

# Remote Type Pressure Sensors/Controllers



Compact Pressure Sensor for Pneumatics **PSE530**



Compact Pressure Sensor for Pneumatics **PSE540**



Low Differential Pressure Sensor **PSE550**



Pressure Sensor for General Fluids **PSE560**



Multi-channel, Digital  
Pressure Sensor  
Controller

**PSE200**









2-colour Display, Digital  
Pressure Sensor  
Controller

**PSE300**

*Series PSE*

# Remote Type Pressure Sensors/

		Pressure Sensors				Controllers		
Model		PSE530  P. 1	PSE540  P. 4	PSE550  P. 7	PSE560  P. 10	PSE200  P. 13	PSE300  P. 19	
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	
	Analogue 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-colour	2-colour	
	Enclosure	IP40			IP65	Front parts IP65 Others IP40	IP40	
	Wiring specification	Connector	Grommet			Connector		
	Major setting function	Key lock, 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	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Flexible cable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Mounting	Direct	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		With bracket	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Panel mount		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

# Controllers

## Rated pressure range Sensors

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

## Minimum display value Controllers

			PSE200	PSE300
Vacuum	-101 kPa	0	0.1 kPa	0.1 kPa
Compound pressure	-100 kPa	100 kPa	0.1 kPa	0.2 kPa
Positive pressure	0	100 kPa	0.1 kPa	0.1 kPa
	0	500 kPa	—	1 kPa
	0	1 MPa	0.001 MPa	0.001 MPa
Low differential pressure	0	2 kPa	—	0.01 kPa

## Main Functions (For details, see page 25.)

<b>Key lock</b>	Locks the keys from functioning.
<b>Peak/Bottom values holding</b>	Displays the maximum and minimum values being set and can keep those values on the display.
<b>Auto preset</b>	Able to set the pressure automatically. In the case of adsorption confirmation, it memorises the pressure when adsorbed and released. By repeating several times, the optimum values are calculated automatically.
<b>Auto shift</b>	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.
<b>Display calibration</b>	Able to adjust the displayed value ( $\pm 5\%$ ) and justify distribution of the values displayed on respective pressure switch.
<b>Anti-chattering</b>	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.

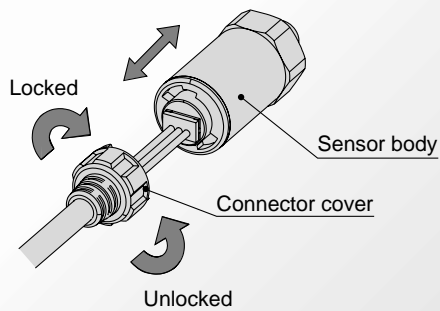
# Compact Pressure Sensor for Pneumatics

Series *PSE530*



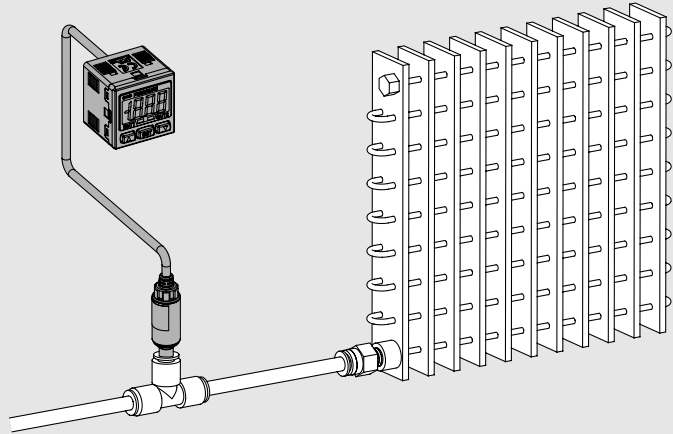
Series	Rated pressure range				
	-100 kPa	0	100 kPa	500 kPa	1 MPa
<b>PSE530</b>		0	1 MPa		
<b>PSE531</b>	-101 kPa	0			
<b>PSE532</b>		0	101 kPa		
<b>PSE533</b>	-101 kPa		101 kPa		

## 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.

# Pressure Sensor

# Series PSE530

## How to Order

PSE53 **0** — **M5** — 



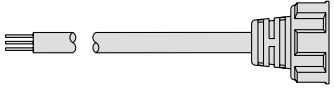
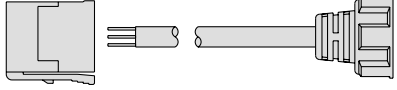
**Sensor range**

<b>0</b>	High pressure [0 to 1 MPa]
<b>1</b>	Vacuum [0 to -101 kPa]
<b>2</b>	Low pressure [0 to 101 kPa]
<b>3</b>	Compound pressure [-101 to 101 kPa]

**Port size**

<b>M5</b>	M5
<b>R06</b>	ø6 reducer
<b>R07</b>	1/4 inch reducer

**Option**

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

## Option/Part No.

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	1pc. 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 connected to the cable at the time of shipment.

