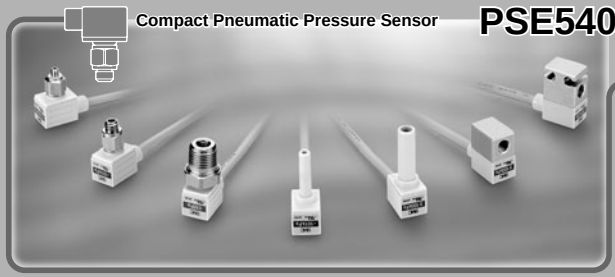
Remote Type Pressure Sensors/ Pressure Sensor Controllers

Series PSE

Compact Pneumatic Pressure Sensor **PSE530**

Compact Pneumatic Pressure Sensor **PSE540**



Low Differential Pressure Sensor **PSE550**

Pressure Sensor for General Fluids **PSE560**

Multi-channel Digital Pressure Sensor Controller

PSE200

2-Color Display Digital Pressure Sensor Controller

PSE300

Connection type

DIN rail/Terminal block type

Current input specification is added.

Remote Type Pressure Sensors/ Pressure Sensor Controllers

	Pressure Sensors				Controllers	
Model	**PSE530** P. 120	**PSE540** P. 123	**PSE550** P. 126	**PSE560** P. 129	**PSE200** P. 132	**PSE300** P. 138
Basic Specifications						
Fluid	Air			General fluids		
Rated pressure range (Minimum display)						
Repeatability % (F.S.)	±1	±0.2	±0.3	±0.2	±0.1	
Voltage	12 to 24 VDC					
No. of outputs for a switch					5	2
Analog output	1 to 5 V		1 to 5 V 4 to 20 mA			1 to 5 V 4 to 20 mA
Operating temperature °C	0 to 50			–10 to 60	0 to 50	
Functions						
Digital display					1-color	2-color
Enclosure	IP40			IP65	Front face IP65 Others IP40	IP40
Wiring specification	Connector	Grommet			Connector	
Major setting function					Keylock, Peak/Bottom values holding, Auto-preset, Auto-shift, Display calibration, Anti-chattering	
Options						
Connection threads	M reducer	M R, NPT reducer	Resin piping	R, NPT, Rc URJ,TSJ*		
Int'l standards	CE	CE, UL/CSA			CE	CE, UL/CSA
Wiring: e-con						
Wiring: Flexible cable						
Mounting: Direct						
Mounting: With bracket						
Mounting: Panel mount						
Mounting: DIN rail						

* For URJ, TSJ, refer to "Glossary of Terms/Technical Information" on pages 878 to 879 in the Best Pneumatics No. 6.

Pressure Sensors/*Series PSE5□□*

	Rated pressure range	PSE53□	PSE54□	PSE55□	PSE56□
Vacuum	–101 kPa to 0	PSE531	PSE541	—	PSE561
Compound pressure	–100 kPa to 100 kPa	PSE533	PSE543	—	PSE563
Positive pressure	0 to 100 kPa	PSE532	—	—	—
Positive pressure	0 to 500 kPa	—	—	—	PSE564
Positive pressure	0 to 1 MPa	PSE530	PSE540	—	PSE560
Low differential pressure	0 to 2 kPa	—	—	PSE550	—

Pressure Sensor Controllers/*Series PSE200/300*

PSE200 Input/Output specifications
- NPN 5 outputs + auto-shift input
- PNP 5 outputs + auto-shift input

PSE300 Input/Output specifications
- NPN 2 outputs + 1–5 V outputs
- NPN 2 outputs + 4–20 mA outputs
- NPN 2 outputs + auto-shift input
- PNP 2 outputs + 1–5 V outputs
- PNP 2 outputs + 4–20 mA outputs
- PNP 2 outputs + auto-shift input

Applicable pressure sensor model				Setting/Display resolution	
PSE531	PSE541	—	PSE561	0.1 kPa	0.1 kPa
PSE533	PSE543	—	PSE563	0.1 kPa	0.2 kPa
PSE532	—	—	—	0.1 kPa	0.1 kPa
—	—	—	PSE564	—	1 kPa
PSE530	PSE540	—	PSE560	0.001 MPa	0.001 MPa
—	—	PSE550	—	—	0.01 kPa

Main Functions (For details, refer to pages 145 and 146.)

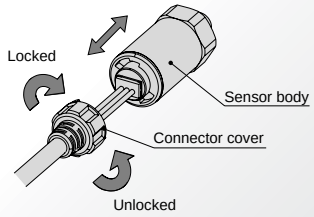
Keylock	Locks the keys from functioning.
Peak/Bottom value indication	Displays the maximum and minimum values being set and can keep those values on the display.
Auto-preset	Able to set the pressure automatically. In the case of suction verification, it memorizes the pressure when adsorbed and released. By repeating several times, the optimum values are calculated automatically.
Auto-shift	Stable switch output is available even though the supply pressure may fluctuate. Automatically corrects the set value in accordance with the fluctuations in the supply pressure.
Display calibration	Able to adjust the displayed value (±5%) and justify distribution of the values displayed on respective pressure switch.
Anti-chattering	Prevents malfunction due to sharp pressure fluctuations. The detection of momentary pressure fluctuation as abnormal pressure can be prevented by changing the setting of the response time.

Compact Pneumatic Pressure Sensor

Series PSE530

Series	Rated pressure range
	–100 kPa / 0 / 100 kPa / 500 kPa / 1 MPa
PSE530	0 … 1 MPa
PSE531	–101 kPa … 0
PSE532	0 … 101 kPa
PSE533	–101 kPa … 101 kPa

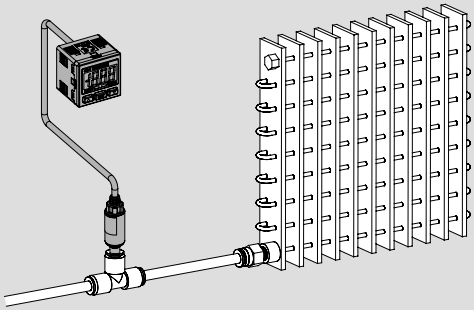
Connection



Application example

Inspection of a radiator

Series PSE532 + PSE300



Low pressure sensor (PSE532-□) is used to detect minute differentiations. Auto-shift function reduces influence of fluctuations in the supply pressure.

Applications

Pressure Sensor
Series PSE530

How to Order

PSE53 0 – M5 – ☐

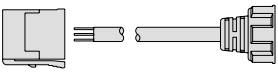
Sensor range

0	Positive pressure [0 to 1 MPa]
1	Vacuum [0 to –101 kPa]
2	Low pressure [0 to 101 kPa]
3	Compound pressure [–101 to 101 kPa]

Port size

M5	M5 x 0.8
R06	ø6 reducer
R07	1/4 inch reducer

Option

Nil	None
L	Sensor cable (3 m) 
C2L	Connector for pressure sensor controller (1 pc.) + Sensor cable (3 m) 

Note) At the factory, the connector is not attached to the cable, but packed together with it for shipment.

Option

When only optional parts are required, order using the part numbers listed below.

Description	Part no.	Note
Connector for pressure sensor controller	ZS-28-C	1 pc. per set
Sensor cable	ZS-26-F	Cable length: 3 m
Connector for pressure sensor controller + Sensor cable	ZS-26-J	Cable length: 3 m The connector is not attached to the cable at the time of shipment.

Specifications

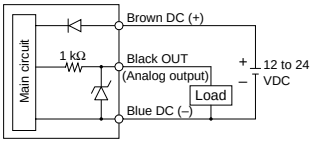
Model		**PSE530** (Positive pressure)	**PSE531** (Vacuum)	**PSE532** (Low pressure)	**PSE533** (Compound pressure)
Rated pressure range		0 to 1 MPa	0 to –101 kPa	0 to 101 kPa	–101 to 101 kPa
Extension analog output range		–0.1 to 0 MPa	10.1 to 0 kPa	–10.1 to 0 kPa	—
Proof pressure		1.5 MPa	500 kPa		
Applicable fluid		Air/Non-corrosive gas/Non-flammable gas			
Power supply voltage		12 to 24 VDC ±10%, Ripple (p-p) 10% or less (with power supply polarity protection)			
Current consumption		15 mA or less (with no load)			
Output specification		Analog output 1 to 5 V (with rated pressure range), 0.6 to 1 V (with extension analog output range), Output impedance: Approx. 1 kΩ			
Accuracy (Ambient temperature at 25°C)		±2% F.S. (with rated pressure range), ±5% F.S. (with extension analog output range)			
Linearity		±1% F.S.			
Repeatability		±1% F.S.			
Power supply voltage effect		±1% F.S. based on the analog output at 18 V ranging from 12 to 24 VDC			
Environment	**Enclosure**	IP40			
	Temperature range	Operating: 0 to 50°C; Stored: –10 to 70°C (No freezing or condensation)			
	Withstand voltage	1000 VAC (in 50/60 Hz) for 1 minute between terminals and housing			
	Insulation resistance	5 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing			
	Vibration resistance	10 to 500 Hz 1.5 mm amplitude or 98 m/s² acceleration, X, Y, Z directions for 2 hours each (De-energized)			
	Impact resistance	980 m/s² in X, Y, Z directions, 3 times each (De-energized)			
Temperature characteristics		±2% F.S. (25°C reference)			
Sensor cable/Option		Halogen-free heavy-duty cable, 3 cores, ø2.7, 3 m, Conductor area: 0.15 mm², Insulator O.D.: 0.8 mm			
Standards		Compliant with CE marking			

Piping Specifications

Model		**M5**	**R06**	**R07**
Port size		M5 x 0.8 male thread	ø6 reducer type	1/4 inch reducer type
Wetted parts material		Pressure sensor: Silicon, O-ring: NBR		
		Body: Stainless steel 304	Body: PBT	
Weight	**With sensor cable (3 m)**	41 g	38 g	
	Without sensor cable	7 g	3.8 g	

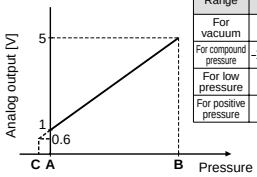
Internal Circuit

PSE53□
Voltage output type
1 to 5 V



Analog Output

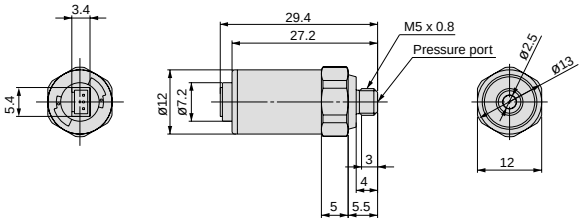
1 to 5 VDC



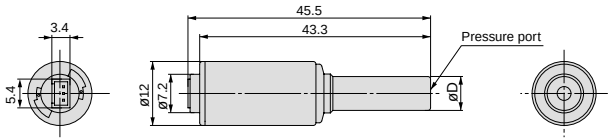
Range	Rated pressure range	A	B	C
For vacuum	0 to –101 kPa	0	–101 kPa	10.1 kPa
For compound pressure	–101 kPa to 101 kPa	–101 kPa	101 kPa	–
For low pressure	0 to 101 kPa	0	101 kPa	–10.1 kPa
For positive pressure	0 to 1 MPa	0	1 MPa	–0.1 MPa

Dimensions

PSE53□-M5



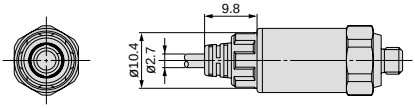
PSE53□-R06 / R07



(mm)

Model	Applicable fitting size (**D**)
PSE53□-R06	6
PSE53□-R07	1/4"

With sensor cable

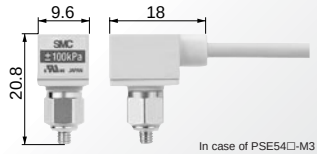


Compact Pneumatic Pressure Sensor

Series PSE540

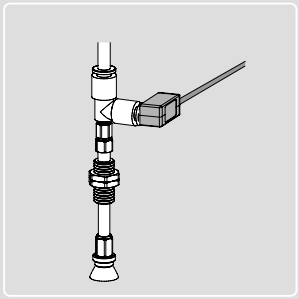
Series	Rated pressure range
	–100 kPa, 0, 100 kPa, 500 kPa, 1 MPa
PSE540	0 – 1 MPa
PSE541	–101 kPa – 0
PSE543	–100 kPa – 100 kPa

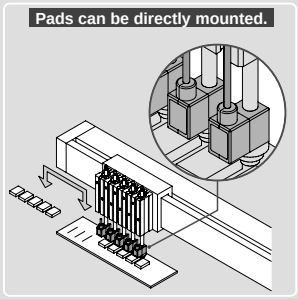
- **Weight: 2.9 g**
- **Head size: 9.6 x 20.8 x 18 mm**

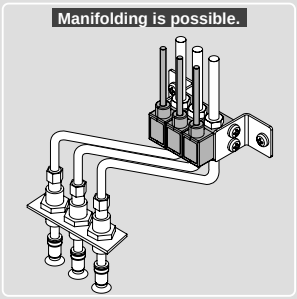


In case of PSE54□-M3

Application examples







Applications

Compact Pneumatic Pressure Sensor

Series PSE540

How to Order

Sensor range

0	Positive pressure [0 to 1 MPa]
1	Negative pressure [0 to –101 kPa]
3	Compound pressure [–100 to 100 kPa]

Accuracy

Nil	±2% F.S.
A	±1% F.S.

