

### Pressure Sensor with an Easy-to-see Digital Display

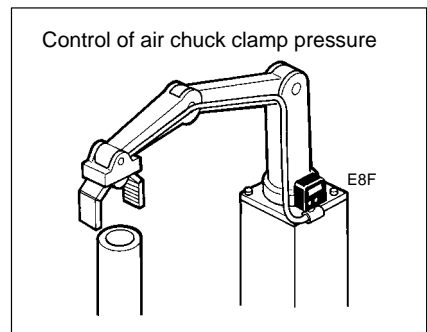
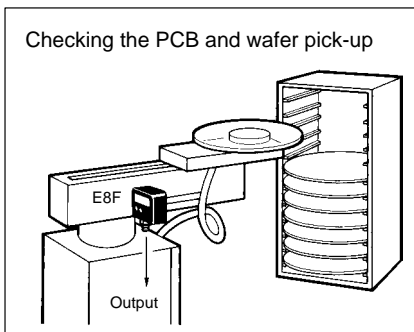
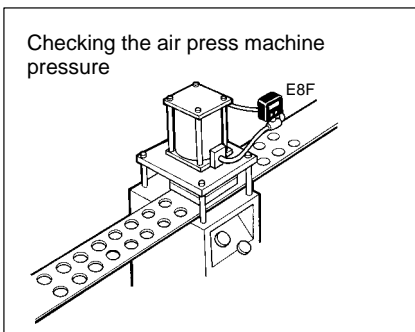
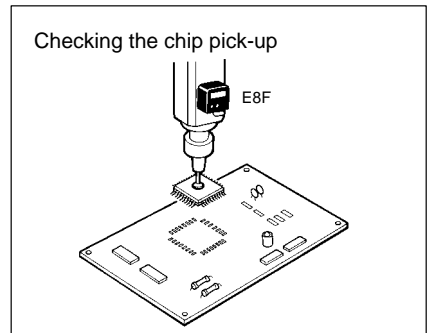
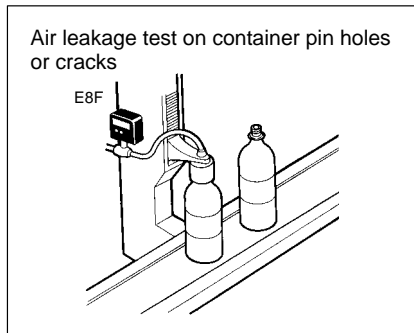
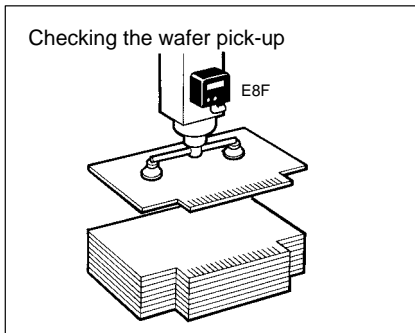
- Two output modes ensure easy pressure control.
- Compact model incorporates a self-diagnostic function.
- Washable (IP66).
- SI-compatible models are available.



### Ordering Information

Pressure range		ON/OFF output	Linear output	Model
Positive pressure	0 to 98 kPa	NPN open collector	1 to 5 V	E8F-A01C
	0 to 980 kPa			E8F-B10C
Negative pressure	0 to -101 kPa			E8F-AN0C
Positive pressure	0 to 1 kgf/cm <sup>2</sup>			E8F-01C
	0 to 10 kgf/cm <sup>2</sup>			E8F-10C
Negative pressure	0 to -76 cmHg			E8F-CN0C

