

OMRON TM Collaborative Robots



OMRON

OMRON TM Collaborative Robots

OMRON's line-up of collaborative robots include a variety of models to guarantee the right reach and payload for different applications, including mobile robot compatible (DC) versions.



Designed to meet safety regulations ISO 10218-1 (including TS 15066) and ISO 13849-1.



TM 5-700

Reach: 700 mm



MAX
PAYLOAD
6 Kg

TM 5-900

Reach: 900 mm



MAX
PAYLOAD
4 Kg

TM14

Reach: 1100 mm



MAX
PAYLOAD
14 Kg

TM12

Reach: 1300 mm



MAX
PAYLOAD
12 Kg

Key Industries & Applications

OMRON TM Collaborative Robots are designed for a wide variety of applications in a number of industries.

Key Industries

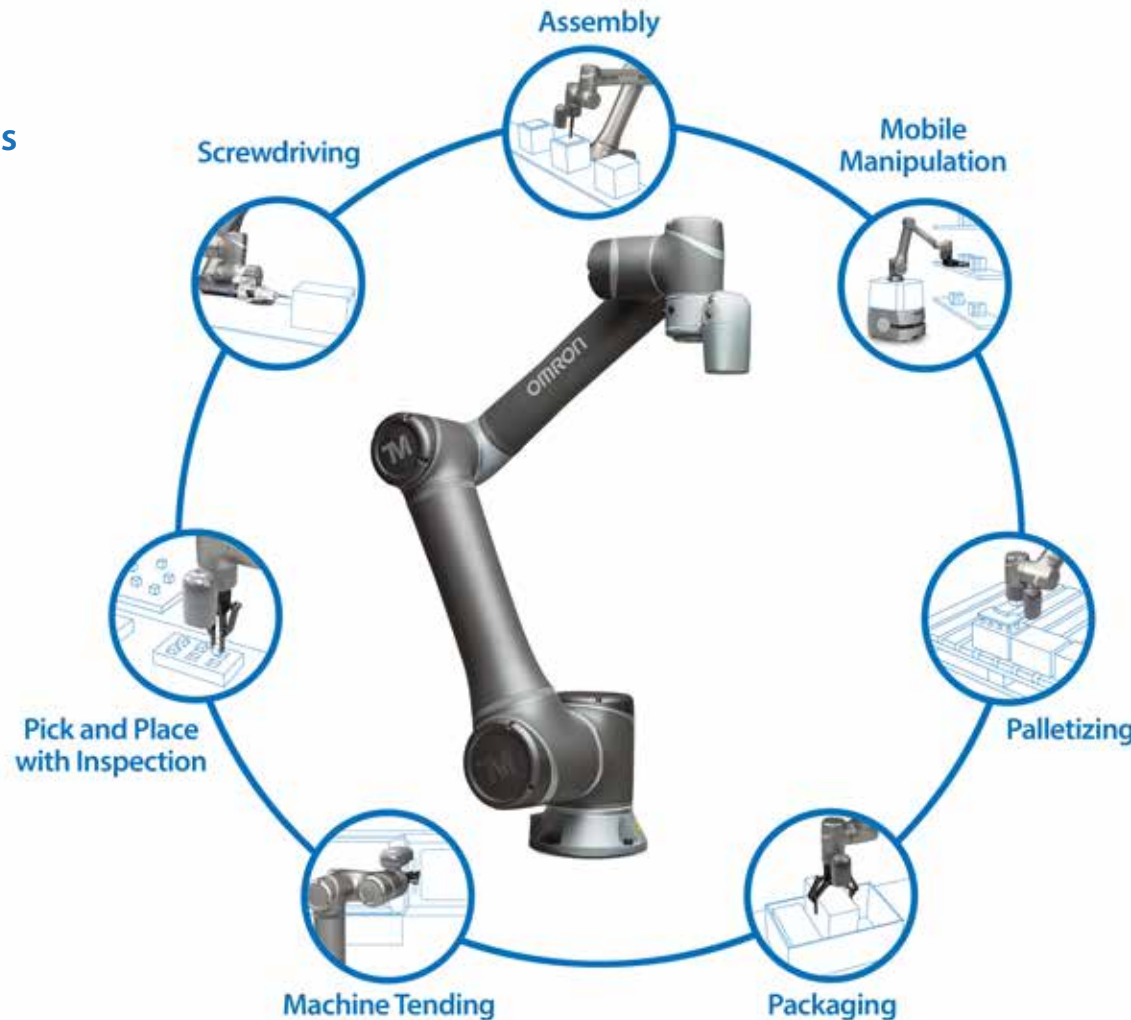
Automotive



Food & Commodities



Digital & Semiconductor



Assembly:

Our cobots can improve throughput and consistency of repetitive or complex assembly tasks including part joining, insertion, tool changing, and working alongside people.

