0	J7TKN-A		J7KNA-09-4_ _ _	24	110	230	400	24D
DC solenoid with diode	3	4	4	4	9	20	1	0	J7TKN-A		J7KNA-09-10_ _ _	–	–	–	–	24VS
							0	1	J7TKN-A		J7KNA-09-01_ _ _	–	–	–	–	24VS
		5.5	5.5	5.5	12	20	1	0	J7TKN-A		J7KNA-12-10_ _ _	–	–	–	–	24VS
							0	1	J7TKN-A		J7KNA-12-01_ _ _	–	–	–	–	24VS
AC/DC solenoid	3 reversing contactors	4	4	4	9	20	0	1	J7TKN-A	57.5x94.5x50	J7KNA-09-01 R_ _ _	24	110	230	400	24D
		5.5	5.5	5.5	12	20	0	1	J7TKN-A		J7KNA-12-01 R_ _ _	24	110	230	400	24D
DC solenoid with diode		4	4	4	9	20	0	1	J7TKN-A		J7KNA-09-01 R_ _ _	–	–	–	–	24VS
		5.5	5.5	5.5	12	20	0	1	J7TKN-A		J7KNA-12-01 R_ _ _	–	–	–	–	24VS

*1 Other coil voltages available on request

Accessories

Auxiliary contacts				
Contacts		Rated current		Order code
NO	NC	AC15 230 V	400 V	
1	1	3 A	2 A	J73KN-AM-11
0	2	3 A	2 A	J73KN-AM-02
2	2	3 A	2 A	J73KN-AM-22
Auxiliary contacts for reversing contactors				
1	1	3 A	2 A	J73KN-AM-11V
1	1	3 A	2 A	J73KN-AM-11X
Link modules between MPCB & contactors				
For MPCB J7MN-3P/J7MN-3R				J77MN-VKA-3
Insulated wiring system for J7KNA				
Reversing or parallel contactors				J75-WK11
Star-delta combination				J75-WK12

Specifications

Suffix to contactor type e.g. J7KNA-09-10-24	Voltage marking at the coil for		Rated control voltage U_s range for			
	50 Hz	60 Hz	50 Hz		60 Hz	
	V	V	min. V	max. V	min. V	max. V
24	24	24	22	24	24	24
110	110 to 115	120 to 125	110	115	120	125
230	220 to 230	240	220	230	240	250

Main contacts		J7KNA-09-___	J7KNA-12-___
Rated insulation voltage U_i		690 VAC	690 VAC
Making capacity Ieff	at U_e = 690 VAC	165 A	165 A
Breaking capacity I_{eff} cosϕ = 0,65	400 VAC	100 A	100 A
	500 VAC	90 A	90 A
	690 VAC	80 A	80 A
Mechanical life AC operated		5×106	5×106
DC operated		15×106	15×106
Short time current	10 s current	96 A	120 A



Motor contactors from 4-110 kW for normal and heavy-duty switching

This modular system consists of main contactors and additional contact blocks. The basic units can be combined with auxiliary contacts. DC-DC versions, integrated mechanical interlock, are available as well as 3-main-pole and 4-main-pole versions.

- Basic units can be combined with auxiliary contacts (top/side mounting)
- 3-main-pole and 4-main-pole versions are possible
- The power range covers 4 to 110 kW
- Different coil voltages (AC and DC)

Ordering information

Operation	Poles	AC3 400 V rated motor current	Rating AC2, AC3			Rated current	Auxiliary contact		Overload relay	Size in mm (HxWxD)	Order code	Coil voltage *1, replace ___ with:					
			380 V 400 V 415 V kW	500 V kW	660 V 690 V kW	AC1 690 V A	NO	NC				VAC				VDC	
AC/DC	3	10 A	4	5.5	5.5	25	1	0	J7TKN-B	67x45x82.5	J7KN-10-10___	24	110	230	400	24D	110D
			4	5.5	5.5	25	0	1			J7KN-10-01___	24	110	230	400	24D	110D
		14 A	5.5	7.5	7.5	25	1	0			J7KN-14-10___	24	110	230	400	24D	110D
			5.5	7.5	7.5	25	0	1			J7KN-14-01___	24	110	230	400	24D	110D
		18 A	7.5	10	10	32	1	0			J7KN-18-10___	24	110	230	400	24D	110D
			7.5	10	10	32	0	1			J7KN-18-01___	24	110	230	400	24D	110D
		22 A	11	10	10	32	1	0			J7KN-22-10___	24	110	230	400	24D	110D
			11	10	10	32	0	1			J7KN-22-01___	24	110	230	400	24D	110D
		24 A	11	15	15	50	0	0	J7TKN-C	78x45x104.5	J7KN-24___	24	110	230	400	24D	110D
		32 A	15	18.5	18.5	65	0	0			J7KN-32___	24	110	230	400	24D	110D
		40 A	18.5	18.5	18.5	80	0	0			J7KN-40___	24	110	230	400	24D	110D
		50 A	22	30	30	110	0	0	J7TKN-D	112x60x113	J7KN-50___	24	110	230	400	24D	110D
		62 A	30	37	37	120	0	0			J7KN-62___	24	110	230	400	24D	110D
		74 A	37	45	45	130	0	0			J7KN-74___	24	110	230	400	24D	110D
		85 A	45	55	55	150	2	2	J7TKN-E	134x90x119	J7KN-85-22___	24	110	230	400	–	–
											J7KN-85-21___	–	–	–	–	24D	110D
		110 A	55	75	55	170	2	2			J7KN-110-22___	24	110	230	400	–	–
											J7KN-110-21___	–	–	–	–	24D	110D
DC operated solenoid motor contactor	3	10 A	4	5.5	5.5	25	1	0	J7TKN-B	67x45x82.5	J7KNG-10-10___	–	–	–	–	24D	110D
			4	5.5	5.5	25	0	1			J7KNG-10-01___	–	–	–	–	24D	110D
		14 A	5.5	7.5	7.5	25	1	0			J7KNG-14-10___	–	–	–	–	24D	110D
			5.5	7.5	7.5	25	0	1			J7KNG-14-01___	–	–	–	–	24D	110D
		18 A	7.5	10	10	32	1	0			J7KNG-18-10___	–	–	–	–	24D	110D
			7.5	10	10	32	0	1			J7KNG-18-01___	–	–	–	–	24D	110D
		22 A	11	10	10	32	1	0			J7KNG-22-10___	–	–	–	–	24D	110D
			11	10	10	32	0	1			J7KNG-22-01___	–	–	–	–	24D	110D
		24 A	11	15	15	50	0	0	J7TKN-B J7TKN-C	78x45x104.5	J7KNG-24___	–	–	–	–	24D	110D
		32 A	15	18.5	18.5	65	0	0			J7KNG-32___	–	–	–	–	24D	110D
		40 A	18.5	18.5	18.5	80	0	0			J7KNG-40___	–	–	–	–	24D	110D
AC/DC		150 A	75	75	75	230	0	0	J7TKN-F	170x110x162	J7KN-151___	24	110	230	400	24	110
		175 A	90	90	90	250	0	0			J7KN-176___	24	110	230	400	24	110
		200 A	110	132	132	350	2	2		202x130x190	J7KN-200-21___	24	110	230	400	24	110
AC for fuseless load feeders	3	10 A	4	5.5	5.5	25	1	0	–	67x45x82.5	J7KN-10-10___VKN-3	24	110	230	400	24D	110D
			4	5.5	5.5	25	0	1			J7KN-10-01___VKN-3	24	110	230	400	24D	110D
		14 A	5.5	7.5	7.5	25	1	0			J7KN-14-10___VKN-3	24	110	230	400	24D	110D
			5.5	7.5	7.5	25	0	1			J7KN-14-01___VKN-3	24	110	230	400	24D	110D
		18 A	7.5	10	10	32	1	0			J7KN-18-10___VKN-3	24	110	230	400	24D	110D
			7.5	10	10	32	0	1			J7KN-18-01___VKN-3	24	110	230	400	24D	110D
		22 A	11	10	10	32	1	0			J7KN-22-10___VKN-3	24	110	230	400	24D	110D
			11	10	10	32	0	1			J7KN-22-01___VKN-3	24	110	230	400	24D	110D

*1 Other coil voltages available on request

Operation	Poles	AC3 400 V rated motor current	Rating AC2, AC3 380 V 400 V 415 V kW	AC1 400 V kW	Rated current AC1 690 V A	Auxiliary contact NO	NC	Overload relay	Size in mm (HxWxD)	Order code	Coil voltage *1, replace ___ with: VAC				VDC	
AC	4	10 A	4	17.5	25	0	0	–	67x45x82.5	J7KN-10-4___	24	110	230	400	–	
		14 A	5.5	17.5	25	0	0			J7KN-14-4___	24	110	230	400		
		18 A	7.5	22	32	0	0			J7KN-18-4___	24	110	230	400		
		22 A	11	22	32	0	0			J7KN-22-4___	24	110	230	400		
DC solenoid motor contactor	4	10 A	4	17.5	25	0	0	–	67x45x82.5	J7KNG-10-4___	–				24D	110D
		14 A	5.5	17.5	25	0	0			J7KNG-14-4___					24D	110D
		18 A	7.5	22	32	0	0			J7KNG-18-4___					24D	110D
		22 A	11	22	32	0	0			J7KNG-22-4___					24D	110D
AC/DC		150 A	75	159	230	0	0		170x110x162	J7KN-151-4___	24	110	230	400	24	110
		175 A	90	173	250	0	0			J7KN-176-4___	24	110	230	400	24	110

*1 Other coil voltages available on request

Accessories

Auxiliary contact blocks	Rated operational current			Contacts		Order code
Suitable for:	AC15 230 V A	AC15 400 V A	AC1 690 V A	NO	NC	
J7KN-10… to -74…	3	2	10	1	–	J73KN-B-10
	3	2	10	–	1	J73KN-B-01
	3	2	10	–	–	J73KN-B-10U
	3	2	10	–	–	J73KN-B-01U
	6	4	25	1	–	J73KN-B-10A
	6	4	25	–	1	J73KN-B-01A
J7KN-151… to -176…	3	2	10	1	1	J73KN-D-11F
	3	2	10	2	2	J73KN-D-22F
	3	2	10	1	1	J73KN-D-11S
J7KN-24… to KN-110 and J7KN-200	3	2	10	1	1	J73KN-C-11S
	3	2	10	2	2	J73KN-E-22

Pneumatic timers	Function	Time range	Contacts		Order code
Suitable for:			NO	NC	
J7KN-10... to -40…	ON-delay	0.1 to 40 s	1	–	J74KN-B-TP40DA
	ON-delay	10 to 180 s	1	–	J74KN-B-TP180DA
	OFF-delay	0.1 to 40 s	–	1	J74KN-B-TP40IA
	OFF-delay	10 to 180 s	–	1	J74KN-B-TP180IA

Mechanical interlocks	Interlocks contactor with contactor	Order code
Mounting	Order code + Order code	
Horizontal	J7KN-10 to -40 + J7KN-10 to -40	J74KN-B-ML
	J7KN-24 to -74 + J7KN-24 to -74	J74KN-C-ML
	J7KN-85 to -110 + J7KN-85 to -110	J74KN-D-ML
	J7KN-151 to -176 + J7KN-151 to -176	J74KN-E-ML

Suppressor units Suitable for contactors	Type		Applicable coil voltage	Order code
J7KNA	AC/DC	Varistor snap-on coil terminals	110 to 230 V	J74KN-A-VG230
J7KN10-J7KN22	AC/DC		250 to 415 V	J74KN-A-VG400
J7KN10-J7KN74	AC/DC	Varistor snap-on top of contactor	110 to 230 V	J74KN-B-VG230
	AC/DC		250 to 415 V	J74KN-B-VG400
J7KNA	AC/DC	RC-unit snap-on contactor	12 to 48 V	J74KN-D-RC24
	AC/DC		48 to 127 V	J74KN-D-RC110
	AC/DC		110 to 230 V	J74KN-D-RC230
J7KN10-J7KN74	AC/DC	RC-unit snap-on contactor	12 to 48 V	J74KN-C-RC24
	AC/DC		48 to 127 V	J74KN-C-RC110
	AC/DC		110 to 230 V	J74KN-C-RC230
J7KN85-J7KN110	AC/DC	RC-unit to fix via fixing band or adhesive strip with contactor	12 to 24 V	J74KN-B-RC48
	AC/DC		110 to 250 V	J74KN-B-RC230
	AC/DC		250 to 415 V	J74KN-B-RC400

Additional terminals single pole Suitable for contactors	Cable cross-sections to clamp (mm^2) Solid or stranded	Flexible	Flexible with multi-core cable end	Order code
J7KN50 - KN74	4 to 35	6 to 25	4 to 25	J74KN-LG-9030
J7KN151 - KN176	16 to 120	–	16 to 95	J74KN-LG-11224

Terminal covers Suitable for contactors	Specification	Order code
J7KN151 - KN176	One unit	J74KN-LG-10404

Marking systems Description	Specification	Order code
Marking plate	2-section without marking, divisible	J74KN-P487-1
Marking plate	4-section without marking, divisible	J74KN-P245-1

Specifications

Coil voltages	Suffix to contactor type:								
Contactor type	20	24	48	90	110	180	230	400	500
J7KN-10 to J7KN-74	–	yes	yes	–	yes	yes	yes	yes	yes
J7KN-85 to J7KN-110	yes	yes	yes	yes	yes	yes	yes	yes	yes
J7KN-151 to J7KN-200	–	yes	yes	–	yes	–	yes	yes	–



Thermal overload relays for J7 contactors

J7TKN relays protect motors against thermal overload. They can be mounted on the contactor or separately. The relays comply with IEC 947 (single-phase sensitivity).

- Series of overload relays covering a setting range from 0.24 A to 220 A
- All components are finger proof

Ordering information

Applicable contactors	Setting range		Size in mm (HxWxD)	Order code
	D.O.L. (A)	Star-delta (A)		
J7KNA-09…, J7KNA-12…	0.12 to 0.18	–	38.8x48.5x77	J7TKN-A-E18
	0.18 to 0.27	–		J7TKN-A-E27
	0.27 to 0.4	–		J7TKN-A-E4
	0.4 to 0.6	–		J7TKN-A-E6
	0.6 to 0.9	–		J7TKN-A-E9
	0.8 to 1.2	–		J7TKN-A-1E2
	1.2 to 1.8	–		J7TKN-A-1E8
	1.8 to 2.7	–		J7TKN-A-2E7
	2.7 to 4	–		J7TKN-A-4
	4 to 6	7 to 10.5		J7TKN-A-6
	6 to 9	10.5 to 15.5		J7TKN-A-9
	8 to 11	14 to 19		J7TKN-A-11
	10 to 14	18 to 24		J7TKN-A-14
J7KN-10… to J7KN-40…	0.12 to 0.18	–	63.5x45x70	J7TKN-B-E18
	0.18 to 0.27	–		J7TKN-B-E27
	0.27 to 0.4	–		J7TKN-B-E4
	0.4 to 0.6	–		J7TKN-B-E6
	0.6 to 0.9	–		J7TKN-B-E9
	0.8 to 1.2	–		J7TKN-B-1E2
	1.2 to 1.8	–		J7TKN-B-1E8
	1.8 to 2.7	–		J7TKN-B-2E7
	2.7 to 4	–		J7TKN-B-4
	4 to 6	7 to 10.5		J7TKN-B-6
	6 to 9	10.5 to 15.5		J7TKN-B-9
	8 to 11	14 to 19		J7TKN-B-11
	10 to 14	18 to 24		J7TKN-B-14
	13 to 18	23 to 31		J7TKN-B-18
	17 to 24	30 to 41		J7TKN-B-24
	23 to 32	40 to 55		J7TKN-B-32
J7KN-24… to J7KN-40…	28 to 42	48 to 73	47x67x90	J7TKN-C-42
J7KN-50… to J7KN-74…	40 to 52	70 to 90	57x69x93	J7TKN-D-52
	52 to 65	90 to 112		J7TKN-D-65
	60 to 74	104 to 128		J7TKN-D-74
J7KN-85… to J7KN-150…	60 to 90	104 to 156	101x107x102	J7TKN-E-90
	80 to 120	140 to 207		J7TKN-E-120
J7KN-175… to J7KN-200…	100 to 150	175 to 260	113x190x176	J7TKN-F-150
	140 to 220	240 to 380		J7TKN-F-210

Accessories

Busbar sets		
For overload relays	For contactors	Order code
J7TKN-F-150	J7KN-151, J7KN-176	J74TK-SU-176
J7TKN-F-210	J7KN-200	J74TK-SU-200

Sets for single mounting				
For overload relays	Cable cross-section to clamp (mm^2)			Order code
	Solid or stranded	Flexible	Flexible with multi-core cable	
J7TKN-A	0.75 to 6	0.75 to 4	0.5 to 4	J74TK-M
J7TKN-B	0.75 to 6	0.75 to 4	0.5 to 4	J74TK-SM

Specifications

Type		J7TKN-A	J7TKN-B	J7TKN-C	J7TKN-D	J7TKN-E	J7TKN-F
Rated insulation voltage U_i		690 VAC					
Permissible ambient temperature	Operation	-25 to 60°C					
	Storage	-50 to 70°C					
Trip class according to IEC 947-4-1		10 A				20 A	
Cable cross-section Main connector	Solid or stranded mm^2	0.75 to 6 0.75 to 2.5	0.75 to 6	0.75 to 10	4 to 35	–	–
	Flexible mm^2	0.75 to 4 0.5 to 2.5	1 to 4	0.75 to 6	6 to 25	–	–
	Flexible with multi-core cable end mm^2	0.5 to 2.5 0.5 to 1.5	0.75 to 4	0.75 to 6	4 to 25	–	–
Cables per clamp	Number	1 + 1	2	2	1	–	–
Auxiliary connector	Solid mm^2	0.75 to 2.5					
	Flexible mm^2	0.5 to 2.5					
	Flexible with multi-core cable end mm^2	0.5 to 1.5					
Cables per clamp	Number	2					
Auxiliary contacts							
Rated insulation voltage U_i	same potential	690 VAC					
	different potential	440 VAC		250 VAC		440 VAC	
Rated operational current I_e Utilization category AC15	24 V	5 A	3 A	4 A		5 A	
	230 V	3 A	2 A	2.5 A	2.5 A	3 A	3 A
	400 V	2 A	1 A	1.5 A	1.5 A	2 A	2 A
	690 V	0.6 A	0.5 A	0.6 A			
Rated operational current I_e Utilization category DC13	24 V	1.2 A	1 A	1.2 A			
	110 V	0.15 A					
	220 V	0.1 A					
Short circuit protection (without welding 1 kA)	Highest fuse rating gL (gG)	6 A	4 A	6 A			
Setting range		to 23 A	All	28 to 42 A	52 to 65 A	All	–
Power loss per current path (max.)	Minimum setting value	1.1 W	1.1 W	1.3 W	2.9 W	1.1 W	–
	Maximum setting value	2.3 W	2.3 W	3.3 W	4.5 W	2.5 W	–



J7MN motor-protection circuit breakers from 0.10 A to 100 A

J7MN starters protect motors against thermal overload and short circuit. The J7MN can be equipped with additional auxiliary contacts, tripping indicator (alarm), undervoltage release and/or shunt release. All models can be locked for safe maintenance.