### Application Examples



# Specifications

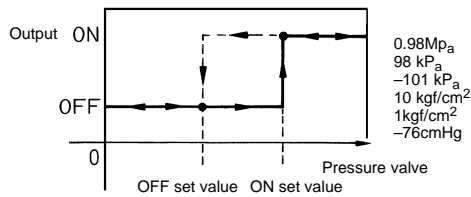
## ■ Ratings

Item/Model	E8F-A01C	E8F-AN0C (see note 1)	E8F-B10C	E8F-01C	E8F-CN0C (see note 1)	E8F-10C
<b>Supply voltage</b>	12 to 24 VDC $\pm 10\%$ with a ripple (p-p) of 10% max.					
<b>Current consumption</b>	30 mA max.					
<b>Pressure type</b>	Gauge pressure					
<b>Permissible pressure range</b>	0 to 98 kPa	0 to -101 kPa	0 to 980 kPa	0 to 1 kgf/cm <sup>2</sup> (0 to 98 kPa)	0 to -76 cmHg (0 to -101 kPa)	0 to 10 kgf/cm <sup>2</sup> (0 to 980 kPa)
<b>Pressure setting range</b>	0 to 98 kPa	0 to -101 kPa	0 to 980 kPa	0 to 1 kgf/cm <sup>2</sup> (0 to 98 kPa)	0 to -76 cmHg (0 to -101 kPa)	0 to 10 kgf/cm <sup>2</sup> (0 to 980 kPa)
<b>Withstand pressure</b>	490 kPa		2.0 MPa	5 kgf/cm <sup>2</sup> (490 kPa)		20 kgf/cm <sup>2</sup> (2 MPa)
<b>Applicable fluid</b>	Non-corrosive gasses, inert gasses					
<b>Operating mode (see note 2)</b>	Hysteresis mode and wind mode					
<b>Repeat accuracy (ON/OFF output)</b>	$\pm 1\%$ FS max.					
<b>Accuracy (linear output)</b>	$\pm 3\%$ FS max.					
<b>Linearity (linear output)</b>	$\pm 1\%$ FS max.					
<b>Response time (ON/OFF output)</b>	6 ms max.					
<b>Linear output</b>	1 to 5 V with output impedance of 1 k $\Omega$ and permissible resistive load of 500 k $\Omega$ min.					
<b>ON/OFF output</b>	NPN open collector (NO/NC)					
<b>Load current</b>	100 mA max.					
<b>Output applied voltage</b>	30 VDC max.					
<b>Residual voltage</b>	1 V max. (with load current of 100 mA) or 0.4 V max. (with load current of 20 mA)					
<b>Error output</b>	NPN open collector					
<b>Load current</b>	50 mA max.					
<b>Output applied voltage</b>	30 VDC max.					
<b>Residual voltage</b>	1 V max. (with load current of 50 mA) or 0.4 V max. (with load current of 20 mA)					
<b>Power-ON reset time</b>	200 ms max.					
<b>Display (see note 2)</b>	2 <sup>1</sup> / <sub>2</sub> -digit LCD Red indicator ON with output transistor turned ON Green indicator ON in normal operation (OFF at the time of malfunctioning or error detection)					
<b>Display accuracy</b>	$\pm 3\%$ FS $\pm 1$ digit max.					
<b>Circuit protection</b>	Reversed connection and load short-circuiting					
<b>Ambient temperature</b>	Operating: 0°C to 50°C (with no icing) Storage: -10°C to 60°C					
<b>Ambient humidity</b>	35% to 85% (with no condensation)					
<b>Accessories (provided)</b>	Mounting brackets (horizontal bracket, vertical bracket, and two mounting screws) and operation manual					

- Note:** 1. Negative-pressure model  
2. Refer to the following for the operation modes available at the time of initial settings.

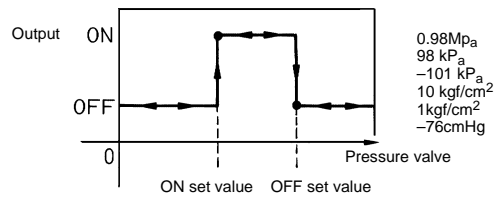
3. The 2<sup>1</sup>/<sub>2</sub>-digit display refers to a display in which the third digit displays only 0 or 1.

### Hysteresis Mode



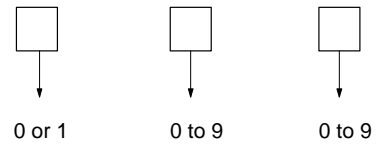
In the above, the ON point is set larger than the OFF point.

### Wind Mode



In the above, the ON point is set smaller than the OFF point.