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

## Specifications

Model	PSE530	PSE531	PSE532	PSE533
<b>Rated pressure range</b>	0 to 1 MPa	0 to -101 kPa	0 to 101 kPa	-101 to 101 kPa
<b>Proof pressure</b>	1.5 MPa	500kPa		
<b>Applicable fluid</b>	Air, Non-corrosive gas, Non-flammable gas			
<b>Power supply voltage</b>	12 to 24 VDC, Ripple (p-p) 10% or less (With power supply polarity protection)			
<b>Current consumption</b>	15 mA or less (no load)			
<b>Output specification</b>	Analogue output 1 to 5 V, Output impedance: Approx. 1 kΩ			
<b>Accuracy (Ambient temperature of 25°C)</b>	±2% F.S. or less			
<b>Linearity</b>	±1% F.S. or less			
<b>Repeatability</b>	±1% F.S. or less			
<b>Power supply voltage effect</b>	±1% F.S. or less based on the analogue output at 18 V ranging from 12 to 24 VDC			
<b>Environmental resistance</b>	<b>Enclosure</b>	IP40		
	<b>Temperature range</b>	0 to 50°C; Stored: -10 to 70°C (No freezing or condensation)		
	<b>Withstand voltage</b>	1000 VAC, 50/60Hz for 1 minute between live parts and case		
	<b>Insulation resistance</b>	5 MΩ between live parts and case (at 500 VDC Mega)		
	<b>Vibration resistance</b>	10 to 500 Hz 1.5 mm amplitude or 98 m/s <sup>2</sup> acceleration, X, Y, Z directions for 2 hours each (De-energised)		
	<b>Impact resistance</b>	980 m/s <sup>2</sup> in X, Y, Z directions, 3 times each (De-energised)		
<b>Temperature characteristics</b>	±2% F.S. or less (Based on 25°C)			
<b>Sensor cable/Option</b>	Halogen-free heavy-duty cord, ø2.7, 0.15 mm <sup>2</sup> , 3 cores, 3 m			