Option (Connector)

Nil	None
C2	Connector for pressure sensor controller (1 pc.)

Note) At the factory, the connector is not attached to the cable, but packed together with it for shipment.

PSE54 1 □ – M3 – □

Port size

M3	M3 x 0.5	**IM5**	M5 female thread, through type
M5	M5 x 0.8	**IM5H**	M5 female thread, through type (with mounting hole)
01	R 1/8 (with M5 female thread)		
N01	NPT 1/8 (with M5 female thread)		
R04	ø4 reducer		
R06	ø6 reducer		

Option

Description	Part no.	Note
Connector for pressure sensor controller	ZS-28-C	1 pc.

Specifications

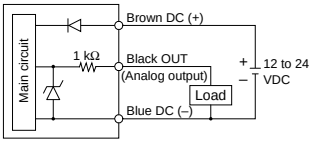
Model		PSE540	PSE541	PSE543
Rated pressure range		0 to 1 MPa	0 to –101 kPa	–100 to 100 kPa
Extension analog output range		–0.1 to 0 MPa	10.1 to 0 kPa	—
Proof pressure		1.5 MPa	500 kPa	
Applicable fluid		Air/Non-corrosive gas/Non-flammable gas		
Power supply voltage		12 to 24 VDC±10%, Ripple (p-p) 10% or less (with power supply polarity protection)		
Current consumption		15 mA or less		
Output specification		Analog output 1 to 5 V (with rated pressure range), 0.6 to 1 V (with extension analog output range), Output impedance: Approx. 1 kΩ		
Accuracy (Ambient temperature at 25°C)		PSE54□: ±2% F.S. (with rated pressure range), ±5% F.S. (with extension analog output range) PSE54□A: 1% F.S. (with rated pressure range), ±3% F.S. (with extension analog output range)		
Linearity		±0.7% F.S. or less	±0.4% F.S.	
Repeatability		±0.2% F.S.		
Power supply voltage effect		±0.8% F.S.		
Environment	**Enclosure**	IP40		
	Operating temperature range	Operating: 0 to 50°C, Stored: –20 to 70°C (No freezing or condensation)		
	Operating humidity range	Operating/Stored: 35 to 85% RH (No condensation)		
	Withstand voltage	1000 VAC (in 50/60 Hz) for 1 minute between terminals and housing		
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing		
	Vibration resistance	10 to 500 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s^2 acceleration, in X, Y, Z directions, for 2 hours each (De-energized)		
	Impact resistance	980 m/s^2 in X, Y, Z directions, 3 times each (De-energized)		
Temperature characteristics		±2% F.S. (Based on 25°C)		
Standards		Compliant with CE marking, UL (CSA)		

Piping Specifications

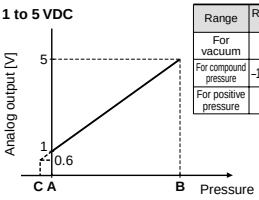
Model		M3	M5	01	N01	R04	R06	IM5	IM5H
Port size		M3 x 0.5	M5 x 0.8	R 1/8 M5 x 0.8	NPT 1/8 M5 x 0.8	ø4 reducer	ø6 reducer	M5 female thread, through type	M5 female thread, through type (with mounting hole)
Material	**Case**	Resin case: PBT Fitting: Stainless steel 303		Resin case: PBT Fitting: C3604BD		PBT		Resin case: PBT Fitting: A6063S-T5	
	Pressure sensing section	Pressure sensor: Silicon, O-ring: NBR							
Sensor cable		Oil proof heavy-duty vinyl cable (ellipse), 3 cores, 2.7 x 3.2, 3 m, Conductor area: 0.15 mm^2, Insulator O.D.: 0.9 mm							
Weight	**With sensor cable**	42.4 g	42.7 g	49.3 g		41.4 g	41.6 g	43.3 g	44.1 g
	Without sensor cable	2.9 g	3.2 g	9.8 g		1.9 g	2.1 g	3.8 g	4.6 g

Internal Circuit

PSE54□
Voltage output type
1 to 5 V



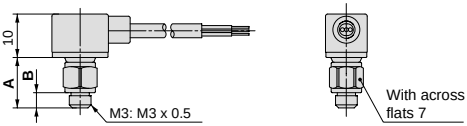
Analog Output



Range	Rated pressure range	A	B	C
For vacuum	0 to –101 kPa	0	–101 kPa	10.1 kPa
For compound pressure	–100 kPa to 100 kPa	–100 kPa	100 kPa	–
For positive pressure	0 to 1 MPa	0	1 MPa	–0.1 MPa

Dimensions

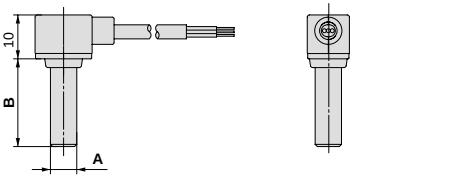
PSE54□-M3 / M5



(mm)

	PSE54□-M3	PSE54□-M5
A	10.8	11.5
B	3	3.5

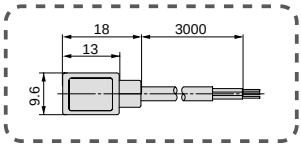
PSE54□-R04 / R06



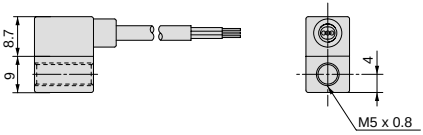
(mm)

	PSE54□-R04	PSE54□-R06
A	ø4	ø6
B	18	20

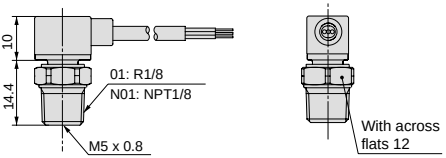
Common Dimensions



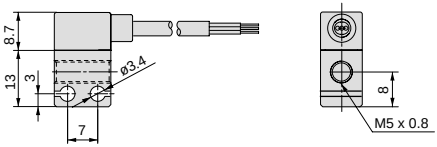
PSE54□-IM5



PSE54□-01 / N01



PSE54□-IM5H



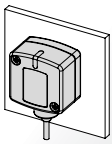
Low Differential Pressure Sensor

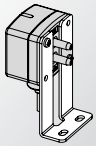
Series PSE550

Series	Rated pressure range
PSE550	0 kPa – 1 kPa – 2 kPa

With LED display for confirming energization

2 mounting types


Mounting directly

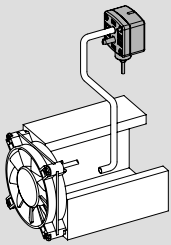

Mounting with bracket

Accuracy
±1% F.S.

Proof pressure
65 kPa

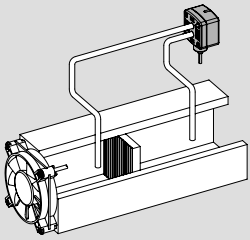
Application examples

Flow control
Series ***PSE550***



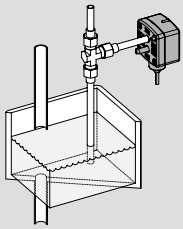
Can control air flow by monitoring the flow rate inside the duct.

Filter clogging monitoring
Series ***PSE550***



Can control filtration and replacement periods by monitoring the clogging of the filter.

Liquid level detection
Series ***PSE550***



Can detect the liquid level through changes in the purge pressure.

Applications

Low Differential Pressure Sensor
Series PSE550

How to Order

PSE550 − □ − □ □

Output specifications

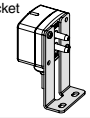
Nil	Voltage output type 1 to 5 V
28	Current output type 4 to 20 mA

Option 2 (Connector)

Nil	None
C2	Connector for pressure sensor controller (1 pc.) 

Note 1) Current-output type cannot be connected to the PSE 200 series.
Note 2) At the factory, the connector is not attached to the cable, but packed together with it for shipment.

Option 1 (Bracket)

Nil	None
A	Bracket 

Note) The bracket is not attached in the factory, but packed together for shipment.

Option/Part No.

Description	Part no.	Note
Bracket	ZS-30-A	With M3 x 5L (2 pcs.)
Connector for pressure sensor controller	ZS-28-C	1 pc.

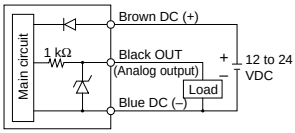
Specifications

Model		PSE550	PSE550-28
Rated differential pressure range		0 to 2 kPa	
Operating pressure range		–50 to 50 kPa Note)	
Extension analog output range		–0.2 to 0 kPa	—
Proof pressure		65 kPa	
Applicable fluid		Air/Non-corrosive gas/Non-flammable gas	
Power supply voltage		12 to 24 VDC±10%, Ripple (p-p) 10% or less (with power supply polarity protection)	
Current consumption		15 mA or less	—
Output specification		Analog output: 1 to 5 VDC (within rated differential pressure range) 0.6 to 1 VDC (with extension analog output range) Output impedance: Approx. 1 kΩ	Analog output: 4 to 20 mA DC (within rated differential pressure range) Allowable load impedance: 500 Ω or less (at 24 VDC) 100 Ω or less (at 12 VDC)
Accuracy (Operating temperature at 25°C)		±1% F.S. (with rated pressure range), ±3% F.S. (with extension analog output range)	
Linearity		±0.5% F.S.	
Repeatability		±0.3% F.S.	
Indicator light		Orange light is turned on. (When energized)	
Environment	**Enclosure**	IP40	
	Operating temperature range	Operating: 0 to 50°C, Stored: –20 to 70°C (No freezing or condensation)	
	Operating humidity range	Operating/Stored: 35 to 85% RH (No condensation)	
	Withstand voltage	1000 VAC (in 50/60 Hz) for 1 minute between terminals and housing	
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing	
	Vibration resistance	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 100 m/s^2 acceleration, in X, Y, Z directions, for 2 hours each (De-energized)	
	Impact resistance	300 m/s^2 in X, Y, Z directions, 3 times each (De-energized)	
Temperature characteristics		±3% F.S. (25°C reference)	
Port size		ø4.8 (ø4.4 in the end) resin piping (Applicable to I.D. ø4 air tubing)	
Wetted parts material		Resin pipe: Nylon, Piston area of sensor: Silicon	
Sensor cable		Oil proof heavy-duty vinyl cable (ellipse), 3 cores, 2.7 x 3.2, 3 m Conductor area: 0.15 mm^2, Insulator O.D.: 0.9 mm	Oil proof heavy-duty vinyl cable (ellipse), 2 cores, 2.7 x 3.2, 3 m Conductor area: 0.15 mm^2, Insulator O.D.: 0.9 mm
Weight	**With sensor cable**	75 g	
	Without sensor cable	35 g	
Standards		Compliant with CE marking, UL (CSA)	

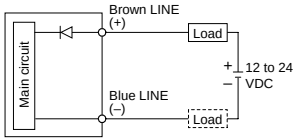
Note) Can detect differential pressure from 0 to 2 kPa within the range of –50 to 50 kPa.