Third digit Second digit First digit



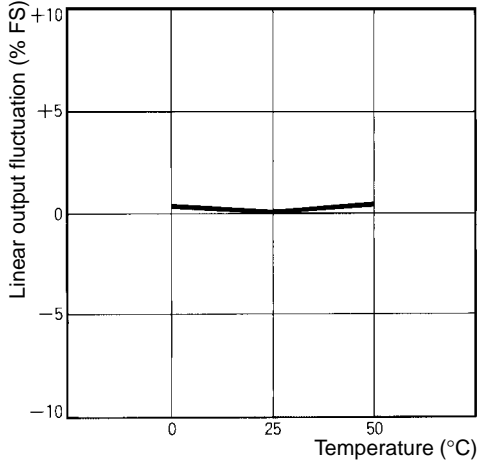
## ■ Characteristics

Voltage influence	±1.5% FS max.
Temperature influence	±3% FS max.
Degree of protection	IEC IP66
Dielectric strength	1,000 VAC for 1 min
Insulation resistance	100 MΩ min. (at 500 VDC) between current carry parts and case
Vibration resistance	Destruction: 10 to 500 Hz, 1.5-mm double amplitude or 100 m/s <sup>2</sup> (approx. 10G) for 2 hours each in X, Y, and Z directions
Shock resistance	Destruction: 500 m/s <sup>2</sup> (approx. 50G) 2 times each in X, Y, and Z directions.
Pressure port	R(PT) 1/8 taper screw and M5 x P0.8 female screw for zinc die-cast pressure port
Cord	2-m-long UL-approved cord
Weight	60 g (excluding cord)

# Engineering Data

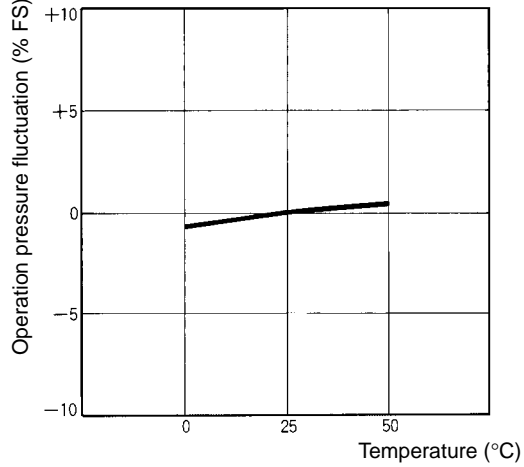
**Temperature vs. Linear Output Current Fluctuation (Typical)**

E8F-01C



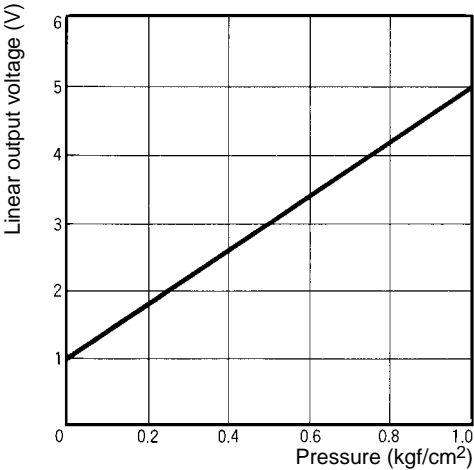
**Temperature vs. Operating Pressure Fluctuation (Typical)**

E8F-01C



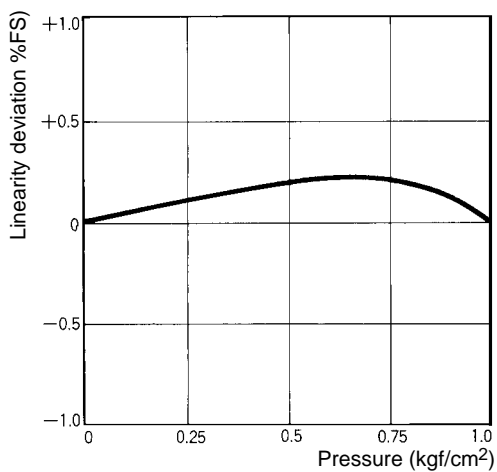
**Pressure vs. Linear Output (Typical)**