- Rated operational currents of 32 A for the rocker type
- Rated operational currents of 32 A, 63 A and 100 A for the rotary types
- Switching capacity is 100 kA/415 V up-to 13 A and 50 kA/415 V up-to 100 A
- Electrical/mechanical link modules available up-to 11 kW motor protection units
- All components are finger proof

Ordering information

Rated current in A	Suitable for motors 3 ~ 400 V kW	Current setting range		Short-circuit breaking capacity at 3 ~ 400 V kA	Size in mm (HxWxD)	Order code
		Thermal overload release A	Instantaneous short-circuit release A			
0,16	–	0.10 - 0.16	2,1	100	98x45x75	J7MN-3P-E16
0,25	0,06	0.16 - 0.25	3,3	100		J7MN-3P-E25
0,4	0,09	0.25 - 0.4	5,2	100		J7MN-3P-E4
0,63	0,18	0.4 - 0.63	8,2	100		J7MN-3P-E63
1	0,25	0.63 - 1	13	100		J7MN-3P-1
1,6	0,55	1 - 1.6	20,8	100		J7MN-3P-1E6
2,5	0,75	1.6 - 2.5	32,5	100		J7MN-3P-2E5
4	1,5	2.5 - 4	52	100		J7MN-3P-4
6	2,2	4 - 6	78	100		J7MN-3P-6
8	3	5 - 8	104	100		J7MN-3P-8
10	4	6 - 10	130	50		J7MN-3P-10
13	5,5	9 - 13	169	50		J7MN-3P-13
17	7,5	11 - 17	221	20		J7MN-3P-17
22	7,5	14 - 22	286	15		J7MN-3P-22
26	11	18 - 26	338	15		J7MN-3P-26
32	15	22 - 32	416	15		J7MN-3P-32
0,16	–	0.10 - 0.16	2,1	100	98x45x100	J7MN-3R-E16
0,25	0,06	0.16 - 0.25	3,3	100		J7MN-3R-E25
0,4	0,09	0.25 - 0.4	5,2	100		J7MN-3R-E4
0,63	0,18	0.4 - 0.63	8,2	100		J7MN-3R-E63
1	0,25	0.63 - 1	13	100		J7MN-3R-1
1,6	0,55	1 - 1.6	20,8	100		J7MN-3R-1E6
2,5	0,75	1.6 - 2.5	32,5	100		J7MN-3R-2E5
4	1,5	2.5 - 4	52	100		J7MN-3R-4
6	2,2	4 - 6	78	100		J7MN-3R-6
8	3	5 - 8	104	100		J7MN-3R-8
10	4	6 - 10	130	100		J7MN-3R-10
13	5,5	9 - 13	169	100		J7MN-3R-13
17	7,5	11 - 17	221	50		J7MN-3R-17
22	7,5	14 - 22	286	50		J7MN-3R-22
26	11	18 - 26	338	50		J7MN-3R-26
32	15	22 - 32	416	50		J7MN-3R-32
26	12,5	18 - 26	338	50	140x55x144	J7MN-6R-26
32	15	22 - 32	416	50		J7MN-6R-32
40	18,5	28 - 40	520	50		J7MN-6R-40
50	22	34 - 50	650	50		J7MN-6R-50
63	30	45 - 63	819	50		J7MN-6R-63
63	30	45 - 63	819	50	165x70x171	J7MN-9R-63
75	37	55 - 75	975	50		J7MN-9R-75
90	45	70 - 90	1170	50		J7MN-9R-90
100	–	80 - 100	1300	50		J7MN-9R-100

Accessories

Description	Version		For circuit breaker	Order code
Transverse auxiliary contact block				
Contact block	1 NO + 1 NC		All	J7MN-11F
	2NO			J7MN-20F
	2NC			J7MN-02F
Auxiliary contact block for left hand side mounting (max. 2 pc. per circuit breaker)				
Contact block (9 mm)	1 NO + 1 NC		All	J7MN-11S
	2NO			J7MN-20S
	2NC			J7MN-02S
Signalling switch for left hand side mounting (max. 1 pc. per circuit breaker)				
Signalling switch (18 mm)	1 NO + 1 NC any tripping condition		–	J7MN-TA-11S
	1 NO + 1 NC short circuit tripping condition		–	J7MN-T-11S
Undervoltage releases for right hand side mounting (max 1 pc. per circuit breaker)				
Trips the circuit breaker when the voltage is interrupted. Prevents the motor from being restarted accidentally when the voltage is restored, suitable for EMERGENCY STOP according to VDE 0113	AC 50 Hz	AC 60 Hz	All	–
	24 V	28 V		J7MN-U-24
	110-127 V	120 V		J7MN-U-110
	220-230 V	240-260 V		J7MN-U-230
	240 V	277 V		J7MN-U-240
	380-400 V	440-460 V		J7MN-U-400
	415-440 V	460-480 V		J7MN-U-415
Shunt releases for right hand side mounting (max 1 pc. per circuit breaker)				
Trips the circuit breaker when the release coil is energized	AC 50 Hz	AC 60 Hz	All	–
	24 V	28 V		J7MN-S-24
	110-127 V	120 V		J7MN-S-110
	220-230 V	240-260 V		J7MN-S-230
	240 V	277 V		J7MN-S-240
	380-400 V	440-460 V		J7MN-S-400
	415-440 V	460-480 V		J7MN-S-415
Terminal block				
Terminal block	Up to 600 V according to UL 489 not for transverse auxiliary contact block		J7MN-3R	J7MN-TB32
			J7MN-9R	J7MN-TB100

Specifications

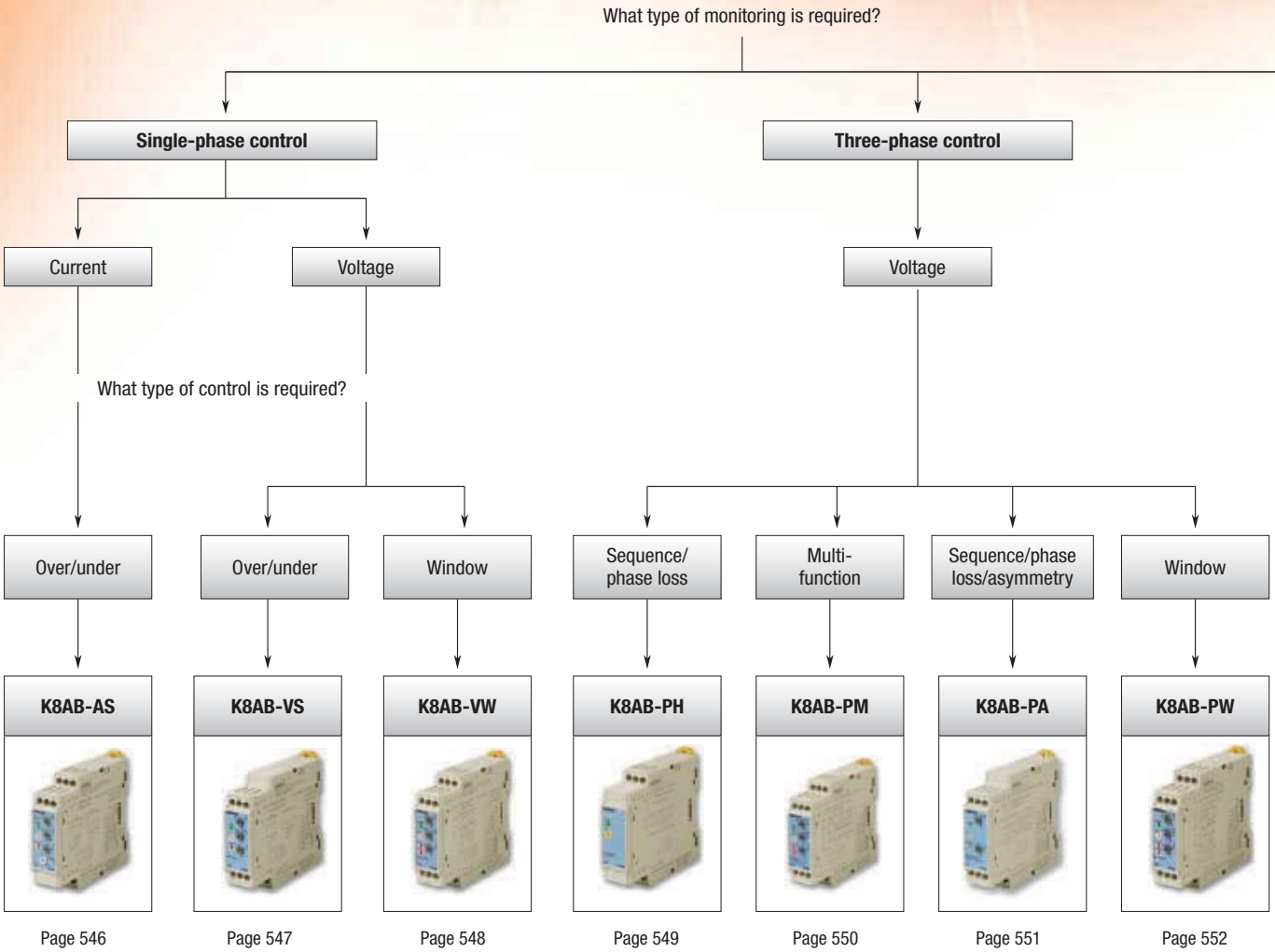
Type		J7MN-3P	J7MN-3R	J7MN-6R	J7MN-9R
Number of poles		3	3	3	3
Max. rated current Inmax (= max. rated operational current I_e)	**A**	32	32	63	100
Permissible ambient temperature	**Storage/transport**	-50 to 80°C			
	Operation	-20 to 60°C			
Rated operational voltage U_e	**V**	690			
Rated frequency	**Hz**	50/60			
Rated insulation voltage U_i	**V**	690			
Rated impulse withstand voltage U_{imp}	**kV**	6			
Utilization category	**IEC 60 947-2 (circuit breaker)**	A			
	IEC 60 947-4-1 (motor starter)	AC-3			
Class	**According to IEC 60 947-4-1**	10			
Degree of protection	**According to IEC 60 529**	IP20	IP20	IP20	IP20
Phase failure sensitivity	**According to IEC 60 947-4-1**	Yes			
Explosion protection	**According to EC Directive 94191EC**	Yes			
Isolator characteristics	**According to IEC 60 947-3**	Yes			
Main and EM. STOP switch characteristics	**According to IEC 60 204-1 (VDE113)**	Yes			
Safe isolation between main and auxiliary circuits According to DIN VDE 0106 Part 101	**Up to 400 V + 10%**	Yes			
	Up to 415 V + 5%	Yes			
Mechanical endurance	**Operating cycles**	100,000	100,000	50,000	50,000
Electrical endurance		100,000	100,000	25,000	25,000
Max. operating frequency per hour (motor starts)	**1/h**	25	25	25	25

THE COMPLETE MONITORING RANGE

K8 series – The smart way to protect your system

The K8 series offers you a flexible and complete one-stop shopping solution!
This monitoring range can be split into models for single-phase current and voltage control, three-phase voltage control, conductive level control and a temperature alarm unit.

- 1-phase: full-span of range setting, all models with timer function
- 3-phase: wide range of global voltage settings
- Easy-to-set parameters





Temperature

K8AB-TH



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Level control

Single- or two-point

Which mounting method is required?

Plug-in

DIN-rail

AC power supply

DC power supply

DC power supply

61F-GP-N8



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61F-GPN-BT/ -BC



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61F-D21T



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Leakage

Which function is required?

Standard

Disconnection detection

K7L-AT50



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K7L-AT50D



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Selection table

	Category	1-phase current	1-phase voltage		Phase-sequence phase-loss	3-phase phase-sequence phase-loss	3-phase asymmetry and phase-sequence phase-loss
Selection criteria							
	Model	K8AB-AS	K8AB-VS	K8AB-VW	K8AB-PH	K8AB-PM	K8AB-PA
	Specialty	Ideal for current monitoring for industrial heaters and motors.	Ideal for voltage monitoring for industrial facilities and equipment.	Ideal for voltage monitoring for industrial facilities and equipment.	Ideal for phase-sequence and phase-loss monitoring for industrial facilities and equipment.	Ideal for monitoring 3-phase power supplies for industrial facilities and equipment.	Ideal for 3-phase voltage asymmetry monitoring for industrial facilities and equipment.
	Sensing range (configurable)	20 mA to 10 A, current transformer: 100/200 A	60 mV to 600 V	60 mV to 600 V	Same as supply voltage		
Supply voltage AC	24 VAC	■	■	■	–	–	–
	100 VAC	–	–	–	–	–	–
	110 VAC	–	–	–	–	–	–
	115 VAC	■	■	■	–	–	–
	120 VAC	–	–	–	–	–	–
	200 VAC	–	–	–	–	–	–
	220 VAC	–	–	–	–	–	–
	230 VAC	■	■	■	–	–	–
	240 VAC	–	–	–	–	–	–
	200 to 500 VAC	–	–	–	■	–	–
	200 to 240 VAC	–	–	–	–	■ (-PM1, 3-wire)	■ (-PA1, 3-wire)
	115 to 138 VAC	–	–	–	–	■ (-PM1, 4-wire)	■ (-PA1, 4-wire)
	380 to 480 VAC	–	–	–	–	■ (-PM2, 3-wire)	■ (-PA2, 3-wire)
	220 to 277 VAC	–	–	–	–	■ (-PM2, 4-wire)	■ (-PA2, 4-wire)
Supply voltage DC	24 VDC	■	■	■	–	–	–
	12 to 24 VDC	–	–	–	–	–	–
Control output	Transistor NPN	–	–	–	–	–	–
	Transistor PNP	–	–	–	–	–	–
	Relay	■ (1 SPDT)	■ (1 SPDT)	■ (2 SPDT)	■ (1 SPDT)	■ (2 SPDT)	■ (1 SPDT)
Features	LED operation indicator	■	■	■	■	■	■
	Adjustable sensitivity	–	–	–	–	–	–
	Electrode types	–	–	–	–	–	–
	Page	546	547	548	549	550	551

3-phase voltage	Conductive level controller				Liquid leakage sensor amplifier	
						
K8AB-PW	**61F-GP-N8**	**61F-GPN-BT**	**61F-GPN-BC**	**61F-D21T**	**K7L-AT50**	**K7L-AT50D**
Ideal for monitoring 3-phase power supplies for industrial facilities and equipment.	Single or two-point	AC sine wave between electrodes for stable detection with no electrolysis	AC sine wave between electrodes for stable detection with no electrolysis	Ideal for level control for industrial facilities and equipment	Sensor amplifier, AC sine wave between electrodes for stable detection with no electrolysis	Sensor amplifier with disconnection detection function
Same as supply voltage	4 to 50 kΩ	0 to 100 kΩ	1 to 100 kΩ	10 to 100 kΩ	0 to 50 MΩ	1 to 50 MΩ
–	□	–	–	■	–	–
–	□			–		
–	□			–		
–	–			■		
–	□			–		
–	□			–		
–	□			–		
–	□			■		
–	□			–		
–	–			–		
■ (-PW1, 3-wire)	–			–		
■ (-PW1, 4-wire)	–			–		
■ (-PW2, 3-wire)	–			–		
■ (-PW2, 4-wire)	–			–		
–	–	■	■	–	–	–
–	–	–	–	–	□	□
–	–	–	■	–	■	■
–		–	–	–	■	■
■ (2 SPDT)	■	■	■	■	–	–
■	■	■	■	■	■	■
–	–	■	■	–	■	■
–	Electrode holder: PS-_S, PS-31, BF-1 and BS-1			–	Liquid leakage sensor band F03-16PE	
552	553	555		556	557	

■ Standard □ Available – No/not available



Single-phase current relay

These single-phase current relays monitor over- and undercurrents. Manual resetting and automatic resetting are supported by one relay. The start-up lock and operating time can be set separately. The relay warning status is easily monitored with the LED indicator.

- Single-phase current relay
- In 22.5 mm wide industrial housing
- Under or over control
- Supply voltages: 24 VAC/24 VDC/115 VAC/230 VAC
- Easy wiring with ferrules

Ordering information

Measuring current	Supply voltage	Order code
2 to 20 mA AC/DC, 10 to 100 mA AC/DC, 50 to 500 mA AC/DC	24VAC/DC	K8AB-AS1 24VAC/DC
	100 to 115 VAC	K8AB-AS1 100-115 VAC
	200 to 230 VAC	K8AB-AS1 200-230 VAC
0.1 to 1 A AC/DC, 0.5 to 5 A AC/DC, 0.8 to 8 A AC/DC	24VAC/DC	K8AB-AS2 24VAC/DC
	100 to 115 VAC	K8AB-AS2 100-115 VAC
	200 to 230 VAC	K8AB-AS2 200-230 VAC
10 to 100 A AC, 20 to 200 A AC	24VAC/DC	K8AB-AS3 24VAC/DC
	100 to 115 VAC	K8AB-AS3 100-115 VAC
	200 to 230 VAC	K8AB-AS3 200-230 VAC

Accessories

Current transformer	Input range	Applicable relay	Order code
	10 to 100 A AC, 20 to 200 A AC	K8AB-AS3	K8AC-CT200L

Note: The K8AB-AS3 is designed to be used in combination with the K8AC-CT200L (direct input not possible)

Specifications

Ambient temperature		Operating: -20 to 60°C (with no condensation or icing), storage: -40 to 70°C (with no condensation or icing)
Operating voltage range		85 to 110% of rated operating voltage
Rated power supply frequency		50/60 Hz ±5 Hz (AC power supply)
Output relays (SPDT)	Resistive load	6 A at 250 VAC ($\cos\phi$ = 1), 6 A at 30 VDC (L/R = 0 ms)
	Inductive load	1 A at 250 VAC ($\cos\phi$ = 0.4), 1 A at 30 VDC (L/R = 7 ms)
	Minimum load	10 mA at 5 VDC
	Maximum contact voltage	250 VAC
	Maximum contact current	6 A AC
	Maximum switching capacity	1,500 VA
	Life expectancy	Mechanical: 10,000,000 operations, electrical: Make: 50,000 times, break: 30,000 times
Crimp terminals		Two solid wires of 2.5 mm^2, two crimp terminals of 1.5 mm^2 with insulation sleeves, can be tightened together
Degree of protection		Terminal section: IP20, rear case: IP40
Case material		ABS resin (self-extinguishing resin) UL94-V0
Weight		200 g
Operating power	**Isolated power supply**	24 VAC (3 VA)/24 VDC (1 W), 100 to 115 VAC (4 VA), 200 to 230 VAC (5 VA)
Operate (SV)	**Operating value setting range**	10 to 100% of maximum rated input value
	Operating value	100% operation at set value
Reset (HYS.)	**Hysteresis**	5 to 50% of operating value
	Resetting method	Manual reset/automatic reset (switchable) Manual reset: Turn OFF operating power for 1 s or longer
Operating time (T)		0.1 to 30 s (value when input rapidly changes from 0 to 120%)
Operating power ON lock (LOCK)		0 to 30 s (value when input rapidly changes from 0 to 120%, lock timer starts upon input 30% of SV)
Setting accuracy		±10% of full scale
Time error		±10% of set value (minimum error: 50 ms)
Input frequency		K8AB-AS1/-AS2: DC input, 45 to 65 Hz; K8AB-AS3: 45 to 60 Hz
Continuous input	**K8AB-AS1/-AS2**	Continuous input: 115% of maximum input, 10 s max.: 125% of maximum input
	K8AB-AS3	Continuous input: 240 A, 30 s max.: 400 A, 1 s max.: 1,200 A
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM): Red LED
Size in mm (HxWxD)		90x22.5x100



Single-phase voltage relay

These single-phase voltage relays are for monitoring over- and undervoltages. Manual resetting and automatic resetting are supported by one relay. Relay warning status can easily be monitored using the LED indicator.