Internal Circuit

PSE550
Voltage output type
1 to 5 V



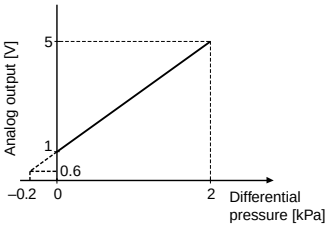
PSE550-28
Current output type
4 to 20 mA



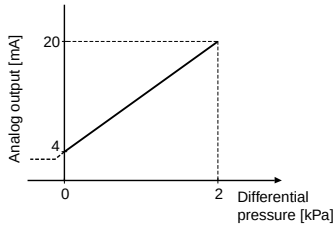
∗ Install the load either on the LINE (+) or LINE (–) side.

Analog Output

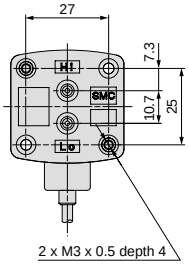
1 to 5 VDC

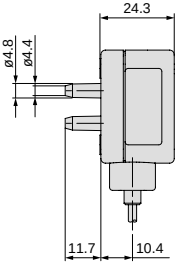


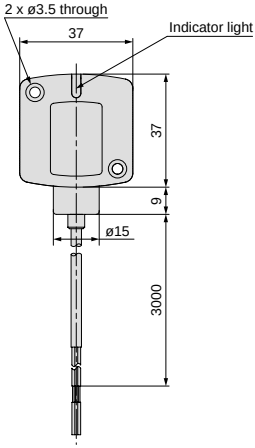
4 to 20 mA DC



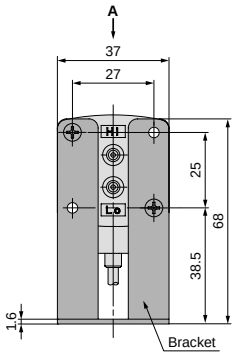
Dimensions

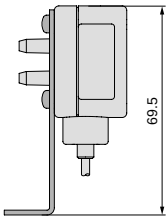


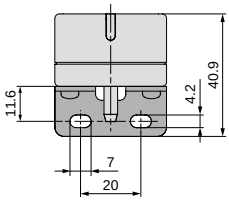




With bracket







A View

Pressure Sensor For General Fluids

Series PSE560

Series	Rated pressure range
PSE560	0 to 1 MPa
PSE561	−101 kPa to 0
PSE563	−100 kPa to 100 kPa
PSE564	0 to 500 kPa

Applicable fluids example

- Argon
- Air-containing drainage
- Ammonia
- Freon
- Nitrogen
- Hydraulic oil
- Silicon oil
- Water
- Carbon dioxide
- Lubricant
- Fluorocarbon
- Air

Wetted parts material: Stainless steel 316L

IP65

Copper-free Fluorine-free

Oil-free (Single diaphragm construction)

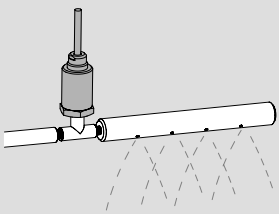
Variations

Port type	Thread type	Special fitting type for semiconductors
Port size	R 1/8, R 1/4, Rc 1/8, NPT 1/8, NPT 1/4	URJ 1/4, TSJ 1/4*
Leakage	1 x 10^{-5} Pa·m^3/s	1 x 10^{-10} Pa·m^3/s
Analog output	1 to 5 V voltage output	
	4 to 20 mA current output	

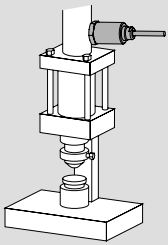
* For URJ1/4, TSJ1/4, refer to "Glossary of Terms/Technical Information" on pages 878 to 879 in the Best Pneumatics No. 6.

Application examples

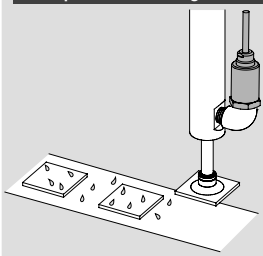
Cleaning lines



Confirmation of working pressure of hydraulic cylinders



Suction verification of work pieces containing moisture



Note: When vacuum is released, take precautions to avoid water collision with rush inertia. (An adapter with throttle (ZS-31-X175) is available to prevent water collision with rush inertia.) (Refer to "Intrusion of water or drainage" on page 149 for details.)

Applications

Pressure Sensor
For General Fluids
Series PSE560

How to Order

Sensor range

0	Positive pressure [0 to 1 MPa]
1	Vacuum [0 to –101 kPa]
3	Compound pressure [–100 to 100 kPa]
4	Positive pressure [0 to 500 kPa]

Option (Connector)

Nil	None
C2	Connector for pressure sensor controller (1 pc.)

Note 1) Current output type cannot be connected to the PSE200 series.
Note 2) At the factory, the connector is not attached to the cable, but packed together with it for shipment.

PSE56 0 – 01 – □ – □

Port size

01	R 1/8 (with M5 female thread)
02	R 1/4 (with M5 female thread)
C01	Rc 1/8
N01	NPT 1/8 (with M5 female thread)
N02	NPT 1/4 (with M5 female thread)
A2	URJ 1/4
B2	TSJ 1/4

Output specifications

Nil	Voltage output type 1 to 5 V
28	Current output type 4 to 20 mA

Option/Part No.

Description	Part no.	Note
Connector for pressure sensor controller	ZS-28-C	1 pc.
Adapter with throttle Rc 1/4	ZS-31-X175	1 pc.
Adapter with throttle NPT 1/4	ZS-31-X186	1 pc.
Adapter with throttle Rc 1/8	ZS-31-X188	1 pc.
Adapter with throttle NPT 1/8	ZS-31-X189	1 pc.

Specifications

Model	**PSE560** (Positive pressure)	**PSE561** (Vacuum)	**PSE563** (Compound pressure)	**PSE564** (Positive pressure)
Rated pressure range	0 to 1 MPa	0 to –101 kPa	–100 to 100 kPa	0 to 500 kPa
Extension analog output range	–0.1 to 0 MPa	10.1 to 0 kPa	—	–50 to 0 kPa
Proof pressure	1.5 MPa	500 kPa	500 kPa	750 kPa

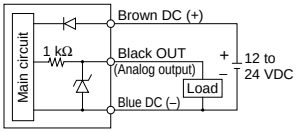
Model		**PSE56□-□**	**PSE56□-□-28**
Applicable fluid		Liquid or gas that will not corrode stainless steel 316L	
Power supply voltage		12 to 24 VDC ±10%, Ripple (p-p) 10% or less (with power supply polarity protection)	
Current consumption		10 mA or less	—
Output specification		Analog output: 1 to 5 V (within rated differential pressure range) 0.6 to 1 V (with extension analog output range) Output impedance: Approx. 1 kΩ	Analog output: 4 to 20 mA DC (within rated differential pressure range) Allowable load impedance: 500 Ω or less (at 24 VDC) 100 Ω or less (at 12 VDC)
Accuracy (Ambient temperature at 25°C)		±1% F.S. (with rated pressure range), ±3% F.S. (with extension analog output range)	
Linearity		±0.5% F.S.	
Repeatability		±0.2% F.S.	
Power supply voltage effect		±0.3% F.S.	
Environment	**Enclosure**	IP65	
	Operating temperature range	Operating: –10 to 60°C, Stored: –20 to 70°C (No freezing or condensation)	
	Operating humidity range	Operating/Stored: 35 to 85% RH (No condensation)	
	Withstand voltage	250 VAC for 1 minute between terminals and housing	
	Insulation resistance	50 MΩ or more (50 VDC measured via megohmmeter) between terminals and housing	
	Vibration resistance	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 20 m/s^2 acceleration, in X, Y, Z directions, for 2 hours each (De-energized)	
	Impact resistance	500 m/s^2 in X, Y, Z directions, 3 times each (De-energized)	
Temperature characteristics		±2% F.S. (0 to 50°C: Based on 25°C), ±3% F.S. (–10 to 60°C: Based on 25°C)	
Standards		Compliant with CE marking, UL (CSA)	

Piping Specifications

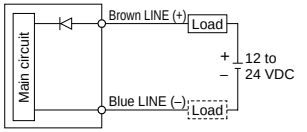
Model		**01**	**02**	**N01**	**N02**	**C01**	**A2**	**B2**
Port size		R 1/8 M5 x 0.8	R 1/4 M5 x 0.8	NPT 1/8 M5 x 0.8	NPT 1/4 M5 x 0.8	Rc 1/8	URJ 1/4	TSJ 1/4
Material		Case: C3604 + nickel plated, Piping port/pressure sensor: Stainless steel 316L						
Sensor cable		PSE56□-□: Oil proof heavy-duty vinyl cable with air tubing, 3 cores, ø5.1, 3 m, Conductor area: 0.2 mm^2, Insulator O.D.: 1.12 mm PSE56□-□-28: Oil proof heavy-duty vinyl cable with air tubing, 2 cores, ø5.1, 3 m, Conductor area: 0.2 mm^2, Insulator O.D.: 1.12 mm						
Weight	**With sensor cable**	193 g	200 g	194 g	201 g	187 g	203 g	193 g
	Without sensor cable	101 g	108 g	102 g	109 g	95 g	111 g	101 g

Internal Circuit

PSE56□-□
Voltage output type
1 to 5 V

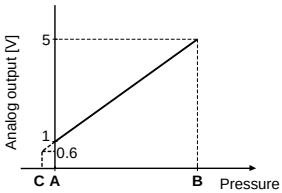


PSE56□-□-28
Current output type
4 to 20 mA

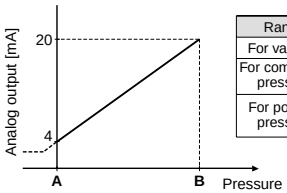


∗ Install the load either on the LINE (+) or LINE (–) side.

1 to 5 VDC



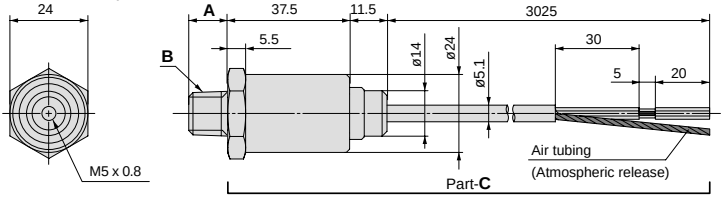
4 to 20 mA DC



Range	Rated pressure range	A	B	C
For vacuum	0 to –101 kPa	0	–101 kPa	10.1 kPa
For compound pressure	–100 kPa to 100 kPa	–100 kPa	100 kPa	—
For positive pressure	0 to 1 MPa	0	1 MPa	–0.1 MPa
	0 to 500 kPa	0	500 kPa	–50 kPa

Dimensions

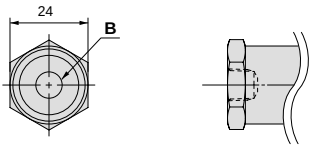
PSE56□-$^{01}_{02}$, PSE56□-$^{N01}_{N02}$



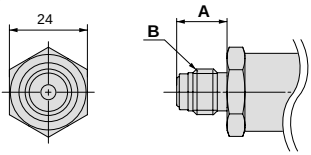
∗ The dimensions of part **C** are common to all PSE56□ models.

Be sure to release the air in the air tubing of the cable to the atmosphere. If the air tubing is restricted, or left in environments where it is exposed to water or oil, it cannot be detected normally.