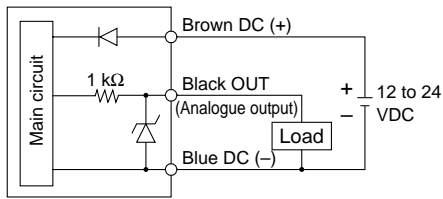
## Piping Specifications

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

# Series PSE530

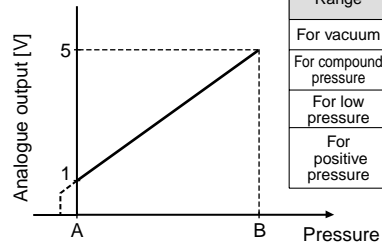
## Internal Circuit

**PSE53□**  
 Voltage output type  
 1 to 5 V  
 Output impedance  
 Approx. 1 kΩ



## Analogue Output

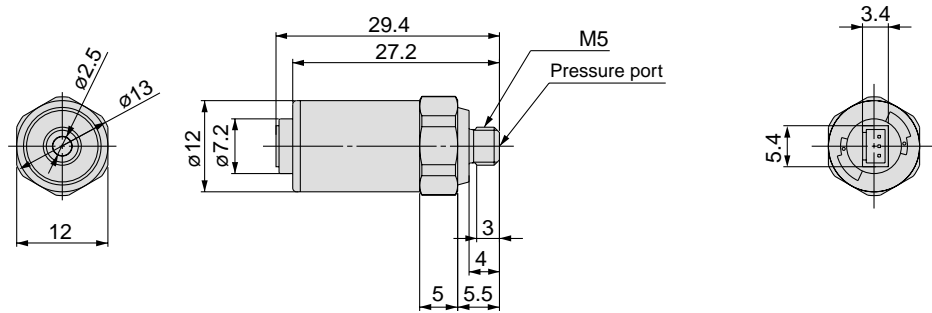
1 to 5 VDC



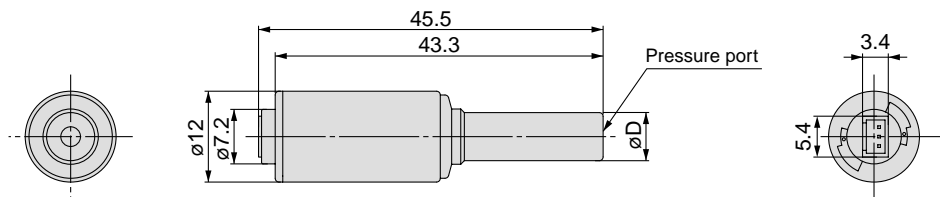
Range	Rated pressure range	A	B
For vacuum	0 to -101 kPa	0	-101 kPa
For compound pressure	-101 kPa to 101 kPa	-101 kPa	101 kPa
For low pressure	0 to 101 kPa	0	101 kPa
For positive pressure	0 to 1 MPa	0	1 MPa
	0 to 500 kPa	0	500 kPa

## Dimensions

### PSE53□-M5

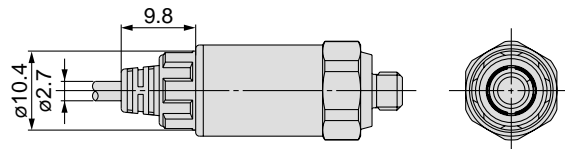


### PSE53□-R06 R07



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

With sensor cable



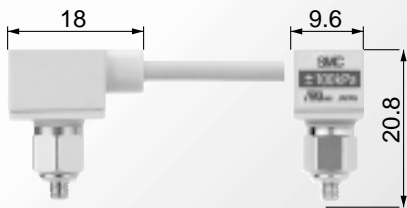


# Compact Pressure Sensor for Pneumatics

Series *PSE540*

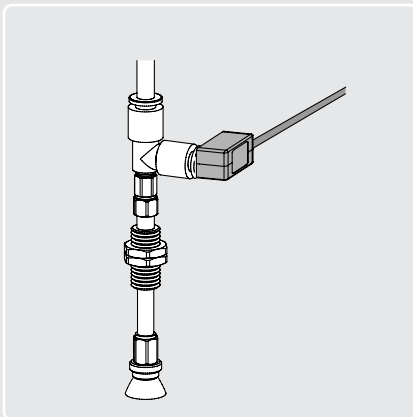
Series	Rated pressure range				
	-100 kPa	0	100 kPa	500 kPa	1 MPa
PSE540		0	1 MPa		
PSE541	-101 kPa	0			
PSE543	-100 kPa		100 kPa		

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

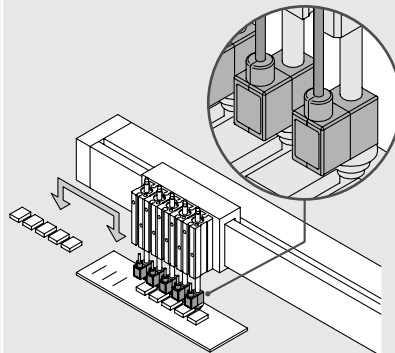


In case of PSE54□-M3

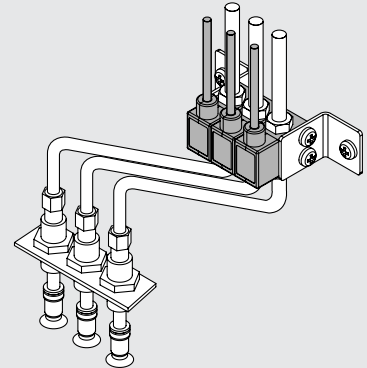
## Application Example



Pads can be directly mounted.



Manifolding is possible.

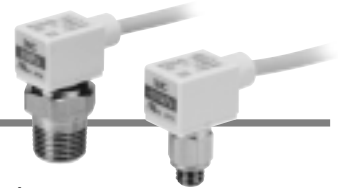


# Compact Pressure Sensor for Pneumatics

# Series PSE540



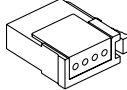
## How to Order



Sensor range	
0	Positive pressure [0 to 1 MPa]
1	Vacuum [0 to -101 kPa]
3	Compound pressure [-100 to 100 kPa]










Accuracy	
Nil	±2% F.S.
A	±1% F.S.