Mobile Manipulation:

Mounting an Omron TM cobot onto an OMRON LD mobile robot, this robotics solution automates not only transportation of goods but also complicated picking operations.

Palletizing:

Our space-saving cobots can streamline end-of-line case stacking onto a pallet. With built-in vision, cases can be sorted by barcode or other visual indication.

Packaging:

Our cobots can inspect and sort products, before putting them into cases. Customers can quickly adapt production lines to new products or seasonal models.

Machine Tending:

A cobot can be used to tend CNC machines, injection molding machines, stamping and punch pressers, grinding, and cutting machines, relieving workers from repetitive and dangerous work.

Pick and Place with Inspection:

Our cobots feature a built-in vision system that allows for easy pick-and-place together with sophisticated inspection, without the need for installing additional cameras or lighting equipment.

Screwdriving:

Our cobots add precision and consistency to your screwdriving and parts fastening applications. A complete ready-to-use solution is provided with a screwdriving kit and pneumatic control box.

Easy to Use

With graphical programming, hand guiding, and intelligent vision, OMRON TM cobots are designed to be easy and intuitive. Customers can set up simple applications in just a few minutes.

Hand Guide

Hand guide mode allows users to easily set points and assign tasks to the robot. With buttons built into the cobot arm, users can guide the robot into position and automatically record the position in the software.



ISO/TS 15066 Oriented Safety Settings

Our unique patented "body region safety settings" have preset safety parameter values, based on TS 15066 and robot kinematics. There is no need to understand complicated safety calculations to set up a safe application.

Intelligent Vision

Our built-in vision system allows for quick setup of pick-and-place tasks, with the help of easy hand guiding and landmark positioning.

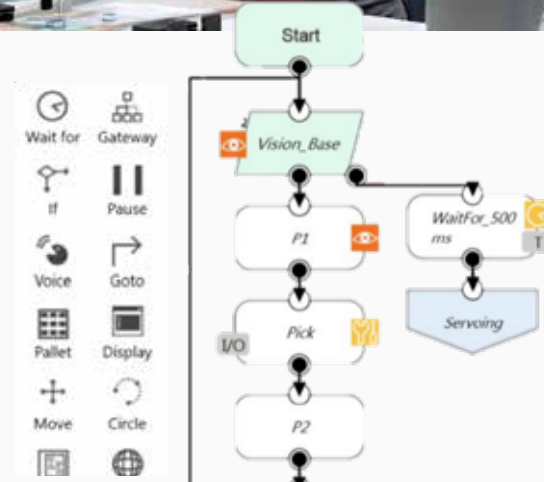


Landmark

A landmark is a physical object that can be recognized by the robot's built-in camera, and acts as a beacon to help the robot navigate. The robot uses a Landmark as a reference point so it can better locate objects within the workspace. During high-mix, low-volume production with quick changeovers, customers can redeploy the robot without spending time to recalibrate the vision system.

Graphical Programming

Intuitive programming allows users to automate a task with flow-based software, creating full workflows with a click-and-drag method.



Designed for Flexible Manufacturing

OMRON TM Collaborative Robots are designed to be easily redeployed to different tasks and applications, making production as flexible as needed.