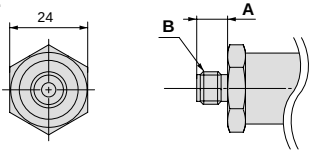
PSE56□-C01



PSE56□-A2



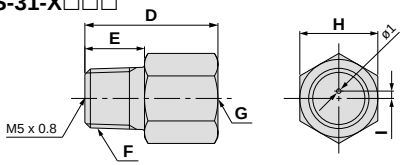
PSE56□-B2



(mm)

Model	A	B
PSE56□-01	8.2	R 1/8
PSE56□-02	12	R 1/4
PSE56□-N01	9.2	NPT 1/8
PSE56□-N02	12.2	NPT 1/4
PSE56□-C01	—	Rc 1/8
PSE56□-A2	15.5	URJ 1/4
PSE56□-B2	9.5	TSJ 1/4

Adapter with throttle
ZS-31-X□□□



(mm)

Model	D	E	F	G	H	I
ZS-31-X188	20	9	R 1/8	Rc 1/8	14	1.5
ZS-31-X189	20	9	NPT 1/8	NPT 1/8	14	1.5
ZS-31-X175	29	13	R 1/4	Rc 1/4	17	1.6
ZS-31-X186	29	13	NPT 1/4	NPT 1/4	17	1.6

Multi-Channel Digital Pressure Sensor Controller

Series PSE200

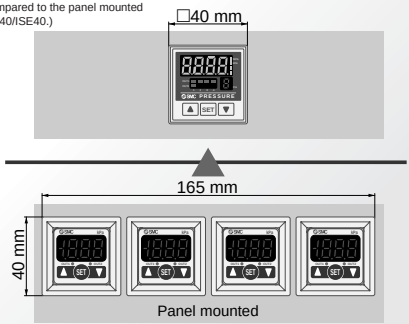
Applicable sensors				Rated pressure range	Setting/Display resolution
PSE53□	PSE54□	PSE55□	PSE56□	−100 kPa 0 100 kPa 1 MPa	
PSE531	**PSE541**	—	**PSE561**	−101 kPa to 0	**0.1 kPa**
PSE533	**PSE543**	—	**PSE563**	−100 kPa to 100 kPa	**0.1 kPa**
PSE530	**PSE540**	—	**PSE560**	0 to 1 MPa	**0.001 MPa**
PSE532		—		0 to 100 kPa	**0.1 kPa**

A single controller monitors up to 4 pressure sensors

- **Sensor input: 4 inputs**
- **Switch output: 5 outputs (2 outputs for 1ch, 1 output for 2 to 4ch)**

76% reduction in installation space

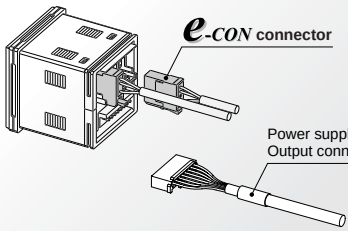
(Compared to the panel mounted ZSE40/ISE40.)



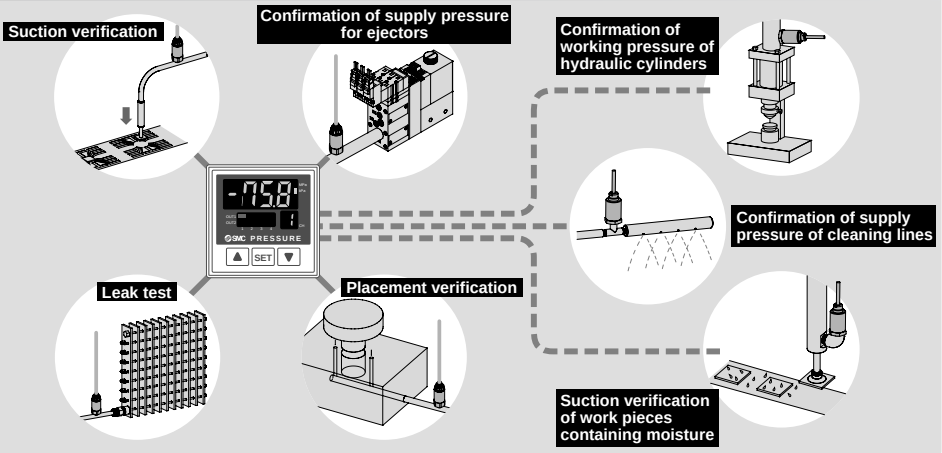
Functions

- **Auto-shift function**
- **Auto-preset function**
- **Auto-identification function**
- **Copy function**
- **Channel scan function**
- **Zero-clear function**
- **Keylock function**
- **Peak/Bottom value indication**
- **Display unit switching function**
- **Display calibration function**
- **Anti-chattering function**

Connection



A single controller monitors various applications.



Multi-Channel Controller
Series PSE200

How to Order

PSE20 0 – M □ □

Input/Output specifications

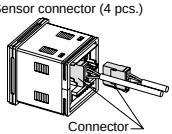
0	NPN 5 outputs + Auto-shift input
1	PNP 5 outputs + Auto-shift input

Unit specifications

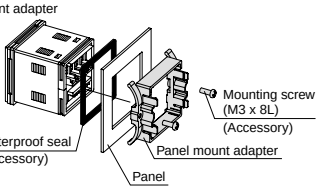
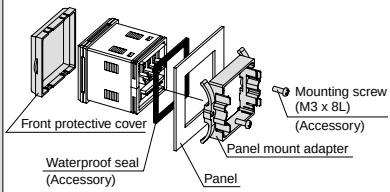
Nil	With unit display switching function Note1)
M	Fixed SI unit Note2)

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 and compound pressure: kPa
For positive pressure: MPa

Option 2

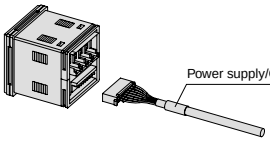
Nil	None
4C	Sensor connector (4 pcs.)  Connector

Option 1

Nil	None
A	Panel mount adapter  Mounting screw (M3 x 8L) (Accessory) Waterproof seal (Accessory) Panel mount adapter Panel
B	Front protective cover + Panel mount adapter  Front protective cover Mounting screw (M3 x 8L) (Accessory) Panel mount adapter Waterproof seal (Accessory) Panel

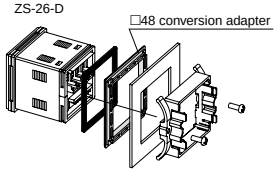
Accessory: Power supply/Output connection cable (2 m)

Included with the controller.



Option

When only optional parts are required, order with the part numbers listed below.

Description	Part no.	Note
Panel mount adapter	ZS-26-B	Waterproof seal, screws included
Front protective cover + Panel mount adapter	ZS-26-C	Waterproof seal, screws included
□48 conversion adapter ∗ This adapter is used to mount the PSE200 series on the panel fitting of the PSE100 series.	ZS-26-D  □48 conversion adapter Order panel mount adapter separately.	
Front protective cover	ZS-26-01	
Sensor connector	ZS-28-C (1 pc. per set)	

Specifications

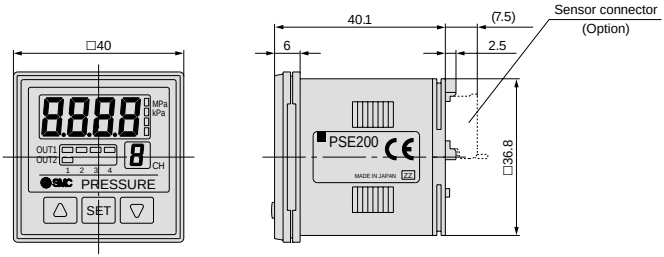
Model		PSE200	PSE201
Power supply voltage		12 to 24 VDC±10%, Ripple (p-p) 10% or less (with power supply polarity protection)	
Current consumption		55 mA or less (Current consumption for sensor is not included.)	
Power supply voltage for sensor		[Power supply voltage] –1.5 V	
Power supply current for sensor Note 1)		Maximum 40 mA (100 mA maximum for the total power supply current when 4 sensors are input.)	
Sensor input		1 to 5 VDC (Input impedance: Approx. 800 kΩ)	
	Number of inputs	4 inputs	
	Input protection	With excess voltage protection (Up to 26.4 V)	
Switch output		NPN open collector output: 5 outputs (Sensor input CH1: 2 outputs, CH2 to 4: 1 output)	PNP open collector output: 5 outputs (Sensor input CH1: 2 outputs, CH2 to 4: 1 output)
	Maximum load current	80 mA	
	Maximum load voltage	30 V	—
	Residual voltage	1 V or less (with load current of 80 mA)	
	Response time	5 ms or less (Response time selections with anti-chattering function: 20 ms, 160 ms, 640 ms)	
	Short circuit protection	With short circuit protection function	
Repeatability		±0.1% F.S. ±1 digit	
Hysteresis	**Hysteresis mode**	Adjustable (can be set from 0)	
	Window comparator mode	Fixed (3 digits)	
Display		For measured value display: 4-digit, 7-segment indicator, Display color: Orange (Sampling frequency: 4 times/sec) For channel display: 1-digit, 7-segment indicator, Display color: Red	
Display accuracy (Operating temerature at 25°C)		±0.5% F.S. ±1 digit	
Indicator light		Red (Lights up when output is turned ON.)	
Auto-shift input		Non-voltage input (Reed or Solid state), Input 10 ms or more, Independently controllable auto-shift function ON/OFF	
Auto-identification function		With auto-identification function Note 2)	
Environment	**Enclosure**	Front face: IP65 (when panel-mounted), Others: IP40	
	Ambient temperature range	Operating: 0 to 50°C, Stored: –10 to 60°C (No freezing or condensation)	
	Ambient humidity range	Operating/Stored: 35 to 85% RH (No condensation)	
	Vibration resistance	10 to 500 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s² acceleration, in X, Y, Z directions for 2 hrs. each (De-energized)	
	Impact resistance	980 m/s² in X, Y, Z directions, 3 times each (De-energized)	
Temperature characteristics		±0.5% F.S. (25°C reference)	
Connection		Power supply/Output connection: 8P connector, Sensor connection: e-con connector	
Material		Housing: PBT; Display: Transparent nylon; Back rubber cover: CR	
Weight		Approx. 60 g (Excluding power supply/output cable)	
Power supply/Output connection cable		Oil proof heavy-duty vinyl cable, 8 cores, ø4.8, 2 m, Conductor area: 0.15 mm², Insulator O.D.: 0.9 mm	
Standards		Compliant with CE marking	

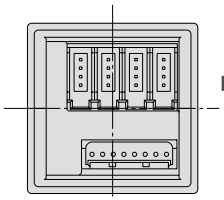
Pressure range	For compound pressure	For vacuum	For low pressure	For positive pressure
Applicable pressure sensor	**PSE533** **PSE543** **PSE563**	**PSE531** **PSE541** **PSE561**	**PSE532**	**PSE530** **PSE540** **PSE560**
Rated pressure range	–101 to 101 kPa	0 to –101 kPa	0 to 101 kPa	0 to 1 MPa
Pressure display range/Set pressure range	–101 to 101 kPa	10 to –101 kPa	–10 to 101 kPa	–0.1 to 1 MPa
Minimum unit display/Minimum unit setting	0.1 kPa	0.1 kPa	0.1 kPa	0.001 MPa

Note 1) If the Vcc and 0 V side of the sensor input connector are short circuited, the inside of the controller will be damaged.
Note 2) Auto-identification function comes with "the PSE53□ series" pressure sensor only. Other SMC series (PSE540 and 560) are not equipped with this function.

