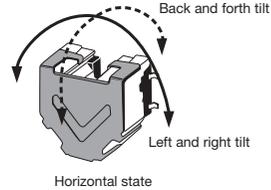


Subminiature PCB Mounting Sensor Discriminating Left or Right Tilt

- Detects the inclination of the Sensor within an activated angle range between 45° and 75° (left and right) and a reset angle between 50° and 20°
- A subminiature SMD PCB mounting model
- A highly reliable solid-state type by Hall IC
- A surprisingly low power consumption with a maximum of 20µA
- Lead-free



Ordering Information

Output configuration	Model
ON/OFF	D6B-2(P)

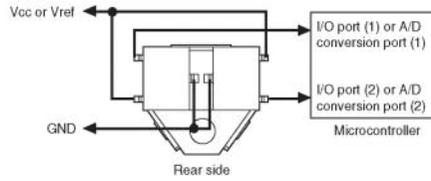
Application

Vertical or horizontal discrimination of digital cameras, PDAs, and cellular phones.

Performance

Operating characteristics	Activated angle	45° to 75° (left and right)
	Reset angle	50° and 20° (left and right)
Output Config.	Horizontal state	High-voltage signal output from the terminals on both sides.
	Inclined left or right	Low-voltage signal output only from the terminals on the side of the moving direction.
Electrical characteristics	<p>Note: Characteristic values are provided, on condition that there is no tilt back and forth while the operation speed is 10° per second.</p>	
	Ta = 25° and Vdd = 3V DC	
	Power supply voltage range (Vdd)	2.7 to 3.3 V DC
	High-voltage output	Vdd-0.5V min.
	Low-voltage output	0.5V DC max.
	Current consumption	20 µA max. (10 µA typical)
Maximum ratings	-0.1 to 5.0 V	
	Power supply voltage (Vdd)	
	Output current (Iout)	± 1mA
Basic specs.	Ambient temperature (operating)	-10°C to 60°C (with no condensation)
	Ambient temperature (storage)	-25°C to 70°C (with no condensation)
	Ambient humidity (operating)	25% to 85%

Electrical Connections



Soldering Condition

1. Recommendation reflow solder condition(infrared rays method)Please set the thermo-couple on the side of the terminal and set the reflow furnace as follows.

*In the case of Sn-Pb eutectic solder

	Temperature °C	Time(s)
Preheat area	140	90±30
Reflow area	230±5	≥ 20
Peak temperature	max. 240	≥ 5

*In the case of Pb-free solder

	Temperature °C	Time(s)
Preheat area	160±180	90±30
Reflow area	230±5	≥ 40
Peak temperature	max. 250	≥ 10

*Reflow times: Less than 2 times

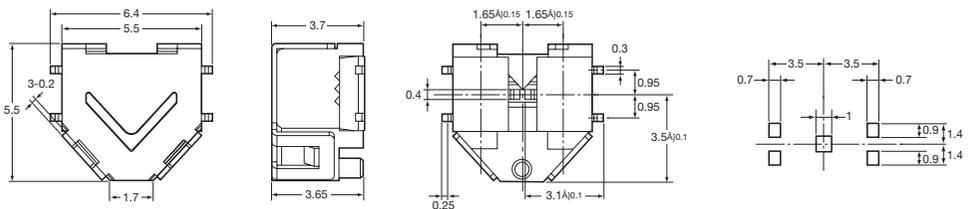
2. Detaching condition by blower

Please go within the detaching condition temperature 240°C and 5 seconds.

3. Please go for the hand solder at temperature 260°C and 10 second ahead or 350°C and 3 second or less.

4. The conventional solder containing lead can also be used.

External Conditions



Cautions

- The Sensor does not use any materials detrimental to the ozone layer.
- Specifications other than the electrical or mechanical characteristics, external dimensions, or mounting dimensions of the Sensor are subject to change without notice.

■ Handling Precautions

Operating Environment

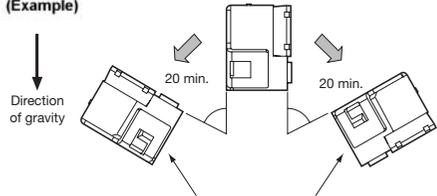
- The Sensor consists of a Hall IC and a magnet. Check that the Sensor in operation will not be influenced by any external magnetic fields.
- Do not install any magnetic materials within 2 mm of the Sensor, else the performance characteristics of the Sensor may not be guaranteeable. If there are any objects (e.g., motors and solenoids) generating magnetic fields near the Sensor, operate and test the Sensor before the Sensor comes into actual use.
- Do not apply any voltage exceeding 5V to the Sensor, else the Sensor may break.
- Do not wash the Sensor after the Sensor is soldered.
- Do not mount or dismount the Sensor while power is flowing to the Sensor.
- The Sensor may generate error signals if impacted at a minimum acceleration of 294 m/s^2 .
- The Sensor may generate error signals if a vibration at a minimum frequency of 15 Hz and a minimum acceleration of 15m/s^2 is applied to the Sensor.

