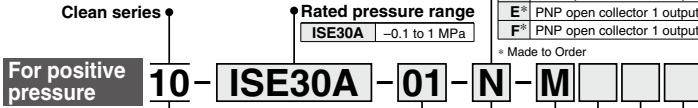


# Series 10-ZSE30A(F)/10-ISE30A



## How to Order






**Rated pressure range**

ISE30A	-0.1 to 1 MPa
--------	---------------



**Piping**

01	R1/8 (M5 female thread)	
N01*	NPT1/8 (M5 female thread)	
C4H	One-touch fitting ø4 mm, ø5/32 inch	
C6H	One-touch fitting ø6 mm	
N7H	One-touch fitting ø1/4 inch	
C4L	One-touch fitting ø4 mm, ø5/32 inch	
C6L	One-touch fitting ø6 mm	
N7L	One-touch fitting ø1/4 inch	

\* Made to Order

**Display unit**



Nil	With unit switching function (Note 1)
M	Fixed SI unit (Note 2)
P*	With unit switching function (Note 1) (Initial value psi)

\* Made to Order

Note 1) Under the New Measurement Law, sales of switches with the unit switching function are not allowed for use in Japan.

Note 2) Fixed unit kPa, MPa

**Option 1**

Nil	Without lead wire	
L	Lead wire with connector (Lead wire length 2 m) (Note)	
G	Lead wire with connector (Lead wire length 2 m) (Note) With connector cover	

(Note) For output types N and P, the number of core of lead wires will be 3, and for other types, it will be 4.

### Output

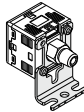
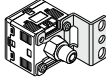
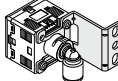
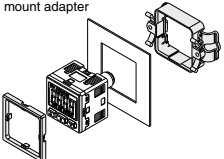
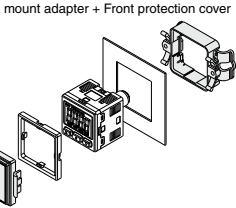
N	NPN open collector 1 output
P	PNP open collector 1 output
A	NPN open collector 2 outputs
B	PNP open collector 2 outputs
C*	NPN open collector 1 output + Analog voltage output
D*	NPN open collector 1 output + Analog current output
E*	PNP open collector 1 output + Analog voltage output
F*	PNP open collector 1 output + Analog current output

\* Made to Order

### Option 3

Symbol	Operating manual Booklet	Calibration certificate
Nil	<input type="radio"/>	<input type="radio"/>
Y	<input type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input type="checkbox"/>
T	<input type="checkbox"/>	<input type="checkbox"/>

### Option 2

Nil	None	
A1	Bracket A	
A2	Bracket B	
A3	Bracket C	
B	Panel mount adapter	
D	Panel mount adapter + Front protection cover	

## ⚠ Caution

This product is 10-ZSE30A(F)/ISE30A series blown with air and double packed in a Class M3.5 (ISO Class 5) clean room.

Directional Control Valves  
 Air Cylinders  
 Rotary Actuators  
 Air Grippers  
 Air Preparation Equipment  
 Modular F. R.  
 Pressure Control Equipment  
 Fittings & Tubing  
 Flow Control Equipment  
 Pressure Switches/Pressure Sensors

## 2-Color Display High-Precision Digital Pressure Switch 10-ZSE30A(F)/10-ISE30A

Refer to the SMC website for Pressure Switches Precautions (M-E03-3) and Specific Product Precautions (Operation Manual).

