

Series 10-PSE300

Remote Type
2-Color Display Digital Pressure Sensor Controller



How to Order



Input/Output specifications

0	NPN2 output + 1 to 5 V output
1	NPN2 output + 4 to 20 mA output
2	NPN2 output + Auto shift input
3	PNP2 output + 1 to 5 V output
4	PNP2 output + 4 to 20 mA output
5	PNP2 output + Auto shift input

Unit specifications

Nil	With unit switching function ^{Note 1)}
M	Fixed SI unit ^{Note 2)}

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

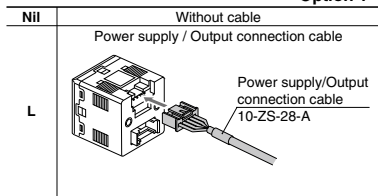
For vacuum/low pressure/low differential pressure/compound pressure: kPa
For positive pressure: MPa (for 1 MPa)
kPa (for 500 kPa)

10 — PSE30 0 — M — — —

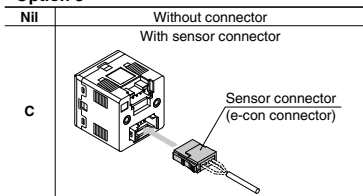
Clean series

Option 1

Option 3



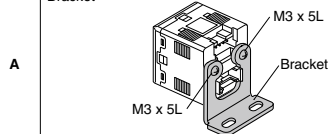
Note) At the factory, the cable is packed together without being connected.



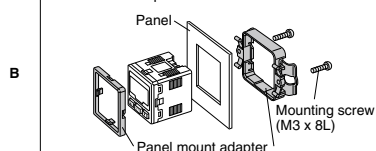
Note) At the factory, the connector is packed together without being connected.

Option 2

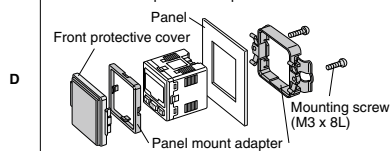
Nil None
Bracket



Panel mount adapter



Panel mount adapter + Front protective cover



Note) These options are unassembled in the factory, but are included with the shipment.

Options/Part No.

Description	Part no.	Note
Power supply / Output connection cable (2 m)	10-ZS-28-A	
Bracket	10-ZS-28-B	With M3 x 5L (2 pcs.)
Sensor connector	10-ZS-28-C	1 pc.
Panel mount adapter	10-ZS-27-C	With M3 x 8L (2 pcs.)
Panel mount adapter + Front protective cover	10-ZS-27-D	With M3 x 8L (2 pcs.)