### Option (Connector)

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

PSE54 1 [ ] M3 [ ]

### Port size

M3	M3		IM5	M5 female thread, through type		
M5	M5			IM5H	M5 female thread, through type (With mounting hole)	
01	R 1/8 (With M5 female thread)		IM5H		M5 female thread, through type (With mounting hole)	
N01	NPT1/8 (With M5 female thread)				IM5H	M5 female thread, through type (With mounting hole)
R04	ø4 plug-in reducer					
R06	ø6 plug-in reducer					

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

### Option/Part No.

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

## Specifications

Conforms to CE marking and UL (CSA) standards.

Model	PSE540	PSE541	PSE543
Rated pressure range	0 to 1 MPa	0 to -101 kPa	-100 to 100 kPa
Proof pressure	1.5 MPa	500 kPa	
Applicable fluid	Air, Non-corrosive gas, Non-flammable gas		
Power supply voltage	12 to 24 VDC, Ripple (p-p) 10% or less (With power supply polarity protection)		
Current consumption	15 mA or less		
Output specification	Analogue output 1 to 5 V, Output impedance: Approx. 1 kΩ		
Accuracy (Ambient temperature of 25°C)	PSE54□: ±2% F.S. or less PSE54□A: ±1% F.S. or less		
Linearity	±0.7% F.S. or less	±0.4% F.S. or less	
Repeatability	±0.2% F.S. or less		
Power supply voltage effect	±0.8% F.S. or less		
Environmental resistance	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, 50/60 Hz for 1 minute between live parts and case	
	Insulation resistance	50 MΩ or more between live parts and case (at 500 VDC Mega)	
	Vibration resistance	10 to 500 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s <sup>2</sup> acceleration, in X, Y, Z directions, for 2 hours each (De-energised)	
Impact resistance	980 m/s <sup>2</sup> in X, Y, Z directions, 3 times each (De-energised)		
Temperature characteristics	±2% F.S. or less (Based on 25°C)		

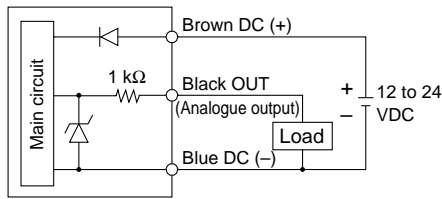
## Piping Specifications

Model	M3	M5	01	N01	R04	R06	IM5	IM5H
Port size	M3	M5	R1/8 M5	NPT1/8 M5	ø4 plug-in reducer	ø6 plug-in 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	3-wire elliptical cable (0.15 mm <sup>2</sup> )							
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



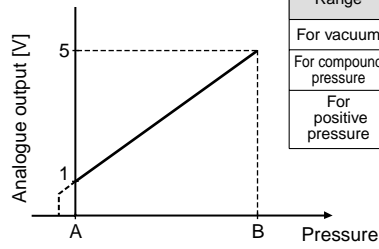
## Internal Circuit

**PSE54□**  
Voltage output type  
1 to 5 V  
Output impedance  
Approx. 1 kΩ



## Analogue Output

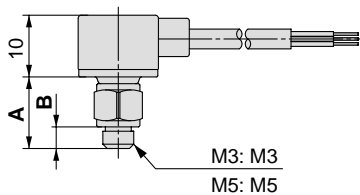
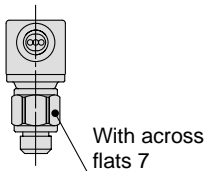
1 to 5 VDC



Range	Rated pressure range	A	B
For vacuum	0 to -101 kPa	0	-101 kPa
For compound pressure	-100 kPa to 100 kPa	-100 kPa	100 kPa
For positive pressure	0 to 1 MPa	0	1 MPa