### Specifications

Model	10-ZSE30A (Vacuum pressure)	10-ZSE30AF (Compound pressure)	10-ISE30A (Positive pressure)
Rated pressure range	0.0 to -101.0 kPa	-100.0 to 100.0 kPa	-0.100 to 1.000 MPa
Display/Set pressure range	10.0 to -105.0 kPa	-105.0 to 105.0 kPa	-0.105 to 1.050 MPa
Withstand pressure	500 kPa	500 kPa	1.5 MPa
Display/Smallest settable increment	0.1 kPa	0.1 kPa	0.001 MPa
Applicable fluid	Air, Non-corrosive gas, Non-flammable gas		
Power supply voltage	12 to 24 VDC $\pm 10\%$ , Ripple (p-p) 10% or less (with power supply polarity protection)		
Current consumption	40 mA or less		
Switch output	NPN or PNP open collector 1 output, NPN or PNP open collector 2 outputs (selectable)		
Maximum load current	80 mA		
Maximum applied voltage	28 V (at NPN output)		
Residual voltage	1 V or less (with load current of 80 mA)		
Response time	2.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000 ms)		
Short circuit protection	Yes		
Repeatability	$\pm 0.2\%$ F.S. $\pm 1$ digit		
Hysteresis	Variable (0 or above) <sup>Note 1)</sup>		
Hysteresis	Window comparator mode		
Output voltage (Rated pressure range)	1 to 5V $\pm 2.5\%$ F.S.		0.6 to 5 V $\pm 2.5\%$ F.S.
Linearity	$\pm 1\%$ F.S.		
Output impedance	Approx. 1 k $\Omega$		
Output current (Rated pressure range)	4 to 20 mA $\pm 2.5\%$ F.S.		2.4 to 20 mA $\pm 2.5\%$ F.S.
Linearity	$\pm 1\%$ F.S.		
Load impedance	Maximum load impedance: Power supply voltage 12 V: 300 $\Omega$ , Power supply voltage 24 V: 600 $\Omega$ Minimum load impedance: 50 $\Omega$		
Display	4-digit, 7-segment, 2-color LCD (Red/Green)		
Display accuracy	$\pm 2\%$ F.S. $\pm 1$ digit (Ambient temperature of 25 $\pm 3^\circ\text{C}$ )		
Indicator light	Lights up when switch output is turned ON. OUT1: Green, OUT2: Red		
Enclosure	IP40		
Operating temperature range	Operating: 0 to 50 $^\circ\text{C}$ , Stored: -10 to 60 $^\circ\text{C}$ (No freezing or condensation)		
Operating humidity range	Operating/Stored: 35 to 85% RH (No condensation)		
Withstand voltage	1000 VAC for 1 minute between live parts and case		
Insulation resistance	50 M $\Omega$ or more between live parts and case (at 500 VDC Mega)		
Temperature characteristics	$\pm 2\%$ F.S. (Based on 25 $^\circ\text{C}$ )		
Lead wire	Oilproof heavy-duty vinyl cable, 3 cores $\phi 3.5, 2$ m 4 cores Conductor area: 0.15 mm $^2$ (AWG26), Insulator O.D.: 1.0 mm		
Standards	CE UL/CSA/E216656) RoHS		
Cleanliness class (ISO class)	Class 4		

Note 1) If applied pressure fluctuates near the set value, set the hysteresis above the fluctuation range to prevent chattering.

Note 2) When analog voltage output is selected, analog current output cannot be used together.

Note 3) When analog current output is selected, analog voltage output cannot be used together.

### Piping Specifications

Model	01	N01	C4H	C6H	N7H	C4L	C6L	N7L
Port size	R1/8 M5 x 0.8	NPT1/8 M5 x 0.8	—	—	—	—	—	—
One-touch fitting, Straight type	—	—	$\phi 4$ mm $\phi 5/32$ inch	$\phi 6$ mm	$\phi 1/4$ inch	—	—	—
One-touch fitting, Elbow type	—	—	—	—	—	$\phi 4$ mm $\phi 5/32$ inch	$\phi 6$ mm	$\phi 1/4$ inch
Wetted parts material	Sensor pressure receiving area: C3602 (electroless nickel plated) O-ring: HNBR		Sensor pressure receiving area: Silicon PBT, POM, Stainless steel 304, C3604 (electroless nickel plated) O-ring: HNBR					
Weight	Including lead wire with connector (3 cores, 2 m) 81 g	81 g	70 g	71 g	73 g	75 g	73 g	75 g
	Including lead wire with connector (4 cores, 2 m) 85 g	85 g	74 g	75 g	77 g	79 g	77 g	79 g
	Excluding lead wire with connector 43 g	43 g	32 g	33 g	35 g	37 g	35 g	37 g

### Options/Part No.

When optional parts are required separately, use the following part numbers to place an order.