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

Remote Type 2-Color Display Digital Pressure Sensor Controller **10-PSE300**

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

Specifications

Model		10-PSE300□					
Set (differential) pressure range		-101 to 101 kPa	10 to -101 kPa	-10 to 100 kPa	-0.1 to 1 MPa	-50 to 500 kPa	-0.2 to 2 kPa
Pressure range ^{Note 1)}	For compound pressure	For vacuum pressure	For low pressure	For positive pressure		For low differential pressure	
Rated (differential) pressure range		-100 to 100 kPa	0 to -101 kPa	0 to 100k Pa	0 to 1 MPa	0 to 500 kPa	0 to 2k Pa
Power supply voltage	12 to 24 VDC, Ripple (p-p) 10% or less (with power supply polarity protection)						
Current consumption	50 mA or less (Current consumption for sensor is not included.)						
Sensor input	Number of inputs	1 input					
	Input protection	With excess voltage protection (up to 26.4 V)					
Hysteresis	Hysteresis mode: Variable, Window comparator mode: Variable						
Switch output	NPN or PNP open collector output: 2 outputs						
	Maximum load current	80 mA					
	Maximum load voltage	30 VDC (at NPN output)					
	Residual voltage	1 V or less (with load current of 80 mA)					
Response time	Output protection	With short-circuit protection					
	Anti-chattering function	Response time selections with anti-chattering function: 20 ms, 160 ms, 640 ms, 1280 ms					
Repeatability	±0.1% F.S. or less						
Analog output	Voltage output ^{Note 2)}	Output voltage: 1 to 5 V (within rated (differential) pressure range), 0.6 to 1 V (within extension analog output range); Output impedance: Approx. 1 kΩ					
	Accuracy (to display value) (25°C)	Linearity: ±0.2% F.S. or less (not including sensor accuracy); Response time: 150 ms or less					
	Current output ^{Note 2)}	Output current: 4 to 20 mA (within rated (differential) pressure range), 2.4 to 4 mA (within extension analog output range)					
	Accuracy (to display value) (25°C)	Maximum load impedance: 300 Ω (12 VDC), 600 Ω (24 VDC), Minimum load impedance: 50 Ω					
Display accuracy (ambient temperature 25°C)		±0.5% F.S.		±0.5% F.S. ±1 digit or less			
		±2 digits or less					
Display	3+1/2 digit, 7 segment indicator, 2 color display (red/green), Sampling cycle: 5 times/sec						
Indicator light	OUT1: Lights up when ON (green), OUT2: Lights up when ON (red)						
Auto shift input ^{Note 2)}	No-voltage input (reed or solid state), Low level input: 5 ms or more, Low level: 0.4V or less						
Environment resistance	Enclosure	IP40					
	Operating temperature range	Operating: 0 to 50°C; Stored: -10 to 60°C (with no freezing or condensation)					
	Operating humidity range	Operating and stored: 35 to 85% RH (with no condensation)					
	Withstand voltage	1000 VAC for 1 min. between live parts and case					
Insulation resistance	50 MΩ or more (measured by 500 VDC mega meter) between live parts and case						
Temperature characteristics	±0.5% F.S. or less (based on 25°C)						
Connection	Power supply/Output connection: 5P connector, Sensor connection: 4P connector						
Material	Front case: PBT; Rear case: PBT						
Weight	With power supply and output connection cable	85 g					
	Without power supply and output connection cable	30 g					
Power supply/Output connection cable	Oilproof heavy-duty vinyl cable, 5 cores, ø4.1, 2 m, Conductor area: 0.2 mm ² Insulator O.D.: 1.12 mm						
Standards	CE, UL/CSA (E216656), RoHS						
Cleanliness class (ISO class)	Class 3						

Note 1) Pressure range can be selected during initial setting.

Note 2) Auto shift function can not be selected when analog output option is selected.

Also, analog output option can not be selected when auto shift function is selected.

Note 3) The following units can be selected with unit conversion function:

For vacuum/compound pressure: KPa-kgf/cm²-bar-psi-mmHg-inHg

For positive/low pressure: MPa-kPa-kgf/cm²-bar-psi

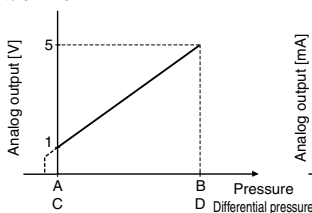
For low differential pressure: KPa-mmH₂O

⚠ Caution

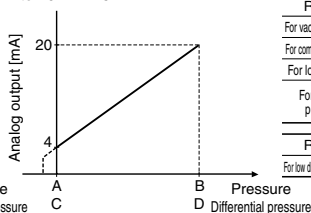
This product is blown with air and double packed in a Class M3.5 (ISO Class 5) clean room.

Analog Output

1 to 5 V DC



4 to 20 mA DC

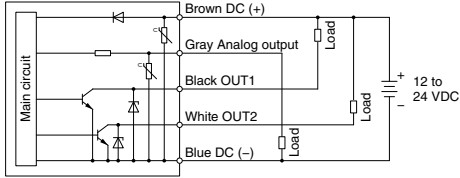


Range	Rated pressure range	A	B
For vacuum pressure	0 to -101 kPa	0	-101 kPa
For compound pressure	-100 kPa to 100 kPa	-100 kPa	100 kPa
For low pressure	0 to 100 kPa	0	100 kPa
	0 to 1 MPa	0	1 MPa
For positive pressure	0 to 500 kPa	0	500 kPa
Range	Rated differential pressure range	C	D
For low differential pressure	0 to 2 kPa	0	2 kPa