E8F-01C

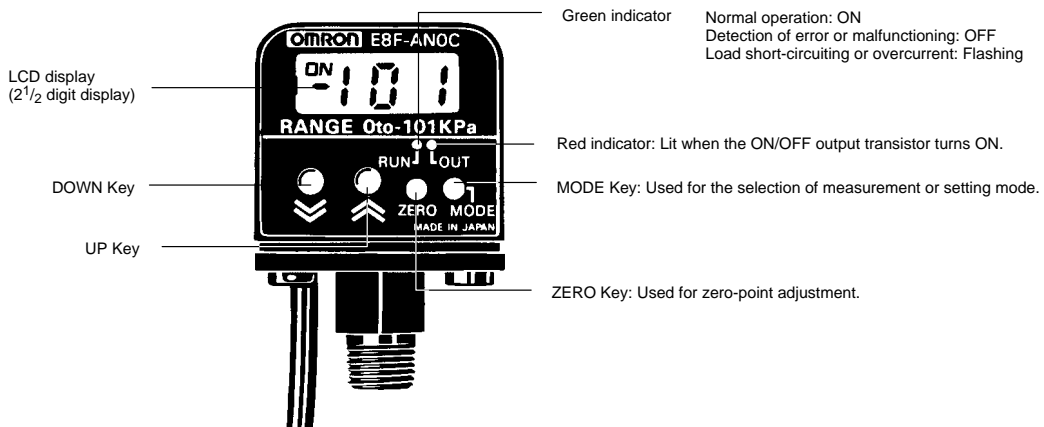


**Linearity (Typical)**

E8F-01C

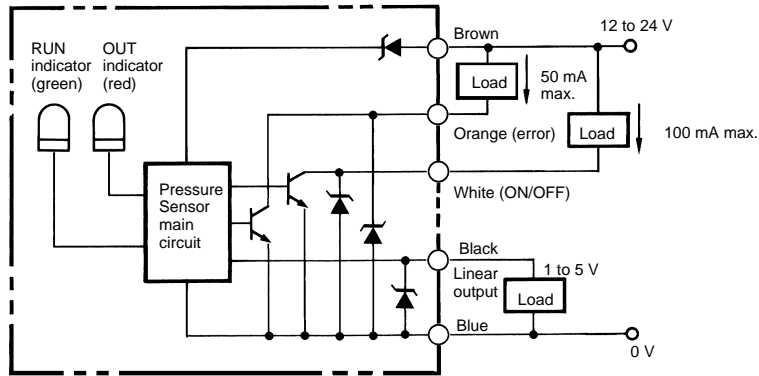


# Nomenclature



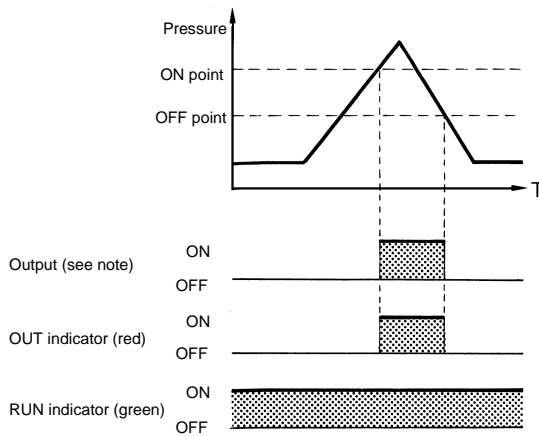
# Operation

## ■ Output Circuit

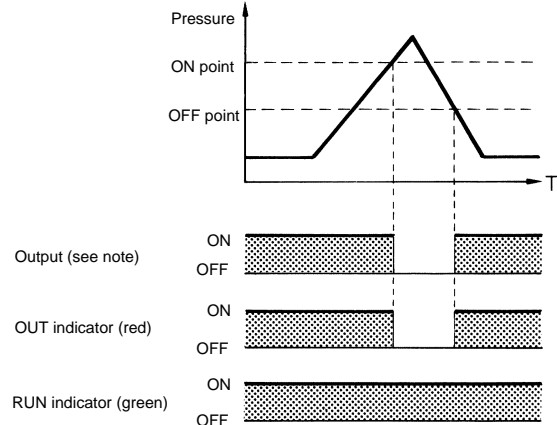


## ■ Output Timing Charts

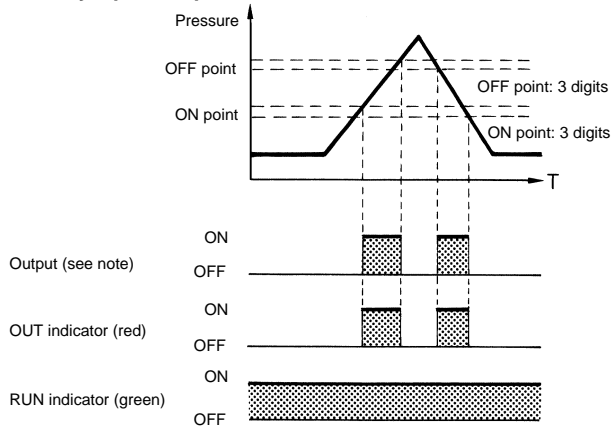
**Normally Open Output in Hysteresis Mode**



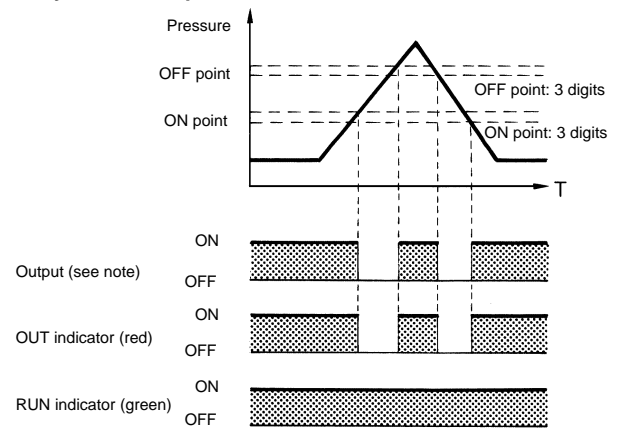
**Normally Closed Output in Hysteresis Mode**



