OMRON

Differential Pressure Sensor

E8Y

"Cube" Type Differential Pressure Sensor with LED Display Offers High Precision Sensing

- New ***psi version*** available
- Compact, cube-style measuring 31 x 30 x 30 mm (1.22 x 1.18 x 1.18 in) saves mounting space
- Easy-to-read red LEDs
- Digital and analog output available
- Flow sensing type available
- PNP output types available upon special request

Ordering Information

■ SENSOR

Type	Digital output	Analog output	Pressure range	Port/Mounting	Part number
Miniature differential pressure sensor	NPN open collector (2 independent outputs)	—	0 to 2.0 kPa	4.5 mm dia. pipe	**E8Y-A2C**
				1/8 NPT	**E8Y-A2C-R**
			0 to 5.0 kPa	4.5 mm dia. pipe	**E8Y-A5C**
				1/8 NPT	**E8Y-A5C-R**
			0 to 0.290 psi	4.5 mm dia. pipe	**E8Y-A2C-D**
				1/8 NPT	**E8Y-A2C-RD**
			0 to 0.725 psi	4.5 mm dia. pipe	**E8Y-A5C-D**
				1/8 NPT	**E8Y-A5C-RD**
		4 to 20 mA	0 to 2.0 kPa	4.5 mm dia. pipe	**E8Y-A2Y**
				1/8 NPT	**E8Y-A2Y-R**
			0 to 5.0 kPa	4.5 mm dia. pipe	**E8Y-A5Y**
				1/8 NPT	**E8Y-A5Y-R**
			0 to 0.290 psi	4.5 mm dia. pipe	**E8Y-A2Y-D**
				1/8 NPT	**E8Y-A2Y-RD**
			0 to 0.725 psi	4.5 mm dia. pipe	**E8Y-A5Y-D**
				1/8 NPT	**E8Y-A5Y-RD**
Flow sensor		—	0.3 to 3.0 liter/min. (0.07 to 0.68 gal./min.)	1/8 NPT, vertical	**E8Y-A5C-F03V**
				1/8 NPT, horizontal	**E8Y-A5C-F03H**
			2.0 to 20 liter/min. (0.45 to 4.54 gal./min.)	1/8 NPT, vertical	**E8Y-A5C-F20V**
				1/8 NPT, horizontal	**E8Y-A5C-F20H**