Part no.	Option	Note	Part no.	Option	Note
10-ZS-38-A1	Bracket A	Mounting screw (with 2 pcs. of M3 x 5L)	10-ZS-38-4G	Lead wire with connector (with connector cover)	4 cores, for 2 outputs, 2 m
10-ZS-38-A2	Bracket B	Mounting screw (with 2 pcs. of M3 x 5L)	10-ZS-38-5L	Lead wire with a connector for copying	3 cores, copy function, 1 m
10-ZS-38-A3	Bracket C	Mounting screw (with 2 pcs. of M3 x 5L)	10-ZS-38-U	Lead wire unit with a connector for copying	Copy function (up to 10 slaves)
10-ZS-27-C	Panel mount adapter	Mounting screw (with 2 pcs. of M3 x 8L)	10-ZS-38-C4H	One-touch fittings $\phi 4$ mm straight	O-ring, one-touch clip included
10-ZS-27-D	Panel mount adapter + Front protection cover	Mounting screw (with 2 pcs. of M3 x 8L)	10-ZS-38-C6H	One-touch fittings $\phi 6$ mm straight	O-ring, one-touch clip included
10-ZS-27-01	Front protection cover		10-ZS-38-N7H	One-touch fittings $\phi 1/4$ inch straight	O-ring, one-touch clip included
10-ZS-38-3L	Lead wire with connector	3 cores, for 1 output, 2 m	10-ZS-38-C4L	One-touch fittings $\phi 4$ mm elbow	O-ring, one-touch clip included
10-ZS-38-4L	Lead wire with connector	4 cores, for 2 outputs, 2 m	10-ZS-38-C6L	One-touch fittings $\phi 6$ mm elbow	O-ring, one-touch clip included
10-ZS-38-3G	Lead wire with connector (with connector cover)	3 cores, for 1 output, 2 m	10-ZS-38-N7L	One-touch fittings $\phi 1/4$ inch elbow	O-ring, one-touch clip included

### Set Pressure Range and Rated Pressure Range

**Set the pressure within the rated pressure range.**

The set pressure range is the range of pressure that is possible in setting.

The rated pressure range is the range of pressure that satisfies the specifications (accuracy, linearity, etc.) on the switch.

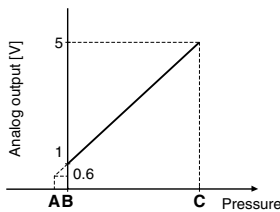
Although it is possible to set a value outside the rated pressure range, the specifications will not be guaranteed even if the value stays within the set pressure range.

Switch		Pressure range				
		-100 kPa	0	100 kPa	500 kPa	1 MPa
For vacuum pressure	10-ZSE30A	-101 kPa	0			
		-105 kPa	10 kPa			
For compound pressure	10-ZSE30AF	-100 kPa	100 kPa			
		-105 kPa	105 kPa			
For positive pressure	10-ISE30A	-100 kPa				1 MPa
		-105 kPa (-0.105 MPa)				1.05 MPa

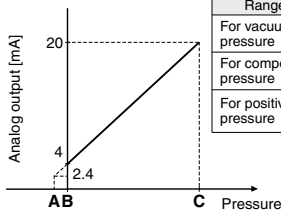
■ Rated pressure range of switch  
 ■ Set pressure range of switch

### Analog Output

**Voltage output**



**Current output**



Range	Rated pressure range	A	B	C
For vacuum pressure	0.0 to -101.0 kPa	—	0	-101 kPa
For compound pressure	-100.0 to 100.0 kPa	—	-100 kPa	100 kPa
For positive pressure	-0.100 to 1.000 MPa	-0.1 MPa	0	1 MPa

Directional Control Valves

Air Cylinders

Rotary Actuators

Air Grippers

Air Preparation Equipment

Modular F. R.

Pressure Control Equipment

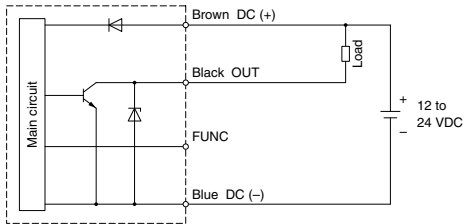
Fittings & Tubing

Flow Control Equipment

Pressure Switches/ Pressure Sensors

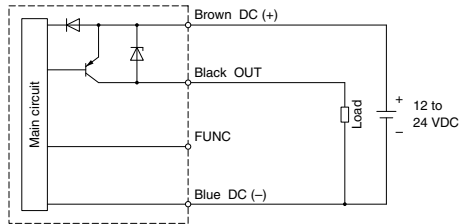
**Internal Circuits and Wiring Examples**

**-N  
NPN (1 output)**



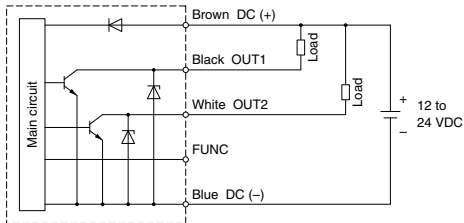
Max. 28 V, 80 mA  
Residual voltage 1 V or less