**Normally Open Output in Wind Mode**



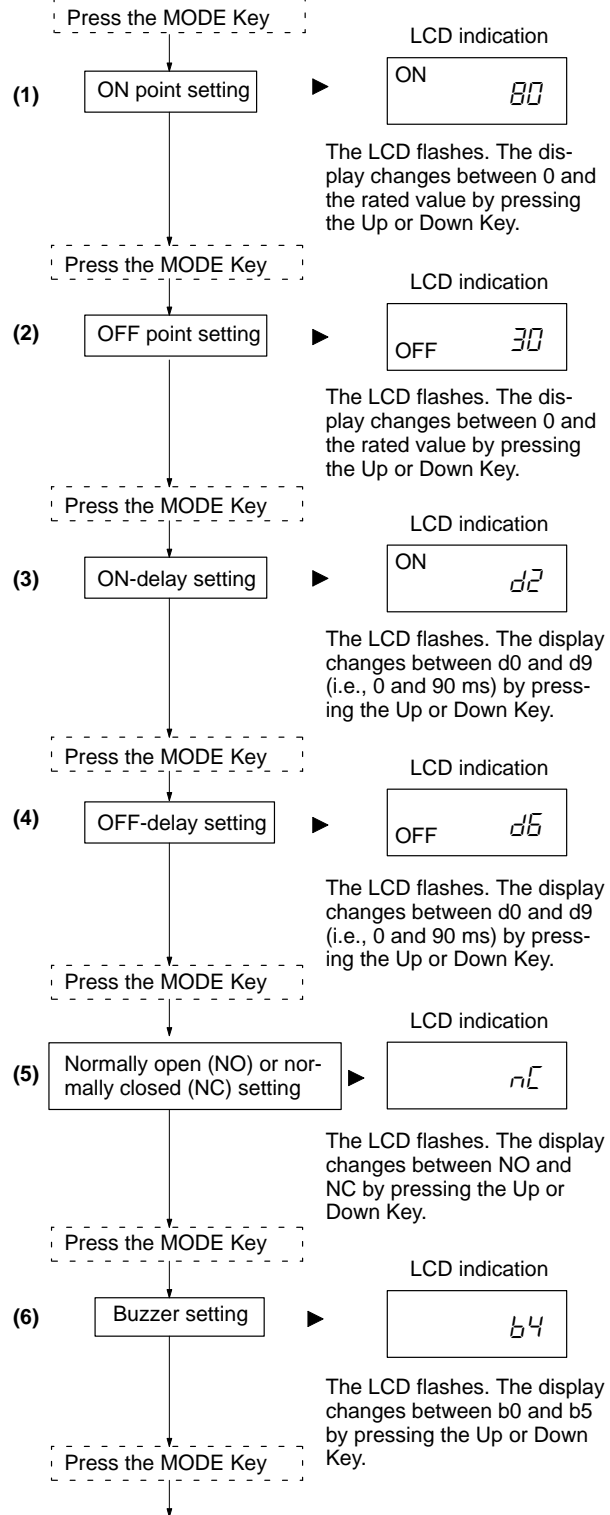
**Normally Closed Output in Wind Mode**



**Note:** In the above examples, the ON- and OFF-delay timers are both set to 0 ms.

**■ Pressure Setting Method**

(The decimal point will not be displayed under the setting mode.)



Setting completed. (proceeds to measurement mode)  
 Set values are stored in the EEPROM and not lost when the E8F is turned OFF. If the Up Key is pressed in measurement mode, the set ON point will be displayed for two seconds. If the Down Key is pressed instead, the set OFF point will be displayed for two seconds.

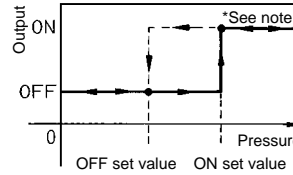
**(1) (2) ON/OFF Point Settings**

ON point value > OFF point value: The E8F will be in hysteresis mode.

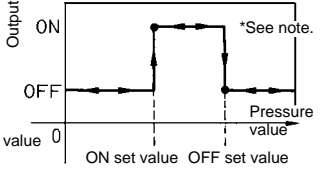
ON point value < OFF point value: The E8F will be in wind mode.  