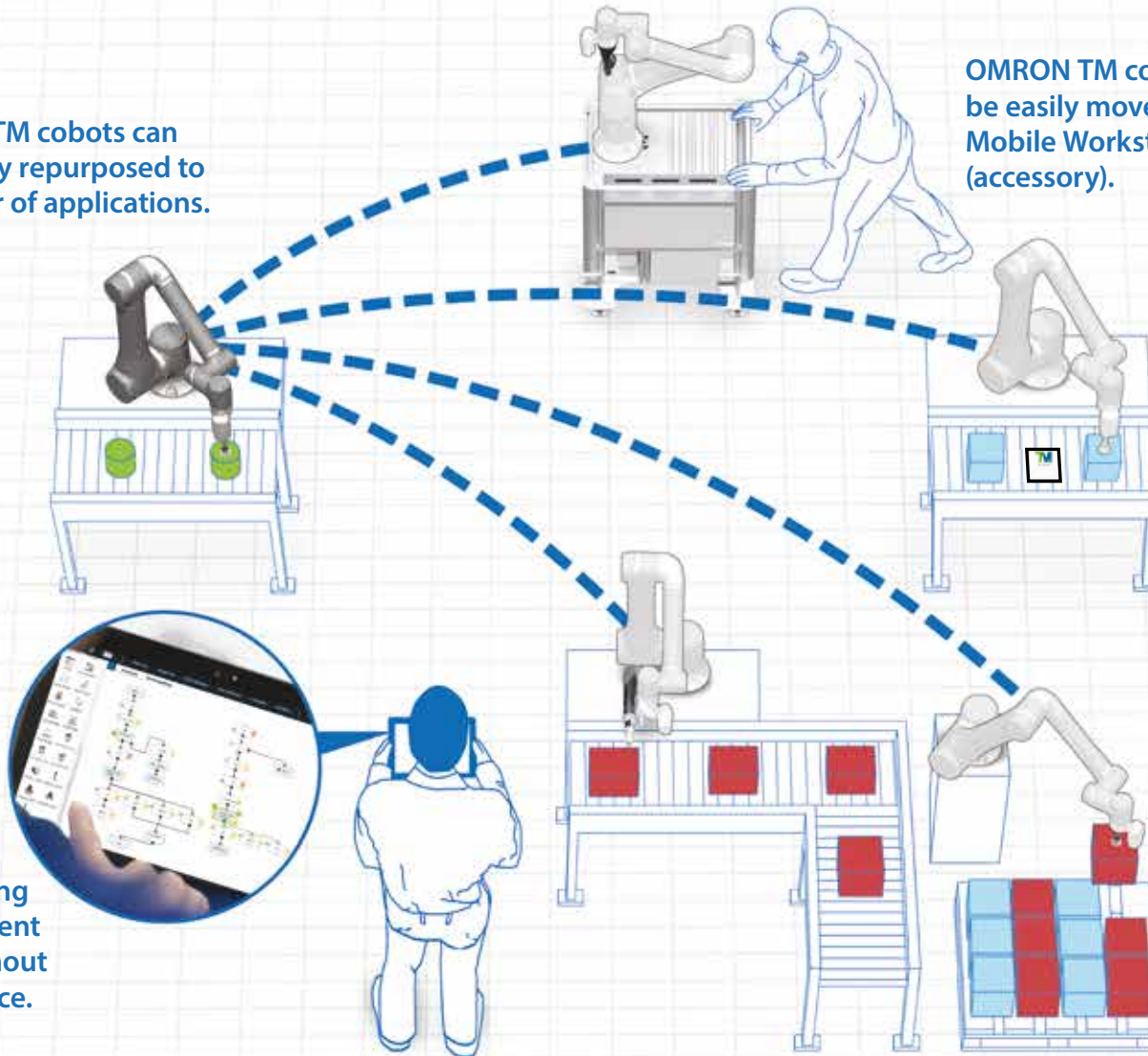
OMRON TM cobots can be quickly repurposed to a number of applications.

OMRON TM cobots can be easily moved on the Mobile Workstation (accessory).

The built-in vision system uses Landmarks that help the cobot navigate without the need for fixed jigs.

Graphical programming allows quick deployment and changeovers without prior coding experience.

OMRON TM Collaborative Robots can fit into small spaces, even inverted or at any angle, making them adaptable to almost any factory environment.