**-P  
PNP (1 output)**



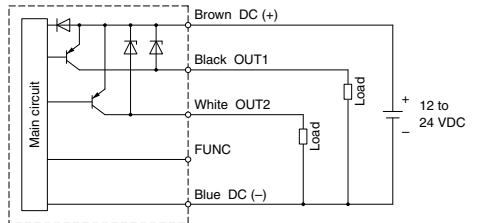
Max. 80 mA  
Residual voltage 1 V or less

**-A  
NPN (2 outputs)**



Max. 28 V, 80 mA  
Residual voltage 1 V or less

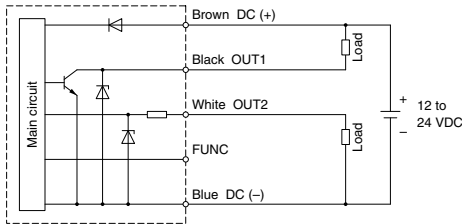
**-B  
PNP (2 outputs)**



Max. 80 mA  
Residual voltage 1 V or less

\* The FUNC terminal is connected using a dedicated lead wire (10-ZS-38-5L or 10-ZS-38-U) when the copy function is used. (Refer to "Copy function" on page 1321.)

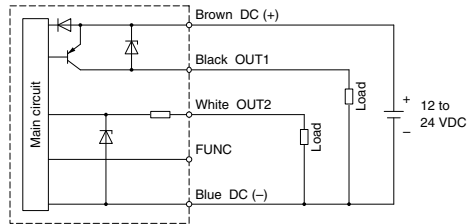
**-C**  
NPN (1 output) + Analog voltage output



Max. 28 V, 80 mA  
Residual voltage 1 V or less

Analog voltage output  
Output impedance: Approx. 1 kΩ

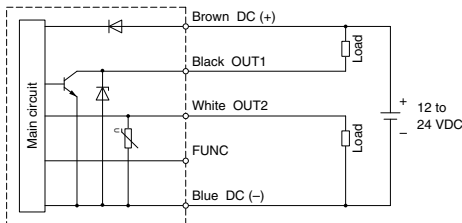
**-E**  
PNP (1 output) + Analog voltage output



Max. 80 mA  
Residual voltage 1 V or less

Analog voltage output  
Output impedance: Approx. 1 kΩ

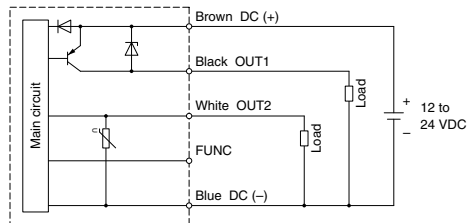
**-D**  
NPN (1 output) + Analog current output



Max. 28 V, 80 mA  
Residual voltage 1 V or less

Analog current output  
Max. load impedance:  
Power supply voltage 12 V: 300 Ω  
Power supply voltage 24 V: 600 Ω  
Min. load impedance: 50 Ω

**-F**  
PNP (1 output) + Analog current output



Max. 80 mA  
Residual voltage 1 V or less

Analog current output  
Max. load impedance:  
Power supply voltage 12 V: 300 Ω  
Power supply voltage 24 V: 600 Ω  
Min. load impedance: 50 Ω

\* The FUNC terminal is connected using a dedicated lead wire (10-ZS-38-5L or 10-ZS-38-U) when the copy function is used. (Refer to "Copy function" on page 1321.)

Directional Control Valves

Air Cylinders

Rotary Actuators

Air Grippers

Air Preparation Equipment

Modular F. R.