 ON point = OFF point: No ON/OFF operation is possible.

**Note:** The ON and OFF points are both set to 30 before shipping.

**Hysteresis Mode**



**Wind Mode**



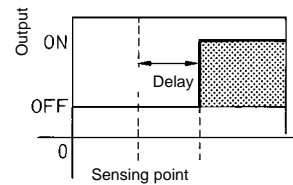
**Note:** Allowable pressure varies with the model.

**(3), (4) ON- and OFF-delay Timer Settings**

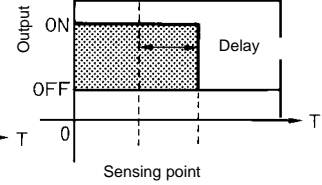
It is possible to set ON- or OFF-delay timer within a range of 0 and 90 ms in 10-ms increments. Set the timer to 0 ms if the timer function is not required.

**Note:** The timer is set to 0 ms before shipping.

**ON-delay**



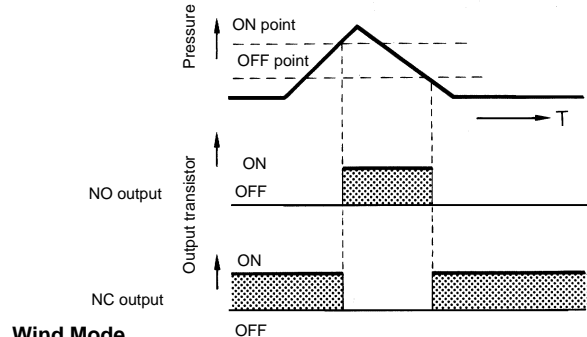
**OFF-delay**



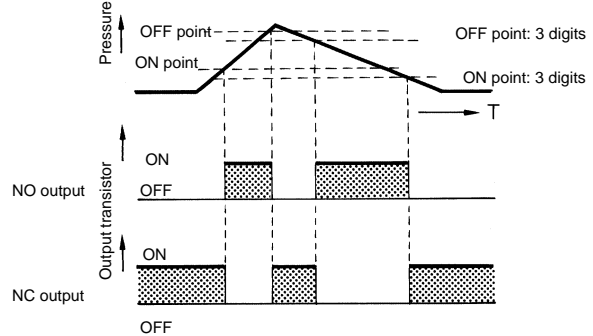
**(5) Normally Open (NO) and Normally Closed (NC) Settings**

**Note:** The E8F is set to NO before shipping.

**Hysteresis Mode**



**Wind Mode**



### (6) Buzzer Mode Settings

Set the buzzer mode to 0 if the buzzer function is not required.