- Confirm that no static electricity at a maximum voltage of 5kV is applied to the pins, else the Sensor may break.

Operating Characteristics

The present output may be kept if the inclination of the Sensor back and forth is 20° or over. Under that condition, the output may not change even when the Sensor is leaned left or right.

(Example)



If the Sensor is kept inclined back or forth as shown in the above illustration, the level of output may not change from high to low or low to high when the Sensor inclines left or right.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Air Flow detector specifically to detect clogged conditions in air filters on servers and other types of computer equipment

- Detects the clogged conditions of air filters more efficiently than a conventional time totaling meter
- Adopts a velocity of the wind monitor employing an NTC thermistor to output 0 to 5V analog voltage signals



Ordering Information

Model
D6A-N

Specifications

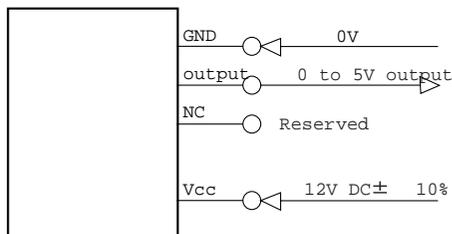
Mounting method	Front secured with nylon rivets (see External Dimensions for the dimensions of the Sensor)
Temperature device	NTC thermistor (epoxy resin coat)
Detection method	Velocity of wind monitor method (80 °C own heating type)
Connector	Japan Aviation Electronics Industry's 1L-Z Series
Operating temperature	0°C to 45°C (with no icing)
Storage temperature	-25°C to + 65°C
Operating humidity	25 to 85%RH
Storage humidity	25 to 85%RH
Applicable gas	Air
Range of velocity of wind detection	0.5 to 1.5m/sec.
Mounting direction	Mount the Sensor so that the ventilation opening will be located vertical to the wind direction.
Drive power supply	12V DC asd ± 10%
Operating environmental conditions	The Sensor must be free of oil, moisture, and/or dust. Otherwise, the thermal diffusion characteristics of the Sensor will change.

Caution: Judge the degree of clogging condition from a voltage differential based on the initial voltage obtained when the filter is clean. One minute will be required for the stabilization of the Sensor after the Sensor is turned on.