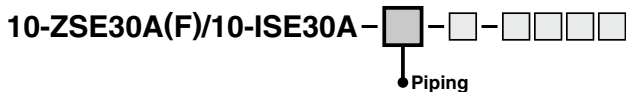
Pressure Control Equipment

Fittings & Tubing

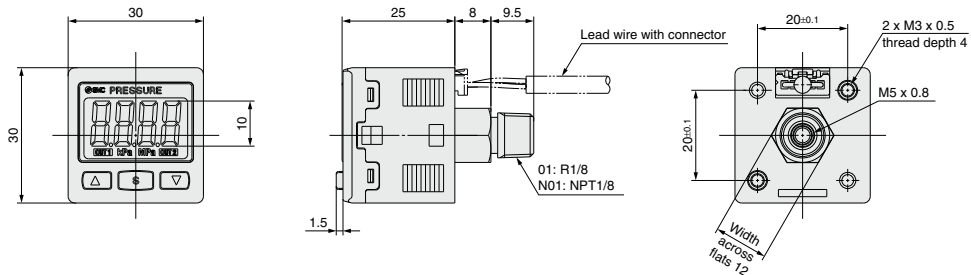
Flow Control Equipment

Pressure Switches/ Pressure Sensors

**Dimensions** (For details about lead wires, refer to the product specifications.)

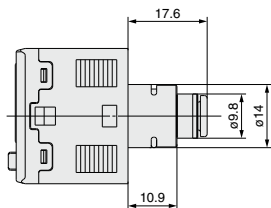


**01 / N01**



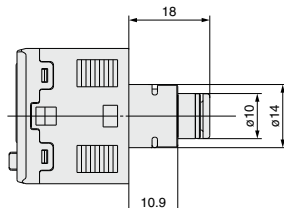
**C4H**

One-touch fitting  $\varnothing 4$  mm  
 $\varnothing 5/32$  inch straight



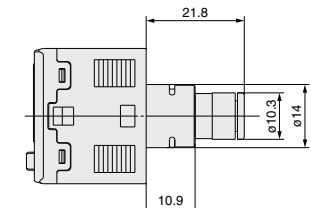
**C6H**

One-touch fitting  $\varnothing 6$  mm  
straight



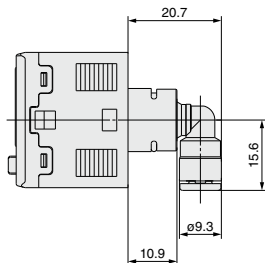
**N7H**

One-touch fitting  $\varnothing 1/4$  inch  
straight



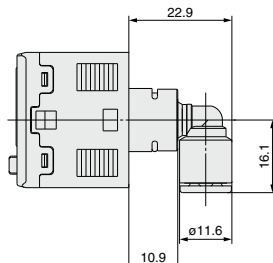
**C4L**

One-touch fitting  $\varnothing 4$  mm  
 $\varnothing 5/32$  inch elbow



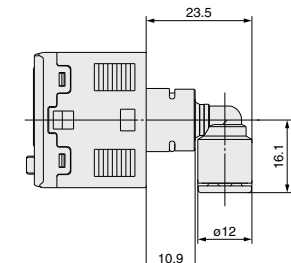
**C6L**

One-touch fitting  $\varnothing 6$  mm  
elbow



**N7L**

One-touch fitting  $\varnothing 1/4$  inch  
elbow



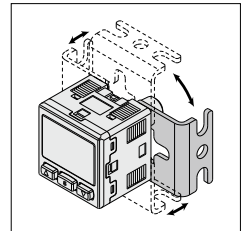
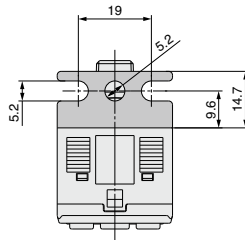
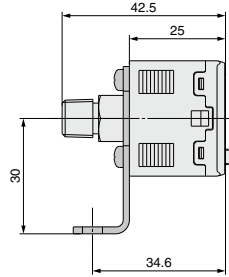
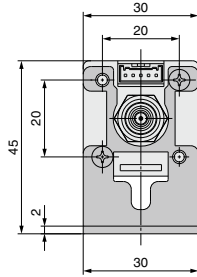
With bracket

10-ZSE30A(F)/10-ISE30A - □ - □ - □ - □ - □ - □

Option 2

**A1**

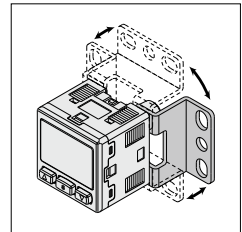
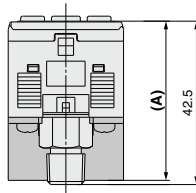
**Bracket A**  
(Option unit part no.: 10-ZS-38-A1)



\* Bracket configuration allows mounting in four orientations.

**A2**

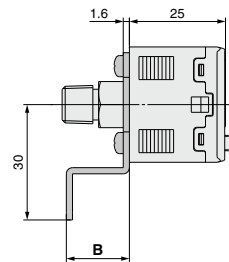
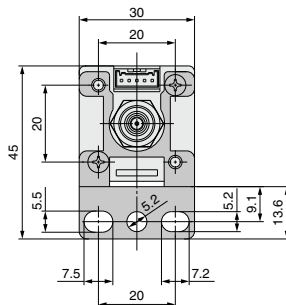
**Bracket B**  
(Option unit part no.: 10-ZS-38-A2)



\* Bracket configuration allows mounting in four orientations.