Global Network

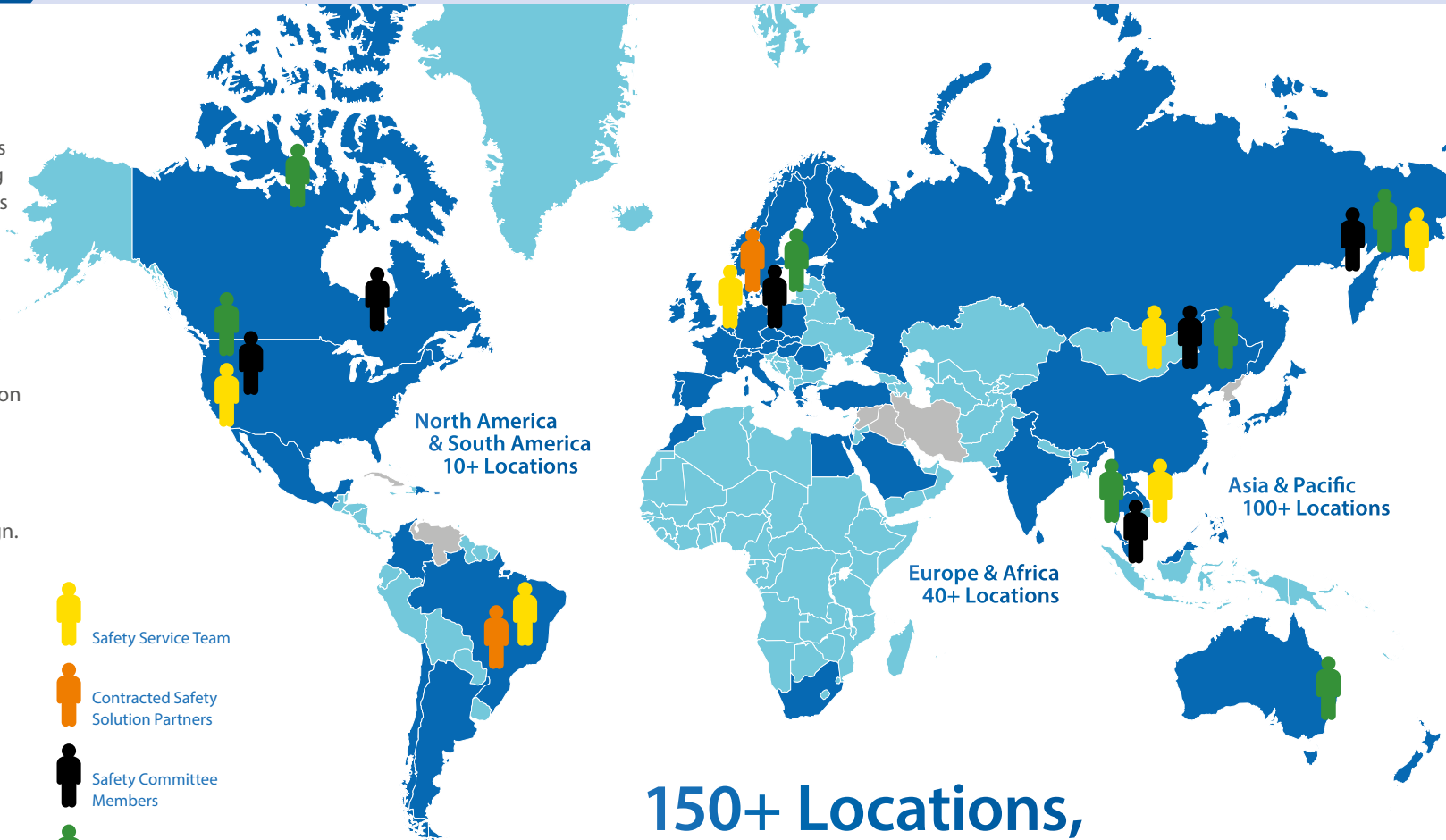
For decades, OMRON safety services have been the partner of choice of global brands and machine manufactures in automotive, food and beverage, consumer electronics and cosmetics industries. Our expertise in industrial, mobile, and collaborative robotics combined with 85+ years of experience in industrial automation gives us unparalleled expertise in safety.

Risk Assessment Service

OMRON's Risk Assessment Service helps customers mitigate potential safety hazards before deploying a robotics solution. Our functional safety engineers bring unrivaled expertise to work with customers onsite, to identify relevant standards and requirements for human-machine interaction.

We offer:

- Support with process analysis, identification of application use cases, tasks, and potential collision points.
- Risk, compliance, and conformity assessment according to latest industry standards.
- Risk reduction strategies with a focus on shared human-robot workspace and end-effector design.



**150+ Locations,
40+ Countries
20+ Languages**

Anatomy of OMRON TM Cobot



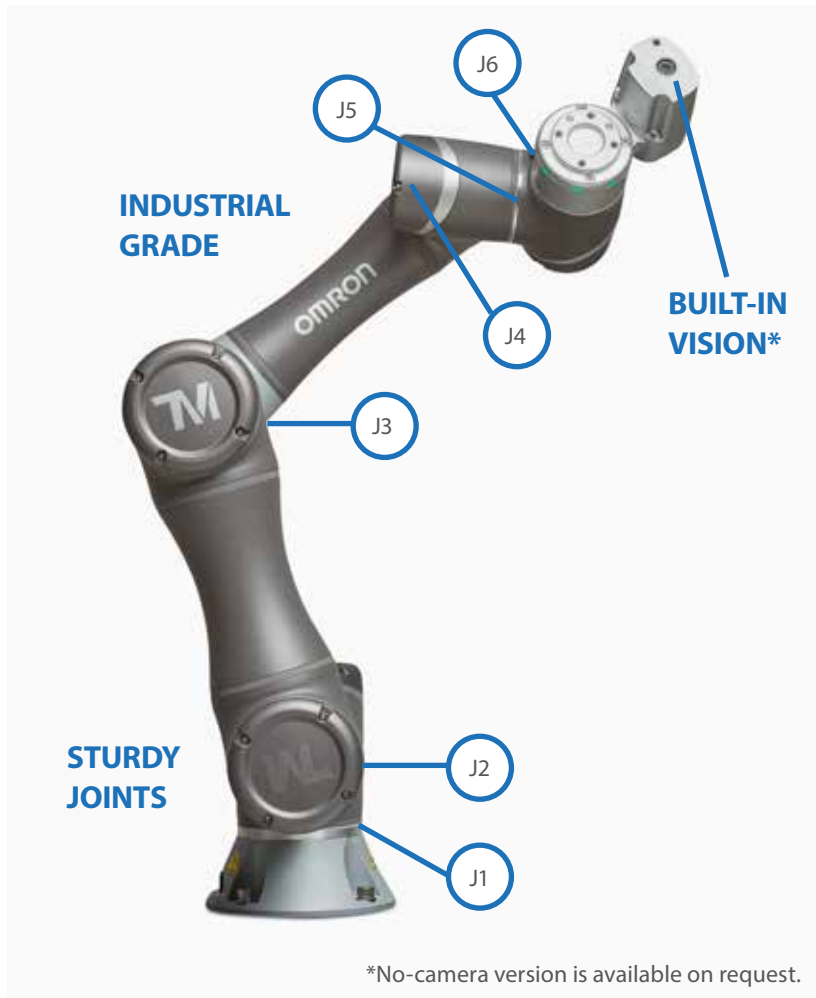
- 1 VISION button teaches vision tasks and task sequences
- 2 POINT button records position in cobot program
- 3 FREE button allows hands-on teaching