■ ACCESSORIES

Description	Part number
Panel-mounting bracket	**E89-Y1**

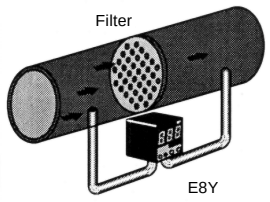
Specifications

■ RATINGS/CHARACTERISTICS

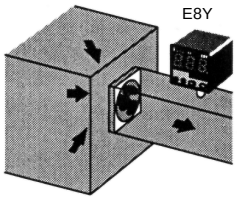
Item	E8Y-A2C E8Y-A2C-R E8Y-A2C-D E8Y-A2C-RD	E8Y-A5C E8Y-A5C-R E8Y-A5C-D E8Y-A5C-RD	E8Y-A2Y E8Y-A2Y-R E8Y-A2Y-D E8Y-A2Y-RD	E8Y-A5Y E8Y-A5Y-R E8Y-A5Y-D E8Y-A5Y-RD	E8Y-A5C-F03V E8Y-A5C-F03H	E8Y-A5Y-F20V E8Y-A5Y-F20H
Sensor type	Differential pressure sensor				Flow sensor	
Power supply voltage	12 to 24 VDC ±10%, ripple (p-p) 10% max.					
Current consumption	50 mA max.		75 mA max.		50 mA max.	
Pressure type	Differential pressure				Differential pressure sensing	
Rated pressure / volume range	0 to 2.0 kPa 0 to 0.29 psi	0 to 5.0 kPa 0 to 0.73 psi	0 to 2.0 kPa 0 to 0.29 psi	0 to 5.0 kPa 0 to 0.73 psi	0.3 to 3.0 L/min. 0.068 to 0.68 gal/min.	2.0 to 20.0 L/min. 0.45 to 4.54 gal/min.
Withstand pressure / volume	50 kPa (7.25 psi)				5 L/min (1.14 gal)	40 L/min (9.08 gal)
Applicable fluid	Non-corrosive gas and non-flammable gas					
Accuracy	±3% FS max.					
Linearity	±1% FS max.					
Responce time (digital output)	±0.5 sec max.					
Linear output	—		4 to 20 mA ±1%FS with a permissible resistive load of 250 Ω		—	
Digital output	NPN open collector (NO/NC) Load current: 100 mA max. Applied voltage: 30 VDC max. Residual voltage: 1 V max. with a load current of 100 mA or 0.4 V max. with a load current of 16 mA					
Display	3 digit red LED; the orange LED indicator is lit for two independent outputs.					
Display accuracy	±1% FS				±3% FS	
Circuit protection	Reverse polarity connection, load short-circuiting					
Ambient temperature	Operating: -10°C to 55°C (14°F to 131°F) with no icing Storage: -25°C to 65°C (-13°F to 149°F)					
Ambient humidity	Operating: 25% to 85% (with no condensation)					
Temperature influence	±3% FS max.					
Voltage influence	±1.5% FS max.					
Setting resolution	0.01 kPa 0.001 psi				0.0 1L/min.	0.1 L/min.
Insulation resistance	100 MΩ (at 500 VDC) between current-carry parts and case					
Dielectic strength	1,000 VAC 50/60 Hz at 1 min.					
Vibration resistance	Endurance: 10 to 500 Hz, 1.0-mm double amplitude or 150 m/s^2, 3 times each for 11 min. in X, Y and Z directions					
Shock resistance	Endurance: 300 m/s^2 (30G) 3 times each to X,Y and Z directions					
Degree of protection	IEC60529, IP40					
Pressure port	NPT 1/8 female screw or 4.5 dia. pipe				1/8 NPT female screw	
Connection method	Pre-wired (standard length: 2 m)					
Cable	Approved by UL					
Weight	Approx. 80 g (2.8 oz) (including packing material)				Approx. 160 g (5.6 oz) (including packing material)	
Material	Pressure port: resin pipe for 4.5 dia., zinc die-cast for 1/8 NPT taper screw Case: heat-resistant PBT					
Accessories	Mounting bracket and instruction sheet				Instruction sheet	

Application Examples

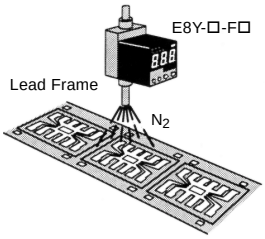
■ DETECTION OF FILTER CLOGGING



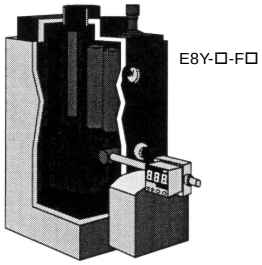
■ EXHAUST FAN ROTATION DETECTION



■ DETECTION OF FLOW

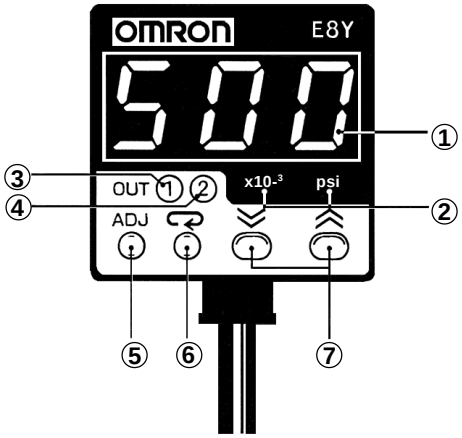


■ AIR FLOW CONTROL



Nomenclature

■ E8Y PRESSURE SENSOR



Display

① Numerical value/menu indication

Displays the measured pressure and some menu settings.

② Unit

Shows the measuring unit. Unit currently in use is illuminated.