**A3**

**Bracket C**  
(Option unit part no.: 10-ZS-38-A3)



	A	B
Bracket B	41.4	16.4
Bracket C	53	28

**Dimensions**

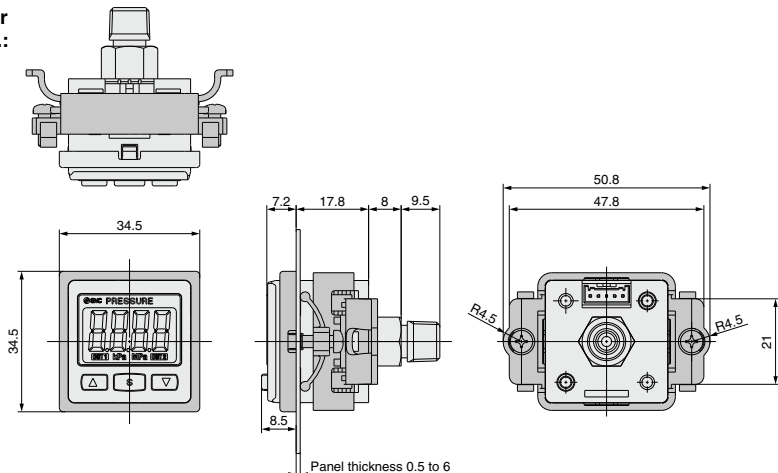
Panel mount

**10-ZSE30A(F)/10-ISE30A** - □ - □ - □ - □ - □

Option 2

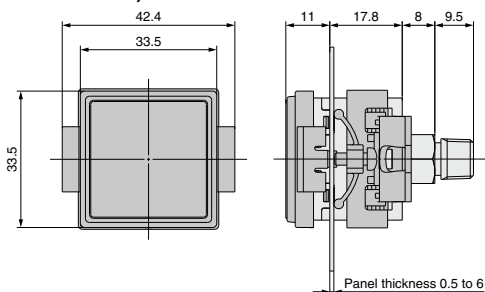
**B**

Panel mount adapter  
(Option unit part no.:  
10-ZS-27-C)

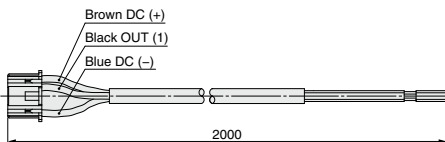


**D**

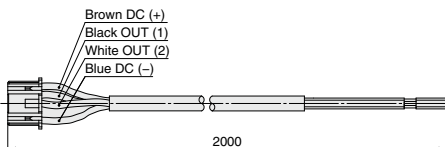
Panel mount adapter + Front protection cover  
(Option unit part no.: 10-ZS-27-D)



Lead wire with connector  
(Option unit part no.: 10-ZS-38-3L)



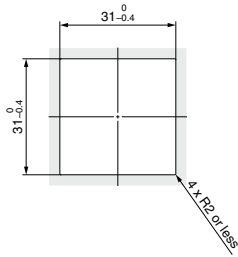
(Option unit part no.: 10-ZS-38-4L)