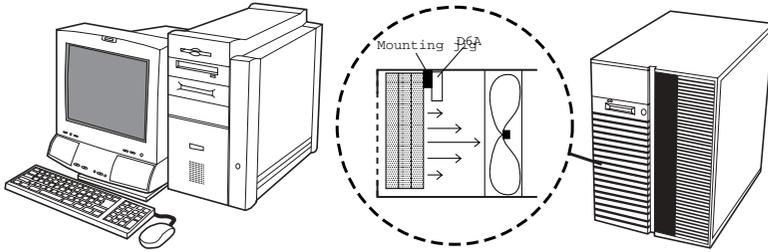
Performance

Head	Test Method	Criteria
(1) Output voltage characteristics	<ul style="list-style-type: none"> Power supply voltage: 12.0V DC Load resistance: 1MΩ Ambient temperature: 25 \pm 5 degrees, Relative humidity: 25% to 85% RH 	Output range: 0.2 to 5.0V (0 to 1.5m/sec.) [Relative value] Based on output at a velocity of wind of 1.5m/sec. Output at velocity of wind of 1.0m/sec.: -1.80V \pm 0.45V Output at velocity of wind of 0.5m/sec.: -4.25V \pm 0.75V [Absolute value] (Reference value) <ul style="list-style-type: none"> EVelocity of wind of 0.5m/sec.: Output of 0.25V \pm 1.2V EVelocity of wind of 1.0m/sec.: Output of 2.70V \pm 1.35V EVelocity of wind of 1.5m/sec.: Output of 4.50V \pm 1.35V
(2) Temperature characteristics	<ul style="list-style-type: none"> Power supply voltage: 12.0V DC Ambient temperature: 0°C to 45°C Relative humidity : 25% to 85% RH 	[Relative value] Based on output (at 25 °C) at a velocity of wind of 1.5m/sec. Output at velocity of wind of 1.0m/sec.: -1.80V \pm 0.55V Output at velocity of wind of 0.5m/sec.: -4.25V \pm 0.90V
(3) Max. output voltage	<ul style="list-style-type: none"> Power supply voltage: 13.2V DC Velocity of the wind: 1.5m/sec. Ambient temperature: 25 \pm 5°C Load resistance: 1MΩ 	5.2V max
(4) Current consumption	<ul style="list-style-type: none"> Power supply voltage: 13.2V DC Measured velocity of the wind: 1.5m/sec. Ambient temperature: 25 \pm 5°C Load resistance: 1MΩ 	60mA max.
(5) Insulation resistance	Measure the insulation resistance between the whole terminals and the sensor frame with a 100V DC insulation resistance tester	20M Ω min.
(6) Dielectric strength	Apply 500V AC for one minute between the whole terminals and the sensor frame.	Max. leak current of 1mA

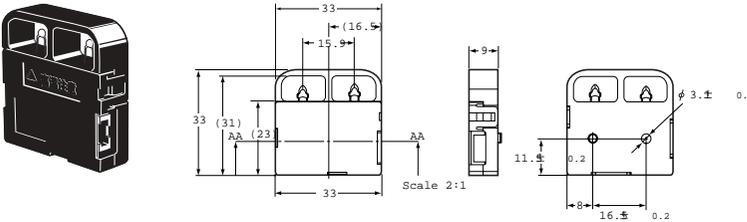
Electrical Connections



Application Example



External Dimensions



Cautions

HANDLING PRECAUTIONS

Storage

Pay the utmost attention as follows when storing the Sensor for long periods of time.

- (1) Select a storage venue in consideration of protecting the Sensor from dust and humidity.
- (2) Store the Sensor in the original packing materials

Mounting to Store computer

- (1) Perform a safety check if the Sensor is dropped.
- (2) Connect the Sensor to the connector securely.
- (3) Use Kitagawa Industries' NRP-345 nylon rivets to secure the Sensor.

Precautions for Operation

- (1) Do not apply a voltage of 13.2V DC or higher to the Sensor.
- (2) Keep clean the thermistor during maintenance. The output voltage of the thermistor will drop if there is any oil, moisture, and/or dust on the surface of the thermistor.
- (3) Do not bend the terminals of the thermistor while cleaning, otherwise the output voltage of the thermistor will drop.
- (4) Check that the PCB is free of water or moistened dust, otherwise the internal circuit will short-circuit.
- (5) A maximum of 12V DC is applied to the terminals of the thermistor.

Do not touch them, otherwise an electric shock may be received. When incorporating the Sensor into your product, describe this precaution in the maintenance manual of the product.

- (6) When the Sensor is turned on, the thermistor will heat to approximately 80°C. Touching the thermistor may result in burns.

When incorporating the Sensor into your product, describe this precaution in the maintenance manual of the product.

- (7) When disposing of the Sensor, be mindful of necessary risk prevention and environmental maintenance.

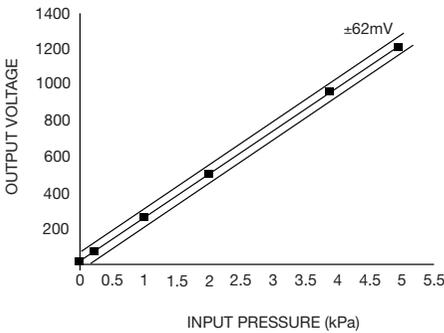
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

- Analogue output
- Pressure range 0 to 4.9kPa
- Current Consumption 2.5mA (supply voltage $2.2 \pm 0.01V$, load resistance $1M\Omega$ min., supply pressure 4.9kPa)
- Temperature compensated over full range -30° to $70^\circ C$
- Supply Voltage $2.2 \pm 0.1VDC$
- Output resistance 500Ω
- Protection Structure IP40