- 4 Analog I/O port
- 5 Indicator light ring shows robot status
- 6 Digital I/O port



- 7 Built-in camera with integrated light
- 8 Gripper button
- 9 End-of-arm tooling flange



Built-In Vision

The integrated vision system is the biggest advantage of OMRON cobots. It is designed for industrial grade pattern recognition, object positioning, and feature identification. Users can set up vision tasks for immediate deployment without going through complex steps of integrating external cameras or lighting equipment.



Landmarks



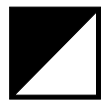
Contrast



Color Plane Extraction



Smoothing



Thresholding



Morphology



Image Flipping

Character Recognition



Anchor



Pattern Matching (Shape)



Pattern Matching (Image)



Fiducial Mark Matching



Blob Detection



Barcode, 2D, QR Reading



Color Identification



Plug & Play

OMRON has partnered with a select number of companies to offer a wide variety of peripherals that quickly and easily integrate with our cobots, allowing for a faster deployment and return on investment. They are collectively referred to as Plug & Play devices and software, designed to serve a broad range of customer applications and meet the highest testing standards of OMRON.

Plug & Play Categories



Plug & Play Kits

All products come as a ready-to-use kit for easy installation.

Mobile Manipulator

More manufacturers are exploring mobile manipulator solutions to combine the benefits of collaborative robotics with autonomous mobile robotics, so they can deploy the most agile solution into their factories. With our extensive experience in industrial automation, both mobile and collaborative robots, OMRON is uniquely capable of providing a complete mobile manipulation solution. The whole manipulator can be built with OMRON products, with the best performance in the market.

By mounting an OMRON TM collaborative robot arm onto an OMRON LD series autonomous mobile robot, this mobile manipulator is capable of picking up a product and carrying it to different locations. It greatly reduces human error associated with transporting high-value products, as well as human contamination associated with products such as wafer FOUP. Working as a standalone platform or in a fleet, this solution adds traceability to your production and increases efficiency.

OMRON's mobile manipulator solution provides the easiest integration, and offers the most stable performance and longest battery life in the market. The solution also adheres to SEMI S2 standards. OMRON's local application engineering team can provide guidance on how to optimally integrate our mobile and cobot offerings.