- Single-phase voltage relay
- In 22.5 mm wide industrial housing
- Under or over control
- Supply voltages: 24 VAC/24 VDC/115 VAC/230 VAC
- Easy wiring with ferrules

Ordering information

Measuring voltage	Supply voltage	Order code
6 to 60 mV AC/DC, 10 to 100 mV AC/DC, 30 to 300 mV AC/DC	24VAC/DC	K8AB-VS1 24VAC/DC
	100 to 115 VAC	K8AB-VS1 100-115 VAC
	200 to 230 VAC	K8AB-VS1 200-230 VAC
1 to 10 VAC/VDC, 3 to 30 VAC/VDC, 15 to 150 VAC/VDC	24VAC/DC	K8AB-VS2 24VAC/DC
	100 to 115 VAC	K8AB-VS2 100-115 VAC
	200 to 230 VAC	K8AB-VS2 200-230 VAC
20 to 200 VAC/VDC, 30 to 300 VAC/VDC, 60 to 600 VAC/VDC	24VAC/DC	K8AB-VS3 24VAC/DC
	100 to 115 VAC	K8AB-VS3 100-115 VAC
	200 to 230 VAC	K8AB-VS3 200-230 VAC

Specifications

Ambient operating temperature		-20 to 60°C (with no condensation or icing)
Storage temperature		-40 to 70°C (with no condensation or icing)
Operating voltage range		85 to 110% of rated operating voltage
Rated power supply frequency		50/60 Hz ±5 Hz (AC power supply)
Output relays	Resistive load	6 A at 250 VAC (cosϕ = 1), 6 A at 30 VDC (L/R = 0 ms)
	Inductive load	1 A at 250 VAC (cosϕ = 0.4), 1 A at 30 VDC (L/R = 7 ms)
	Minimum load	10 mA at 5 VDC
	Maximum contact voltage	250 VAC
	Maximum contact current	6 A AC
	Maximum switching capacity	1,500 VA
	Mechanical life	10,000,000 operations
	Electrical life	Make: 50,000 times, break: 30,000 times
Crimp terminals		Two solid wires of 2.5 mm^2, two crimp terminals of 1.5 mm^2 with insulation sleeves, can be tightened together
Degree of protection		Terminal section: IP20, rear case: IP40
Case colour		Munsell 5Y8/1 (ivory)
Case material		ABS resin (self-extinguishing resin) UL94-V0
Weight		200 g
Mounting		Mounted to DIN-rail or via M4 screws
Operating power	Isolated power supply	24 VAC (4 VA)/24VDC (1 W, 100 to 115 VAC (4 VA), 200 to 230 VAC (5 VA)
Operate (SV)	Operating value setting range	10 to 100% of maximum rated input value
	Operating value	100% operation at set value
Reset (HYS.)	Hysteresis	5 to 50% of operating value
	Resetting method	Manual reset/automatic reset (switchable) Manual reset: Turn OFF operating power for 1 s or longer
Operating time (T)		0.1 to 30 s (value when input rapidly changes from 0 to 120%)
Power ON lock (LOCK)		1 s or 5 s error ±0.5 s (value when input rapidly changes from 0 to 100%. The operating time is the shortest at this point)
Setting accuracy		±10% of full scale
Time error		±10% of set value (minimum error: 50 ms)
Input frequency		40 to 500 Hz
Input impedance		K8AB-VS1: 9 kΩ min., K8AB-VS2: 100 kΩ min., K8AB-VS3: 1 MΩ min.
Indicators		LED power (PWR): Green LED, relay output (RY): Yellow LED, alarm output (ALM): Red LED
Output relays		One SPDT relay (6 A at 250 VAC, resistive load)
Size in mm (HxWxD)		90x22.5x100



Single-phase voltage relay, window type

For monitoring over- and undervoltages simultaneously. Manual resetting and automatic resetting are supported by one relay. Separate settings and outputs are supported for over- and undervoltages. Relay warning status can easily be monitored with the LED indicator.

- Single-phase voltage window relay
- In 22.5 mm wide industrial housing
- Under and over, low/low or high/high control
- Supply voltages: 24 VAC/24 VDC/115 VAC/230 VAC
- Easy wiring with ferrules

Ordering information

Measuring voltage	Supply voltage	Order code
6 to 60 mV AC/DC, 10 to 100 mV AC/DC, 30 to 300 mV AC/DC	24VAC/DC	K8AB-VW1 24VAC/DC
	100 to 115 VAC	K8AB-VW1 100-115 VAC
	200-230 VAC	K8AB-VW1 200-230 VAC
1 to 10 V AC/DC, 3 to 30 V AC/DC, 15 to 150 V AC/DC	24VAC/DC	K8AB-VW2 24VAC/DC
	100 to 115 VAC	K8AB-VW2 100-115 VAC
	200 to 230 VAC	K8AB-VW2 200-230 VAC
20 to 200 V AC/DC, 30 to 300 V AC/DC, 60 to 600 V AC/DC	24VAC/DC	K8AB-VW3 24VAC/DC
	100 to 115 VAC	K8AB-VW3 100-115 VAC
	200 to 230 VAC	K8AB-VW3 200-230 VAC

Specifications

Ambient operating temperature		-20 to 60°C (with no condensation or icing)
Storage temperature		-40 to 70°C (with no condensation or icing)
Operating voltage range		85 to 110% of rated operating voltage
Rated power supply frequency		50/60 Hz ±5 Hz (AC power supply)
Output relays (SPDT)	**Resistive load**	6 A at 250 VAC ($\cos\phi$ = 1), 6 A at 30 VDC (L/R = 0 ms)
	Inductive load	1 A at 250 VAC ($\cos\phi$ = 0.4), 1 A at 30 VDC (L/R = 7 ms)
	Minimum load	10 mA at 5 VDC
	Maximum contact voltage	250 VAC
	Maximum contact current	6 A AC
	Maximum switching capacity	1,500 VA
	Mechanical life	10,000,000 operations
	Electrical life	Make: 50,000 times, break: 30,000 times
Crimp terminals		Two solid wires of 2.5 mm^2, two crimp terminals of 1.5 mm^2 with insulation sleeves, can be tightened together
Degree of protection		Terminal section: IP20, rear case: IP40
Case colour		Munsell 5Y8/1 (ivory)
Case material		ABS resin (self-extinguishing resin) UL94-V0
Weight		200 g
Mounting		Mounted to DIN-rail or via M4 screws
Operating power	**Isolated power supply**	24 VAC (4 VA)/24VDC (1 W), 100 to 115 VAC (4 VA), 200 to 230 VAC (5 VA)
Operation (AL1 and AL2)	**Operating value setting range**	10 to 100% of maximum rated input value
	Operating value	100% operation at set value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Manual reset/automatic reset (switchable) Manual reset: Turn OFF operating power for 1 s or longer
Operating time (T)		0.1 to 30 s (value when input rapidly changes from 0 to 120%)
Power ON lock (LOCK)		1 s or 5 s error ±0.5 s (value when input rapidly changes from 0 to 100%)
Setting accuracy		±10% of full scale
Time error		±10% of set value (minimum error: 50 ms)
Input frequency		40 to 500 Hz
Input impedance		K8AB-VW1: 9 kΩ min., K8AB-VW2: 100 kΩ min., K8AB-VW3: 1 MΩ min.
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM 1/2): Red LED
Output relays		Two SPDT relays (6 A at 250 VAC, resistive load), normally closed operation (normally ON)
Size in mm (HxWxD)		90x22.5x100



3-phase sequence, phase loss relay

K8AB-PH simultaneously monitors phase sequence and phase loss for 3-phase 3-wire power supplies. The relay warning status can easily be monitored using the LED indicator. Suitable for industrial facilities and equipment.

- 3-phase sequence, phase loss relay
- Monitors both functions at once
- Measuring range: 200 to 500 VAC
- Power supply voltage is the same as measuring voltage
- Operation reaction time: 0.1 s maximum

Ordering information

Rated input voltage	Order code
200 to 500 VAC	K8AB-PH1

Specifications

Ambient operating temperature		-20 to 60°C (with no condensation or icing)
Storage temperature		-40 to 70°C (with no condensation or icing)
Altitude		2,000 m max.
Voltage fluctuation range		85 to 110% of rated input voltage
Input frequency		50/60 Hz ±5 Hz (AC power supply)
Output relays	Resistive load	6 A at 250 VAC (cosϕ = 1), 6 A at 30 VDC (L/R = 0 ms)
	Inductive load	1 A at 250 VAC (cosϕ = 0.4), 1 A at 30 VDC (L/R = 7 ms)
	Minimum load	10 mA at 5 VDC
	Maximum contact voltage	250 VAC
	Maximum contact current	6 A AC
	Maximum switching capacity	1,500 VA
	Mechanical life	10,000,000 operations
	Electrical life	Make: 50,000 times, break: 30,000 times
Terminal screw tightening torque		1.2 Nm
Degree of protection		Terminal section: IP20, rear case: IP40
Case colour		Munsell 5Y8/1 (ivory)
Case material		ABS resin (self-extinguishing resin) UL94-V0
Weight		200 g
Mounting		Mounted to DIN-rail or via M4 screws
Rated input voltage	**Non-isolated**	200 to 500 VAC (15 VA)
Phase-sequence, phase-loss operating time		0.1 s max. (value when rated operating voltage changes quickly from 0 to 100%) (relays are normally ON and turn OFF for phase-sequence or loss phase errors)
Resetting method		Automatic reset
Input frequency		45 to 65 Hz
Input impedance		100 kΩ min.
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED
Output relays		One SPDT relay (6 A at 250 VAC, resistive load)
Size in mm (HxWxD)		90x22.5x100



3-phase voltage, phase sequence, phase loss relay

K8AB-PM monitors overvoltages, undervoltages, phase sequence and phase loss for 3-phase, 3-wire or 4-wire power supplies, in one unit. This relay features a switch setting for 3-phase, 3-wire or 3-phase, 4-wire power supply.

- Worldwide power specifications supported by one unit
- Phase sequence, phase loss: Operation reaction time 0.1 s maximum
- Overvoltages or undervoltages: Operation time setting from 0.1 to 30 s
- Relay warning status can easily be monitored using the LED indicator
- Easy wiring with ferrules

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8AB-PM1
3-phase 4-wire mode	115, 127, 133, 138 VAC	
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8AB-PM2
3-phase 4-wire mode	220, 230, 240, 277 VAC	

Specifications

Ambient operating temperature		-20 to 60°C (with no condensation or icing)
Ambient operating humidity		25 to 85%
Voltage fluctuation range		85 to 110% of rated input voltage
Input frequency		50/60 Hz ±5 Hz (AC power supply)
Output relays	**Resistive load**	6 A at 250 VAC (cosϕ = 1), 6 A at 30 VDC (L/R = 0 ms)
	Inductive load	1 A at 250 VAC (cosϕ = 0.4), 1 A at 30 VDC (L/R = 7 ms)
	Minimum load	10 mA at 5 VDC
	Maximum contact voltage	250 VAC
	Maximum contact current	6 A AC
	Maximum switching capacity	1,500 VA
	Mechanical life	10,000,000 operations
	Electrical life	Make: 50,000 times, break: 30,000 times
Crimp terminals		Two solid wires of 2.5 mm^2, two crimp terminals of 1.5 mm^2 with insulation sleeves, can be tightened together
Degree of protection		Terminal section: IP20, rear case: IP40
Case colour		Munsell 5Y8/1 (ivory)
Case material		ABS resin (self-extinguishing resin) UL94-V0
Weight		200 g
Mounting		Mounted to DIN-rail or via M4 screws
Rated input voltage	**K8AB-PM1**	3-phase, 3-wire mode: 200, 220, 230, 240 VAC, 3-phase, 4-wire mode: 115, 127, 133, 138 VAC
	K8AB-PM2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC, 3-phase, 4-wire mode: 220, 230, 240, 277 VAC
Operation (overvoltage or undervoltage)	**Operating value setting range**	Overvoltage = -30 to 25% of maximum rated input voltage *1 Undervoltage = -30 to 25% of maximum rated input voltage *1
	Operating value	100% operation at set value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	**Overvoltage/undervoltage**	0.1 to 30 s (value when input rapidly changes from 0 to 120%)
	Phase-sequence, phase-loss	0.1 s max. (value when input rapidly changes from 0 to 100%)
Power ON lock (LOCK)		1 s or 5 s error ±0.5 s (value when input rapidly changes from 0 to 100%. The operating time is the shortest at this point)
Setting accuracy		±10% of full scale
Time error		±10% of set value (minimum error: 50 ms)
Input frequency		45 to 65 Hz
Input impedance		100 kΩ min.
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM 1/2): Red LED
Output relays		Two SPDT relays (6 A at 250 VAC, resistive load), normally closed operation (normally ON) (separate outputs possible for overvoltages and undervoltages)
Size in mm (HxWxD)		90x22.5x100

*1 The rated input voltage is switched with a switch



3-phase asymmetry, phase sequence, phase loss relay

Monitors voltage asymmetry, phase sequence and phase loss for 3-phase 3-wire or 4-wire power supplies, in one unit.

- Worldwide power specifications supported by one unit
- Phase sequence, phase loss: Operation reaction time 0.1 s maximum
- Asymmetry: Operation time setting from 0.1 to 30 s
- Reset method: Automatic
- Power ON lock: 1 s or 5 s

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8AB-PA1
3-phase 4-wire mode	115, 127, 133, 138 VAC	
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8AB-PA2
3-phase 4-wire mode	220, 230, 240, 277 VAC	

Specifications

Ambient operating temperature		-20 to 60°C (with no condensation or icing)
Storage temperature		-40 to 70°C (with no condensation or icing)
Altitude		2,000 m max.
Voltage fluctuation range		85 to 110% of rated input voltage
Input frequency		50/60 Hz ±5 Hz (AC power supply)
Output relays	**Resistive load**	6 A at 250 VAC (cosϕ = 1), 6 A at 30 VDC (L/R = 0 ms)
	Inductive load	1 A at 250 VAC (cosϕ = 0.4), 1 A at 30 VDC (L/R = 7 ms)
	Minimum load	10 mA at 5 VDC
	Maximum contact voltage	250 VAC
	Maximum contact current	6 A AC
	Maximum switching capacity	1,500 VA
	Mechanical life	10,000,000 operations
	Electrical life	Make: 50,000 times, break: 30,000 times
Crimp terminals		Two solid wires of 2.5 mm^2, two crimp terminals of 1.5 mm^2 with insulation sleeves, can be tightened together
Degree of protection		Terminal section: IP20, rear case: IP40
Case colour		Munsell 5Y8/1 (ivory)
Case material		ABS resin (self-extinguishing resin) UL94-V0
Weight		200 g
Rated input voltage	**K8AB-PA1**	3-phase, 3-wire mode: 200, 220, 230, 240 VAC, 3-phase, 4-wire mode: 115, 127, 133, 138 VAC
	K8AB-PA2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC, 3-phase, 4-wire mode: 220, 230, 240, 277 VAC
Asymmetry operation (ASY.)	**Operating value setting range**	Asymmetry rate: 2 to 22%
	Operating value	100% operation at set value Asymmetry operating value = rated input voltage x asymmetry set value [%] The asymmetry operation will function when the difference between the highest and lowest voltage phases equals or exceeds the asymmetry operating value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	**Asymmetry**	0.1 s to 30 s (value when input rapidly changes from 0 to 120%)
	Phase-sequence, phase-loss	0.1 s max. (value when input rapidly changes from 0 to 100%)
Power ON lock (LOCK)		1 s or 5 s (value when input rapidly changes from 0 to 100%. The operating time is the shortest at this point)
Setting accuracy		±10% of full scale
Time error		±10% of set value (minimum error: 50 ms)
Input frequency		45 to 65 Hz
Input impedance		100 kΩ min.
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM 1/2): Red LED
Output relays		One SPDT relay (6 A at 250 VAC, resistive load), normally closed operation (normally ON)
Size in mm (HxWxD)		90x22.5x100



3-phase voltage relay

Monitors overvoltages and undervoltages for 3-phase 3-wire or 4-wire power supplies, in one unit. Switch setting for 3-phase 3-wire or 3-phase 4-wire power supply.

- Overvoltages or undervoltages: Operation time setting from 0.1 to 30 s
- Relay warning status can easily be monitored using the LED indicator
- Separate outputs possible for overvoltages and undervoltages
- Reset method: Automatic
- Power ON lock: 1 s or 5 s

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8AB-PW1
3-phase 4-wire mode	115, 127, 133, 138 VAC	
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8AB-PW2
3-phase 4-wire mode	220, 230, 240, 277 VAC	

Specifications

Ambient operating temperature		-20 to 60°C (with no condensation or icing)
Storage temperature		-40 to 70°C (with no condensation or icing)
Altitude		2,000 m max.
Voltage fluctuation rang		85 to 110% of rated input voltage
Input frequency		50/60 Hz ±5 Hz (AC power supply)
Output relays	**Resistive load**	6 A at 250 VAC (cosϕ = 1), 6 A at 30 VDC (L/R = 0 ms)
	Inductive load	1 A at 250 VAC (cosϕ = 0.4), 1 A at 30 VDC (L/R = 7 ms)
	Minimum load	10 mA at 5 VDC
	Maximum contact voltage	250 VAC
	Maximum contact current	6 A AC
	Maximum switching capacity	1,500 VA
	Mechanical life	10,000,000 operations
	Electrical life	Make: 50,000 times, break: 30,000 times
Crimp terminals		Two solid wires of 2.5 mm^2, two crimp terminals of 1.5 mm^2 with insulation sleeves, can be tightened together
Degree of protection		Terminal section: IP20, rear case: IP40
Case colour		Munsell 5Y8/1 (ivory)
Case material		ABS resin (self-extinguishing resin) UL94-V0
Weight		200 g
Rated input voltage	**K8AB-PW1**	3-phase, 3-wire mode: 200, 220, 230, 240 VAC, 3-phase, 4-wire mode: 115, 127, 133, 138 VAC
	K8AB-PW2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC, 3-phase, 4-wire mode: 220, 230, 240, 277 VAC
Operation (overvoltage and undervoltage)	**Operating value setting range**	Overvoltage = -30 to 25% of maximum rated input voltage *1 Undervoltage = -30 to 25% of maximum rated input voltage *1
	Operating value	100% operation at set value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	**Overvoltage/undervoltage**	0.1 to 30 s (value when input rapidly changes from 0 to 120%)
Power ON lock (LOCK)		1 s or 5 s (value when input rapidly changes from 0 to 100%. The operating time is the shortest at this point)
Setting accuracy		±10% of full scale
Time error		±10% of set value (minimum error: 50 ms)
Input frequency		45 to 65 Hz
Input impedance		100 kΩ min.
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM 1/2): Red LED
Output relays		Two SPDT relays (6 A at 250 VAC, resistive load), normally closed operation (normally ON) (separate outputs possible for overvoltages and undervoltages)
Size in mm (HxWxD)		90x22.5x100

*1 The rated input voltage is switched with a switch



Compact plug-in (8-pin) level controller

The 61F-GP-N8 can be used for single- or two-point level control of conductive materials, both liquids and solids. These products are equipped with a red LED operation indicator.