Recommended Operating Condition

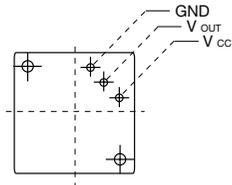
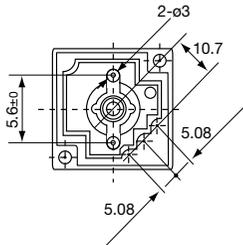
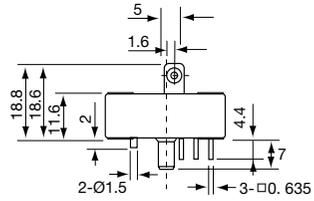
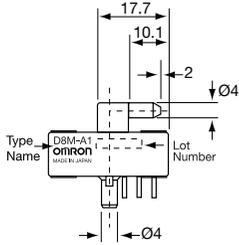
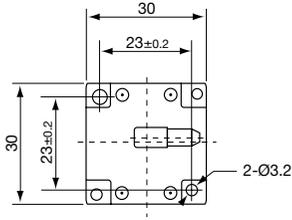


Characteristics

Output Voltage	15 to 1247mV (at the central value)
Repeatability & Hysteresis	$\pm 0.5\%$
Operating Temperature	-30° to $70^\circ C$
Storage Temperature	-40° to $80^\circ C$
Operating Humidity	25 to 95%
Insulation Resistance	100M Ω min (250VDC between load terminals and base)
Dielectric Withstand	250VAC 50/60Hz for 1 min
Material	Case: PBT(poly-butylene-teleftaret) Base: PBT(poly-butylene-teleftaret)
Withstand Pressure	0.1MPa (3 minutes)

Dimensions

(All dimensions in mm)



TERMINAL ARRANGEMENT (TOP VIEW)

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

- Digital Output
- High noise immunity
- Pressure range 0 to 4.9kPa
- Current consumption 100mA ± 5% at output 3VDC
- Operating temperature range -10°C to 60°C
- Protection Structure IP40



Characteristics

Model	D8M-D82
Pressure Type	Gauge
Pressure range	0 to 4.9kPa (0 to 0.71 psi)
Withstand pressure	19.6 kPa for 5 minutes
Repeatability/hysteresis	± 5% FS
Non-linearity characteristics	±2% FS max
Response time	1.5 ms (pressure) 30 ms max. (switch) 45 ms (discharge)
Operating temperature	-10°C to 60°C (with no icing or condensation)
Storage temperature	-20°C to 70°C (with no icing or condensation)
Operating humidity	25 to 95%
Degree of protection	IP40
Pressure port	6mm OD
Connection method	Three AWG26 wires, 115mm long
Material	PBT (polybutylene terephthalate)

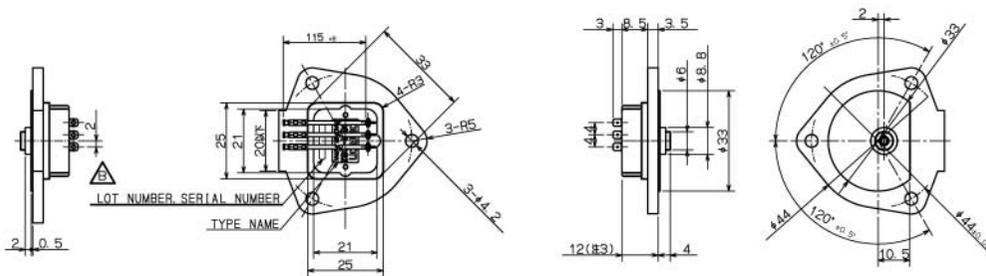
Ratings

Power supply voltage	2.2 to 3.4 VDC with regulator
Current consumption	100mA ±5% at 3VDC
Leakage current	1 mA or less
Output resolution	1 pulse/9.81 Pa
Operating characteristics	0 kPa = 30 pulses 0.15 kPa = 45 ±30 pulses 2 kPa = 204 ±15 pulses 4 kPa = 436 ±46 pulses

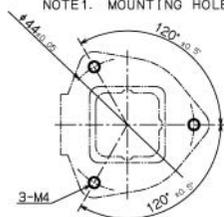
Heading?

T1: Pressure measurement time	1.5ms min.
T2: Response time	30ms max.
T3: Electrical discharge time	45ms min.