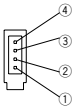
Dimensions

PSE200/201



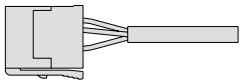


Sensor connector (4P x 4)

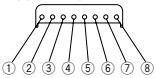


PIN no.	Terminal
①	DC (+)
②	N.C.
③	DC (–)
④	IN (1 to 5 V)

Connector (Option)

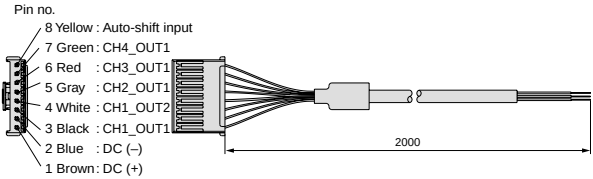


Power supply/Output connector (8P)



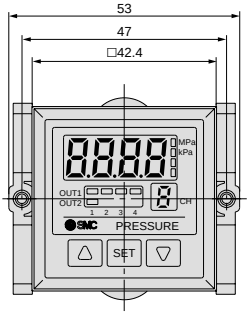
PIN no.	Terminal
①	DC (+)
②	DC (–)
③	CH1_OUT1
④	CH1_OUT2
⑤	CH2_OUT1
⑥	CH3_OUT1
⑦	CH4_OUT1
⑧	Auto-shift input

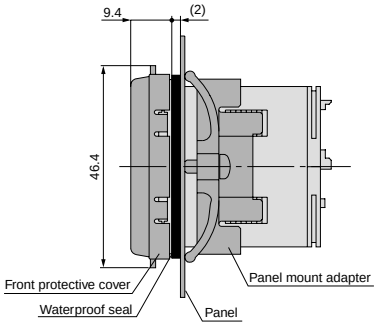
Power supply/Output connection cable (Accessory)



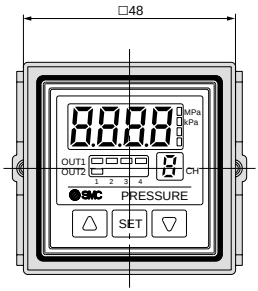
Dimensions

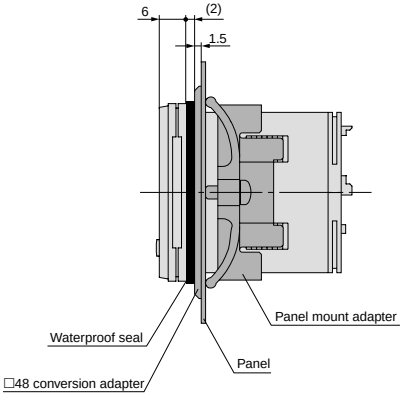
Front protective cover + Panel Mount Adapter

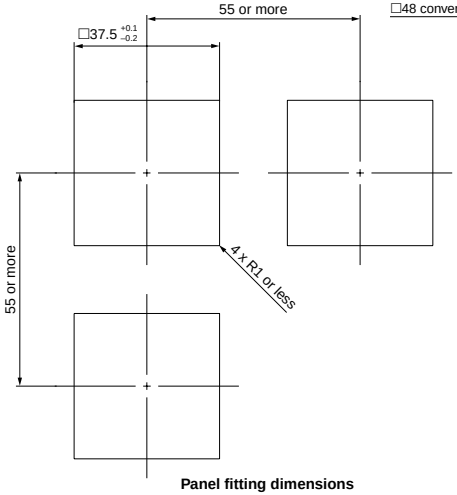




□48 conversion adapter + Panel Mount Adapter







Panel fitting dimensions
Applicable panel thickness: 0.5 to 8 mm

Descriptions

4-digit display

Displays the measured pressure value, content for each setting, and error code.

Switch output display

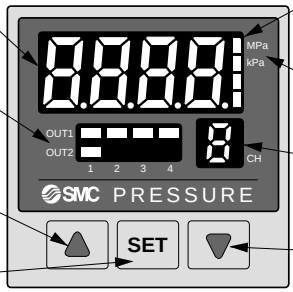
Displays the output status of OUT1 (CH1 to CH4), OUT2 (CH1 only).
Lights up when it is turned ON.

UP button

Use this button to change the mode or set value.

SET button

Use this button to set the mode or set value.



Unit display

The selected unit lights up. Use unit labels for units other than MPa and kPa.

Unit labels

kgf/cm² | bar | PSI | inHg | mmHg

Channel display

Displays the selected channel.

DOWN button

Use this button to change the mode or set value.

Error Code and Action

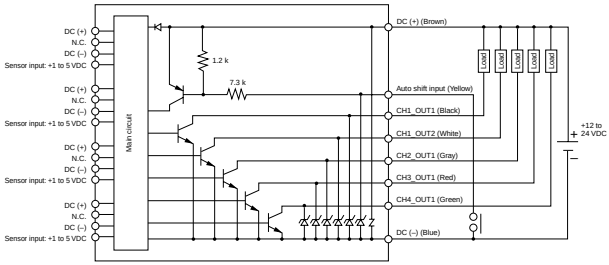
Error name	LED display	Contents	Action
Overcurrent error	Er 1	Excess current is flowing into the switch output of OUT1.	Eliminate the cause of the over current by turning off the power supply, and then turn on it again.
	Er 2	Excess current is flowing into the switch output of OUT2.	
Residual pressure error	Er 3	Pressure is applied to a pressure sensor during the reset operation (a zero point adjustment) as follows: When compound pressure is used: ± 2.5% F.S. or more. When pressure other than compound pressure is used: ±5% F.S. or more. ∗ After displaying for 2 seconds, it will return to the measuring mode.	Bring the pressure back to atmospheric pressure and use the reset function (zero point adjustment) again.
Applied pressure error	---	The DC (–) wire of the sensor may be disconnected, or pressure exceeding the upper limit of the set pressure range may be applied.	Confirm the connection and wiring of the sensor and get the applied pressure back to within the set pressure range.
	----	The sensor may be disconnected or mis-wired, or pressure exceeding the lower limit of the set pressure range may be applied.	
System error	Er 5	Internal data error.	Turn the power off and turn it on again.
	Er 6	Internal data error.	
	Er 7	Internal data error.	
	Er 8	Internal data error.	

∗ If the failure cannot be solved after the above instructions are performed, please contact SMC for investigation.

Internal Circuit and Connection

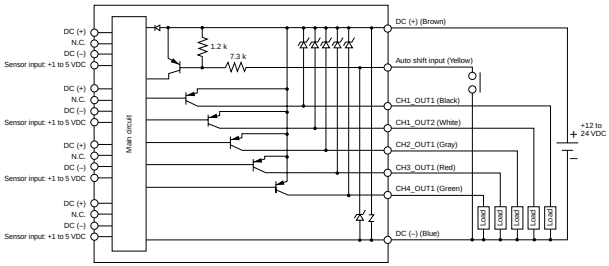
PSE200-(M)□

• NPN open collector 5 outputs + Auto-shift 1 input specification



PSE201-(M)□

• PNP open collector 5 outputs + Auto-shift 1 input specification



2-Color Display Digital Pressure Sensor Controller

Series PSE300

Applicable sensors				Rated pressure range	Setting/Display resolution
PSE53□	PSE54□	PSE55□	PSE56□		
PSE531	**PSE541**	—	**PSE561**	−101 kPa to 0	**0.1 kPa**
PSE533	**PSE543**	—	**PSE563**	−100 kPa to 100 kPa	**0.2 kPa**
PSE530	**PSE540**	—	**PSE560**	0 to 1 MPa	**0.001 MPa**
PSE532	—	—	—	0 to 100 kPa	**0.1 kPa**
—	—	—	**PSE564**	0 to 500 kPa	**1 kPa**
—	—	**PSE550**	—	0 to 2 kPa	**0.01 kPa**

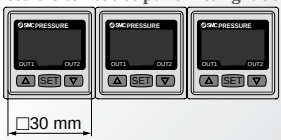
2-color display (Red/Green)

Possible to set the 4 patterns of the display color.

Pattern	ON	OFF
①	Red	Green
②	Green	Red
③	Red	Red
④	Green	Green

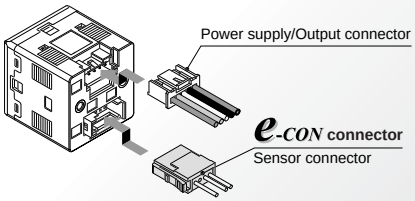
Can be mounted in close proximity with each other either horizontally or vertically.

Possible to reduce panel fitting labor



Response time
1 ms

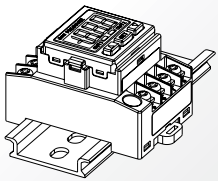
Connection



Functions

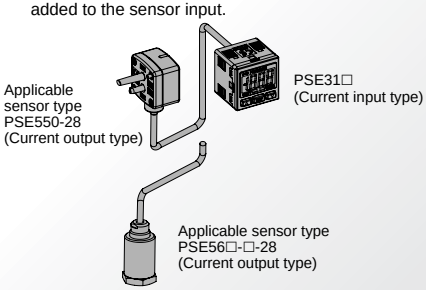
- **Auto-shift function**
- **Auto-preset function**
- **Display calibration function**
- **Peak/Bottom value indication**
- **Keylock function**
- **Zero-clear function**
- **Error indication function**
- **Display unit switching function**
- **Anti-chattering function**

DIN rail/Terminal block type



Current input

Electrical current input (4 to 20 mA DC) is added to the sensor input.



Pressure Sensor Controller
Series PSE300

How to Order

DIN rail/Terminal block type **PSE3 0 0 T − M**

Connector type **PSE3 0 0 − M**

Input specifications

0	Voltage input
1	Current input

Input/Output specifications

0	NPN 2 outputs + 1-5 V output
1	NPN 2 outputs + 4-20 mA output
2	NPN 2 outputs + Auto-shift input
3	PNP 2 outputs + 1-5 V output
4	PNP 2 outputs + 4-20 mA output
5	PNP 2 outputs + Auto-shift input

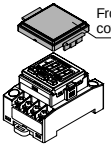
Unit specifications

Nil	With unit display switching function
M	Fixed SI unit Note)

Note) Fixed unit
For vacuum, low pressure, low differential pressure and compound pressure: kPa
For positive pressure: MPa (For 1 MPa)
kPa (For 500 kPa)

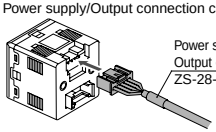
Option

Nil	None
E	Front protective cover



Option 1

Nil	None
L	Power supply/Output connection cable

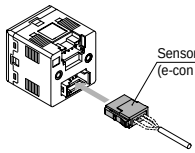


Note) The cable is unassembled in the factory, but is included with the shipment.

Order DIN rail separately. Refer to page 144.

Option 3

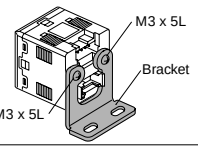
Nil	None
C	Sensor connector



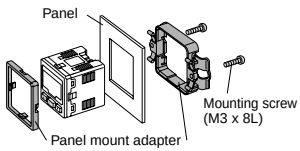
Note) At the factory, the connector is not attached to the cable, but packed together with it for shipment.

Option 2

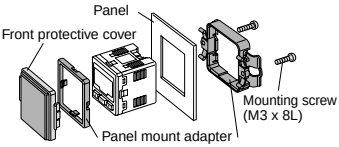
Nil	None
A	Bracket



B	Panel mount adapter



D	Panel mount adapter + Front protective cover



Note) These options are not attached in the factory, but packed together with it for shipment.

Option

Description	Part no.	Note
Power supply/Output connection cable (2 m)	ZS-28-A	
Bracket	ZS-28-B	With M3 x 5L (2 pcs.)
Sensor connector	ZS-28-C	1 pc.
Panel mount adapter	ZS-27-C	With M3 x 8L (2 pcs.)
Panel mount adapter + Front protective cover	ZS-27-D	With M3 x 8L (2 pcs.)
Front protective cover	ZS-27-01	1 pc.