Internal Circuit

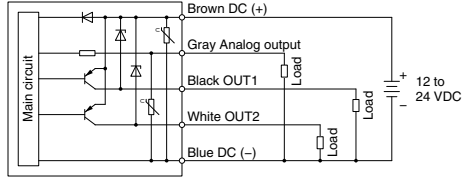
10-PSE300

NPN open collector output: 2 outputs,
 Maximum 30 V, 80 mA, Residual voltage: 1 V or less
 Analog output: 1 to 5 V
 Output impedance: Approx. 1 k Ω



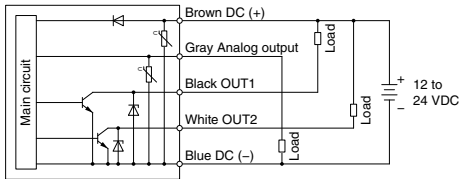
10-PSE300

PNP open collector output: 2 outputs,
 Maximum 80 mA, Residual voltage: 1 V or less
 Analog output: 1 to 5 V
 Output impedance: Approx. 1 k Ω



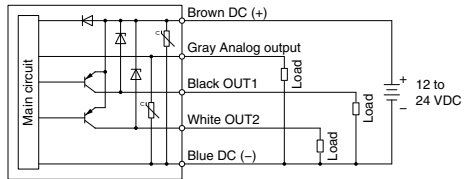
10-PSE301

NPN open collector output: 2 outputs,
 Maximum 30 V, 80 mA, Residual voltage: 1 V or less
 Analog output: 4 to 20 mA
 Maximum load impedance: 300 Ω (12 VDC) 600 Ω (24 VDC)
 Minimum load impedance: 50 Ω



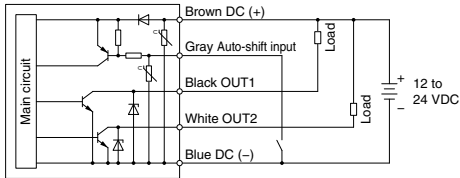
10-PSE304

PNP open collector output: 2 outputs,
 Maximum 80 mA, Residual voltage: 1 V or less
 Analog output: 4 to 20 mA
 Maximum load impedance: 300 Ω (12 VDC) 600 Ω (24 VDC)
 Minimum load impedance: 50 Ω



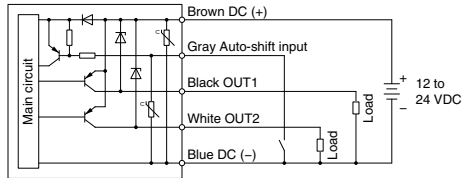
10-PSE302

NPN open collector output with auto shift input: 2 outputs,
 Maximum 30 V, 80 mA, Residual voltage: 1 V or less



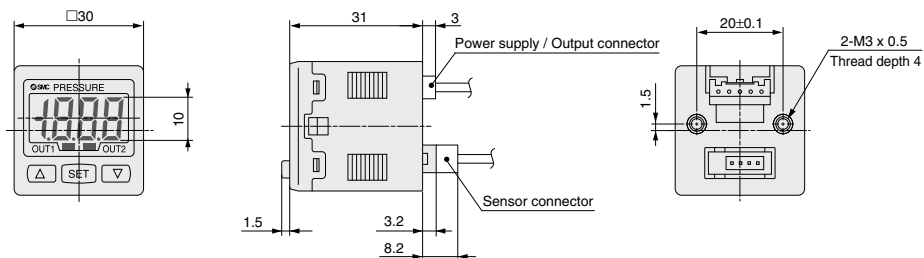
10-PSE305

PNP open collector output with auto shift input: 2 outputs,
 Maximum 80 mA, Residual voltage: 1 V or less