③ OUT 1 indication LED

In measurement mode, it lights when OUT 1 output is on. In setting mode, it flashes when OUT 1 is being set.

④ OUT 2 indication LED

In measurement mode, it lights when OUT 2 output is on. In setting mode, it flashes when OUT 2 is being set.

Operation key

⑤ ADJ

In measurement mode, it adjusts the Zero Point. In setting mode, it shifts to measurement mode.

⑥ MODE

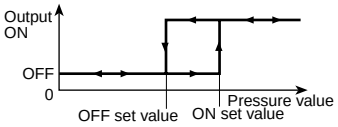
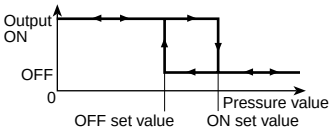
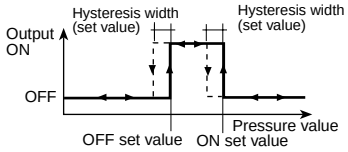
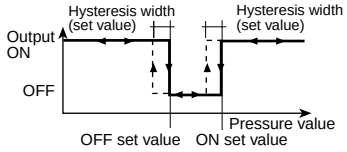
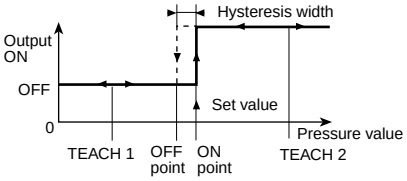
Selects the current number setting or menu option.

⑦ UP/DOWN

In measurement mode, pushing the DOWN key displays the ON and OFF points of OUT 1; pushing the UP key displays the ON and OFF points of OUT 2. In setting mode, the UP and DOWN keys increase or decrease the numeric value, respectively, or scroll through the menu options.

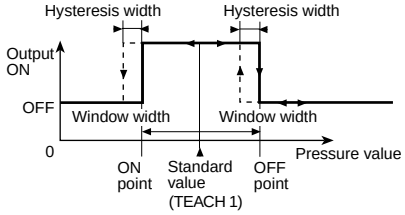
Operation

■ FUNCTIONS

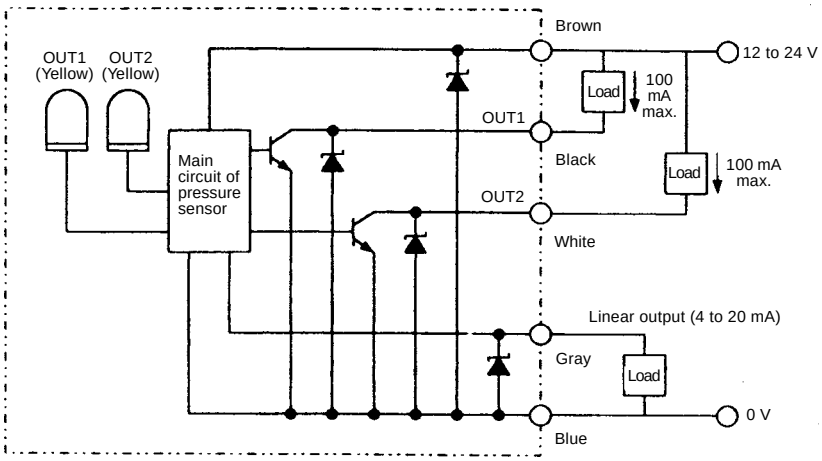
Function	Description
Pressure units switching	Switches between mmH2O and kPa, excluding the E8Y-□-F□ flow sensor.
Comparitive ON/ OFF output (two independent outputs	Two independent outputs can be set. **(1) Output mode** (mode is automatically determined from the ON and OFF point set values.) **Hysteresis mode:** If ON point point set value > OFF point set value For normal open:  For normal close:  **Window mode:** If ON point set value < OFF point set value For normal open:  For normal close:  **(2) Setting mode** ON point / OFF point: Each output can be set in the range from 0 to the rated value. Set value: 0 to rated value Output configuration: Each output can be set as normally open (NO) or normally closed (NC). Setting: NO <> NC Hysteresis: Each output can be set at 10% of the range from 0 to the rated value. (Effective in window mode and 2-point auto-teaching mode.) Setting range: (0 to rated value) x 10%
Auto-teaching	When the auto-teaching mode is used, measured values can be input as ON point or OFF point set values instead of key inputs. Two types of auto-teaching are available: 1-point auto-teaching, where only one single point is set, and 2-point auto-teaching, where two points are set. **(1) 2-point auto-teaching (Hysteresis mode teaching)** This function automatically sets the ON point and OFF point for the comparative output by designating a point with no object (TEACH 1) and a point with an object (TEACH 2) using actual objects. The outputs are made in hysteresis mode. The hysteresis is a set value.  The set value is the mid-point between TEACH 1 and TEACH 2. Example: If TEACH 1 is 0.25 kPa and TEACH 2 is 0.95 kPa, the ON point set value = (0.95+0.25)/2 = 0.60