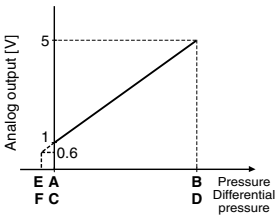
Specifications

Model		PSE3□□					
Applicable pressure sensor		PSE533 PSE543 PSE563	PSE531 PSE541 PSE561	PSE532	PSE530 PSE540 PSE560	PSE564	PSE550
Pressure display range/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
Display resolution/Setting resolution		0.2 kPa	0.1 kPa	0.1 kPa	0.001 MPa	1 kPa	0.01 kPa
Pressure range Note 1)		For compound pressure	For vacuum	For low pressure	For positive pressure		For low differential pressure
Rated (differential) pressure range		–100 to 100 kPa	0 to –101 kPa	0 to 100 kPa	0 to 1 MPa	0 to 500 kPa	0 to 2 kPa
Extension analog output range		—	10.1 to 0 kPa	–10 to 0 kPa	–0.1 to 0 MPa	–50 to 0 kPa	–0.2 to 0 kPa
Power supply voltage		12 to 24 VDC ±10%, 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		PSE30□: Voltage input 1 to 5 VDC (Input impedance: 1 MΩ) PSE31□: Current input 4 to 20 mA DC (Input impedance: 100 Ω)					
	Number of inputs	1 input					
	Input protection	With excess voltage protection (Up to 26.4 V)					
Hysteresis		Hysterisis 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)					
	Output protection	With short circuit protection					
Response time		1 ms or less					
	Anti-chattering function	Response time settings for anti-chattering function: 20 ms, 160 ms, 640 ms, 1280 ms					
Repeatability		±0.1% F.S.					
Analog output	Voltage output Note 2)	Output voltage: 1 to 5 V (within rated pressure range (Differential pressure)), 0.6 to 1 V (within extension analog output range) Output impedance: Approx. 1 kΩ, Linearity: ±0.2% F.S. (Not including sensor accuracy), Response speed: 150 ms or less					
	Accuracy (To display value) (25°C)	±0.6% F.S.				±1.0% F.S.	±1.5% F.S.
	Current output Note 2)	Output current: 4 to 20 mA (within rated pressure range (Differential pressure)), 2.4 to 4 mA (within extension analog output range) Maximum load impedance: 300 Ω (at 12 VDC), 600 Ω (at 24 VDC), Minimum load impedance: 50 Ω Linearity: ±0.2% F.S. (Not including sensor accuracy), Response time: 150 ms or less					
	Accuracy (To display value) (25°C)	±1.0% F.S.				±1.5% F.S.	±2.0% F.S.
Display accuracy (Ambient temperature at 25°C)		±0.5% F.S. ±2 digits	±0.5% F.S. ±1 digit				
Display		3 + 1/2 digit, 7 segment indicator, 2-color display (Red/Green), Sampling frequency: 5 times/sec					
Indicator light		OUT1: Lights up when turned ON (Green), OUT2: Lights up when turned ON (Red)					
Auto-shift input Note 2)		Non-voltage input (Reed or Solid state), Low level input: 5 ms or more, Low level: 0.4 V or less					
Environment	Enclosure	IP40					
	Operating temperature range	Operating: 0 to 50°C, Stored: –10 to 60°C (No freezing or condensation)					
	Operating humidity range	Operating/Stored: 35 to 85% RH (No condensation)					
	Withstand voltage	1000 VAC for 1 minute between terminals and housing					
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing					
	Vibration resistance	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s^2 acceleration, in X, Y, Z directions, for 2 hours each (De-energized)					
	Impact resistance	100 m/s^2 in X, Y, Z directions, 3 times each (De-energized)					
Temperature characteristics		±0.5% F.S. (25°C reference)					
Connection		PSE3□□: Power supply/Output connection: 5P connector, Sensor connection: 4P connector PSE3□□T: Terminal block					
Material		Front case: PBT, Rear case: PBT (PSE3□□), Denaturated PPE (PSE3□□T)					
Weight	With power supply/Output connection cable	PSE3□□: 85 g					
	Without power supply/Output connection cable	PSE3□□: 30 g, PSE3□□T: 50 g					
Power supply/Output connection cable		Oil proof heavy-duty vinyl cable, 5 cores, ø4.1, 2 m, Conductor area: 0.2 mm^2 Insulator O.D.: 1.12 mm					
Standards		Compliant with CE marking, UL (CSA)					

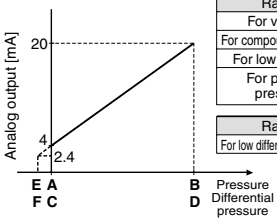
Note 1) Pressure range can be selected during initial setting.
Note 2) Auto-shift function is not available when analog output option is selected.
Also, analog output option is not available when auto-shift function is selected.
Note 3) The following units can be selected with unit conversion function:
For vacuum & compound pressure: kPa·kgf/cm^2·bar·psi·mmHg·inHg
For positive pressure & low pressure: MPa·kPa·kgf/cm^2·bar·psi
For low differential pressure: kPa·mmH$_2$O

Analog Output

1 to 5 VDC



4 to 20 mA DC

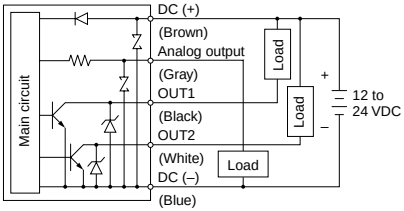


Range	Rated pressure range	A	B	E
For vacuum	0 to –101 kPa	0	–101 kPa	10.1 kPa
For compound pressure	–100 kPa to 100 kPa	–100 kPa	100 kPa	—
For low pressure	0 to 100 kPa	0	100 kPa	–10 kPa
For positive pressure	0 to 1 MPa	0	1 MPa	–0.1 MPa
	0 to 500 kPa	0	500 kPa	–50 kPa

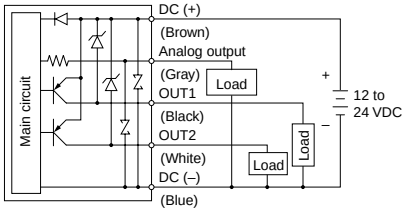
Range	Rated pressure range	C	D	F
For low differential pressure	0 to 2 kPa	0	2 kPa	–0.2 kPa

Internal Circuit

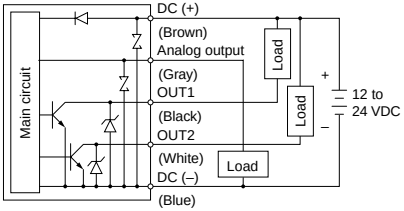
PSE3□0
NPN open collector output (2 outputs)
Analog output: 1 to 5 V



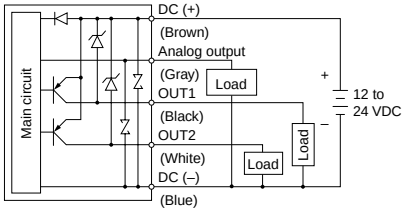
PSE3□3
PNP open collector output (2 outputs)
Analog output: 1 to 5 V



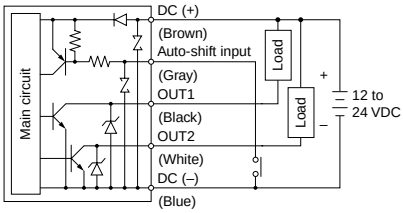
PSE3□1
NPN open collector output (2 outputs)
Analog output: 4 to 20 mA



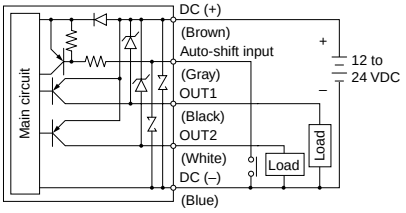
PSE3□4
PNP open collector output (2 outputs)
Analog output: 4 to 20 mA



PSE3□2
NPN open collector output with auto-shift input (2 outputs)



PSE3□5
PNP open collector output with auto-shift input (2 outputs)



Note: The colors in parentheses indicate the color of the lead wire when it is connected to the power supply/output connection cable (ZS-28-A).

Descriptions

LCD
Displays the current pressure, set mode, selected display unit, and error code. Four different display settings are available. Always use red or green display; or switch between green and red according to the output.

Output (OUT1) display (Green)
Lights up when OUT1 is turned ON.

Up button
Use this button to select the mode or increase the ON/OFF set value.
It is also used for switching to the peak display mode.

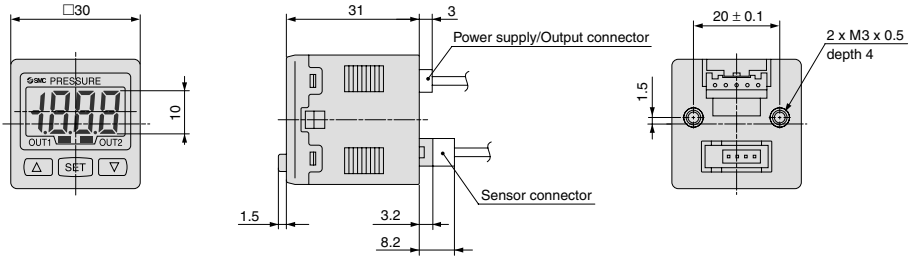
Output (OUT2) display (Red)
Lights up when OUT2 is turned ON.

SET button
Use this button to change the mode or confirm the set value.

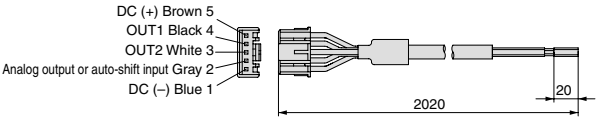
Down button
Use this button to select the mode or decrease the ON/OFF set value.
It is also used for switching to the bottom display mode.

Dimensions

PSE3□□

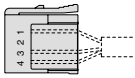


Power supply/Output connection cable (ZS-28-A)



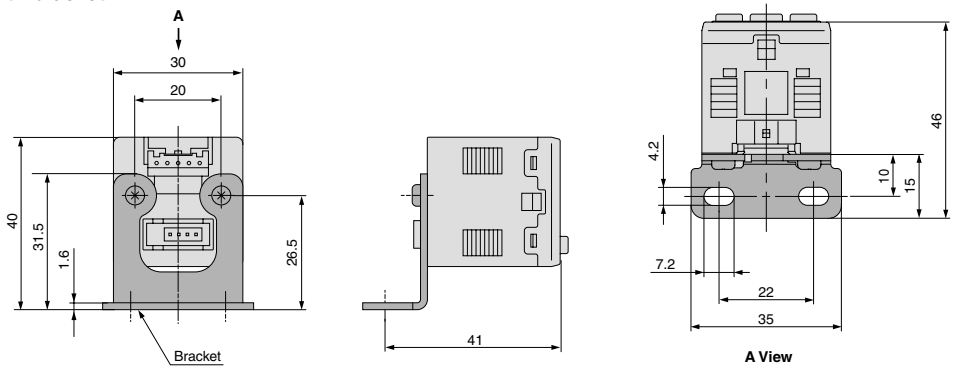
Sensor connector

PIN no.	Terminal	
	PSE30□	PSE31□
1	DC(+)(Brown)	DC(+)(Brown)
2	N.C.	N.C.
3	DC(–)(Blue)	N.C.
4	IN (1 to 5 V) (Black)	IN (4 to 20 mA) (Blue)

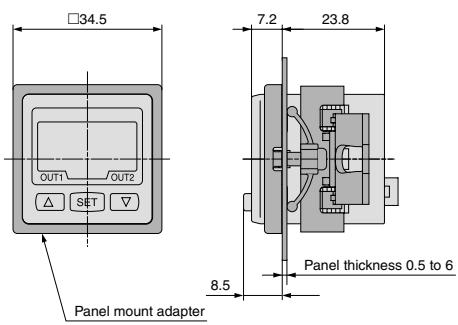


Note: The colors in ( ) indicate the wire color of the PSE5□□ series.

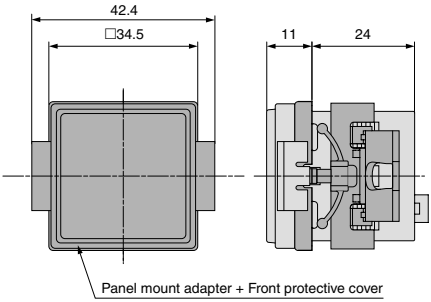
With bracket



With panel mount adapter



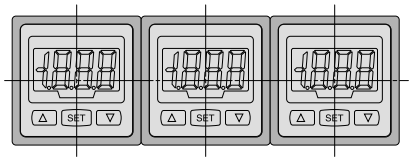
With panel mount adapter + Front protective cover



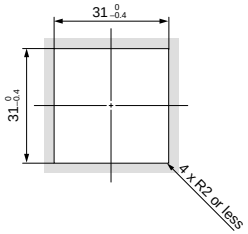
Dimensions

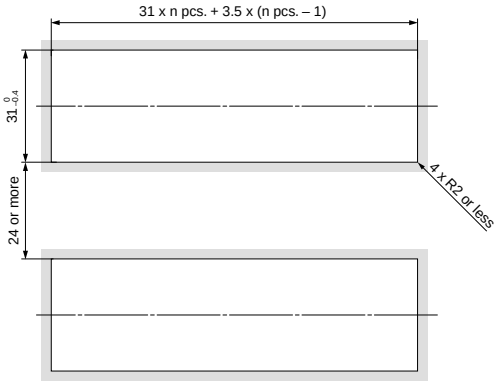
Panel fitting dimensions

Horizontal stacking mount of multiple units (n pcs.)