- Low-voltage (AC) electrodes (8 VAC or 24 VAC)
- Operation range: 4 to 15 kΩ, 70 to 300 kΩ
- Detection method: Conductive
- Probes need to be ordered separately
- Conforms to EMC and LVD directives, UL/CSA approved

Ordering information

Application	Type		Order code
Ordinary purified water or sewage water	General purpose type		61F-GP-N8 24AC
			61F-GP-N8 110AC
			61F-GP-N8 230AC
Ordinary purified water, where the distance between sewage pumps and water tanks or between receiver tanks and supply tanks is long or where remote control is required	Long-distance type	2 km	61F-GP-N8L 24AC 2KM
			61F-GP-N8L 110AC 2KM
			61F-GP-N8L 230AC 2KM
		4 km	61F-GP-N8L 24AC 4KM
			61F-GP-N8L 110AC 4KM
			61F-GP-N8L 230AC 4KM
Liquids with high specific resistance such as distilled water	High sensitivity type		61F-GP-N8H 24AC
			61F-GP-N8H 110AC
			61F-GP-N8H 230AC
Liquids with low specific resistance such as salt water, sewage water, acid chemicals, alkali chemicals	Low sensitivity type		61F-GP-N8D 24AC
			61F-GP-N8D 110AC
			61F-GP-N8D 230AC
Ordinary purified or sewage water, with two-wired-type electrode holder (incorporating a resistor of 6.8 kΩ)	Two-wired type		61F-GP-N8R 24AC
			61F-GP-N8R 110AC
			61F-GP-N8R 230AC
DIN-rail mounting socket			PF083A-E
Back-connecting socket			PL08

Accessories

Electrode holders

Applications	Mounting style	Insulator material	Max. temperature	Number of electrodes	Order code
For city water and other general use. Easy-to-replace separate versions for maintenance.	Flange	Phenol resin	70°C	3	PS-3S
When mounting space is limited. Special 3-pole holder of small size and light weight.	Screw	Phenol resin		3, 300 mm 3, 1,000 mm	PS-31-300MM PS-31-1000MM
Use for sewage, sea water, etc., having a low specific resistance.	Flange	Ceramics	150°C (without water drips or vapour on the electrode holder surface)	1	BF-1
For resistance to high pressure. Use in tanks with high temperature or pressure.	Screw	PTFE	250°C (without water drips or vapour on the surface of the electrode holder)	1	BS-1

Electrode separators

Number of electrodes	Order code
1	F03-14 1P
3	F03-14 3P

Electrodes, connecting, and lock nuts

Applicable liquids	Material	Component	Indication mark	Inscription	Order code
Purified city water, industrial water, sewage	Equivalent to SUS 304 (AISI-304)	Electrode (1 m long)	1 line	–	F03-01 SUS201
		Connecting nut	–	–	F03-02 SUS201
		Lock nut	–	–	F03-03 SUS201
Purified city water, industrial water, sewage, dilute alkaline solution	SUS316 (AISI-316)	Electrode (1 m long)	2 lines	–	F03-01 SUS316
		Connecting nut	–	6	F03-02 SUS316
		Lock nut	–	316	F03-03 SUS316

Specifications

Item	61F-GP-N8	61F-GP-N8L	61F-GP-N8H	61F-GP-N8D	61F-GP-N8R
Supply voltage	24, 100, 110, 120, 200, 220, 230 or 240 VAC; 50/60 Hz				
Operating voltage range	85 to 110% of rated voltage				
Interelectrode voltage	8 VAC		24 VAC	8 VAC	
Interelectrode current	Approx. 1 mA AC max.		Approx. 0.4 mA AC max.	Approx. 1 mA AC max.	
Power consumption	Approx. 3.5 VA max.				
Response time	Operate: 80 ms max., release: 160 ms max.				
Cable length	1 km max.	2 km max. 4 km max.	50 m max.	1 km max.	800 m max.
Control output	1 A, 250 VAC (inductive load: Cosϕ = 0.4), 3 A, 250 VAC (resistive load)				
Ambient temperature	Operating: -10 to 55°C				
Life expectancy	Electrical: 100,000 operations min., mechanical: 5,000,000 operations min				
Size in mm (HxWxD)	49.9x38x70				



Compact plug-in (11-pin) level controller (DC supply)

This controller is for single- or two-point level control. 24 VDC supply allows for usage in locations without AC power supply. Relay contact chattering usually caused by waves has been eliminated by using open collector output, reducing contact wear.

- Adjustable sensitivity: Operation range: 0 to 100 kΩ
- Red LED for operation indicator
- Conforms to EMC and LVD directives
- UL/CSA approved
- Probes need to be ordered separately

Ordering information

Product name	Output	Order code
Conductive level controller	Open collector (NPN)	61F-GPN-BT 24VDC
	Relay contact (SPST-NO)	61F-GPN-BC 24VDC
Front socket		PF113A-E

Accessories

Electrode holders

Applications	Mounting style	Insulator material	Max. temperature	Number of electrodes	Order code
For city water and other general use. Easy-to-replace separate versions for maintenance.	Flange	Phenol resin	70°C	3	PS-3S
When mounting space is limited. Special 3-pole holder of small size and light weight.	Screw	Phenol resin		3, 300 mm 3, 1000 mm	PS-31-300MM PS-31-1000MM
Use for sewage, sea water, etc., having a low specific resistance.	Flange	Ceramics	150°C (without water drips or vapour on the electrode holder surface)	1	BF-1
For resistance to high pressure. Use in tanks with high temperature or pressure.	Screw	PTFE	250°C (without water drips or vapour on the surface of the electrode holder)	1	BS-1

Electrode separators	Number of electrodes	Order code
	1	F03-14 1P
	3	F03-14 3P

Electrodes, connecting, and lock nuts

Applicable liquids	Material	Component	Indication mark	Inscription	Order code
Purified city water, industrial water, sewage	Equivalent to SUS 304 (AISI-304)	Electrode (1 m long)	1 line	–	F03-01 SUS201
		Connecting nut	–	–	F03-02 SUS201
		Lock nut	–	–	F03-03 SUS201
Purified city water, industrial water, sewage, dilute alkaline solution	SUS316 (AISI-316)	Electrode (1 m long)	2 lines	–	F03-01 SUS316
		Connecting nut	–	6	F03-02 SUS316
		Lock nut	–	316	F03-03 SUS316

Specifications

Item	61F-GPN-BT	61 F-GPN-BC
Rated voltage	24 VDC	
Allowable voltage range	85 to 110% of the rated voltage	
Interelectrode voltage	5 VAC max.	
Error	For scale of 0: +10 kΩ, for scale of 100: ±10 kΩ	
Release resistance	200% max. of the operation resistance	
Switching between supply and drainage	Terminals 7 and 8 open: Automatic drainage operation; terminals 7 and 8 shorted: Automatic supply operation	
Output specifications	Open collector (NPN) 30 VDC, 100 mA max.	SPST-NO; 5 A, 240 VAC (resistive load) 2 A, 240 VAC (inductive load: cosϕ = 0.4)
Life expectancy	–	Electrical: 100,000 operations min. Mechanical: 20,000,000 operations min.
Wiring distance	100 m max.	
Ambient operating temperature	-10 to 55°C	
Response time	Operating: 1.5 s max., releasing: 3.0 s max.	
Size in mm (HxWxD)	49.9x38x70	



22.5 mm wide conductive level controller

The 61F-D21T is a conductive level controller in a 22.5 mm wide industrial housing. Via DIP switches its function (supply or drainage) can be selected. This product is for single- or two-point level control.

- Time delay function up to 10 s
- Supply voltages: 24 VAC/DC and 100-240 VAC
- Control output: Relay 6 A at 250 VAC resistive load
- Probes cable length: Max. 100 m from controller
- LED indicator: Green for power ON, yellow for output relay

Ordering information

Supply voltage	Order code
24 VAC/VDC	61F-D21T-V1 24 VAC/DC
100 to 240 VAC	61F-D21T-V1 100 to 240 VAC

Accessories

Electrode holders

Applications	Mounting style	Insulator material	Max. temperature	Number of electrodes	Order code
For city water and other general use. Easy-to-replace separate versions for maintenance.	Flange	Phenol resin	70°C	3	PS-3S
When mounting space is limited. Special 3-pole holder of small size and light weight.	Screw	Phenol resin		3, 300 mm 3, 1000 mm	PS-31-300MM PS-31-1000MM
Use for sewage, sea water, etc., having a low specific resistance.	Flange	Ceramics	150°C (without water drips or vapour on the electrode holder surface)	1	BF-1
For resistance to high pressure. Use in tanks with high temperature or pressure.	Screw	PTFE	250°C (without water drips or vapour on the surface of the electrode holder)	1	BS-1

Electrode separators	Number of electrodes	Order code
	1	F03-14 1P
	3	F03-14 3P

Electrodes, connecting, and lock nuts

Applicable liquids	Material	Component	Indication mark	Inscription	Order code
Purified city water, industrial water, sewage	Equivalent to SUS 304 (AISI-304)	Electrode (1 m long)	1 line	–	F03-01 SUS201
		Connecting nut	–	–	F03-02 SUS201
		Lock nut	–	–	F03-03 SUS201
Purified city water, industrial water, sewage, dilute alkaline solution	SUS316 (AISI-316)	Electrode (1 m long)	2 lines	–	F03-01 SUS316
		Connecting nut	–	6	F03-02 SUS316
		Lock nut	–	316	F03-03 SUS316

Specifications

Rated voltage		24 VAC, 24 VDC, 100 to 240 VAC
Operating voltage range		85 to 110% of rated voltage
Voltage between electrodes		6 VAC p-p (approx. 20 Hz)
Power consumption	**24 VDC**	2 W max.
	24 VAC	4 VA max.
	100 to 240 VAC	5 VA max.
Operating resistance		10 kΩ to 100 kΩ (variable)
Reset resistance		250 kΩ max.
Response time		Approx. 0.1 to 10 s (variable)
Cable length		100 m max. with completely insulated (600 V) cabtire cable with 3 conductors (0.75 mm^2)
Control output		6 A at 250 VAC for resistive load at 20°C, 1 A at 250 VAC for inductive load cosϕ = 0.4 at 20°C
Indicators		Green LED: Power, yellow LED: Control output
Ambient temperature		Operating: -20 to 60°C, storage: -30 to 70°C (with no condensation or icing)
Size in mm (HxWxD)		90x22.5x100



Ultra-miniature liquid leakage sensor amplifier

This very compact plug-in leakage controller fits into Omron's G2R 8-pin sockets (P2RF-08-E). K7L detects a wide variety of liquids, ranging from water to liquid chemicals with low conductivity.

- Operation range: Up to 50 MΩ
- Four sensing ranges available
- Detection method: Conductive
- Two LEDs: Green for power supplied, red for output indication
- Conforms to EMC and LVD Directives, UL/CSA approved

Ordering information

Product name	Characteristics	Order code
Liquid leakage sensor amplifier	Standard	K7L-AT50
	With disconnection function set	K7L-AT50D
	With disconnection function sensor amplifier only	K7L-AT50D-S

Product name		Characteristics	Order code
Sensors	Sensing band	Standard model (material: Polyethylene)	F03-16PE 5M
		For temperature and chemical resistance (material: Polyethylene PTFE)	F03-16PT 5M
		For flexibility and superior workability (material: Plastic fiber braided cable)	F03-16SF 5M
		For flexibility and visual confirmation of leakage (material: Plastic fiber braided cable)	F03-16SFC 5M
	Point sensor	Easier to wipe off than the band type	F03-16PS
		Electrodes have PTFE coating to resist chemicals	F03-16PS-F

Accessories

Product name	Characteristics	Order code
Terminal blocks (10 pcs)		F03-20
DIN-rail mounted socket	With finger protection	P2RF-08-E
	Without finger protection	P2RF-08

Product name		Characteristics	Order code
Mounting brackets and stickers	Sensing band stickers	Used for F03-16SF(C)	F03-25
		Used for F03-16PE (adhesive tape)	F03-26PES
		Used for F03-16PE (screws) (30 pcs)	F03-26PEN
		Used for F03-16PT (screws)	F03-26PTN
	Pointsensor mounting brackets	Used for F03-16PS	F03-26PS

Specifications

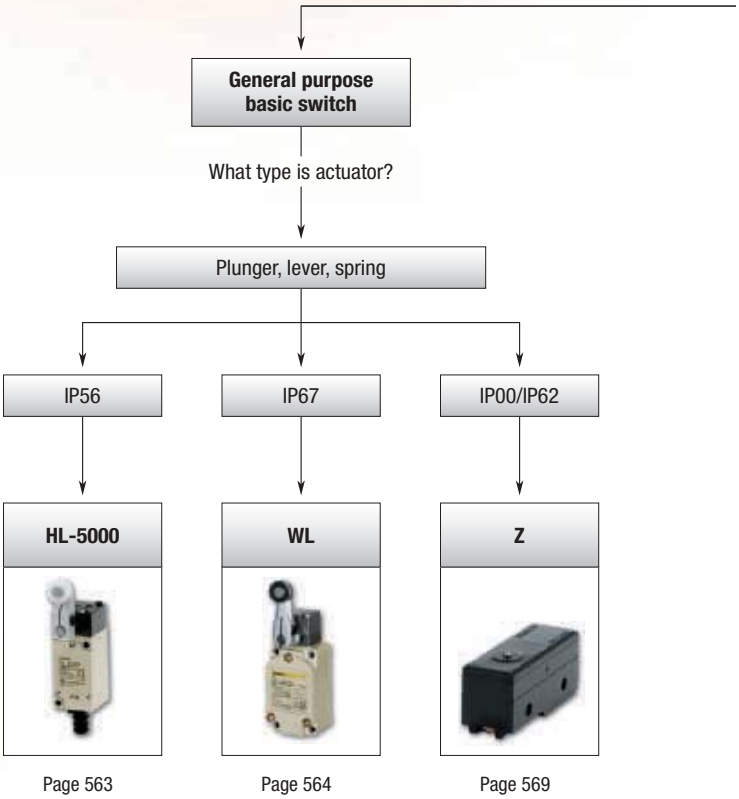
Rated power supply voltage	12 to 24 VDC (allowable voltage fluctuation range: 10 to 30 VDC)
Operate resistance	0 Ω to 50 MΩ, variable Range 0: 0 to 250 kΩ Range 1: 0 to 600 kΩ Range 2: 0 to 5 MΩ Range 3: 0 to 50 MΩ
Release resistance	105% min. of operate resistance
Output configuration	NPN open-collector transistor output with 100 mA at 30 VDC max.
Wiring distance	Connecting cable: 50 m max. Sensing band length: 10 m max.
Ambient temperature	Operating: -10 to 55°C
Power consumption	1 W max.
Response time	Operate: 800 ms max., release: 800 ms max.
Weight	Approx. 14 g
Disconnection detection function (K7L-AT50D & K7L-AT50D-S only)	Detection signal: 10 VDC max., 200 ms, detection time: 10 s max. Release: By resetting the power supply
Size in mm (HxWxD)	28.8x12.8x46

DOWNSIZE WITHOUT COMPROMISE

D4C – Compact, flat, high performing switches

With only a width of 16 mm these compact & flat switches will contribute to the demand to down-sizing without compromising on specifications. The changeover contact inside can switch up to 5 A/250 VA resistive load. A full range of actuators is available to meet all your mechanical requirements.

- Slim, compact body sizes
- Wide range of actuators
- Strong metal housing with IP67 rating





Which type of switch is needed?

Miniature switch

What type is actuator?

Plunger, lever

IP67

D4C



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D4CC



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Enclosed switch

What type is actuator?

Plunger, lever

IP67

D4E-_N



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D4MC



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Selection table

			Type	General purpose basic switch	Two circuit limit switch	Enclosed switch	Miniature limit switch
Selection criteria							
			Model	HL-5000	WL	D4C	D4CC
			Category	General purpose switches	Special purpose switches		
	Degree of protection		IEC	IP65	IP67		
			JIS	Jet-proof	Immersion-proof		
	Rated current [A]		5 VDC	–	–	–	–
			12 to 24 VDC	–	–	–	–
			30 VDC	5	–	4	1
			125/250 VDC	–	–	–	–
			24 VAC	–	–	–	–
			115 VAC	–	–	–	–
			125 VAC	5	10	5	1
			100 to 240 VAC	–	–	–	–
			250 VAC	5	10	5	–
			480 VAC	–	10	–	–
			500 VAC	–	10	–	–
Features			Microload type	–	0.1 A	0.1 A	–
			Operation indicator	–	■	■	■
Actuators			Adjustable rod lever	■	–	–	–
			Adjustable roller lever	■	–	–	–
			Bevel plunger	–	–	■	■
			Center roller lever	–	–	–	■
			Coil spring	■	–	–	
			Cross roller plunger	–	–	■	■
			Fork lever lock	–	■	–	–
			Hinge lever	–	–	–	–
			Hinge roller lever	–	–	–	–
			Hinge cross roller lever	–	–	–	–
			Horizontal plunger	–	■	–	–
			Horizontal roller plunger	–	■	–	–
			Horizontal ball plunger	–	■	–	–
			Leaf spring	–	–	–	–
			Long hinge lever	–	–	–	–
			Low force hinge lever	–	–	–	–
			Low force wire hinge lever	–	–	–	–
			One-way action hinge roller lever	–	–	–	–
			One-way action short hinge roller lever	–	–	–	–
			One-way action roller lever	–	–	–	–
			Panel mount plunger	–	–	■	–
			Panel mount pin plunger	–	–	■	■
			Panel mount roller plunger	–	–	■	■
			Panel mount cross roller plunger	–	–	■	■
			Pin plunger	–	–	■	■
			Plastic rod	–	–	–	■
			Reverse hinge lever	–	–	–	–
			Reverse hinge roller lever	–	–	–	–
			Reverse short hinge roller lever	–	–	–	–
			Roller leaf spring	–	–	–	–
			Roller lever	–	–	–	–
			Roller lever	■	–	■	–
			Roller plunger	–	–	■	■
			Sealed cross roller plunger	–	–	■	■
			Sealed plunger	■	–	■	■
			Sealed plunger roller	■	■	■	■
			Short hinge cross roller lever	–	–	–	–
			Short hinge lever	–	–	–	–
			Short hinge roller lever	–	–	–	–
			Short spring plunger	–	–	–	–
			Side plunger	–	■	–	–
			Side roller plunger horizontal	–	■	–	–
			Side roller plunger vertical	–	■	–	–
			Slim spring plunger	–	–	–	–
			Spring plunger	–	–	–	–
			Top ball plunger	–	■	–	–
			Top plunger	–	■	–	–
			Unidirectional short hinge roller lever	–	–	–	–
			Variable rod lever	■	–	–	–
			Variable roller lever	■	■	–	–
			Page	563	564	565	566