(This table continues on the next page)

Functions Table - continued from previous page

Function	Description
Auto-teaching (continued)	**(2) 1-point auto-teaching (Window mode teaching)** This function automatically sets the ON point and OFF point for the comparitive output by inputing a reference point (TEACH 1) using an actual object. The function operates only when an object exists. The outputs are made in the window mode. The hysteresis width and window width are set values. (The window width set value is valid only when 1-point teaching is set. Setting range: (0 to rated value) x 30%)  The ON point and OFF point set values are set at the reference point ±window width. Example: If the reference point (TEACH 1) is 0.90 kPa and the window width is 0.50 kPa, the ON set value = (0.90 - 0.50)/2 = 0.20 and the OFF point set value = (0.90+0.50)/2 = 0.70.
Key-protect (Set value lock function)	This function restricts switch operation to prevent the set value from being easily changed. Set value: OFF <> ON
Set value zero-setting	Hold down the ADJ key for several seconds in the measurement mode to activate this function.
Speed control function with measured pressure display	Select from three values of display speed for the measured pressure values. Set value: 0.1 s, 0.5 s, 1.0 s
Error display	**(1) Pressure warning during zeroing:** Error display and warning if excess pressure or flow (exceeding rated value ±5%) is applied during zeroing. **(2) Teaching error display:** Warning if teaching is unsuccessful. **(3) Short-circuit protection and display:** If overcurrent flows in a connected load, the abnormal status is notified by an error display and the OUT LED, for the corresponding output, flashing. Transistor acts to cut the abnormal current. **(4) Abnormal pressure or flow detection:** The diplayed value flashes to indicate the abnormal status if the applied pressure or flow exceeds the rated value by 10%. This error is automatically reset when the supplied value enters the rated range. **(5) ON/OFF point input error warning:** Indicates if the difference between the ON point and OFF point in the window mode exceeds the hysteresis value + setting resolution (0.01 kPa/1 mmH_2O).

■ OUTPUT CIRCUIT DIAGRAM



■ WIRING

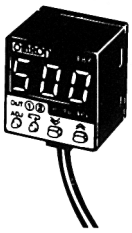
Color	Comparison output type	Linear output type
Brown	Power supply 12 to 24 V	Power supply 12 to 24 V
Blue	0 V	0 V
Black	Comparison output 1	Comparison output 1
White	Comparison output 2	Comparison output 2
Gray	—	Linear output

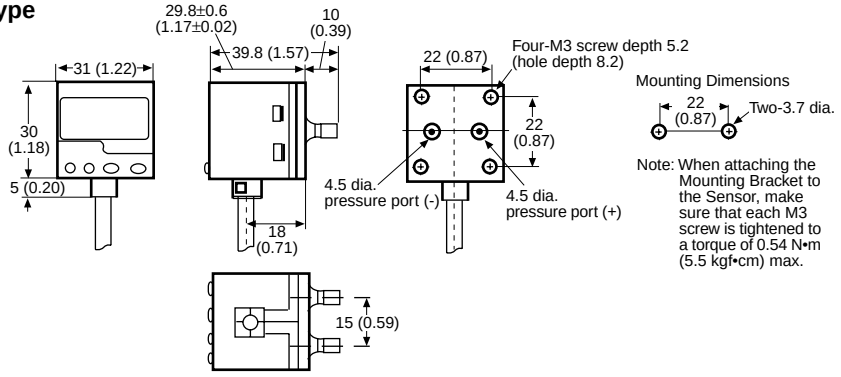
Dimensions

Unit: mm (inch)