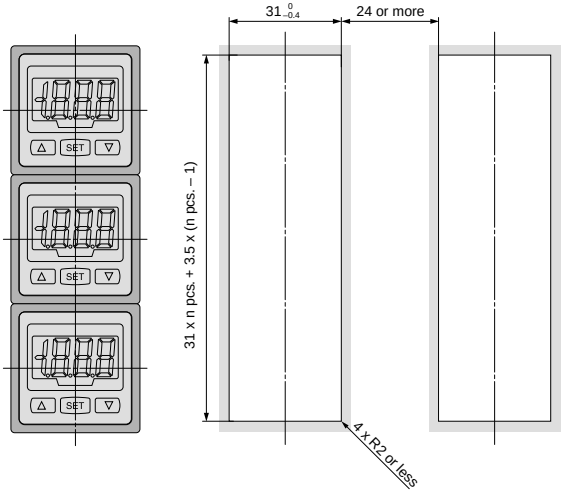


Mount of single unit



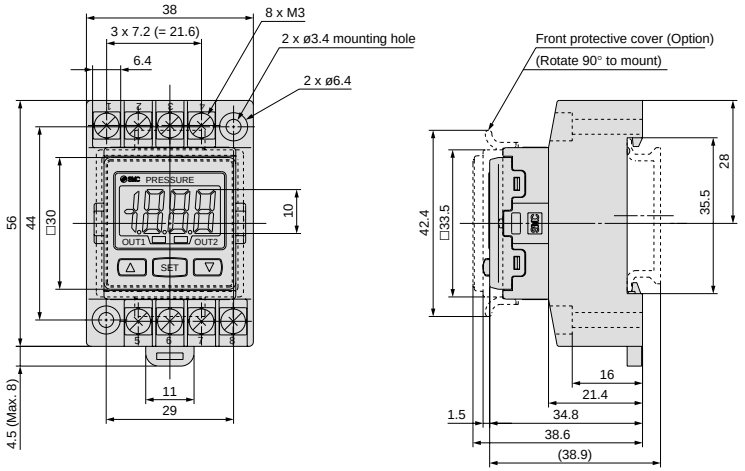


Vertical stacking mount of multiple units (n pcs.)



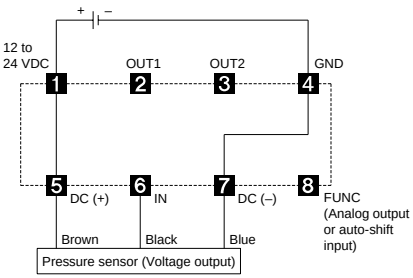
Dimensions

PSE3□□T

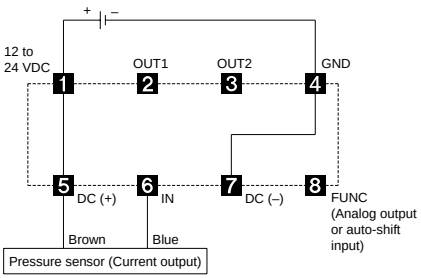


Connections

PSE30□T (Voltage input type)

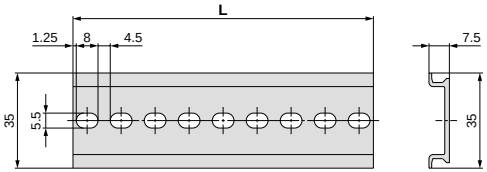


PSE31□T (Current input type)



DIN Rail

ISA-5-□



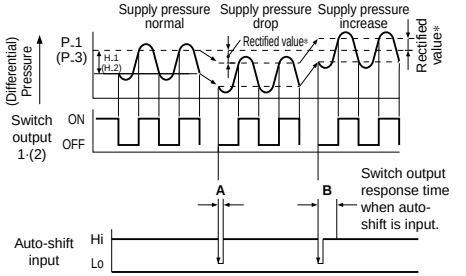
Part no.	L
ISA-5-1	73.0
ISA-5-2	135.5
ISA-5-3	173.0
ISA-5-4	210.5
ISA-5-5	248.0
ISA-5-6	285.5
ISA-5-7	323.0

Function Details

A Auto-shift function

When there are large fluctuations in the supply pressure, the switch may fail to operate correctly. The auto-shift function compensates 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



	A Auto-shift input time	B Switch output response time at time of auto-shift input
PSE200	10 ms or more	15 ms or less
PSE300	5 ms or more	10 ms or less

∗ **Rectified value**
When the auto-shift is selected, "ooo" will be displayed for approximately 1 second, and the pressure value at that point will be saved as a rectified value "C_5" (for CH1 of PSE200 and PSE300) or "C_3" (for CH2 to 4 for PSE200). Based on the saved rectified values (Note), the set value "P_1" to "P_4" (for PSE200) or "P_1", "H_1", "P_3", "H_2" (for PSE300) will likewise be rectified.

Note) When an output is reversed, "n_1" to "n_4" (for PSE200) or "n_1", "H_1", "n_3", "H_2" (for PSE300) will be rectified.

Settable Range for Auto-Shift Input

PSE200	Set pressure (Differential pressure) range	Settable range
Compound pressure	–101.0 to 101.0 kPa	–101.0 to 101.0 kPa
Vacuum	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	—	—

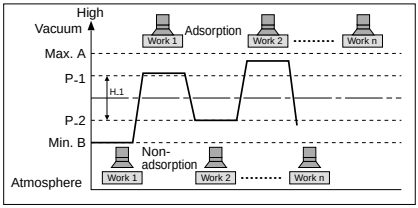
PSE300	Set pressure (Differential pressure) range	Settable range
Compound pressure	–101.0 to 101.0 kPa	–101.0 to 101.0 kPa
Vacuum	10.0 to –101.0 kPa	101.0 to –101.0 kPa
Low pressure	–10 to 100.0 kPa	–100.0 to 100.0 kPa
Positive pressure	–0.1 to 1.000 MPa	–1.000 to 1.000 MPa
	–50 to 500 kPa	–500 to 500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

Auto-shift zero (Series PSE300 only)
The basic function of auto-shift zero is the same as the function for auto-shift. Also it corrects values on the display, based on a pressure value of 0, when the auto-shift is selected.

B Auto-preset function

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

Suction Verification

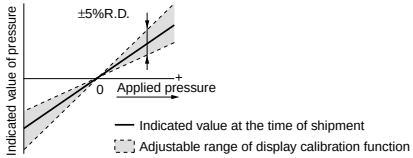


Formula for Obtaining the Set Value

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

C Display calibration function

Fine adjustment of the indicated value of the pressure sensor can be made within the range of ±5% of the read value.
(The scattering of the indicated value can be eliminated.)



Note) When the display calibration function is used, the set pressure value may change ±1 digit.

D Peak and bottom display function

This function constantly detects and updates the maximum and minimum values and allows to hold the display value.
For PSE300, when the △▽ are simultaneously pressed for 1 second or longer, while "holding", the hold value will be reset.

E Keylock function

Prevents operation errors such as accidentally changing setting values.

F Zero-clear function

This function clears and resets the zero value on the display of measured (differential) pressure within ±7% F.S. of the factory adjusted value.

Function Details

G Error indication function

Error name	Error code PSE200	Error code PSE300	Description
Overcurrent error	Er 1	Er1	Load current of 80 mA or more is applied to the switch output (OUT1).
	Er 2	Er2	Load current of 80 mA or more is applied to the switch output (OUT2).
Residual pressure error	Er 3	Er3	Pressure applied during the zero reset operation exceeds ±7% F.S. ∗ 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 be disconnected or mis-wired. 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 one second, the switch returns to the measuring mode.
System error	Er 5	Er4	Internal data error
	Er 6	Er6	Internal data error
	Er 7	Er7	Internal data error
	Er 8	Er8	Internal data error

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

I Auto-identification function (Series PSE200 only)

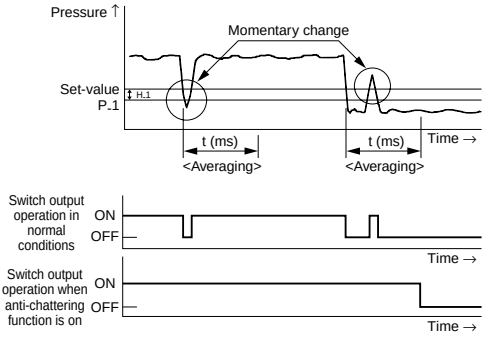
This function automatically identifies the pressure range of the pressure sensor that is connected to the multi-channel pressure sensor controller, thus eliminating the need of having to reset the range again after replacing the sensor. This function will be activated either when “Aon” is set in the 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 setting the range. Turning the power back on while in the “Aon” setting can cause a malfunction.

J Anti-chattering function

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
PSE200	20 ms, 160 ms, 640 ms
PSE300	20 ms, 160 ms, 640 ms, 1280 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.



K Channel selection function (Series PSE200 only)

Pressure value for the selected channel is displayed.

L Channel scan function (Series PSE200 only)

Pressure values for each channel are displayed by turns at 2-second intervals.

Function Details

M Display unit switching function

Display units can be switched with this function.
Units that can be displayed vary depending on the range of the pressure sensors connected to the controller.

PSE200

Pressure range		For compound pressure	For vacuum	For low pressure	For positive pressure
Applicable pressure sensor		**PSE533 PSE543 PSE563**	**PSE531 PSE541 PSE561**	**PSE532**	**PSE530 PSE540 PSE560**
Set pressure (differential pressure) range		–101 to 101 kPa	10 to –101 kPa	–10 to 101 kPa	–0.1 to 1 MPa
PA	kPa	0.1	0.1	0.1	—
	MPa	—	—	—	0.001
GF	kgf/cm²	0.001	0.001	0.001	0.01
bAr	bar	0.001	0.001	0.001	0.01
PSI	psi	0.02	0.01	0.01	0.1
inH	inHg	0.1	0.1	—	—
mmH	mmHg	1	1	—	—

PSE300

Pressure range		For compound pressure	For vacuum	For low pressure	For positive pressure		For low differential pressure
Applicable pressure sensor		**PSE533 PSE543 PSE563**	**PSE531 PSE541 PSE561**	**PSE532**	**PSE530 PSE540 PSE560**	**PSE564**	**PSE550**
Set pressure (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
PA	kPa	0.2	0.1	0.1	—	1	0.01
	MPa	—	—	—	0.001	—	—
GF	kgf/cm²	0.002	0.001	0.001	0.01	0.01	—
bAr	bar	0.002	0.001	0.001	0.01	0.01	—
PSI	psi	0.05	0.02	0.02	0.2	0.1	—
inH	inHg	0.1	0.1	—	—	—	—
mmH	mmHg	2	1	—	—	—	1 mmH₂O

Series PSE5□□
Specific Product Precautions 1

Be sure to read before handling. Refer to back page 1 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Pressure Switch Precautions.

■ Pressure Sensors

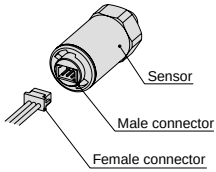
Handling

⚠ Caution

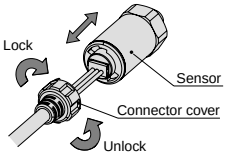
1. **Do not drop, bump, or apply excessive impact (PSE530, 540: 980 m/s², PSE560: 500 m/s², PSE550: 300 m/s²) while handling. Although the body of the sensor may not be damaged, the inside of the sensor could be damaged and lead to malfunction.**
2. **The tensile strength of the cord is PSE530: 23 N, PSE540, 550, 560: 50 N or less. Applying a greater pulling force to it can cause malfunction. When handling, hold the body of the sensor—do not dangle it from the cord.**
3. **Do not use pressure sensors with corrosive and/or flammable gases or liquids.**

(PSE530)

1. **Do not exceed the screw-in torque of 3.5 N·m when installing piping. Exceeding this value may cause malfunctioning of the sensor.**
2. **Connecting the sensor cable (option)**
   Hold the female connector of the sensor cable with your fingers and carefully insert it into the connector.