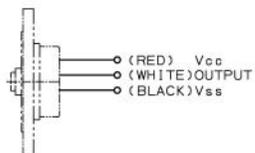
Dimensions



NOTE1. MOUNTING HOLE



NOTE2. LEAD ARRANGEMENT (LEFT SIDE-VIEW)



High accuracy mass flow sensing

- Small size
- Fast response
- Applicable to air, non-corrosive gas, LNG
- Applications include: Medical equipment
Analysis apparatus
Combustion control



Ordering Information

Model	Case	Gsa	Flow Range	Notes
D6F-01A1-110	PPS	Air*	0-1L/min	Integral orifice
D6F-02A1-110			0-2L/min	
D6F-05N2-000	Aluminum	LNG* (13A)	0-5L/min	

Ratings

Absolute Maximum Rating

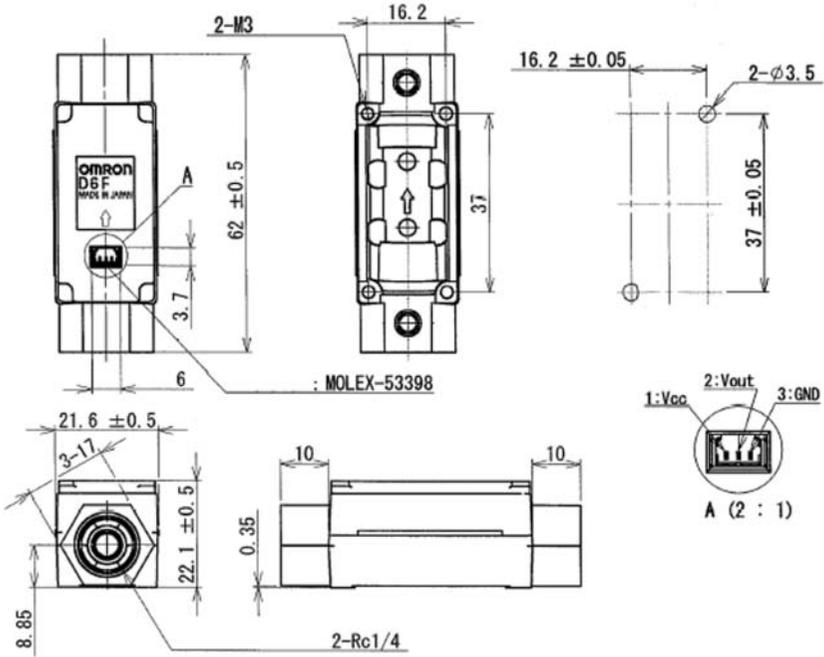
Item	Symbol	Rating	Unit
Power Supply	V_{CC}	26.4	VDC
Output Voltage	V_{OUT}	6	VDC

Recommendation Condition

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply	V_{CC}	–	10.8	–	26.4	VDC
Operating Temperature	T_{OPR}	–	-10	–	60	°C
Output Voltage (Max.)	V_{OH}	$V_{CC} = 12$ to 24VDC $I_{OH} = 5$ mA	5	–	5.7	VDC
Output Voltage (Min.)	V_{OL}	$V_{CC} = 12$ to 24VDC $I_{OH} = -5$ mA	0	–	1	VDC

(All dimensions in mm)

D6F-05N2-000



- Pure mechanical vibration detector.
- Sealed enclosure.
- Output capacity from 0.1mA at 5VDC to 100mA at 30VDC.



Ordering Information

Model	Operating Angle
D7E-3	50 to 80 degrees

Characteristics

Model	D7E-3
Operating Angle	Tilt of 50 to 80 degrees. The value of tilt degree is specified when the switch is tilted gradually (approx. 1 degree/s) from the horizontal.
Returning Angle	Tilt of more than 25 degrees. The value of tilt degree is specified when the switch is tilted gradually (approx. 1 degree/s) from the horizontal
Permissible Mounting Level	1 degree max. from the horizontal
Contact Form	Single pole single throw (NC contact / slow action)
Mounting	Pitch: 30mm 2 screws (M3) Height: 5.3mm
Soldering	Soldering iron: temperature 350±10°, 3 sec. MAX
Ratings	5VDC, 0.1mA to 30VDC, 100mA (Resistive load)
Insulation Resistance	100MΩ MIN. (250VDC, between each terminal of the same polarity To measure off condition
Contact Resistance	300m Ohm MAX. (Initial value)
Vibration During Transportation	Condition: Vibration: 200 gal (1cycle: 0.5 sec.) Vibration direction: 2 axial directions Time: Total 50 hours
Shock	Condition: Acceleration: 980 m/s ² 3 times Shock direction: 3 axial directions
Operating temperature and humidity	Temperature: -25 degrees to +60 degrees (with no icing and condensation) Humidity: 45 to 95 % RH
Storage temperature and humidity	Temperature: -25 degrees to +60 degrees (with no icing and condensation) Humidity: 45 to 95 % RH Protection
Protection	IP67

(All dimensions in mm)