			Type	Small sealed switch	Enclosed switch	General purpose basic switch	
Selection criteria							
			Model	D4E-_N	D4MC	Z	
			Category	Special purpose switches		General purpose switches	
	Degree of protection		IEC	IP67		IP00/IP62	
			JIS			(drip-proof)	
	Rated current [A]		5 VDC	–	–	–	
			12 to 24 VDC	–	–	–	
			30 VDC	1	6	–	
			125/250 VDC	–	–	–	
			24 VAC	–	–	–	
			115 VAC	–	0.5	–	
			125 VAC	5	10	15	
			100 to 240 VAC	–	–	–	
			250 VAC	–	10	15	
			480 VAC	–	3	0.1	
			500 VAC	–	–	–	
Features			Microload type	0.1 A	0.1 A	0.1 A	
			Operation indicator	–	–	–	
Actuators			Adjustable rod lever	–	–	–	
			Adjustable roller lever	–	–	–	
			Bevel plunger	–	–	–	
			Center roller lever	–	–	–	
			Coil spring	–	–	–	
			Cross roller plunger	–	–	–	
			Fork lever lock	–	–	–	
			Hinge lever	–	■	■	
			Hinge roller lever	–	■	■	
			Hinge cross roller lever	–	–	■	
			Horizontal plunger	–	–	–	
			Horizontal roller plunger	–	–	–	
			Horizontal ball plunger	–	–	–	
			Leaf spring	–	–	■	
			Long hinge lever	–	–	■	
			Low force hinge lever	–	–	■	
			Low force wire hinge lever	–	–	■	
			One-way action hinge roller lever	–	–	–	
			One-way action short hinge roller lever	–	■	–	
			One-way action roller lever	■	–	–	
			Panel mount plunger	–	■	■	
			Panel mount pin plunger	–			
			Panel mount roller plunger	–	■	■	
			Panel mount cross roller plunger	–	■	■	
			Pin plunger	■	–	■	
			Plastic rod	–	–	–	
			Reverse hinge lever	–	–	■	
			Reverse hinge roller lever	–	–	■	
			Reverse short hinge roller lever	–	–	■	
			Roller leaf spring	–	–	■	
			Roller lever	■	–	–	
			Roller lever	■	–	–	
			Roller plunger	■	–	–	
			Sealed cross roller plunger	■	–	–	
			Sealed plunger	■	–	–	
			Sealed plunger roller	■	–	–	
			Short hinge cross roller lever	–	–	■	
			Short hinge lever	–	■	■	
			Short hinge roller lever	–	–	■	
			Short spring plunger	–	–	■	
			Side plunger	–	–	–	
			Side roller plunger horizontal	–	–	–	
			Side roller plunger vertical	–	–	–	
			Slim spring plunger	–	–	■	
			Spring plunger	–	–	■	
			Top ball plunger	–	–	–	
			Top plunger	–	–	–	
			Unidirectional short hinge roller lever	–	–	■	
			Variable rod lever	–	–	–	
			Variable roller lever	–	–	–	
			Page	567	568	569	

■ Standard ☐ Available – No/not available



Economical, miniature limit switch

With a highly rigid, dust- and drip-proof construction, HL-5000 can be used in a variety of heavy industrial applications.

- Highly rigid construction (head and cover snugly fit in box)
- Smooth operation with greater overtravel
- Easy-to-wire conduit opening design
- Models with grounding terminals conform to the CE marking
- Jet-proof IP65

Ordering information

Application		Operating force max. (OF)	Release force max. (RF)	Pre travel (PT)	Over travel (OT)	Movement differential (MD)	Operating position (OP)	Size in mm (HxWxD) excl. actuator	Order code
Roller lever		7.35 N	0.98 N	20°	50°	12°	–	82.4x33x34	HL-5000G
Adjustable roller lever		7.35 N	0.98 N	20°	50°	12°	–	–	HL-5030G
Adjustable rod lever		7.35 N	0.98 N	20°	50°	12°	–	–	HL-5050G
Sealed plunger		8.83 N	1.47 N	1.5 mm	4 mm	1 mm	30 ±0.8 mm	60.6x33x34	HL-5100G
Sealed roller plunger		8.83 N	1.47 N	1.5 mm	4 mm	1 mm	40 ±0.8 mm	–	HL-5200G
Coil spring		1.47 N	–	30 mm	–	–	–	–	HL-5300G

Specifications

Ratings	Non-inductive load				Inductive load			
Rated voltage	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 A		1.5 A	0.7 A	3 A		2 A	1 A
250 VAC	5 A		1 A	0.5 A	3 A		1.5 A	0.8 A
12 VDC	5 A		3 A		4 A		3 A	
24 VDC	5 A		3 A		4 A		3 A	
Inrush current	NC				24 A max.			
	NO				12 A max.			
Degree of protection	IP65							
Life expectancy	Mechanical: 10,000,000 operations min. (under rated conditions)							
Operating speed	5 mm/s to 0.5 m/s (HL-5000)							
Operating frequency	Mechanical: 120 operations/min, electrical: 30 operations/min							
Rated frequency	50/60 Hz							
Ambient temperature	Operating: -5 to 65°C (with no icing)							
Ambient humidity	Operating: 95% max.							
Weight	Approx. 130 to 190 g							



Wide selection of two circuit limit switches

A wide selection of models is available, including overtravel models with greater OT, lamp equipped models for checking operation, low temperature and heat resistant models and micro-load models. Various plungers and levers are also available.

- Two circuit limit switch
- Direct and pre-wiring
- Metal housing, immersion-proof IP67
- Ground terminal models are approved by EN and IEC and bear the CE marking
- UL, CSA

Ordering information

Actuator		Order code	
		Ground terminal	
		No	Yes
Adjustable roller lever: Standard		WLCA12	WLCA12-G
Adjustable roller lever: Overtravel 90°		WLCA12-2N	WLCA12-2NG
Roller lever: Standard model (R38)		WLCA2	WLCA2-2G
Rod lever: Standard		WLCA2-2	WLCA2-G
Rod lever: Overtravel 90°		WLCA2-2N	WLCA2-2NG
Roller lever: Standard, standard model (R50)		WLCA2-7	WLCA2-7G
Fork lever lock: Protective, WL-5A100		WLCA32-41	WLCA32-41G
Fork lever lock: Protective, WL-5A104		WLCA32-43	WLCA32-43G
Adjustable rod lever: Standard		WLCL	WLCL-G
Adjustable rod lever: Overtravel 90°, 25 to 140 mm		WLCL-2N	WLCL-2NG
Plunger: Top plunger		WLD	WLDG
Plunger: Top roller plunger		WLD2	WLD2-G
Plunger: Top ball plunger		WLD3	WLD3-G
Adjustable rod lever: Overtravel, high sensitivity, 80°, 350 to 380 mm		WLGL	WLGL-G
Flexible rod: Coil spring		WLNJ	WLNJ-G
Flexible rod: Coil spring, resin rod		WLNJ-2	WLNJ-2G
Flexible rod: Coil spring, multi-wire		WLNJ-30	WLNJ-30G
Flexible rod: Steel wire		WLNJ-S2	WLNJ-S2-G
Plunger: Horizontal roller plunger		WLSD2	WLSD2-G
Plunger: Horizontal ball plunger		WLSD3	WLSD3-G
Plunger: Horizontal plunger		WLSD	WLSD-G

Note: For other model please refer to the datasheet

Specifications

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	10 A	60 A	6 A	7,200 VA	720 VA
240 VAC		30 A	3 A		
480 VAC		15 A	1.5 A		
600 VAC		12 A	1.2 A		

Agency	Standard	File No.
UL	UL508	E76675
CSA	CSA C22.2 No. 14	LR45746
TÜV Rheinland	EN60947-5-1	R9551016
Size in mm (HxWxD)	68.7x40x42 (excluding the actuator)	

Type	Rated voltage	Non-inductive load				Inductive load			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
Standard, overtravel (except high-sensitivity models), and high-precision models.	125 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A
	250 VAC	10 A		2 A	1 A	10 A		3 A	1.5 A
	500 VAC	10 A		1.5 A	0.8 A	3 A		1.5 A	0.8 A
	8 VDC	10 A		6 A	3 A	10 A		6 A	
	14 VDC	10 A		6 A	3 A	10 A		6 A	
	30 VDC	6 A		4 A	3 A	6 A		4 A	
	125 VDC	0.8 A		0.2 A	0.2 A	0.8 A		0.2 A	
	250 VDC	0.4 A		0.1 A	0.1 A	0.4 A		0.1 A	
Overtravel (high-sensitivity models)	125 VAC	5 A		–	–	–		–	
	250 VAC	5 A		–	–	–		–	
	125 VDC	0.4 A		–	–	–		–	
	250 VDC	0.2 A		–	–	–		–	



Compact, 16 mm thick cable type switch

The D4C range of switches offers a wide choice of actuators. All switches are liquid and dust resistant, conforming to IEC IP67. Various types are available: pre-wired, low temperature, viscosity resistant, etc.

- Enclosed miniature limit switch, only 16 mm thick
- Metal housing with triple-sealed construction
- LED indicator for easy monitoring
- Ganged mounting for multiple switching
- Mechanical life expectancy = 10 million, switching/min = 30

Ordering information

Actuator		Operating force max. (OF)	Release force max. (RF)	Pre travel (PT)	Over travel (OT)	Movement differential (MD)	Operating position (OP)	Order code
								S-FLEX VCTF Cable
								3 m
Pin plunger		11.77 N	4.41 N	1.8 mm	3 mm	0.2 mm	15.7±1 mm	D4C-1201
Sealed plunger		17.65 N	4.41 N	1.8 mm	3 mm	0.2 mm	24.9±1 mm	D4C-1231
Roller plunger		11.77 N	4.41 N	1.8 mm	3 mm	0.2 mm	28.5±1 mm	D4C-1202
Sealed roller plunger		17.65 N	4.41 N	1.8 mm	3 mm	0.2 mm	34.3±1 mm	D4C-1232
Crossroller plunger		11.77 N	4.41 N	1.8 mm	3 mm	0.2 mm	28.5±1 mm	D4C-1203
Sealed crossroller plunger		17.65 N	4.41 N	1.8 mm	3 mm	0.2 mm	34.3±1 mm	D4C-1233
Coil spring		1.47 N	–	15°	–	–	–	D4C-1250
Roller lever		5.69 N	1.47 N	25°	40°	3°	–	D4C-1220
Center roller lever plunger		6.67 N	1.47 N	10±3°	50°	3°	–	D4C-1260

Note: For other product specifications please refer to the datasheet

Specifications

Agency	Standard	File number
TÜV Rheinland	EN60947-5-1	R9451333/J9950970
UL	UL508	E76675
CSA	CSA C22.2 No. 14	LR45746

Order code	Rated voltage	Non-inductive load				Inductive load				Inrush current	
		Resistive load		Lamp load		Inductive load		Motor load			
		NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
D4C-1___	125 VAC	5 A	5 A	1.5 A	0.7 A	3 A	3 A	1.3 A	1.3 A	20 A max.	10 A max.
	250 VAC	5 A	5 A	1 A	0.5 A	2 A	2 A	1.5 A	0.8 A		
	8 VDC	5 A	5 A	2 A	2 A	5 A	4 A	3 A	3 A		
	14 VDC	5 A	5 A	2 A	2 A	4 A	4 A	3 A	3 A		
	30 VDC	4 A	4 A	2 A	2 A	3 A	3 A	3 A	3 A		
	125 VD	0.4 A	0.4 A	0.05 A	0.4 A	0.4 A	0.4 A	0.05 A	0.05 A		
	250 VDC	0.2 A	0.2 A	0.03 A	0.2 A	0.2 A	0.2 A	0.03 A	0.03 A		

Note: For other loads, please refer to the datasheet

Degree of protection	IP67
Durability	Mechanical: 10,000,000 operations min. Electrical: 200,000 operations min. (5A at 250 VAC, resistive load)
Operating speed	0.1 mm to 0.5 m/s (in case of plunger)
	1 mm to 1 m/s (in case of roller lever)
Operating frequency	Mechanical: 120 operations/min
	Electrical: 30 operations/min
Short-circuit protective device (SCPD)	10 A fuse type gG (IEC269)
Ambient temperature	Operating: -10 to 70°C (with no icing)
Weight	With 3 m VCTF cable: 360 g; with 5 m VCTF cable: 540 g
Size in mm (HxWxD)	49 or 51.5x34x16 (excluding the actuator)



Compact, 16 mm thick connector type switch

The D4CC family of limit switches comes as standard with a triple-seal construction (IP67), cable connectors for easy switch replacement and an operation indicator for easy monitoring.

- Miniature limit switch
- Various models including roller lever
- Switches are only 16 mm thick with connector
- Cable connectors for easy switch replacement
- Immersion proof; IEC IP67, UL and CSA (type 3, 4 and 13)

Ordering information

Actuator		Operating force max. (OF)	Release force max. (RF)	Pre travel (PT)	Over travel (OT)	Movement differential (MD)	Operating position (OP)	Order code	
								1 A at 125 VAC	1 A at 30 VDC
								Without indicator	Without indicator
Pin plunger		11.77 N	4.41 N	1.8 mm	3 mm	0.2 mm	15.7 ±1 mm	D4CC-1001	D4CC-3001
Roller plunger		11.77 N	4.41 N	1.8 mm	3 mm	0.2 mm	28.5 ±1 mm	D4CC-1002	D4CC-3002
Crossroller plunger		11.77 N	4.41 N	1.8 mm	3 mm	0.2 mm	28.5 ±1 mm	D4CC-1003	D4CC-3003
High-sensitivity roller lever		5.69 N	1.47 N	10 ±3°	50°	3°		D4CC-1024	D4CC-3024
Sealed pin plunger		17.65 N	4.41 N	1.8 mm	3 mm	0.2 mm	24.9 ±1 mm	D4CC-1031	D4CC-3031
Sealed roller plunger		17.65 N	4.41 N	1.8 mm	3 mm	0.2 mm	34.3 ±1 mm	D4CC-1032	D4CC-3032
Sealed crossroller plunger		17.65 N	4.41 N	1.8 mm	3 mm	0.2 mm	34.3 ±1 mm	D4CC-1033	D4CC-3033
Plastic rod		1.47 N	–	15°	–	–	–	D4CC-1050	D4CC-3050
Center roller lever		6.67 N	1.47 N	10 ±3°	50°	3°	–	D4CC-1060	D4CC-3060

Accessories

Type	Appearance	Number of conductors	Cable length	Order code
VAC	Straight 	4	2 m	XS2F-A421-D90-A
			5 m	XS2F-A421-G90-A
			10 m	XS2F-A421-J90-A
VDC			2 m	XS2F-D421-D80-A
			5 m	XS2F-D421-G80-A
			10 m	XS2F-D421-J80-A

Specifications

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	1.0 A	3.6 A	3.6 A	432 VA	72 VA

Agency	Standard	File number
UL	UL508	E76675
CSA	CSA C22.2 No. 14	LR45746

Rated voltage	Non-inductive load				Inductive load			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	1 A	1 A	1 A	0.7 A	1 A	1 A	1 A	1 A
30 VDC	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A

Degree of protection	IP67
Durability	Mechanical: 10,000,000 operations min., electrical: 200,000 operations min. (1 A at 125 VAC, resistive load)
Operating speed	Plunger: 0.1 mm to 0.5 m/s, roller lever: 1 mm to 1 m/s
Operating frequency	Mechanical: 120 operations/min, electrical: 30 operations/min
Ambient temperature	Operating: -10 to 70°C (with no icing)
Weight	Approx. 120 g (in the case of D4CC-1002)
Size in mm (HxWxD)	57 or 59.5x34x16 (excluding the actuator)



Slim, compact sealed switch

D4E-_N comes with flat springs that improve the lever ratio of the built-in switch, ensuring smooth snap action and long life expectancy. Its one-touch connector eliminates the need for tedious wiring operations and reduces downtime.

- Protection cover protects the built-in switch from dust and oil
- Plunger incorporates a tough, long-lasting seal cap
- Minute load model with gold cladding is optimal for electronic control
- IP67

Ordering information

Actuator		Operating force max. (OF)	Release force max. (RF)	Pre travel (PT)	Over travel (OT)	Movement differential (MD)	Operating position (OP)	Order code		
								One-touch connector type		Screw terminal type
								General purpose		General purpose
								AC	DC	
Roller plunger		11.77 N	4.90 N	1.5 mm	3 mm	(0.1 mm)	31.4 ±0.8 mm	D4E-1A00N	D4E-1A10N	D4E-1A20N
Crossroller plunger		11.77 N	4.90 N	1.5 mm	3 mm	(0.1 mm)	31.4 ±0.8 mm	D4E-1B00N	D4E-1B10N	D4E-1B20N
Plunger		11.77 N	4.90 N	1.5 mm	3 mm	(0.1 mm)	25.4 ±0.8 mm	D4E-1C00N	D4E-1C10N	D4E-1C20N
Sealed roller plunger		11.77 N	4.90 N	1.5 mm	3 mm	(0.1 mm)	41.3 ±0.8 mm	D4E-1D00N	D4E-1D10N	D4E-1D20N
Sealed crossroller plunger		11.77 N	4.90 N	1.5 mm	3 mm	(0.1 mm)	41.3 ±0.8 mm	D4E-1E00N	D4E-1E10N	D4E-1E20N
Sealed plunger		11.77 N	4.90 N	1.5 mm	3 mm	(0.1 mm)	30 ±0.8 mm	D4E-1F00N	D4E-1F10N	D4E-1F20N
Roller lever		3.92 N	0.78 N	2 mm	4 mm	(0.3 mm)	23.1 ±0.8 mm	D4E-1G00N	D4E-1G10N	D4E-1G20N
One-way action roller lever		3.92 N	0.78 N	2 mm	4 mm	(0.3 mm)	34.3 ±0.8 mm	D4E-1H00N	D4E-1H10N	D4E-1H20N

Accessories

Type	Number of conductors	Current	Cable length	Applicable models	Order code
Straight	4	AC	2 m	D4E-__00N	XS2F-A421-D90-A
			5 m		XS2F-A421-G90-A
		DC	2 m	D4E-__10N	XS2F-D421-D80-A
			5 m		XS2F-D421-G80-A

Specifications

Rated voltage	Non-inductive load				Inductive load				Microload	
	Resistive load		Lamp load		Inductive load		Motor load		Resistive load	
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 (1) A		1.5 (1) A		3 (1) A		2 (1) A	1 (1) A	0.1 A	
250 VAC	5 (1) A		1.5 (1) A		3 (1) A		1 A	0.5 A	–	
8 VDC	5 (1) A		–		1.5 (1) A		–		0.1 A	
14 VDC	5 (1) A		–		1.5 (1) A		–		0.1 A	
30 VDC	5 (1) A		–		1.5 (1) A		–		0.1 A	
125 VDC	0.5 A		–		0.05 A		–		–	
250 VDC	0.25 A		–		0.03 A		–		–	

Note: The above current ratings are for a standard current and the values in parentheses are for models with a connector

Agency	Standard	File number
UL	UL508	E76675
CSA	CSA C22.2 No. 14	LR45746
TÜV Rheinland	EN60947-5-1	R9551015
Degree of protection	IP67	
Durability	Mechanical: 10,000,000 operations min., electrical: 500,000 operations min. (5 A at 250 VAC, resistive load) 5,000,000 operations min. (10 mA at 24 VDC, resistive load)	
Operating speed	0.1 mm to 0.5 m/sec	
Operating frequency	Mechanical: 120 operations/min Electrical: 30 operations/min	
Ambient temperature	Operating: -10 to 80°C (with no icing)	
Weight	Approx. 86 g (in case of roller plunger)	
Size in mm (HxWxD)	32.9x18x57 (excluding the actuator)	



Economical, high utility enclosed switch

D4MC provides users with high precision and a long life (10,000,000 mechanical operations). It is sealed with a gasket diaphragm without use of any adhesive or pin, making it suitable for applications demanding higher mechanical strength and for dust-proof and drip-proof applications.