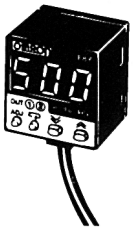
■ CONTROLLER OF PRESSURE SENSOR

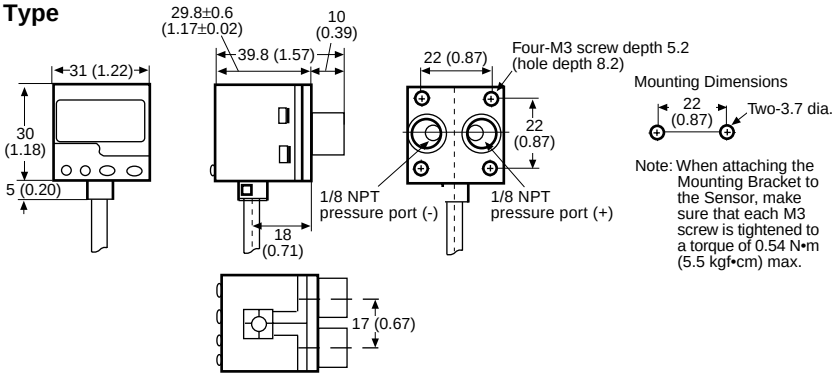
Standard Port (Pressure Port 4.5 dia.) Type
E8Y-A2C
E8Y-A5C
E8Y-A2Y
E8Y-A5Y
E8Y-A2C-D
E8Y-A5C-D
E8Y-A2Y-D
E8Y-A5Y-D





Die-cast Port (Pressure Port Rc(PT) 1/8) Type
E8Y-A2C-R
E8Y-A5C-R
E8Y-A2Y-R
E8Y-A5Y-R
E8Y-A2C-RD
E8Y-A5C-RD
E8Y-A2Y-RD
E8Y-A5Y-RD

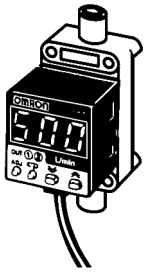


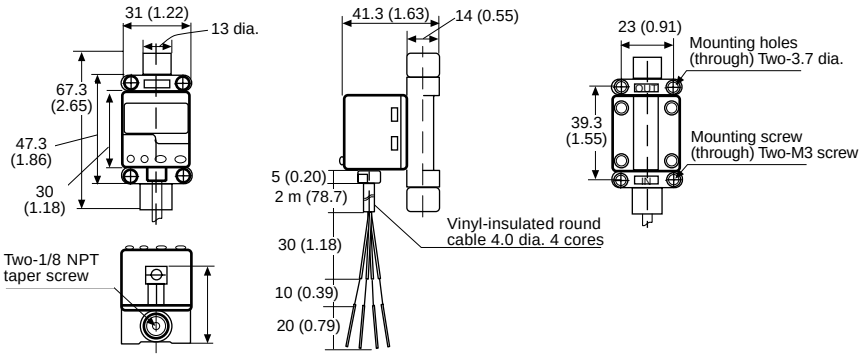


Unit: mm (inch)