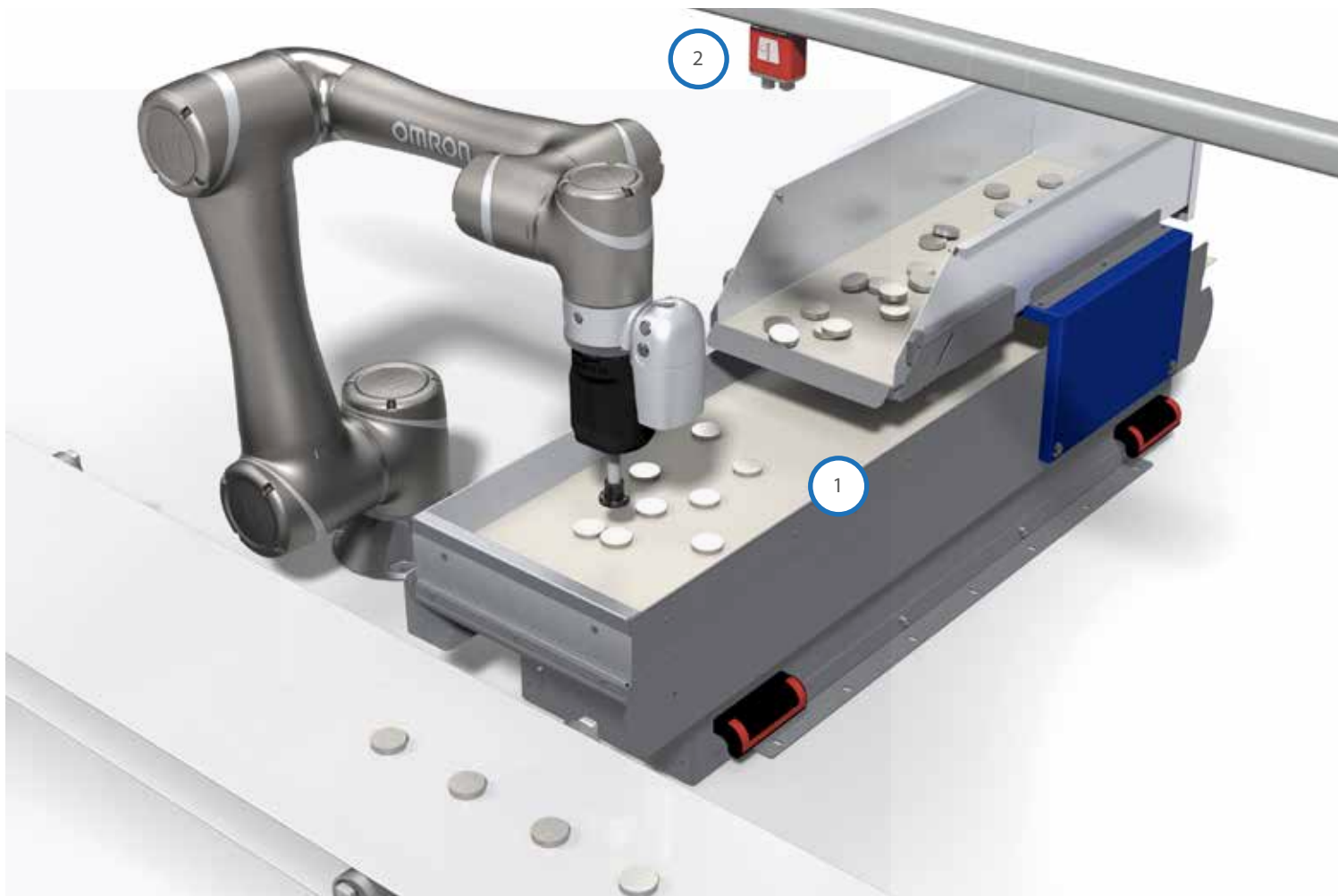
The solution is Ideal for:

- Material transportation of high-value products (e.g., semiconductor wafers, jewelry, biological samples)
- Picking boxes of assembled parts and delivering to inspection station
- Machine tending and tool changing at multiple stations
- Random spot checking, such as identifying cracks of paint imperfection on moving products



Flexible Feeding

OMRON's Flexible Feeding solution provides a compact and cost-effective system for automated assembly. Solution includes OMRON cobot, OMRON Microscan smart camera, and OMRON AnyFeeder.



The solution is ideal for flexible feeding applications requiring vision systems to identify the location, orientation, and shape of different parts, where occasional human interaction might be needed.

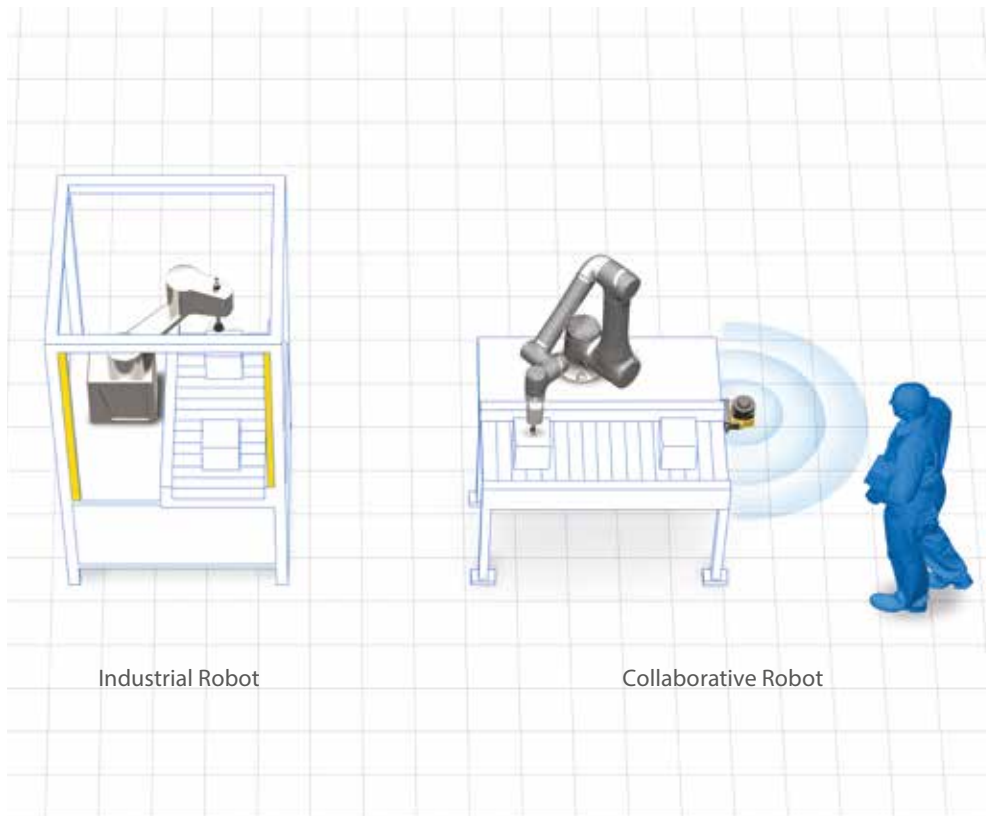
- Simplifies consolidation of compact feeding systems by incorporating integrated vision
- Safe collaboration with humans during feeding and assembly processes
- All cobot and AnyFeeder models compatible with solution