- Various models, plungers and levers available
- Panel-mount versions have the same operating position as the Z basic switch
- IP67, UL, CSA

Ordering information

Actuator		Operating force max. (OF)	Release force max. (RF)	Pre travel (PT)	Over travel (OT)	Movement differential (MD)	Operating position (OP)	Order code
Panel mount plunger		5.88 N	0.98 N	1.6 mm	5 mm	0.2 mm	21.8 ±1.2 mm	D4MC-5000
Panel mount roller		5.88 N	0.98 N	1.6 mm	5 mm	0.2 mm	33.4 ±1.2 mm	D4MC-5020
Panel mount crossroller		5.88 N	0.98 N	1.6 mm	5 mm	0.2 mm	33.4 ±1.2 mm	D4MC-5040
Short hinge lever		2.55 N	0.34 N	–	2.5 mm	1.7 mm	25 ±1 mm	D4MC-1020
Hinge lever		1.67 N	0.25 N	–	4 mm	3 mm	25 ±1 mm	D4MC-1000
Hinge roller lever		1.96 N	0.39 N	–	5 mm	3 mm	40 ±1 mm	D4MC-2000
Short hinge roller		2.94 N	0.39 N	–	2 mm	1.5 mm	40 ±1 mm	D4MC-2020
One-way action short hinge roller		2.94 N	0.39 N	–	2 mm	1.5 mm	50 ±1 mm	D4MC-3030

Note: Use moulded terminal models when using the switch under one of the following conditions: dusty, high amount of dripping oil or high humidity

Specifications

Rated voltage	Non-inductive load				Inductive load			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A
250 VAC	10 A		2.5 A	1.25 A	10 A		3 A	1.5 A
480 VAC	3 A		1.5 A	0.75 A	2.5 A		1.5 A	0.75 A
8 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A
14VDC	10 A		3 A	1.5 A	6 A0.75		5 A	2.5 A
30 VDC	6 A		3 A	1.5 A	5 A		5 A	2.5 A
125VDC	0.5 A		0.4 A		0.05 A		0.05 A	
250 VDC	0.25 A		0.2 A		0.03 A		0.03 A	

Rated voltage	Carry current	Current	
		Make	Break
120 VAC	10 A	60 A	6 A
240 VAC		30 A	3 A

Degree of protection	IP67 (NEMA250: 6.6P)
Life expectancy	Mechanical: 10,000,000 operations min., electrical: 500,000 operations min.
Operating speed	0.05 mm/s to 0.5 m/s (at panel mount plunger)
Operating frequency	Mechanical: 120 operations/min, electrical: 20 operations/min
Pollution degree (operating environment)	3 (IEC947-5-1)
Protection against electric shock	Class II
PTI (tracking characteristics)	175
Switch category	D (IEC335)
Rated operating current (I_e)	10 A
Rated operating voltage (U_e)	250 VAC
Ambient temperature	Operating: -10 to 80°C (with no icing)
Weight	Approx. 71 g (at panel mount plunger)
Size in mm (HxWxD)	45x21.7x55 (excluding the actuator)



Standard high-precision switch

Z basic switches provide a large switching capacity of 15 A with very high repeat accuracy. They come in a wide range of variations in contact form for your selection: basic, split-contact, maintained-contact and adjustable-contact gap types.

- General purpose basic switch
- A series of standard models for micro loads is available
- High-precision switching
- A wide range of variations in contact
- Drip-proof IP00/IP62

Ordering information

Ratings	Contact gap	Actuator		Order code	
				Solder terminal	Screw terminal
15 A	0.5 mm	Pin plunger		Z-15G	Z-15G-B
		Short spring plunger		Z-15GD	Z-15GD-B
		Leaf spring (high OF)		Z-15GL	Z-15GL-B
		Roller leaf spring		Z-15GL2	Z-15GL2-B
		Reverse hinge lever		Z-15GM	Z-15GM-B
		Reverse hinge roller lever		Z-15GM2	Z-15GM2-B
		Reverse hinge short roller lever		Z-15GM22	Z-15GM22-B
		Panel mount plunger (medium OP)		Z-15GQ	Z-15GQ-B
		Panel mount plunger (low OP)		Z-15GQ3	Z-15GQ3-B
		Panel mount plunger (high OP)		Z-15GQ8	Z-15GQ8-B
		Panel mount cross roller plunger		Z-15GQ21	Z-15GQ21-B
		Panel mount roller plunger		Z-15GQ22	Z-15GQ22-B
		Slim spring plunger		Z-15GS	Z-15GS-B
		Hinge lever (low OF)		Z-15GW	Z-15GW-B
		Hinge roller lever		Z-15GW2	Z-15GW2-B
		Short hinge lever		Z-15GW21	Z-15GW21-B
		Short hinge roller lever		Z-15GW22	Z-15GW22-B
		Unidirectional short hinge roller lever (low OF)		Z-15GW2277	Z-15GW2277-B
		Hinge roller lever (large roller)		Z-15GW25	Z-15GW25-B
		Hinge lever (medium OF)		Z-15GW3	Z-15GW3-B
		Low-force hinge lever		Z-15GW4	Z-15GW4-B
		Hinge lever (high OF)		Z-15GW32	Z-15GW32-B
		Short hinge cross roller lever		Z-15GW49	Z-15GW49-B
		Hinge cross roller lever		Z-15GW54	Z-15GW54-B

Note: Many other types are also available, please refer to the full datasheet.

Specifications

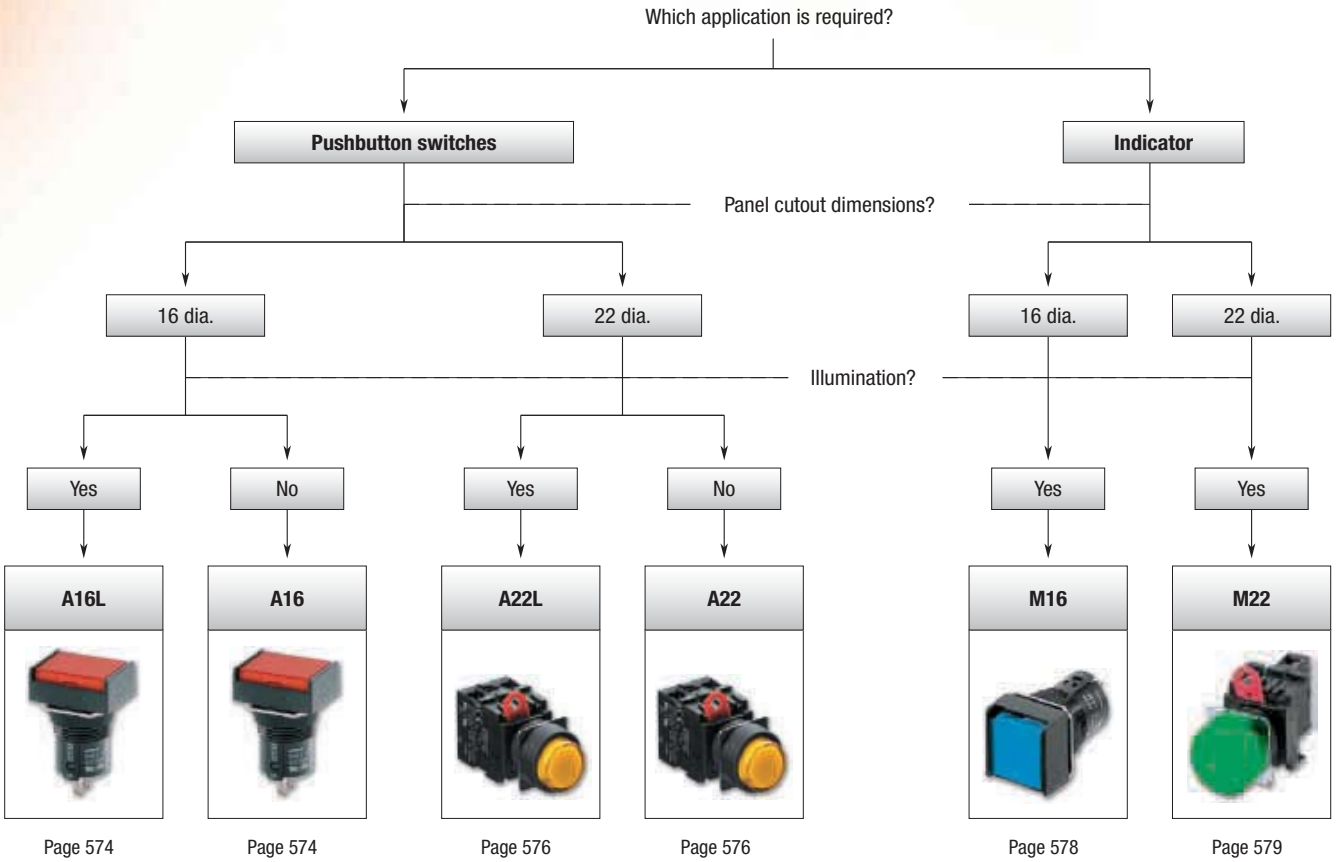
Agency	Standard	File number
UL	UL508	E41515
CSA	CSA C22.2 No. 55	LR21642
TÜV Rheinland	EN61058-1	R9451585
Degree of protection	General purpose: IP00, drip-proof: IP62	
Degree of protection against electric shock	Class I	
Proof tracking index (PTI)	175	
Switch category	D (IEC335-1)	
Ambient operating temperature	General purpose: -25 to 80°C (with no icing) Drip-proof: -15 to 80°C (with no icing)	
Size in mm (HxWxD)	24.2x49.2x17.5 (excluding the actuator)	

16 MM SUB-ASSEMBLED PUSHBUTTON SWITCHES

A165 – Full range with IP65 rating

All our 16 mm pushbuttons are upgraded to IP65 rating. This will increase the reliability of your application. The pushbuttons are very easy to assemble due to their modular construction: Pushbutton + case + lamp (if applicable) + switch.

- Wide range of models: rectangular, square & round
- With or without lamp
- Easy assembly and installation





Selection table

Selection criteria		Category	Pushbutton switch		Indicator	
						
		Model	A16	A22	M16	M22
		Mounting	Nut-mounting			
		Size	16 mm	22 mm	16 mm	22 mm
		Shape	▭ □ ○	▭ □ ○	▭ □ ○	▭ □ ○
Pushbutton colour	Incandescent lamp-lighted	Red	■	■	■	■
		Yellow	■	■	■	■
		Pure yellow	■		■	–
		Green	■	■	■	■
		White	■	■	■	■
		Blue	■	■	■	■
	LED-lighted	Red	■	■	■	■
		Yellow	■	■	■	■
		Pure yellow	■		■	–
		Green	■	■	■	■
		White	■	■	■	■
		Blue	■	■	■	■
	Non-lighted	Red	■	■	–	–
		Yellow	■	■	–	–
		Green	■	■	–	–
		White	■	■	–	–
		Blue	■	■	–	–
		Black	■	■	–	–
Features		Momentary operation	■	■	–	–
		Self-holding	■	■	–	–
		Number of contacts	2	6	–	–
		IP rating	IP65			
		Legend plate	■	■	■	■
Switch ratings [A]		125 VAC	5	10	–	–
		250 VAC	3	6	–	–
		30 VDC	3	10	–	–
		Rated load	5 A at 125 VAC, 3 A at 250 VAC, 3 A at 30 VDC	10 A at 110 VAC, 6 A at 220 VAC	–	–
Terminals		Solder	■	–	■	–
		PCB	–	–	■	–
		Screw-less Clamp	–	–	■	–
Operating voltage		5 VDC	■	■	■	■
		12 VDC	■	■	■	■
		24 VDC	■	■	■	■
Form		SPDT	■	–	–	–
		DPDT	■	–	–	–
		SPST-NO	–	■	–	–
		SPST-NC	–	■	–	–
		SPST-NO + SPST-NC	–	■	–	–
		DPST-NO	–	■	–	–
		DPST-NC	–	■	–	–
		Page	574	576	578	579

■ Standard □ Available – No/not available



16 mm pushbutton switch

These sub-assembled pushbutton switches have a modular construction: pushbutton + case + lamp (if applicable) + switch. A16 is a nut-mounted pushbutton switch with a short mounting depth of less than 28.5mm below panel.

- Wide variety of control and signal devices: lighted, non-lighted and buzzer
- Quick and easy assembly, snap-in switch
- Wide range of switching capacity from standard load to micro load
- High reliability, IP65
- UL, cUL, CSA and VDE approved, conforms to EN60947-5-1 and IEC947-5-1

Ordering information

Type	Colour	Order code		
		Degree of protection: Oil-resistant IP65		
		Rectangular	Square	Round
Non-lighted LED Incandescent lamp	Red	A165L-JR	A165L-AR	A165L-TR
	Yellow	A165L-JY	A165L-AY	A165L-TY
	Pure yellow	A165L-JPY	A165L-APY	A165L-TPY
	White	A165L-JW	A165L-AW	A165L-TW
	Blue	A165L-JA	A165L-AA	A165L-TA
Non-lighted	Black	A165L-JB	A165L-AB	A165L-TB
LED	Green	A165L-TGY	A165L-AGY	A165L-TGY
Non-lighted/incandescent lamp	Green	A165L-JG	A165L-AG	A165L-TG

Cases

Appearance	Classification		Order code
			Oil-resistant IP65
	Momentary operation	Rectangular (2-way guard)	A165-CJM
		Square	A165-CAM
		Round	A165-CTM
	Alternate operation	Rectangular (2-way guard)	A165-CJA
		Square	A165-CAA
		Round	A165-CTA

Switches

Appearance	Classification				Order code
	Lighted/ non-lighted (common use)	Standard load/ microload (common use)	SPDT	Solder terminal	A16-1
			DPDT		A16-2
			SPDT	PCB terminal	A16-1P
			DPDT		A16-2P
			DPDT	Screw-less clamp	A16-2S

Switches with reduced voltage lighting

Appearance	Classification				Order code
	100 V	Standard load/ microload (common use)	SPDT	Solder terminal	A16-T1-1
			DPDT		A16-T1-2
	100 V		DPDT	Screw-less clamp	A16-T1-2S
	200 V				A16-T2-2S

Lamps

Type	Colour	Order code		
		5 VDC	12 VDC	24 VDC
LED	Red	A16-5DSR	A16-12DSR	A16-24DSR
	Yellow	A16-5DSY	A16-12DSY	A16-24DSY
	Green	A16-5DSG	A16-12DSG	A16-24DSG
	White *1	A16-5DSW	A16-12DSW	A16-24DSW
	Blue	**A16-5DA**	A16-12DA	A16-24DA
Type		**5 VAC/VDC**	**12 VAC/VDC**	**24 VAC/VDC**
Incandescent lamp		A16-5	A16-12	A16-24

*1 Use the white LED together with white or pure yellow pushbuttons.

Accessories

Name	Appearance	Classification	Remarks	Order code
Switch guards		For rectangular models	Cannot be used with the dust cover	A16ZJ-5050
		For square and round models		A16ZA-5050
Dust covers		For rectangular models	Cannot be used with the switch guard	A16ZJ-5060
		For square models		A16ZA-5060
		For round models		A16ZT-5060
Panel plugs		For rectangular models	Used for covering the panel cutouts for future panel expansion	A16ZJ-3003
		For square models		A16ZA-3003
		For round models		A16ZT-3003

Specifications

Allowable operating frequency	**Mechanical**	Momentary operation: 120 operations/minute max. Alternate operation: 60 operations/minute max.
	Electrical	20 operations/minute max.
Durability	**Mechanical**	Momentary operation: 2,000,000 operations min. Alternate operation: 200,000 operations min.
	Electrical	100,000 operations min.
Ambient temperature		Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 65°C (with no icing or condensation)
Weight		Approx. 10 g (in the case of a lighted DPDT switch with solder terminals)
Size in mm (HxWxD)		Round/square: 18x18x28.5 rectangular: 18x24x28.5

Operating characteristics	**Pushbutton switch**	
	Oil-resistant IP65	
	SPDT	**DPDT**
Operating force (OF) max.	2.94 N	4.91 N
Releasing force (RF) min.	0.29 N	
Total travel (TT)	Approx. 3 mm	
Pretravel (PT) max.	2.5 mm	
Lock stroke (LTA) min.	0.5 mm	

Item		**Screw-less clamp**			
Recommended wire size		0.5 mm^2 twisted wire or 0.8 mm dia. solid wire			
Usable wires and tensile strength	Twisted wire	0.3 mm^2	0.5 mm^2	0.75 mm^2	1.25 mm^2
	Solid wire	0.5 mm dia.	0.8 mm dia.	1.0 mm dia.	
	Tensile strength	10 N	20 N	30 N	40 N
Length of exposed wire		10 ±1 mm			



22 mm pushbutton switch

A22 comes in a wide variety of shapes and colours and is installable in 22-dia. or 25-dia. panel cutouts. The switch unit can easily be mounted. A22 is mounted using either open-type (fork-type) or closed-type (round-type) crimp terminals.