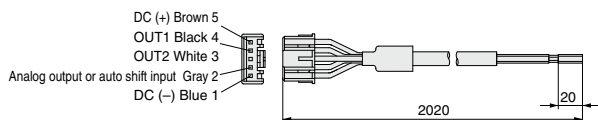


Directional Control Valves
 Air Cylinders
 Rotary Actuators
 Air Grippers
 Air Preparation Equipment
 Modular F. R.
 Pressure Control Equipment
 Fittings & Tubing
 Flow Control Equipment
 Pressure Switches/ Pressure Sensors

Dimensions



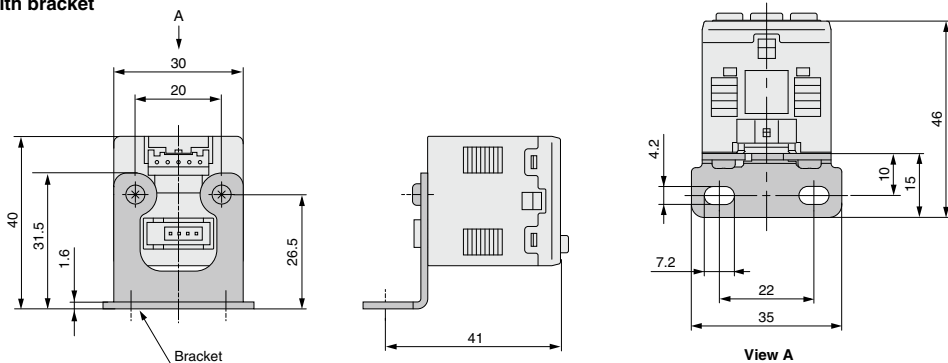
Power supply / Output connection cable (10-ZS-28-A)



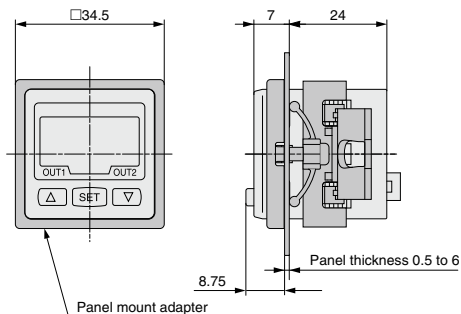
Sensor connector

PIN no.	Terminal
1	DC (+)
2	N.C.
3	DC (-)
4	IN (1 to 5V)