1: OMRON's AnyFeeder is an advanced and flexible bulk parts feeder with an integrated storage to hold components of various shapes and materials.

2: OMRON's MicroHAWK platform offers the most advanced machine vision capability on the world's smallest smart cameras. MicroHAWK cameras are fully-integrated with optics, processors, and lighting to take on any inspection task.

Choosing Cobots vs. Industrial Robot

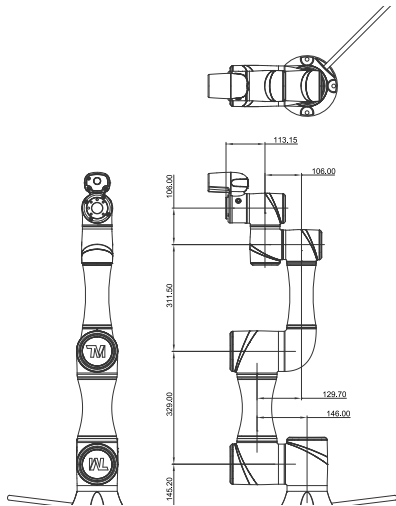
OMRON™ Collaborative Robots change the way the traditional factory used to work. No physical cages are needed anymore. Designed for high-mix, low-volume production at a speed comparable to human workers, OMRON™ cobots can work in harmony with humans.



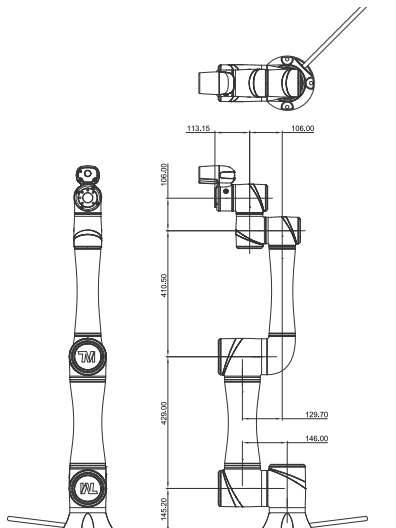
	Traditional Industrial Robots	OMRON Cobots
Safety	Needs a physical barrier, such as a fence or cage, to ensure safety.	Designed to be inherently safe but may need safety sensors to ensure that the application is safe (e.g. OMRON safety laser scanner) based on risk assessment. Typically does not need physical barrier if working in collaborative mode. Software safety setting is easy with graphical user interface.
Workspace	Separated from human workspace.	Can be shared with people.
Footprint	Large	Small
Flexibility	No. Fixed to one location and works on dedicated task.	Yes. Can be moved between locations during the day to work on different tasks. Built-in camera and Landmark positioning enable quick relocation.
Programming	Difficult. Requires skill and training.	Easy. Can be done with minimal training.
Setup	Requires advanced skills and is time-consuming.	Quick and easy.
Application	Fit for mass production at high speeds.	Fit for high-mix, low-volume production at a speed comparable to human workers. Can be used at high speeds with safety measures.
Cycle Time (Pick & Place)	Down to seconds	Over 5 seconds
Speed of Process (Path)	Below 8.2 m/s	Below 1.4 m/s
Repeatability	+/- 0.02 mm	+/- 0.05 mm
Environment	IP requirements above IP54	IP54 (robot arm), IP32 (control box)
Process Complexity	Can be complex	Should be simple