- Finger-protection mechanism on switch unit provided as standard feature
- Increased wiring efficiency with three-row mounting of switch blocks
- IP65 oil-resistant (non-lighted models), IP65 (lighted models)
- Lighted and non-lighted, flat, projection and half- and full-guard versions
- EN60947-5-1, UL and cUL approved

Ordering information

Pushbutton

Illumination	Colour	Order code							
		Flat type	Projection type	Full-guard type	Half-guard type	Square/projection type	Square/ full-guard type	Round/mushroom type (30-dia. head)	Round/ mushroom type (40-dia. head)
									
Non-lighted	Red	A22-FR	A22-TR	A22-GR	A22-HR	A22-CR	A22-DR	A22-SR	A22-MR
	Green	A22-FG	A22-TG	A22-TG	A22-HG	A22-CG	A22-DG	A22-SG	A22-MG
	Yellow	A22-FY	A22-TY	A22-GY	A22-HY	A22-CY	A22-DY	A22-SY	A22-MY
	White	A22-FW	A22-TW	A22-GW	A22-HW	A22-CW	A22-DW	A22-SW	A22-MW
	Blue	A22-FA	A22-TA	A22-GA	A22-HA	A22-CA	A22-DA	A22-SA	A22-MA
	Black	A22-FB	A22-TB	A22-GB	A22-HB	A22-CB	A22-DB	A22-SB	A22-MB
Lighted	Red	–	A22L-TR	A22L-GR	A22L-HR	A22L-CR	A22L-DR	–	–
	Green	–	A22L-TG	A22L-GG	A22L-HG	A22L-CG	A22L-DG	–	–
	Yellow	–	A22L-TY	A22L-GY	A22L-HY	A22L-CY	A22L-DY	–	–
	White	–	A22L-TW	A22L-GW	A22L-HW	A22L-CW	A22L-DW	–	–
	Blue	–	A22L-TA	A22L-GA	A22L-HA	A22L-CA	A22L-DA	–	–
Buttonsize in mm		29.7 dia. x 12D	29.7 dia. x 19D	29.7 dia. x 19D	29.7 dia. x 12/18.5D	29.8 mm^2 x 18D	29.8 mm^2 x 18D	30 dia. x 32D	40 dia. x 32D

Switches

Switch operation	Contacts	Oder code			
		Non-lighted models	Lighted models		
		Without voltage reduction unit		With voltage reduction unit	
				110 VAC	220 VAC
					
Momentary	SPST-NO	A22-10M	A22L-10M	A22L-10M-T1	A22L-10M-T2
	SPST-NC	A22-01M	A22L-01M	A22L-01M-T1	A22L-01M-T2
	SPST-NO + SPST-NC	A22-11M	A22L-11M	A22L-11M-T1	A22L-11M-T2
	DPST-NO	A22-20M	A22L-20M	A22L-20M-T1	A22L-20M-T2
	DPST-NC	A22-02M	A22L-02M	A22L-02M-T1	A22L-02M-T2
Alternate	SPST-NO	A22-10A	A22L-10A	A22L-10A-T1	A22L-10A-T2
	SPST-NC	A22-01A	A22L-01A	A22L-01A-T1	A22L-01A-T2
	SPST-NO + SPST-NC	A22-11A	A22L-11A	A22L-11A-T1	A22L-11A-T2
	DPST-NO	A22-20A	A22L-20A	A22L-20A-T1	A22L-20A-T2
	DPST-NC	A22-02A	A22L-02A	A22L-02A-T1	A22L-02A-T2

Switch blocks

	Standard load	Order code
Switch blocks	SPST-NO	A22-10
	SPST-NC	A22-01
	DPST-NO	A22-20
	DPST-NC	A22-02

Lamp – LED

AC/DC	LED light	Order code			
		Operating voltage			
		6 V	12 V	24 V	24 V superbright
DC	Red	A22-6DR	–	–	–
	Green	A22-6DG	–	–	–
	Yellow *1	A22-6DY	–	–	–
	Blue	A22-6DA	–	–	–
AC	Red	A22-6AR	–	–	–
	Green	A22-6AG	–	–	–
	Yellow *1	A22-6AY	–	–	–
	Blue	A22-6AA	–	–	–
AC and DC	Red	–	A22-12AR	A22-24AR	A22-24ASR
	Green	–	A22-12AG	A22-24AG	A22-24ASG
	Yellow *1	–	A22-12AY	A22-24AY	A22-24ASY
	Blue	–	A22-12AA	A22-24AA	A22-24ASA

*1 Used when the pushbutton colour is yellow or white

Lamp - incandescent lamp

Order code		
Operating voltage		
5 VAC/VDC	12 VAC/VDC	24 VAC/VDC
A22-5	A22-12	A22-24

Accessories

Item				Remarks	Order code
Lamp sockets	Direct lighting			Used when changing the lighting method (LED only)	A22-TN
	Voltage-reduction lighting		220 VAC		A22-T2
Mounting latches	For momentary models			Order mounting latches only when mounting switch blocks or lamp sockets are purchased individually	A22-3200
Legend plate frames	Large size	With snap-in legend plate, without text, black		Snap-in legend plate is acrylic	A22Z-3333
		Without snap-in legend plate			A22Z-3330
Sealing caps	For projection models			Used to prevent dust or water from entering the operation unit (pushbutton, etc.), colour: Opaque, material: Silicon	A22Z-3600T
Three-throw spacer				Used when mounting three non-lighted switches	A22Z-3003
Control boxes (enclosures)	Exclusively for A22		One hole	Do not use DPST-NO or DPST-NC switches, material: Polycarbonate resin	A22Z-B101
			Two holes		A22Z-B102
			Three holes		A22Z-B103
Snap-in legend plates	Standard size	Without text	White	Attached to the standard-size legend plate frame, material: Acrylic	A22Z-3443W
			Transparent		A22Z-3443C
		White text on black background	ON		A22Z-3443B-5
			OFF		A22Z-3443B-6
			DOWN		A22Z-3443B-8
			POWER ON		A22Z-3443B-9
	Large size	Without text	White	Attached to the large-size legend plate frame, material: Acrylic	A22Z-3453W
			Transparent		A22Z-3453C
	For emergency stop switch	60-dia. round plate with black letters on a yellow background		"EMERGENCY STOP" is engraved on the plate. Used as an emergency stop switch legend plate	A22Z-3466-1
		90-dia. round plate with black letters on a yellow background			A22Z-3476-1
Lamp extractor				Rubber tool used to easily replace lamps	A22Z-3901
Tightening wrench				Tool used to tighten nuts from the back of the panel	A22Z-3905

Specifications

Recognized organization	Standards	File number
UL, cUL	UL508	E41515
–	EN60947-5-1	–

Contact ratings (standard load)

Rated carry current (A)	Rated voltage	Rated current (A)			
		AC15 (inductive load)	AC12 (resistive load)	DC13 (inductive load)	DC12 (resistive load)
10	24 VAC	10	10	–	–
	110 VAC	5	10	–	–
	220 VAC	3	6	–	–
	380 VAC	2	3	–	–
	440 VAC	1	2	–	–
	24 VDC	–	–	1,5	10
	110 VDC	–	–	0,5	2
	220 VDC	–	–	0,2	0,6
	380 VDC	–	–	0,1	0,2

Contacts (microload)

Rated applicable load	Minimum applicable load
50 mA at 5 VDC (resistive load)	1 mA at 5 VDC

LED indicators without voltage reduction unit

Rated voltage	Rated current	Operating voltage
6 VDC	60 mA (20 mA)	6 VDC ±5%
6 VAC	60 mA (20 mA)	6 VAC/VDC ±5%
12 VAC/VDC	30 mA (10 mA)	12 VAC/VDC ±5%
24 VAC/VDC	15 mA (10 mA)	24 VAC/VDC ±5%

Super-bright LED indicator

Rated voltage	Rated current	Operating voltage
24 VAC/VDC	15 mA	24 VAC/VDC ±5%

Incandescent lamp

Rated voltage	Rated current	Operating voltage
6 VAC/VDC	200 mA	5 VAC/VDC
14 VAC/VDC	80 mA	12 VAC/VDC
28 VAC/VDC	40 mA	24 VAC/VDC
130 VAC/VDC	20 mA	100 VAC/VDC

Voltage-reduction lighting

Rated voltage	Operating voltage	Applicable lamp (BA8S/13_ gold)
110 VAC	95 to 115 VAC	LED Lamp (A22-24A_)
220 VAC	190 to 230 VAC	

Item		Pushbutton switches		Emergency stop switches		Knob-type selector switches		Key-type selector switch
		Non-lighted	Lighted	Non-lighted	Lighted	Non-lighted	Lighted	Non-lighted
Allowable operating frequency	Mechanical	Momentary operation: 60 operations/minute max.		30 operations/minute max.		Manual release: 30 operations/minute max., automatic release: 30 operations/minute max.		
	Electrical	30 operations/minute max.				30 operations/minute max.		
Durability (number of operations min.)	Mechanical	Momentary operation: 5,000,000		Momentary operation: 300,000		500,000	100,000	500,000
	Electrical	500,000		300,000		500,000	100,000	500,000
Ambient temperature	Operating	-20 to 70°C	-20 to 55°C	-20 to 70°C	-20 to 55°C	-20 to 70°C	-20 to 55°C	-20 to 70°C
	Storage	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C
Degree of protection		IP65 (oil-resistant)	IP65	IP65 (oil-resistant)	IP65	IP65 (oil-resistant)	IP65	IP65 (oil-resistant)
Size in mm (in-panel only)		34Hx34Wx54.7D, 34Hx34Wx72.7D for DPST switches						



Indicators with a mounting aperture of 16 mm

The M16 series of nut-mounted indicators comes in rectangular, square and round versions. Due to its modular construction, assembly is quick and easy. M16 comes in a wide variety of control and signal devices with a wide range of switching capacities, from general load to micro load.

- LED, incandescent and neon lamp
- Snap-in switch unit
- Short mounting depth, less than 28.5 mm below panel
- High reliability, IP65
- UL, CSA and VDE approved, conforms to EN60947-5-1

Ordering information

Pushbutton

Type	Display colour	Order code		
		IP65 oil-resistant		
		Rectangular	Square	Round
LED Incandescent lamp	Red	A165L-JR	A165L-AR	A165L-TR
	Yellow	A165L-JY	A165L-AY	A165L-TY
	Pure yellow	A165L-JPY	A165L-APY	A165L-TPY
	White	A165L-JW	A165L-AW	A165L-TW
	Blue	A165L-JA	A165L-AA	A165L-TA
LED Incandescent lamp	Green	A165L-JGY	A165L-AGY	A165L-TGY
	Green	A165L-JG	A165L-AG	A165L-TG

Lamp

Type	Colour	Order code		
		Operating voltage		
		5 VDC	12 VDC	24 VDC
LED	Red	A16-5DSR	A16-12DSR	A16-24DSR
	Yellow	A16-5DSY	A16-12DSY	A16-24DSY
	Green	A16-5DSG	A16-12DSG	A16-24DSG
	White	A16-5DSW	A16-12DSW	A16-24DSW
	Blue	A16-5DA	A16-12DA	A16-24DA
Type		**5 VAC/VDC**	**12 VAC/VDC**	**24 VAC/VDC**
Incandescent lamp		A16-5	A16-12	A16-24

Case

Classification		Order code
IP65 oil-resistant	Rectangular	A165-CJM
	Square	A165-CAM
	Round	A165-CTM

Socket

Classification			Order code
Solder terminals			M16-0
PCB terminals			M16-0P
Screw-less clamp			M16-S
Solder terminals	Voltage-reduction lighting	100 V	M16-T1
Screw-less clamp		100 V	M16-T1-S
		200 V	M16-T2-S

Specifications

Allowable operating frequency	**Mechanical**	Momentary operation: 120 operations/minute max., alternate operation: 60 operations/minute max.
	Electrical	20 operations/minute max.
Durability	**Mechanical**	Momentary operation: 2,000,000 operations min., alternate operation: 200,000 operations min.
	Electrical	100,000 operations min.
Degree of contamination		3 (IEC947-5-1)
Ambient temperature		Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 65°C (with no icing or condensation)
Weight		Approx. 10 g (in the case of a lighted DPDT switch with solder terminals)
Size in mm		Round/square: 18Hx18Wx28.5D rectangular: 18Hx24Wx28.5D

Agency	Standards	File number
UL, cUL	UL508	E41515

Ratings

Superbright LED			
Rated voltage	**Rated current**	**Operating voltage**	**Built-in limiting resistance**
5 VDC	30 mA (15 mA)	5 VDC ±5%	33 Ω (68 Ω)
12 VDC	15 mA	12 VDC ±5%	270 Ω (560 Ω)
24 VDC	10 mA	24 VDC ±5%	1,600 Ω (2,000 Ω)

Incandescent lamp		
Rated voltage	**Rated current**	**Operating voltage**
6 VAC/VDC	60 mA	5 VAC/VDC
14 VAC/VDC	40 mA	12 VAC/VDC
28 VAC/VDC	24 mA	24 VAC/VDC



Nut-mounted, 22 mm indicator, with high visibility, illuminated buttons

The M22 series of indicators comes in 22 or 25 mm-diameter round versions. They can easily be mounted and removal of the socket unit is also easy. The finger protection mechanism on the lamp is provided as a standard feature. M22 indicators can be equipped with an LED or incandescent lamp.

- Available in 5 colours
- Super-bright LEDs for all versions
- Lamp sockets with or without transformers
- UL and cUL approved

Ordering information

Display

Appearance	IP65 oil-resistant	
	Colour of display	Order code
Round/flat	Red	M22-FR
	Green	M22-FG
	Yellow	M22-FY
	White	M22-FW
	Blue	M22-FA
Square/projection	Red	M22-CR
	Green	M22-CG
	Yellow	M22-CY
	White	M22-CW
	Blue	M22-CA

Socket unit

Order code	
Voltage-reduction circuits	
Without voltage reduction unit	With voltage reduction unit (220 VAC)
M22-00	M22-00-T2

Lamp

AC/DC	LED light	Operating voltage			
		6 V	12 V	24 V	24 V superbright
AC	Red	A22-6DR	–	–	–
	Green	A22-6DG	–	–	–
	Yellow	A22-6DY	–	–	–
	Blue	A22-6DA	–	–	–
DC	Red	A22-6AR	–	–	–
	Green	A22-6AG	–	–	–
	Yellow	A22-6AY	–	–	–
	Blue	A22-6AA	–	–	–
AC and DC	Red	–	A22-12AR	A22-24AR	A22-24ASR
	Green	–	A22-12AG	A22-24AG	A22-24ASG
	Yellow	–	A22-12AY	A22-24AY	A22-24ASY
	Blue	–	A22-12AA	A22-24AA	A22-24ASA

Incandescent lamp	6 VAC/VDC	12 VAC/VDC	24 VAC/VDC	100 VAC/VDC
	A22-5	A22-12	A22-24	A22-H1

Accessories

M22 uses the same accessories as A22. Please refer to the relevant information in the corresponding section for the A22.

Specifications

Recognized organization	Standards	File number
UL, cUL	UL508	E41515

LED lamp

Rated voltage	Rated current	Operating voltage
6 VDC	60 mA (20 mA)	6 VDC ±5%
6 VAC	60 mA (20 mA)	6 VAC ±5%
12 VAC/VDC	30 mA (10 mA)	12 VAC/VDC ±5%
24 VAC/VDC	15 mA (10 mA)	24 VAC/VDC ±5%

Incandescent lamp

Rated voltage	Rated current	Operating voltage
6 VAC/VDC	200 mA	5 V
14 VAC/VDC	80 mA	12 V
28 VAC/VDC	40 mA	24 V
130 VAC/VDC	20 mA	100 V

Superbright LED indicator

Rated voltage	Rated current	Operating voltage
24 VAC/VDC	15 mA	24 VAC/VDC ±5%

Voltage-reduction lighting

Rated voltage	Rated current	Operating voltage
110 VAC	95 to 115 VAC	LED lamp (A22-24_)
220 VAC	190 to 230 VAC	

Ambient temperature	Operating: -20 to 55°C, storage: -40 to 70°C
Degree of protection	IP65
Electric shock protection class	Class II
PTI (tracking characteristic)	175
Degree of contamination	3 (IEC947-5-1)
Size in mm	Button: 29.7 dia.x16D, switch: 34Hx34Wx54.7D

JUST CREATE

One Software

Our software solutions reduce complexity by providing an integrated environment enabling users to design a modular automation system. Our concept is to provide ‘One Software’ that is simple and easy to use. Through Smart Components our software embeds advanced knowledge to speed up the entire process: development, commissioning and maintenance.

Check for more software:
www.omron-industrial.com



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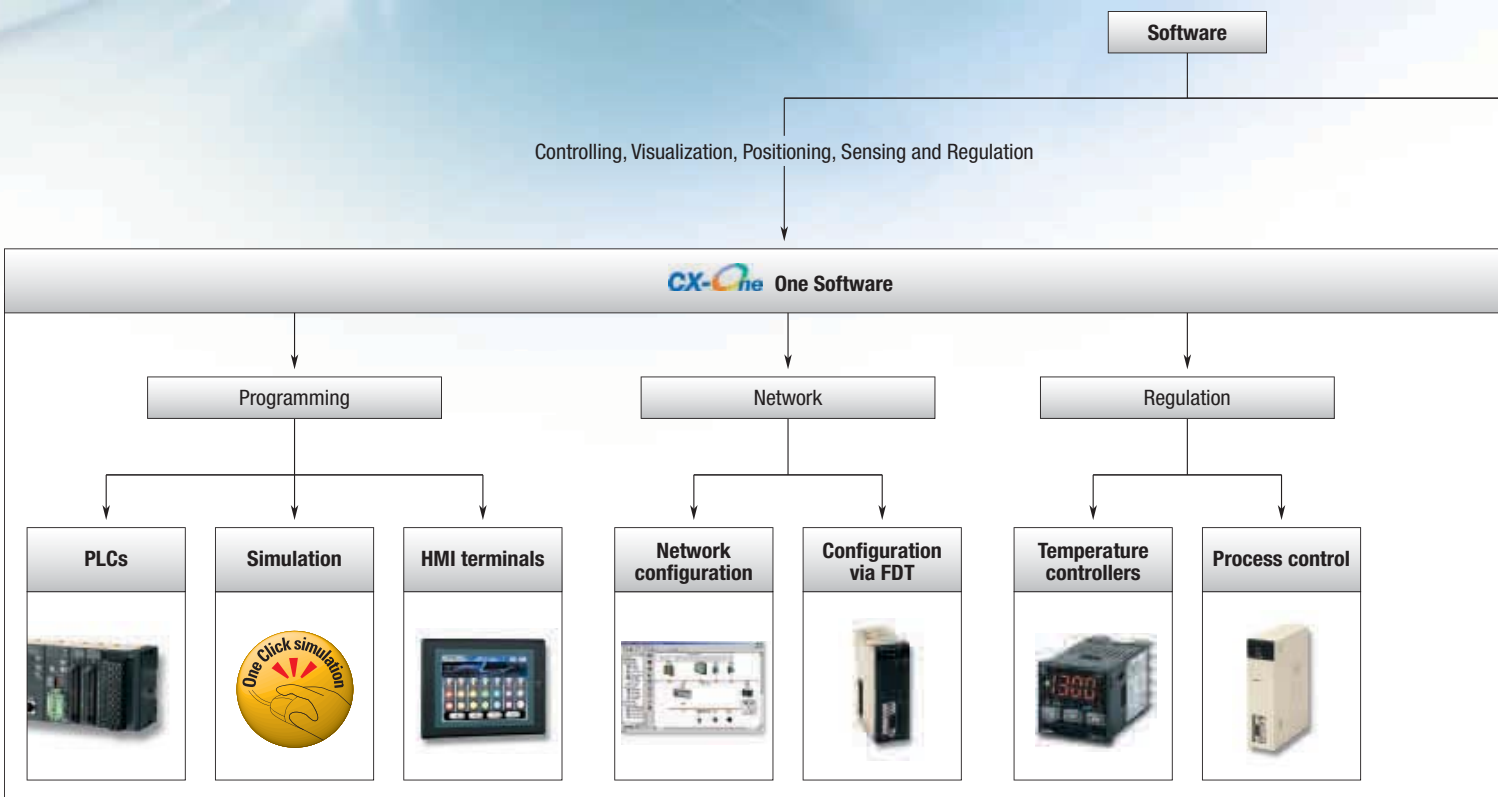
ONE SOFTWARE-ONE CONNECTION-ONE MINUTE

One software for all your automation needs

"One Software" is a key component of the overall vision of Smart Platform; Omron's integrated automation architecture. Our CX-One solution is based on a core architecture of open integration. This architecture not only allows all our applications to share core data and project design, but also we enable open connectivity by our reliance on key open standards such as FDT/DTM and OPC.