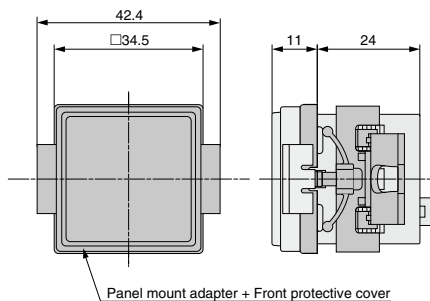
With bracket



With panel mount adapter

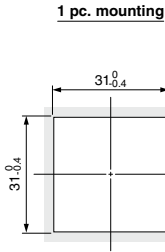


With panel mount adapter + Front protective cover

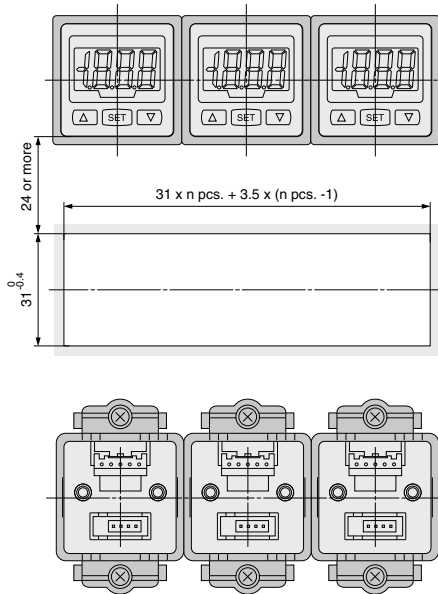


Dimensions

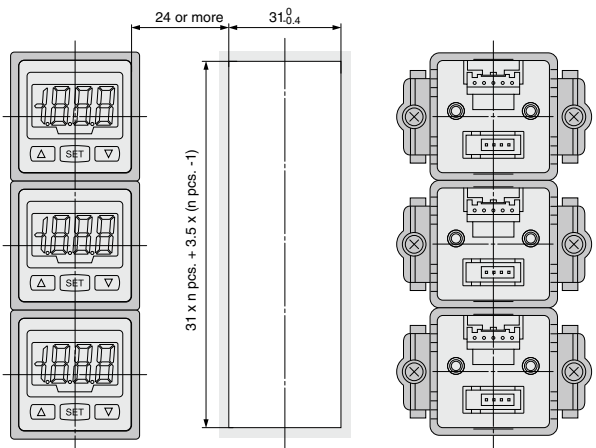
Panel fitting dimensions



Stacking mount of multiple units (n pcs.) (horizontal)



Stacking mounting of multiple units (n pcs.) (vertical)



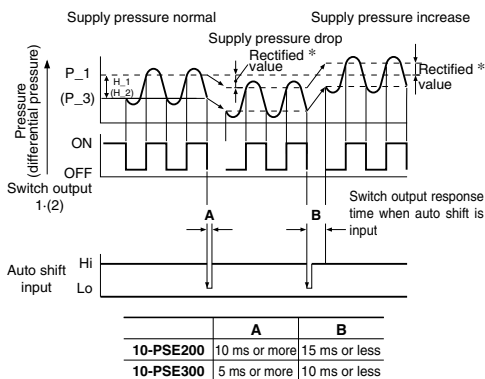
- Directional Control Valves
- Air Cylinders
- Rotary Actuators
- Air Grippers
- Air Preparation Equipment
- Modular F. R.
- Pressure Control Equipment
- Fittings & Tubing
- Flow Control Equipment
- Pressure Switches/ Pressure Sensors

Functions

A Auto shift function

When there are large fluctuations in the supply pressure, the switch may fail to operate correctly. The auto shift function rectifies such supply pressure fluctuations. It measures the differential pressure at the time of auto shift signal input and uses it as the reference (differential) pressure to correct the set value on the switch.

Set value correction by auto shift function



* Rectified value
When the auto shift is input, "ooo" will be displayed for approx. 1 second, and the pressure value at that point will be saved as a rectified value "C_5"(CH1 for 10-PSE200 and 10-PSE300) or "C_3"(CH2 to CH4 for 10-PSE200). Based on the saved rectified values, the set value Note) "P_1" to "P_4" (10-PSE200) or "P_1", "H_1", "P_3", and "H_2" (10-PSE300) will be rectified.

Note) Upon reverse output, "n_1" to "n_4" (10-PSE200) or "n_1", "H_1", "n_3", and "H_2" (10-PSE300) are rectified.

Possible set range for auto shift input

10-PSE200	Set (differential) pressure range	Possible set range
Compound pressure	-101.0 to 101.0 kPa	-101.0 to 101.0 kPa
Vacuum pressure	10.0 to -101.0 kPa	-101.0 to 101.0 kPa
Low pressure	-10.0 to 101.0 kPa	-100.0 to 101.0 kPa
Positive pressure	-0.1 to 1.000 MPa	-1.000 to 1.000 MPa
Low differential pressure	-	-

10-PSE300	Set (differential) pressure range	Possible set range
Compound pressure	-101.0 to 101.0 kPa	-101.0 to 101.0 kPa
Vacuum pressure	10.0 to -101.0 kPa	-101.0 to 101.0 kPa
Low pressure	-10 to 100.0 kPa	-100.0 to 100.0 kPa
Positive pressure	-0.1 to 1.000 MPa	-1.000 to 1.000 MPa
	-50 to 500 kPa	-500 to 500 kPa
Low differential pressure	-0.2 to 2.00 kPa	-2.00 to 2.00 kPa

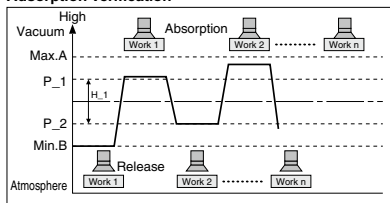
Auto shift zero (10-PSE300 only)

Basic function of auto shift zero is the same as the auto shift function. The only difference is that assuming the pressure value when an auto shift is input to be "0", display value is also rectified .