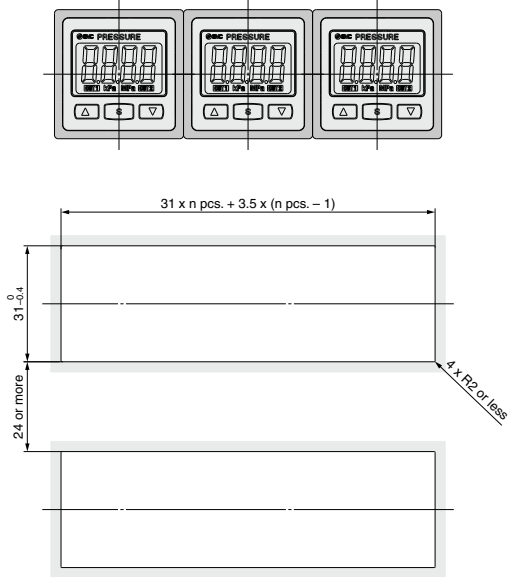


Panel-cut dimensions

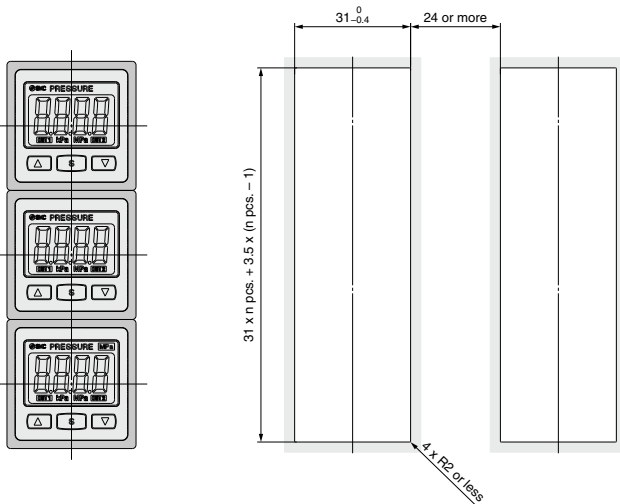
1 pc. mounting



Multiple (2 pcs. or more) horizontal mounting



Multiple (2 pcs. or more) vertical mounting



Directional Control Valves

Air Cylinders

Rotary Actuators

Air Grippers

Air Preparation Equipment

Modular F. R.

Pressure Control Equipment

Fittings & Tubing

Flow Control Equipment

Pressure Switches/ Pressure Sensors

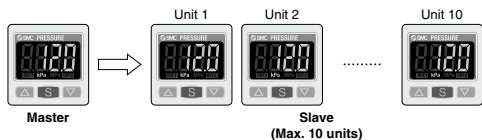
## Function Details

### A Copy function (F97)

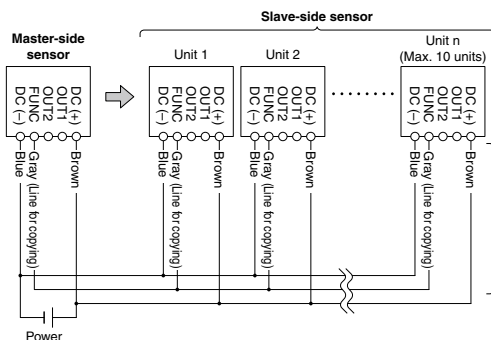
The settings of the master sensor can be copied to the slave sensors. It is to reduce the time taken for setting and prevent the input of wrong values.

**Settings can be copied to up to 10 slave sensors at once.**

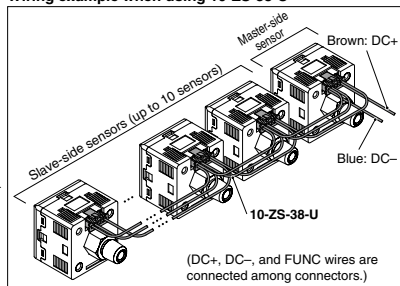
**(Max. transmission distance: 4 m)**



- 1) The sensors are connected by a dedicated lead wire (10-ZS-38-5L (for master and one slave) or 10-ZS-38-U (for master and up to 10 slaves)). Copying is performed through a dedicated communication line.
- 2) Make the slave sensor which needs to be the master into the master by button operation. (Initially all sensors are set as slaves.)
- 3) Press the **[S]** button on the master sensor to start copying.



### Wiring example when using 10-ZS-38-U

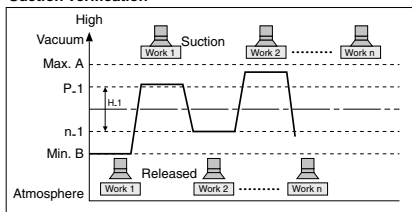


### B Auto-preset function (F5)

Auto-preset function, when selected in the setting, calculates and stores the set-value from the measured pressure.

The optimum set-value is determined automatically by repeating vacuum and break with the target workpiece several times.

#### Suction Verification

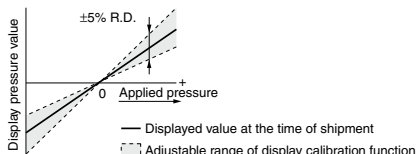


#### Formula for Obtaining the Set-Value

P <sub>1</sub> or P <sub>2</sub>	H <sub>1</sub> or H <sub>2</sub>
$P_1 (P_2) = A - (A-B)/4$	$H_1 (H_2) = (A-B)/2$
$n_1 (n_2) = B + (A-B)/4$	

### C Precision indicator setting function (F6)

Fine adjustment of the indicated value of the pressure sensor can be made within the range of  $\pm 5\%$  of the read value. The scattering of the indicated value can be eliminated.