**Note:** The mode is set to 3 before shipping.

Set value	Contents
0	The buzzer is always OFF.
1	The buzzer is ON when the ON/OFF output transistor is ON.
2	The buzzer is ON when an error is detected.
3	The buzzer is ON when the Up or Down Key is pressed when setting the values.
4	The functions of set values 1 and 3.
5	The functions of set values 2 and 3.

### ■ Error Indication

LCD	Meaning	Remedy
E1	The ON/OFF output and error output transistor have excessive current.	Change the load to a proper one.
E2	No zero point adjustment is possible when the ZERO Key is pressed because pressure is imposed on the pressure port.	Eliminate the pressure imposed on the pressure port.
E3	Excessive pressure is imposed on the pressure port.	Reduce the pressure to the rated value or less.
E4	Reversed pressure is imposed.	Do not impose reversed pressure.
E5	The Sensor has a failure.	Contact your OMRON representatives.
E6	The voltage imposed on the Sensor is not within the rated value.	Impose the voltage within the rated value.

- Note:**
1. If the load is short-circuited or excessive current flows to the load, the green indicator will flash and the ON/OFF output and error output will be turned OFF.
  2. If there is an error other than a load short-circuit or excessive current error (i.e., E2 to E6), the green indicator will be turned OFF and the error output transistor will be turned ON. Therefore, nullify the ON/OFF output at the time of error detection.

### Zero Point Adjustment

Usually, no zero point adjustment is necessary. If the zero point should shift due to secular changes (i.e., a value other than 00 is displayed with no pressure imposed), press the ZERO Key for zero point adjustment.

Perform zero point adjustment with no pressure imposed.

### ON/OFF Set Value Check on E8F in Operation

Press the Up Key to check the ON set value.

Press the Down Key to check the OFF set value.

### Mounting

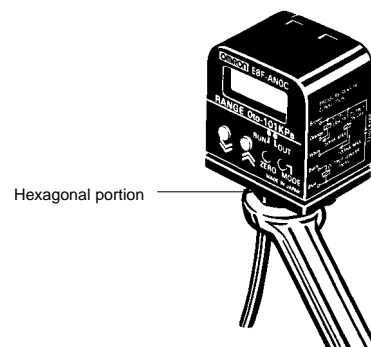
The zinc die-cast pressure leading part incorporates an R(PT) 1/8 taper screw and M5 x P0.8 female screw. The taper screw must be used in combination with an Rc(PT) 1/8 female taper screw.

Apply sealing tape around the taper screw so that there will be no pressure leakage. Make sure that the tightening torque of the taper screw is 9.8 N • m (100 kgf • cm) or less.

Make sure that the tightening torque of the M5 female screw is 2.3 N • m (23 kgf • cm) or less.

When tightening the male screw, apply a 12-mm wrench to the hexagonal portion of the pressure port. Do not tighten the male screw while holding the plastic case.

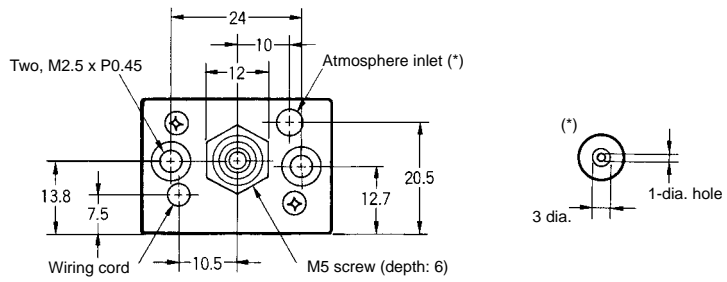
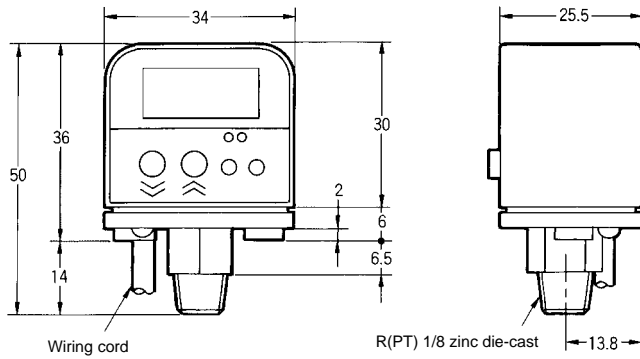
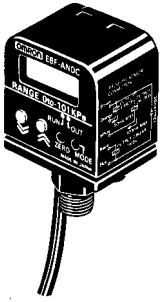
When attaching the mounting bracket to the E8F, make sure that the tightening torque applied to the M2.5 screw is 0.29 N • m (3 kgf • cm) or less.