B Auto preset function

When auto preset function is selected in the initial setting, it calculates and stores the set value from the measured (differential) pressure. The optimum set value is determined automatically by repeating vacuum and release with the target workpiece several times.

Adsorption verification

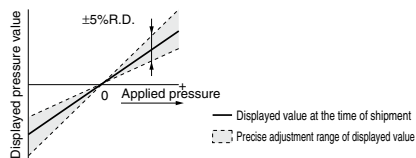


Formula for calculating the set value

	P_1 or P_3	P_2(H_1) or P_4(H_2)
10-PSE200		P_2(H_1) or P_4(H_2)
10-PSE300	$P_1(P_3) = A - (A - B) / 4$	$P_2(P_4) = B + (A - B) / 4$
		$H_1(H_2) = (A - B) / 2$

C Display calibration function

This function eliminates slight differences in the output values and allows uniformity in the numbers displayed. Displayed values of the pressure sensors can be adjusted to within ±5%.



Note) When the precision indicator setting function is used, the set (differential) pressure value may change ±1 digit.

D Peak/Bottom hold display function

This function constantly detects and updates the maximum and minimum values and allows to hold the display value. Series 10-PSE300 allows the hold value to be reset by pressing ↑ and ↓ at the same time for one second or more while holding the display value.

E Key lock function

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

F Reset function

This function clears and resets the zero value on the display of measured (differential) pressure. It is possible to rectify within ±7%F.S. from the factory-set value.

Functions

G Error indication function

Error name	Error indication function	Description	
	10-PSE200	10-PSE300	
Overcurrent error	Er 1	Er 1	Current exceeding 80 mA is applied to switch output (OUT1).
	Er 2	Er 2	Current exceeding 80 mA is applied to switch output OUT2.
Residual pressure error	Er 3	Er 3	Pressure exceeding $\pm 7\%$ F.S. is applied during the zero reset operation. * After displaying the error code for 3 seconds, the switch automatically returns to the measuring mode. Due to individual product differences, the setting range varies ± 4 digits.
Applied pressure error	---	HHH	Supply pressure exceeds the maximum set (differential) pressure or upper limit of the display pressure.
	---	LLL	A sensor may not be unconnected or miswired. Or, supply pressure is below the minimum set (differential) pressure or lower limit of the display pressure.
Auto shift error	/	or	The value measured at the time of auto shift input is outside the set (differential) pressure range. * After displaying the error code for approx. 1 second, the switch returns to the measuring mode.
System error	Er 5	Er 4	Displayed when internal data error has occurred.
	Er 6	Er 6	Displayed when internal data error has occurred.
	Er 7	Er 7	Displayed when internal data error has occurred.
	Er 8	Er 8	Displayed when internal data error has occurred.

H Copy function (10-PSE200 only)

Information that can be copied includes the following: (1)Pressure set values (2)Range settings (3)Display units (4)Output modes (5)Response times.

- When CH1 is copied to CH2, CH3, and CH4, information of OUT1 in CH1 will be copied.
- When CH2, CH3, or CH4 is copied to CH1, information of OUT1 in CH2, CH3, or CH4 will be copied only to OUT1 in CH1.

Note 1) When the copy function is used, the regulating pressure value of the copied channel may change ± 1 digit.

I Auto identification function (10-PSE200 only)

This function automatically identifies the pressure range of the pressure sensor that is connected to the multi-channel pressure sensor monitor, thus eliminating the need of having to reset the range again after replacing the sensor.

This function will be activated either when "Aon" is set in the auto identification mode or when the power is turned back on in that condition. However, this function only works in conjunction with specific pressure sensors (SMC: Series PSE53□).