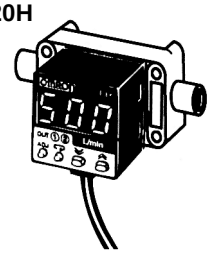
■ CONTROLLER OF FLOW SENSOR

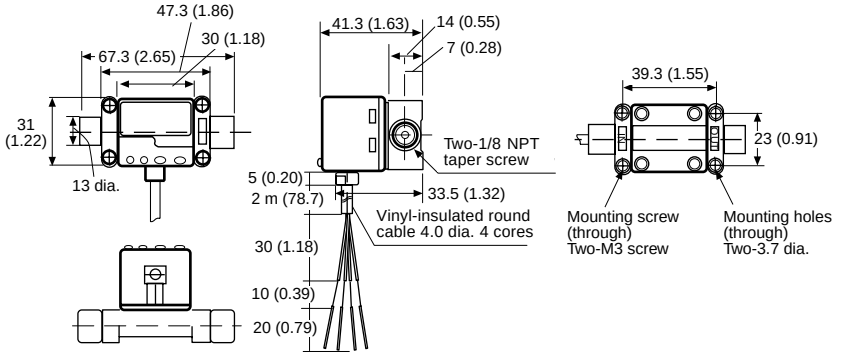
Vertical-mounting Type
E8Y-A5C-F03V
E8Y-A5C-F20V





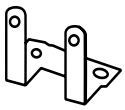
Horizontal-mounting Type
E8Y-A5C-F03H
E8Y-A5C-F20H

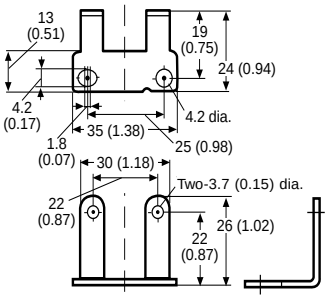




■ ACCESSORIES

Mounting Bracket A





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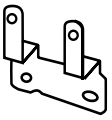
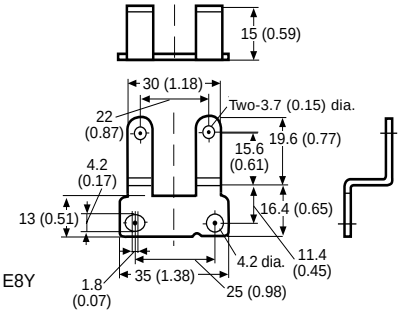
Mounting Bracket B

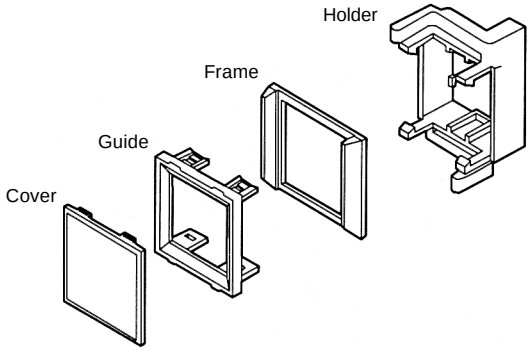




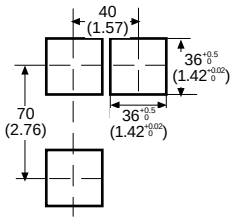
Provided with E8Y

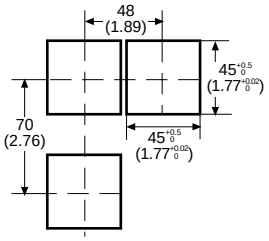
■ PANEL MOUNTING BRACKET

E89-Y1 Panel Mounting Bracket (sold separately)