Note) When the precision indicator setting function is used, the set pressure value may change  $\pm 1$  digit.

### D Peak and bottom display function

This function constantly detects and updates the maximum (minimum) value and allows to hold the maximum (minimum) pressure value.

When the **[Δ]** **[▽]** buttons are simultaneously pressed for 1 second or longer, while "holding", the held value will be reset.

### E Key lock function

This function prevents incorrect operations such as accidentally changing the set-value.

### F Zero-out function

This function clears and resets the zero value on the display of measured pressure.

For the pressure switch with analog output, the analog output shifts according to the indication. A displayed value can be adjusted within  $\pm 7\%$  F.S. of the pressure when ex-factory. ( $\pm 3.5\%$  F.S. for 10-ZSE30AF (compound pressure))

F in brackets stand for the function codes. Refer to the operating manual for how to operate and function codes in detail.

## G Error indication function

Error name	Error code	Description	Solution
Overcurrent error	Er1	Load current of switch output (OUT1) exceeds 80 mA.	Shut off the power supply. After eliminating the output factor that caused the excess current, turn the power supply back on.
	Er2	Load current of switch output (OUT2) exceeds 80 mA.	
Residual pressure error	Er3	A pressure of $\pm 7\%$ F.S. of atmospheric pressure is applied in the zero-out function. ( $\pm 3.5\%$ F.S. or more for 10-ZSE30AF (compound pressure)) The switch will automatically return to measuring mode in 1 second, however. Due to individual product differences, the setting range of the zero-out function varies within $\pm 1\%$ F.S.	Bring the pressure back to atmospheric pressure and try using the zero-out function.
Applied pressure error	HHH	Supply pressure exceeds the maximum set pressure.	Bring the pressure back to within the set pressure range.
	LLL	Supply pressure is below the minimum set pressure.	
System error	Er0	Internal data error	Shut off the power supply. Turn the power supply back on. If the switch will not recover to normal, consult SMC for investigation.
	Er4		
	Er6		
	Er7		
	Er8		
	Er9		

If the switch will not recover to normal even after all of the above-mentioned solutions have been applied, consult SMC for investigation.

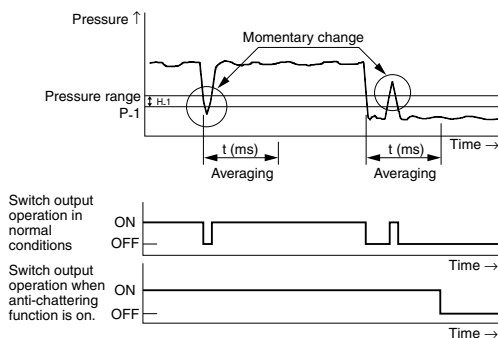
## H Anti-chattering function (F3)

A large bore cylinder or ejector consumes a large volume of air in operation and may experience a temporary drop in the supply pressure. This function prevents detection of such temporary drops in the supply pressure as an error.

Available response time settings
20 ms, 100 ms, 500 ms, 1000 ms, 2000 ms

### Principle

This function averages pressure values measured during the response time set by the user and then compares the average pressure value with the pressure set point value to output the result on the switch.



## I Display unit switching function (F0)

Display units can be switched with this function.

Smallest settable increment	Display unit		PA	GF	PSI	inH	mmH
	kPa	MPa*	kgf/cm <sup>2</sup>	bar	psi	inHg	mmHg
10-ZSE30A (Vacuum pressure)	0.1	0.001	0.001	0.001	0.01	0.1	1
10-ZSE30AF (Compound pressure)	0.1	0.001	0.001	0.001	0.01	0.1	1
10-ISE30A (Positive pressure)	1	0.001	0.01	0.01	0.1	/	/

\* For the 10-ZSE30A (vacuum pressure) and 10-ZSE30AF (compound pressure), when the display unit is MPa, setting and display resolutions are changed.

## J Power-saving mode (F7)

Power-saving mode can be selected.

It shifts to the power-saving mode without button operation for 30 seconds. It is set to the normal mode (Power-saving mode is OFF.) when ex-factory. (Decimal points and operation indicator light (only when the switch output is turned ON.) blink in the power-saving mode.)

## K Secret code setting (F8)

It can be set whether code number input is required or not when key is locked. It is set to input no code number when ex-factory.