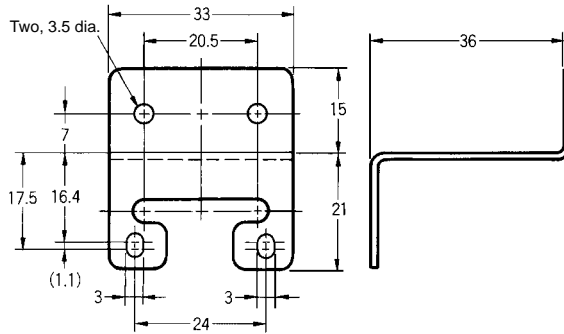
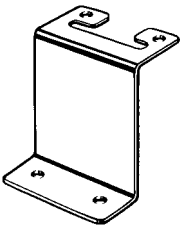
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

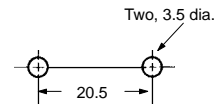
## E8F



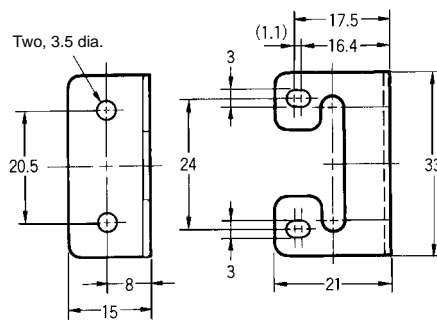
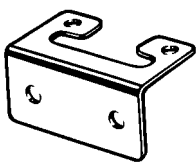
## Mounting Bracket



## Mounting Dimensions



Material: SPCC uni-chrome plating (t=1.2)



Material: SPCC uni-chrome plating (t=1.2)



## Precautions

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### Correct Use

#### Available Gases:

No corrosive or flammable gas can be used.

Filter the gas with an appropriate air filter so that the applied gas will be free of moisture or oil.

Make sure that the pressure applied is within the rated range.

If the silicone diaphragm is damaged, the E8F will not operate properly. Do not insert a screwdriver or steel wire into the interior of the pressure-sensitive parts through the pressure leading part.

The E8F has a display error of  $\pm 3\%$  FS  $\pm 1$  digit at the time of ON or OFF point setting at room temperature. If a highly precise pressure setting is required, use a manometer.

Nullify the ON/OFF output at the time of error detection.

If the use of the E8F requires the IP66 enclosure rating (e.g., washing the E8F with water), be sure to connect a standard silicone tube to the atmosphere inlet. The silicone tube must have a 2-mm inner diameter and 4-mm outer diameter.

#### Reset Time:

The E8F is ready to operate within 200 ms after the E8F is turned ON.

Make sure that the Sensor is free from ultrasonic vibration when mounting the E8F.

#### Others:

If no linear or error output is used, cut off the black and orange lead wires and apply insulation tape to the lead wires so that they will not come in contact with any other terminal.





**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

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

Cat. No. D070-E1-1 **In the interest of product improvement, specifications are subject to change without notice.**

## **OMRON Corporation**

Industrial Sensors Division  
Sensing Devices and Components Division H.Q.  
28th Fl., Crystal Tower Bldg.  
1-2-27, Shiromi, Chuo-ku,  
Osaka 540-6028 Japan  
Phone: (81)6-949-6012 Fax: (81)6-949-6021

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