Technical Data

TM5



TM5-700



TM5-900

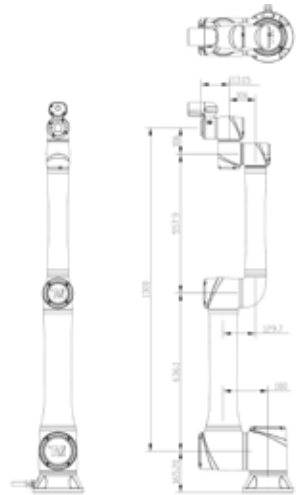
TM5 Specifications

Product Name	TM5-700	TM5M-700	TM5M-700 SEMI	TM5-900	TM5M-900	TM5M-900 SEMI
Part Number	RT6-0007000	RT6-0107000	RT6-0107010	RT6-0009000	RT6-0109000	RT6-0109010
Weight (kg)	22.1			22.6		
Controller Weight (kg)	13.5	14.5	14.5	13.5	14.5	14.5
Max Payload (kg)	6			4		
Reach (mm)	700			900		
Mounting	Wall, Table, Ceiling					
Typical Speed (m/s)	1.1			1.4		
Joint Range	Joint 1	+/- 270°				
	Joint 2,4,5	+/- 180°				
	Joint 3	+/- 155°				
	Joint 6	+/- 270°				
Joint Speeds	Joint 1,2,3	80°/s				
	Joint 4,5,6	225°/s				
Repeatability (mm)	+/- 0.05					
IP	IP54 (robot arm), IP32 (control box), IP40 (robot stick)					
Operating Temperature (° C)	0-50					
Power Supply	100-240 VAC, 50-60 Hz	22-60 VDC	22-60 VDC	100-240 VAC, 50-60 Hz	22-60 VDC	22-60 VDC
I/O Ports	Control Box	Digital In: 16 Digital Out: 16 Analogue In: 2 Analogue Out: 1				
	Tool	Digital In: 4 Digital Out: 4 Analogue In: 1 Analogue Out: 0				
I/O Interface	3 X COM, 1 X HDMI, 3 X LAN, 4 X USB2.0, 2 X USB3.0					
Communication	RS232, Ethernet (master), Modbus TCP/RTU (master & slave)					
Integrated Camera	5M pixels, color					
I/O Power Supply	24V 1.5A (control box and tool)					
Programming Environment	TMflow, flowchart based					
SEMI S2 Certified	No	No	Yes	No	No	Yes

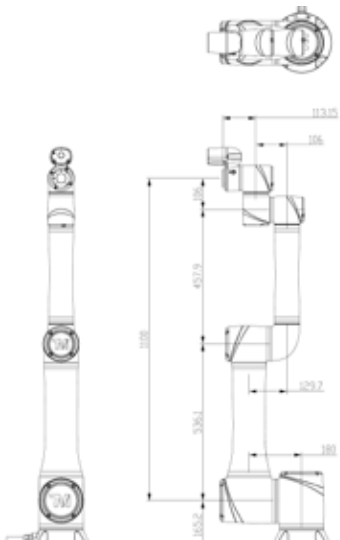
*no-camera version available on request.

Technical Data

TM12/14



TM12




TM14

TM12/14 Specifications

Product Name	TM12	TM12M	TM12M SEMI	TM14	TM14M	TM14 SEMI
Part Number	RT6-1001300	RT6-1101300	RT6-1101310	RT6-2001100	RT6-2101100	RT6-2101110
Weight (kg)	33.3			32.6		
Controller Weight (kg)	13.8	14.5	14.5	13.8	14.5	14.5
Max Payload (kg)	12			14		
Reach (mm)	1300			1100		
Mounting	Wall, Table, Ceiling					
Typical Speed (m/s)	1.3			1.1		
Joint Range	Joint 1	+/- 270°				
	Joint 2,4,5	+/- 180°				
	Joint 3	+/- 166°			+/- 163°	
	Joint 6	+/- 270°				
Joint Speeds	Joint 1,2,	120°/s				
	Joint 3	180°/s				
	Joint 4,5	180°/s			150°/s	
	Joint 6	180°/s				
Repeatability (mm)	+/- 0.1					
IP	IP54 (robot arm), IP32 (control box)					
Operating Temperature (° C)	0-50					
Power Supply	100-240 VAC, 50-60 Hz	22-60 VDC	22-60 VDC	100-240 VAC, 50-60 Hz	22-60 VDC	22-60 VDC
I/O Ports	Control Box	Digital In: 16 Digital Out: 16 Analogue In: 2 Analogue Out: 1				
	Tool	Digital In: 4 Digital Out: 4 Analogue In: 1 Analogue Out: 0				
I/O Interface	3 X COM, 1 X HDMI, 3 X LAN, 4 X USB2.0, 2 X USB3.0					
Communication	RS232, Ethernet (master), Modbus TCP/RTU (master & slave)					
Integrated Camera	5M pixels, color					
I/O Power Supply	24V 1.5A (control box and tool)					
Programming Environment	TMflow, flowchart based					
SEMI S2 Certified	No	No	Yes	No	No	Yes

*no-camera version available on request.



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