- Common graphic user interface
- One programming tool
- Control, visualise, position, detect and regulate

For more information visit:
www.smartplatform.info



A single software for programming controllers, HMIs, networks, motion controllers, drives, control units, switches and sensors



Operation and Monitoring

CX-Supervisor

CX-Server LITE

CX-Server OPC

Motion & Drive

Sensing

Motion control

Drives

Positioning

Laser measuring



Integrated “One software” that covers all your requirements for complete machine automation

This single programming and configuration environment is an integrated software management tool called CX-One that enables the user to build, configure and program networks, PLCs, HMIs, motion control systems, drives, temperature controllers and sensors. The result of a single software is to reduce complexity of the configuration and allow automation systems to be programmed or configured with minimal training.

By registering a licence number at www.omron-industrial.com, users can benefit from free upgrades to their version of CX-One. An automatic update service can notify users as soon as relevant updates are available.

CX-One is available as two types. FULL supporting all PLCs or LITE designed for our compact PLC range. Thus our integrated "One Software" applies to our complete portfolio.

Ordering information

CX-One FULL	Media	Order code
Single licence	Licence Only	CXONE-AL01-EV_
Three user licence	Licence Only	CXONE-AL03-EV_
Ten user licence	Licence Only	CXONE-AL010-EV_
Thirty user licence	Licence Only	CXONE-AL030-EV_
Fifty user licence	Licence Only	CXONE-AL050-EV_
Site licence	Licence Only	CXONE-AL0XX-EV_
Software on CDs	CD	CXONE-CD-EV_
Software on a DVD	DVD	CXONE-DVD-EV_

CX-One LITE	Media	Order code
Single user licence	Licence Only	CXONE-LT01-EV_
Software on CD	CD	CXONE-LTCD-EV_

Specifications

Subject	Indicator	Description
Programming	CX-Programmer	CX-Programmer provides one common PLC software platform for all types of Omron PLC controllers – from micro PLC's up to Duplex processor systems. It allows easy conversion and re-use of PLC code between different PLC types, and the full re-use of control programs created by older generation PLC programming software.
	CX-Simulator	A debugging environment equivalent to the actual PLC system environment can be achieved by simulating the operation of a CS/CJ Series PLC with a virtual PLC in the computer. CX-Simulator makes it possible to evaluate program operation, check the cycle time and reduce debugging time before the actual equipment is assembled.
	CX-Designer	CX-Designer is used to create screen data for NS-series Programmable Terminals. CX-Designer can also check the operation of the created screen data on the computer. CX-Designer enables efficient development process for screen creation, simulation and project deployment. Users can develop screens more efficiently with Easy-to-use Support Software. CX-Designer has about 1,000 standard functional objects with associated graphics and advanced functions, so even first-time users can create screens easily just by arranging functional objects in a screen.
Networks	CX-Integrator	CX-Integrator is the main configuration software for CX-One. It enables easy performance of many operations, such as monitoring the connection status of various networks, setting parameters, and diagnosing networks.
	CX-ConfiguratorFDT	Based on FDT/DTM technology, CX-ConfiguratorFDT can be used to configure devices from any vendor connected to a PROFIBUS network. This concept will later be expanded to support many more networks using this technology.
Motion & Drives	CX-Motion	CX-Motion can be used to create, edit, and print the various parameters, position data, and motion control programs (G code) required to operate Motion Controllers, transfer the data to the Motion Control units, and monitor operation of the Motion Control units. Increase productivity in every step of the motion control process, from development of the motion control program to system operation.
	CX-Drive	The complete current range of Omron Yaskawa inverters and servos is covered in this software with full access to all parameters (with 3 different operator levels available). An easy overview of parameters is also included which includes filters to show values that are: different from default, different from inverter, invalid setting. Graphical overviews are available to further assist with configuration of some more detailed parameters such as jump frequencies, v/f profiles and analogue setting.
	CX-Postion	CX-Position simplifies every aspect of position control, from creating/editing the data used in Position Control units (NC units) to communicating online and monitoring operation. The software is equipped with functions that can improve productivity, such as automatically generating project data and reusing existing data.
Regulation and Switching	CX-ThermoTools	CX-ThermoTools is a configuration and monitoring product for E5CN and E5ZN-series Temperature Controllers. It provides easy setup, online data logging, and real-time monitoring. Users can easily create, edit, and batch-download parameters from a personal computer, reducing the work required to set parameters. It is possible to monitor data for up to 31 Temperature Controllers at the same time.
	CX-Process	CX-Process simplifies every aspect of loop control, from creating/transferring function blocks to running the Boards/units and debugging (tuning PID parameters, etc.) operation. Function block programs can be created easily by pasting function blocks in the window and making software connections with the mouse.
Sensing	CX-Sensor	CX-Sensor allows configuration and monitoring of Omron's ZX range of sensors via a series of easy to use displays. The graphing dialog allows the outputs from several sensors to be reviewed and compared simultaneously, allowing configuration of complex processes. The software also includes a driver that allows sensor data to be accessed via an Omron serial control unit (SCU) and from other Omron applications such as CX-Supervisor. With the aid of Omron's CX-Server OPC application it is even possible to monitor sensor data in real time from Microsoft Excel.



Powerful Machine Visualisation

CX-Supervisor is dedicated to the design and operation of PC visualisation and machine control. It is not only simple to use for small supervisory and control tasks, but also offers a wealth of power for the design of the most sophisticated applications.

CX-Supervisor boasts powerful functions for a wide range of PC based HMI requirements. Simple applications can be created rapidly with the aid of a large number of predefined functions and libraries, and even very complex applications can be generated with a powerful programming language or VBScript™. CX-Supervisor has an extremely simple, intuitive handling and high user friendliness. Importing ActiveX® components makes it possible to create flexible applications and extend functionality.

CX-Supervisor now comes in two editions:

CX-Supervisor Machine Edition is the perfect choice for almost all machine visualization requirements. Supporting connection of up to 15 devices and up to 500 user definable points (array = 1 point), it is flexible and powerful enough for the control and supervision of a complete machine or an entire manufacturing process. And its easy-to-use Windows® Explorer-style development environment makes building the most sophisticated graphic interfaces simple.

CX-Supervisor PLUS is for those exceptional cases where an application demands a higher number of devices or points than can be handled by CX-Supervisor Machine Edition. It otherwise shares all of the same power and features.

Ordering information

Description	Media	Order code
Developer & runtime (no protection included)	CD	CX-SUPERVISOR-V_ _
Developer upgrade (no protection included, requires licence of previous version)	CD	CX-SUPERVISOR-UPGR-V_ _
Machine Edition runtime including USB dongle protection	CD	CX-SUPERVISOR-RUN-ME-V_ _
PLUS Edition runtime including USB dongle protection	CD	CX-SUPERVISOR-RUN-PLUS-V_ _

Specifications

Feature	Supervisor	
	Machine Edition	Plus
ActiveX	Yes	Yes
VBScript	Yes	Yes
Recipes	Yes	Yes
Alarms	300	3000
Animation	Yes	Yes
Max Devices (PLCs etc)	20	256
OPC Connections	Yes	Yes
Max Points	500	8000
Max Regular Interval Scripts	10	100
Max Num Pages	100	500
Databases supported	MS Access	MS Access SQL, ODBC, MS Access, MS Excel. dBase, CSV

CX-Server OPC



Omron's devices meet 'Open Integration'

CX-Server OPC provides a connection between the industry standard OPC interface specification and Omron's network architecture and controllers. CX-Server OPC allows any OPC compliant client software to interface easily with Omron.

The multi-vendor connectivity and information exchange capability of CX-Server OPC eliminates driver development issues.

CX-Server OPC includes an ActiveX OPC client control and a set of graphical components. Linking the graphical controls can be done without a single line of script. No programming knowledge is required!

Ordering information

Description	Media	Order code
CX-Server OPC	CD & Licence	CX-OPC-EV_

CX-Server LITE



Simple but effective connectivity

As a pair to our OPC product, CX-Server LITE is designed to meet a wide variety of programmers' needs from the simple to the advanced. Used to create PC-based simple HMI projects, CX-Server LITE allows designers of custom programs to send and receive PLC data and manipulate controllers within Omron networks.

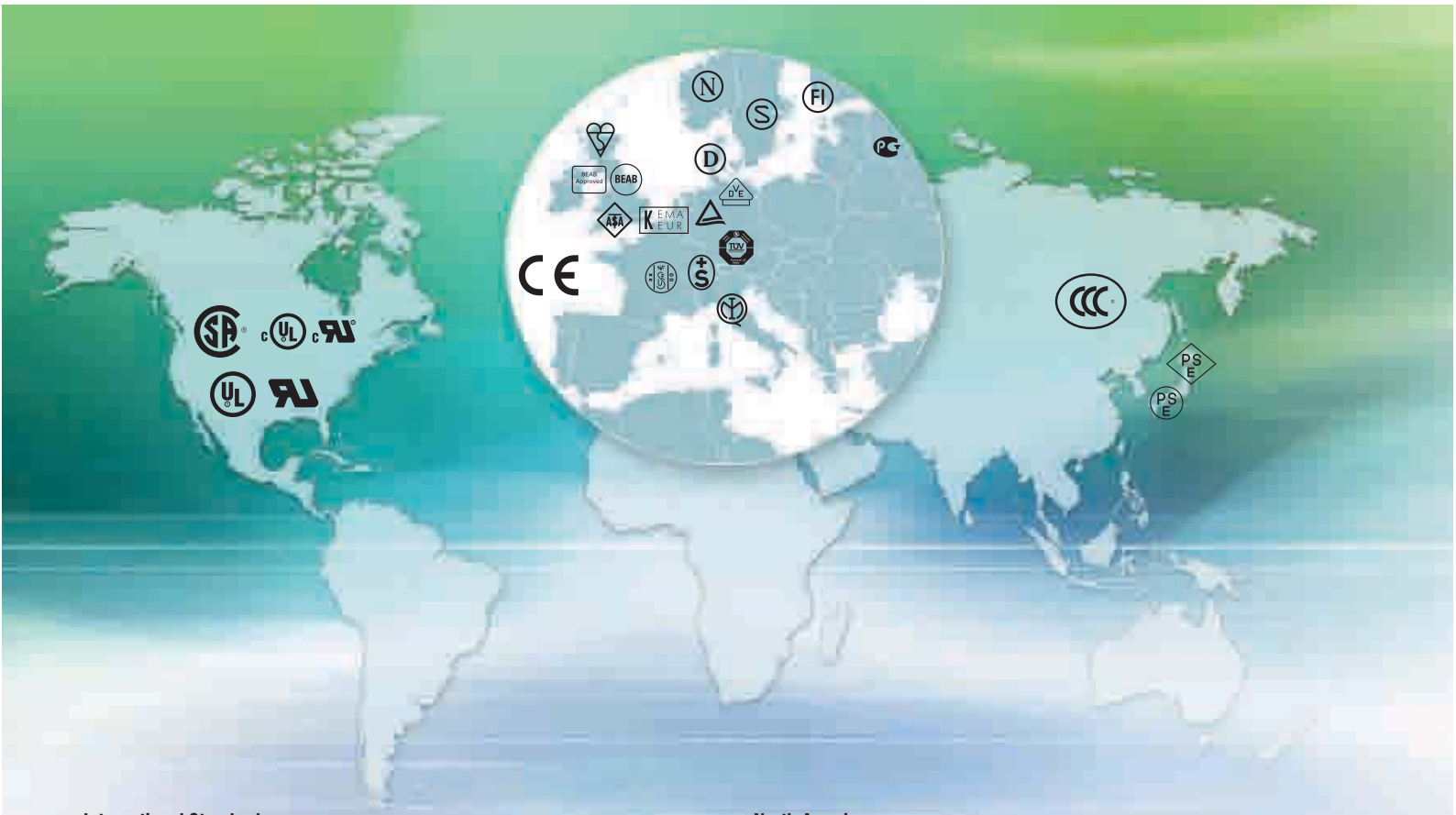
Based on ActiveX technology, it is easy to add a communications control to a VB project or an Excel spreadsheet. Live data can be updated directly into a cell or range of cells.

CX-Server LITE includes a set of graphical components designed to connect to the communications control. Linking the graphical controls can be done without a single line of script. No programming knowledge is required!

Ordering information

Description	Media	Order code
CX-Server LITE	CD & Licence	CX-LITE-EV_

Outline of Major Standards



International Standards

International standards consist of the IEC standards related to electricity and the ISO standards related to other areas (e.g., machines and management.)

IEC (International Electrotechnical Commission)

The IEC is a standardization commission founded in 1908 to promote unification and coordination of international standards relating to electricity. It is headquartered in Geneva, Switzerland.
Based on reports from member nations on the latest science technologies in those nations, IEC standards are issued as technological standards relating to electricity. Established international safety standards provided by various countries and accepted worldwide are based on IEC standards.
The IEC standards committees includes the CISPR (International Special Committee on Radio Interference) that makes standards for EMC (Electromagnetic Compatibility).
To simplify certification procedures for electrical devices and promote smooth international trade, there is an international scheme called CB Scheme (Certification Body Scheme), which is authorized by IEC standards. Based on the CB Scheme, safety tests on electrical devices are conducted and certificates are issued if the devices are proved to meet IEC standards.

ISO (International Organization for Standardization)

ISO is a standardization organization that started official activities in 1947 to promote international standards in all areas (e.g., machines and management) except for electricity, which is covered by the IEC, by issuing ISO standards. It is headquartered in Geneva, Switzerland.

North America

UL Standards (Underwriters Laboratories INC.)

LISTING MARK

A nonprofit organization established in 1894 by the American association of fire insurance companies. Underwriters Laboratories (abbreviated to UL hereafter) conducts certification testing on all kinds of electrical products. In many U.S. cities and states, UL certification is legally required on all electrical items sold. To obtain UL certification on an electrical product, all major internal components also require UL certification. UL offers two classifications of certification, the listing mark and the recognition mark.
A Listing Mark constitutes the entire certification of a product. Products display the Listing Mark shown below.

RECOGNITION MARK

The Recognition Mark applies to the components used in a product, and therefore constitutes a more conditional approval of a product. Use of the Recognition Mark is not required for non-specified parts (e.g., specified parts such as microswitches) Products display the Recognition Mark shown below.

Since October 1992, UL has been recognized as a CO (council organization) and TO (test organization) by the SCC (Standard Council of Canada). This authorizes UL to conduct safety tests and certify products conforming to Canadian standards. The above marks are UL marks for products certifying that the products meet Canadian standards.
The designs of the listing marks and recognition marks have been revised as shown below. These marks have been effective since January 1998. The previous marks are valid until November 2007.

Standards (Canadian Standards Association)

This association descended from a nonprofit, non-government standardization organization established in 1919. In addition to industrial standardization, the association now carries out safety testing on electrical products.
Standard development: The Canadian Standards Association
Product testing and certification: CSA International
This process is known as "certification," and consequently, CSA-certified equipment displays the mark shown below.

For detailed information please refer to:
http://www.ia.omron.com/support/models/outline

Europe

EN (European Norm) Standards

Of the EN standards related to electricity, standards beginning with "EN6" are based on IEC standards and those beginning with "EN55" are based on IEC-CISPR standards. Standards beginning with "EN5" are unique EU standards that do not exist in the IEC standards.
The following marks of recognition are used by the Certification Bodies in European countries in accordance with EN standards.

Germany

VDE MARK — VDE (Verband Deutscher Electroechnischer e.V.)

TÜV Rheinland — TÜV (Technischer Überwachungs Verein e.V.) Rheinland

TÜV Product Service — TÜV product services

Denmark

DEMKO (Danmarks Elektriske Materielkontrol)

Norway

NEMKO (Norges Elektriske Materiellkontroll)

Finland

FIMKO (Finlands Material Kontroll)

United Kingdom

BSI (British Standards Institution, applicable to industrial products)

BEAB (British Electrotechnical Approvals Board, applicable to home electronics products)

ASTA (ASTA Certification Services, applicable to general products)

The Netherlands

KEMA (Keuring van Electrotechnische Materialen Nederland B. V.)

France

UTE (Union Technique De Electricite)

Italy

IMQ (Istituto Italiano del Marchio di Qualita)

Russia

GOST-R

Sweden

SEMKO (Svenska Elektriska Materielkontroll Anstalten)

Switzerland

SEV (Schweizerischer Electrotechnischer Verein)

EC (European Communities) Directives

CE MARKING

In the EU (European Union), EC Directives are announced to instruct the creation of laws in the EU member countries. A product can display the CE Marking only when it conforms to all of the directives applicable to it, such as the New Approach Directives, which cover the Machinery Directive, Low Voltage Directive, and the EMC Directive. As a rule, EN standards announced as Harmonized Standards in the Official Journal of the European Communities are used to evaluate directive compliance.

China

CCC (China Compulsory Certification) Mark

CCC MARK

As a result of China joining the WTO (World Trade Organization) in 2001, the previous Safety License System for Import Commodities and the Compulsory Supervision System for Product Safety Certification were combined to form the CCC. The change was announced on 3 December 2001 and implemented from 1 May 2002. Starting 1 August 2003, any products that have not received the CCC Mark are prohibited from import to or sale in China.
Products Subject to CCC Mark: 19 product sections consisting of 132 product categories
Applicable Standards: National Standards (GB: Guojia Biaozhun) (Standards related to electricity were based on IEC standards.)
CCC Mark: Display of the CCC Mark is legally required.

Japan

Electrical Appliance and Material Safety Law of Japan

Special Electrical Appliances and Materials

Other Electrical Appliances and Materials

Accompanying revisions to laws related to electrical appliances, the Electrical Appliance and Material Safety Law was switched to on 1 April 2001 and the previous Electrical Appliance and Material Control Law was abolished. New marks were also created for the Electrical Appliance and Material Safety Law.
The law covers 112 specified electrical appliances and materials and 340 non-specified electrical appliances and materials.
Article 2 of the Ordinance Concerning Technical Requirements for Electrical Appliances and Materials specifies technical requirements (IEC-J standards) harmonized with IEC standards.

Marine Standards

There are more than 20 classification societies worldwide that individually work to create regulations and certify compliance. The IACS (International Association of Classification Societies) works as an international body currently consisting of 10 member classification societies plus 2 associate classification societies. The classification societies in the IACS certify and register 90% of the world's ships. The option to be classified is made by the owner of the ship; classification certification is undertaken by the shipyard at the request of the owner.
Classification certification has a close relationship to maritime insurance. Insurance underwriters will as a rule insure only ships that have been classified and refuse those without a certified classification. Therefore, automation devices used on ships must conform to classification standards of individual countries if so requested by the owner.
Although classification societies will often recognize portions of inspection data that have the same requirement from other classification societies, requirements and standards differ among the classification societies. Classification societies therefore they do not recognize certification from other classification societies. It is thus necessary to comply with the classification standards of the required classification society. If registration is required in more than one classification, then certification is required for both.

IACS Member Classification Societies

ABS (American Bureau of Shipping), BV (Bureau Veritas, France's classification society), CCS (China Classification Society), DNV (Det Norske Veritas, Norway's classification society), GL (Germanischer Lloyd, Germany's classification society), KR (Korean Register of Shipping), LR (Lloyd's Register of Shipping, Britain's classification society), NK (Nippon Kaiji Kyokai, Japan's classification society), RINA (Registro Italiano Navale, Italy's classification society), RS (Russian Maritime Register of Shipping)

IACS Associate Classification Societies

IRS (Indian Register of Shipping)

Other Classification Societies

CR (China Corporation Register of Shipping, Taiwan's classification society)

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