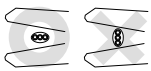


A connector cover is provided as part of the cable assembly (see the figure below). It is designed to keep the female cover in place, first make sure it is facing in the right direction as you slip it over the female connector, then lock it to the sensor body by turning it clockwise. To remove the cover, first unlock it by turning it counterclockwise, then pull back on it. To remove the female connector, grab it with your fingers and pull back on it. Do not pull on the cable.



(PSE540/550)

1. **Care should be taken when stripping the outer cable covering as the insulator may be accidentally torn or damaged if incorrectly stripped, as shown on the right.**

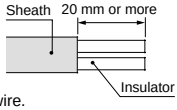


Wiring

⚠ Caution

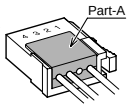
1. Connection of sensor connector

- Cut the sensor cable as illustrated to the right.
- Referring to the table below, insert each lead wire of the cable at the position marked with a number corresponding to the color of the lead wire.

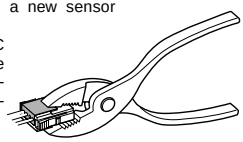


- Confirm that the numbers on the connector match the colors of the wires and that the wires are inserted to the bottom. Press Part A by hand for temporary fixing.

PIN no.	Wire core color	
	PSE5□□	PSE5□□-28
1	Brown (DC (+))	Brown (LINE (+))
2	N.C.	N.C.
3	Blue (DC (–))	N.C.
4	Black (OUT: 1 to 5 V)	Blue (LINE(–))



- Press in the central part of Part A vertically with a tool such as pliers.
- A sensor connector cannot be taken apart for reuse once it is crimped. If the wire arrangement is incorrect or if the wire insertion fails, use a new sensor connector.
- For connection to SMC pressure switches, use sensor connectors (ZS-28-C□) or e-con connectors listed below.



Series	Sumitomo 3M Limited	Tyco Electronics Japan G.K.	OMRON Corp.
PSE53□	37104-3101-000FL	3-1473562-4	XN2A-1430
PSE54□	37104-3101-000FL	1-1473562-4	XN2A-1430
PSE55□	37104-3101-000FL	1-1473562-4	XN2A-1430
PSE56□	37104-3101-000FL	1473562-4	XN2A-1430

- For details about the e-con connector, contact the respective connector manufacturer.

Series PSE5□□
Specific Product Precautions 2

Be sure to read before handling. Refer to back page 1 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Pressure Switch Precautions.

Pressure Source

⚠ Warning

1. Use of toxic, corrosive or flammable gas

Do not use **toxic and corrosive gas**.
Also, note that the switch is not explosion-proof.

2. Applicable fluid

(PSE530/540/550)

Do not use for corrosive, flammable gases or fluids.

(PSE560)

The fluid contact areas are stainless steel 316L (pressure sensor fittings). Use fluid that will not corrode the materials.
(For corrosiveness of fluid, consult the manufacturer of the fluid.)

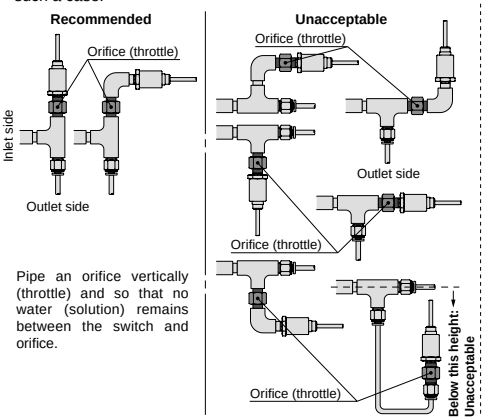
⚠ Caution

1. Helium leakage test (PSE56□-$^{A2}_{B2}$ only)

Helium leakage test is conducted on the welding parts. Use a ferrule by Swagelok Company (Swagelok® fittings) as the TSJ fittings and packing, ground, etc. by Swagelok Company (VCR® fittings) as the URJ fittings. If a ferrule, packing or ground by other manufacturers are to be used, conduct helium leakage test before using those products.
∗ Swagelok® and VCR® are trademarks of Swagelok Company.

2. Intrusion of water or drainage (PSE560)

Although the pressure sensor of this switch employs a stainless steel diaphragm that would not be damaged by water, there are cases in which the inertial force of sudden irruption at the time of vacuum release after adsorption confirmation causes water, or drainage contained in the air, to strike the pressure sensor and damage it.
In the case that water or drainage occurs, an intermediate orifice can be set up, or an adapter with external deflection (ZS-31-X175, X186) can be mounted to the fitting part of the main body.
In the case that water or drainage occurs, an orifice can be set up as shown below, or an external adapter with throttle (ZS-31-X175, X186, X188, X189) can be mounted to the fitting part of the main body.
The external adapter with throttle sometimes does not work for suppression of water hammer effect. Take other measures in such a case.

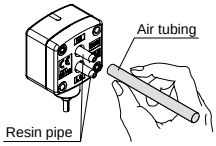


Pipe an orifice vertically (throttle) and so that no water (solution) remains between the switch and orifice.

Piping Connection

⚠ Caution

(PSE550)



- Cut the air tubing vertically.
- Carefully hold the air tubing and slowly push it into the resin pipe, ensuring that it is inserted by more than 8 mm. For your information, the tensile strength is approx. 25 N when inserted by more than 8 mm.
- Insert the low pressure air tubing into "Lo" pipe, and the high-pressure air tubing into "Hi" pipe.
- In cases where SMC air tubing is not used, make sure the product has similar I.D. accuracy within ø4±0.3 mm.
- Make sure that the air tubing is firmly inserted to avoid possible disconnection. (Tensile strength is approx. 25 N when being inserted 8 mm.)

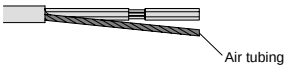
Operating Environment

⚠ Caution

1. When resin piping is used, depending on the fluid, static electricity may occur. When connecting the switch and sensor, please take adequate anti-static electricity measures on the equipment side, and do not use with a grounding that is shared with equipment that generates strong electromagnetic noise or high-frequency waves. This can result in a switch or sensor being damaged by static electricity.

2. Do not bend the atmospheric release tube or close the hole of it. It causes malfunction with the measurement of positive pressure.

3. In a place where water and dust splash on, water and dust may enter inside the switch through the atmospheric vent port. Bring piping of the opposite side up to the safe position to keep it from water and dust.



Series PSE200/300
Specific Product Precautions 1

Be sure to read before handling. Refer to back page 1 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Pressure Switch Precautions.

■ Controllers

Handling

⚠ Caution

1. Do not drop, bump, or apply excessive impact (PSE200: 980 m/s^2, PSE300: 100 m/s^2) while handling. Although the body of the controller case may not be damaged, the inside of the controller could be damaged and cause malfunction.

2. The tensile strength of the power supply/output connection cable is 50 N; that of the pressure sensor lead wire with connector is 25 N. Applying a greater pulling force than the applicable specified tensile strength to either of these components can lead to malfunction. When handling, hold the body of the controller.

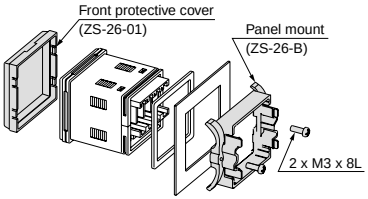
Mounting

⚠ Caution

(PSE200)

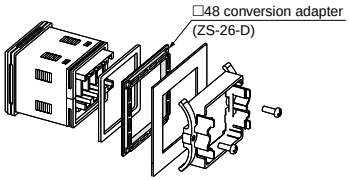
The front face of the panel mount conforms to IP65 (IP40 when using the □48 conversion adapter); however, there is a possibility of liquid filtration if the panel mount adapter is not installed securely and properly. Securely fix the adaptor with screws as shown below.

Standard



Tighten screws 1/4 to 1/2 turn after the heads are flush with the panel.

When using □48 conversion adapter



Mounting

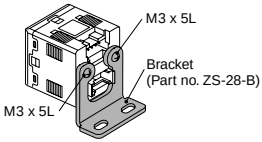
⚠ Caution

(PSE300)

1. Mounting with a bracket

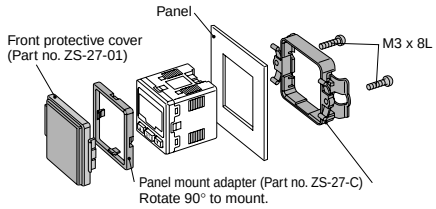
Mount the bracket on the body with two M3 x 5L mounting screws.

Tighten the bracket mounting screws at a tightening torque of 0.5 to 0.7 N·m.



2. Mounting with panel mount adapter

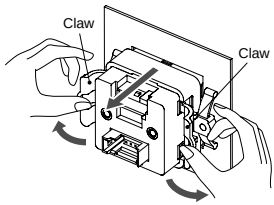
Secure the panel mount adapter with two M3 x 8L mounting screws.



3. Panel mount adapter removal

To remove the controller with panel mount adapter from the equipment, remove the two mounting screws, and pull out the controller while pushing the claws outward.

Failure to follow this procedure can cause damage to the controller and panel mount adapter.



(PSE300T)

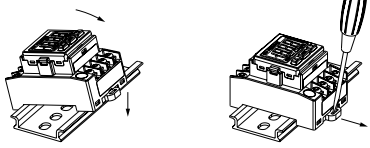


Figure (a) **Figure (b)**

1. Please affix the main body by hooking the claws of the lower part over the DIN rail and pressing in the direction of the arrows as shown in Figure (a).

When removing the main body, use a flat head screwdriver or similar tool to pull it in the direction of the arrows as shown in Figure (b).

Series PSE200/300
Specific Product Precautions 2

Be sure to read before handling. Refer to back page 1 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Pressure Switch Precautions.

Connection

⚠ Warning

1. Incorrect wiring can damage the switch and cause malfunction or erroneous switch output. Connections should be done while the power is turned off.

2. Do not attempt to insert or pull out the pressure sensor or its connector when the power is on. Switch output may malfunction.

⚠ Caution

1. Wire separately from power lines and high voltage lines, avoiding wiring in the same conduit with these lines. Malfunctions may occur due to noise from these other lines.

2. If a commercial switching regulator is used, make sure that the F.G. terminal is grounded.

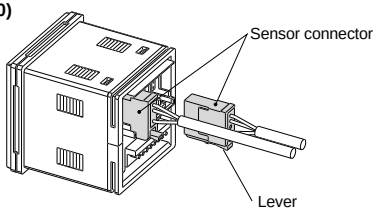
Wiring

⚠ Caution

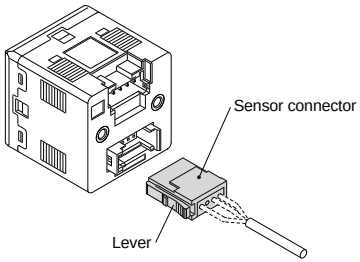
1. Connection and removal of sensor connector

- Hold the lever and connector body with two fingers and insert the connector straight into the pin until it is locked with a click sound.
- To remove the connector, pull it out straight while pressing the lever with one finger.

(PSE200)



(PSE300)



2. Connection of power supply cable and output cable

- Securely connect the power supply cable and the output cable to the body until a click is heard.

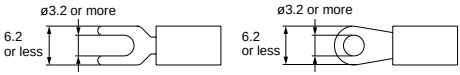
Wiring

⚠ Caution

3. Applicable crimping terminal dimensions (PSE300T)

An M3 terminal screw is used.

If employing a crimping terminal, please use the part shown below.



(Unit: mm)

Please tighten the terminal screw with a tightening torque of 0.35 N·m.

Operating Environment

⚠ Warning

1. Our pressure sensor controllers are CE marked; however, they are not equipped with surge protection against lightning. Lightning surge countermeasures should be applied directly to system components as necessary.

(PSE200)

- **If the product is mounted on a panel, the "IP65" enclosure rating is applicable only to the front parts. Do not use in an environment where oil splashing or spraying are anticipated.**