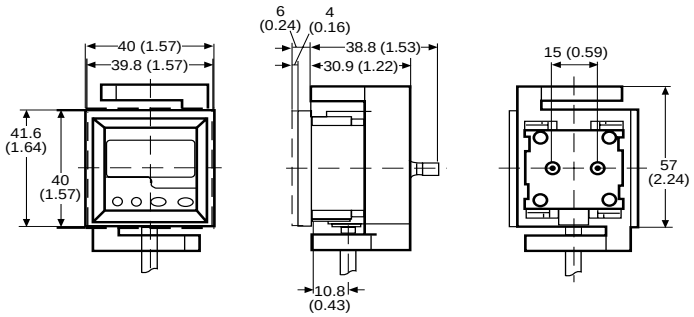
Panel Cutout Dimensions



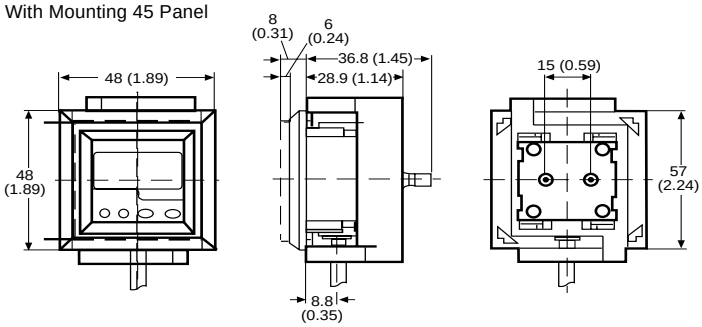


Note: Approximate panel thickness is 1.0 to 3.5 mm.

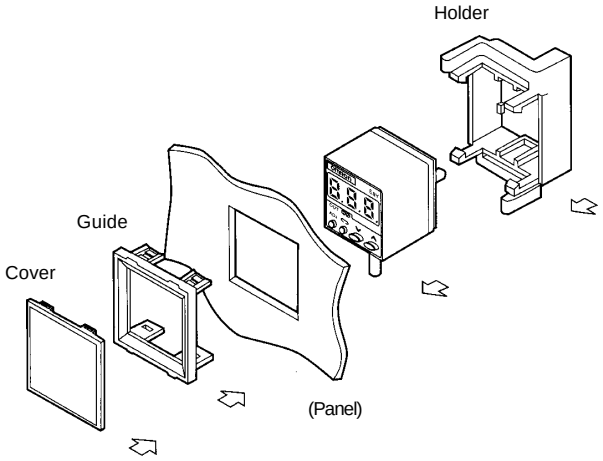
With Mounting 36 Panel



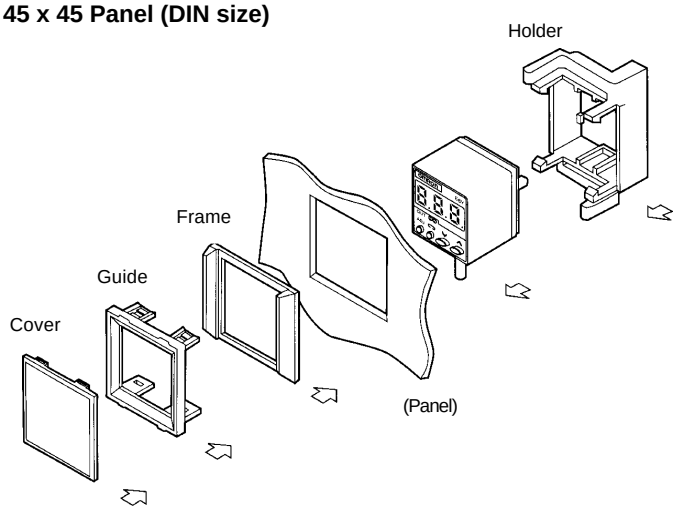
With Mounting 45 Panel



36 x 36 Panel



45 x 45 Panel (DIN size)



Precautions

■ ENVIRONMENT

- Do not use this product where explosive gas, ignitable gas, or any other harmful gas may be present.
- Do not use beyond rated supply voltage or under AC power supply. Explosion or fire may be caused.
- Do not mix up DC pole's wiring. Explosion or fire may be caused.
- This product cannot be used under corrosive gas or flammable gas.
- Do not install beside high voltage line or power line.
- Do not expose to water.
- Do not effect the product by ultrasonic vibration.

■ CORRECT USE

- Use within rated pressure.
- Do not mix up connecting +, – sign of pressure port. The "+" sign is for plus pressure, the "–" sign for minus pressure.
- Do not pull the cable more than 50 N (11.25 lbs).
- Filter the gas with an appropriate air filter so that the applied gas will be free of moisture or oil.
- When not using linear output and/or the ON/OFF output, cut the output lead wire and cover the tip with an insulation tube to prevent wrong connection.

OMRON

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