When other pressure sensors are used, this function will not work. When using other types of pressure sensors, first set the auto identification mode to "AoF" and then proceed to the range setting. Turning the power back on while in the "Aon" setting can cause a malfunction.

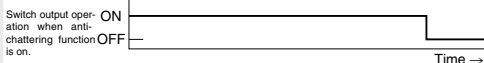
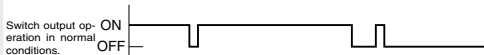
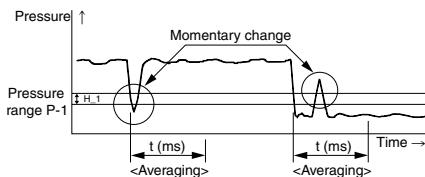
J Anti-chattering function

Devices such as large bore cylinders and high-flow vacuum ejectors consume a large volume of air when they operate, and this may cause a momentary drop in the supply pressure. This function prevents such momentary drops from being detected as abnormal pressures by changing the response time setting.

	Possible response time settings
10-PSE200	20 ms, 160 ms, 640 ms
10-PSE300	20 ms, 160 ms, 640 ms, 1280 ms

<Principle>

The pressure values measured within the response time that are selected by the user are averaged. By comparing this average pressure value with the set pressure value, switch output (ON/OFF) is determined.



K Channel selection function (10-PSE200 only)

This function displays the measured pressure of any channel.

L Channel scan function (10-PSE200 only)

This function displays measured pressure for each channel in order at approx. 2-second intervals.

 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

Functions

M Display unit switching function

Display units can be switched with this function.

Units that can be set vary depending on the range of the pressure sensors connected to the controller.

10-PSE200

Pressure range	For compound pressure	For vacuum pressure	For low pressure	For positive pressure	
Applicable pressure sensor	10-PSE533	10-PSE531		10-PSE530	
	10-PSE543	10-PSE541	10-PSE532	10-PSE540	
	10-PSE563	10-PSE561		10-PSE560	
Set (differential) pressure range	-101 to 101 kPa	10 to -101 kPa	-10 to 100 kPa	-0.1 to 1 MPa	
$P\bar{R}$	kPa	0.1	0.1	0.1	—
	MPa	—	—	—	0.001
$\bar{C}F$	kgf/cm ²	0.001	0.001	0.001	0.01
$\bar{b}\bar{R}\bar{r}$	bar	0.001	0.001	0.001	0.01
$\bar{P}\bar{S}$	psi	0.02	0.01	0.01	0.1
$\bar{m}\bar{H}$	inHg	0.1	0.1	—	—
$\bar{n}\bar{n}\bar{H}$	mmHg	1	1	—	—

10-PSE300

Pressure range	For compound pressure	For vacuum pressure	For low pressure	For positive pressure		For low differential pressure	
Applicable pressure sensor	10-PSE533	10-PSE531		10-PSE530			
	10-PSE543	10-PSE541	10-PSE532	10-PSE540	10-PSE564	10-PSE550	
	10-PSE563	10-PSE561		10-PSE560			
Set (differential) pressure range	-101 to 101 kPa	10 to -101 kPa	-10 to 100 kPa	-0.1 to 1 MPa	-50 to 500 kPa	-0.2 to 2.00 kPa	
$P\bar{R}$	kPa	0.2	0.1	0.1	—	1	0.01
	MPa	—	—	—	0.001	—	—
$\bar{C}F$	kgf/cm ²	0.002	0.001	0.001	0.01	0.01	—
$\bar{b}\bar{R}\bar{r}$	bar	0.002	0.001	0.001	0.01	0.01	—
$\bar{P}\bar{S}$	psi	0.05	0.02	0.02	0.2	0.1	—
$\bar{m}\bar{H}$	inHg	0.1	0.1	—	—	—	—
$\bar{n}\bar{n}\bar{H}$	mmHg	2	1	—	—	—	1 mmH ₂ O