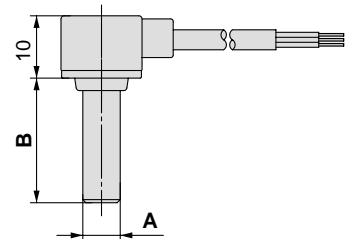
## Dimensions

**PSE54□-M3**  
M5



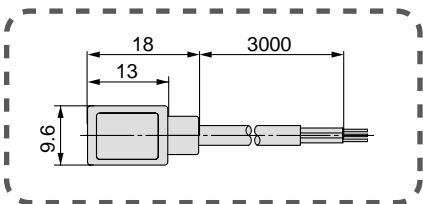
	PSE54□-M3	PSE54□-M5
A	10.8	11.5
B	3	3.5

**PSE54□-R04**  
R06

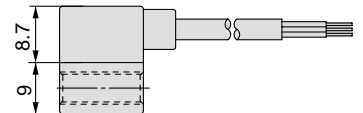
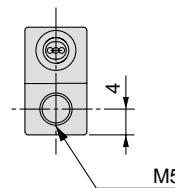


	PSE54□-R04	PSE54□-R06
A	∅4	∅6
B	18	20

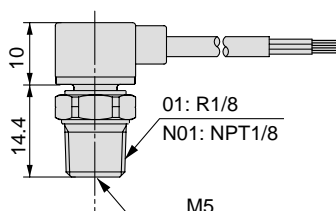
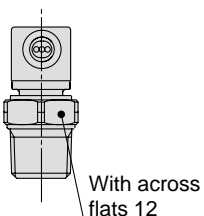
### Common dimensions



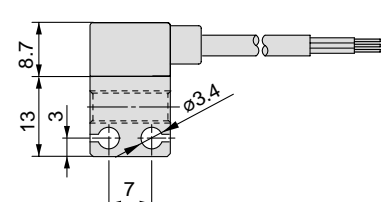
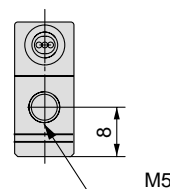
**PSE54□-IM5**



**PSE54□-01**  
N01



**PSE54□-IM5H**



# Low Differential Pressure Sensor

Series *PSE550*

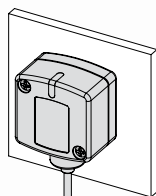


Series	Rated pressure range
PSE550	0 — 1 kPa — 2 kPa

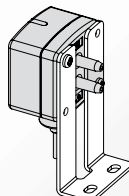
With LED display for confirming energisation



2 types of mountings



Mounting directly



Mounting with bracket

Accuracy

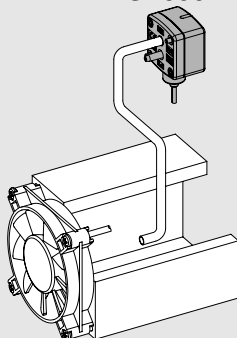
**±1%F.S.**

Proof pressure

**65 kPa**

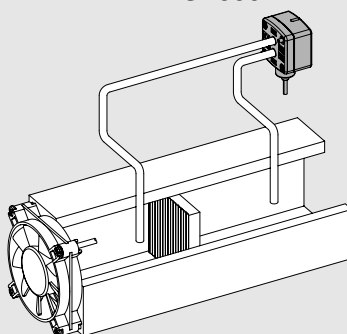
## Application Example

**Flow control**  
Series PSE550



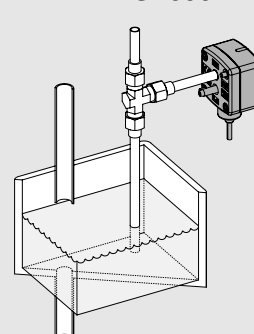
Can control air flow by monitoring the flow rate inside the duct.

**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.

# Low Differential Pressure Sensor

## Series PSE550



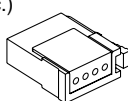
### How to Order

PSE550 — [ ] — [ ] — [ ]

#### Output specifications

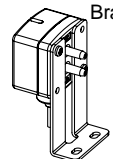
Nil	Voltage output type 1 to 5 V
28	Current output type 4 to 20 mA

#### Option 2 (Connector)

Nil	None
C2	Pressure sensor controller Connector for PSE300 (1 pc.) 

Note 1) Current output type cannot be connected to the Series PSE300.  
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.)
Pressure sensor controller Connector for PSE300	ZS-28-C	1 pc.

### Specifications

Model	PSE550	PSE550-28
<b>Rated differential pressure range</b>	0 to 2 kPa	
<b>Operating pressure range</b>	-50 to 50 kPa <sup>Note)</sup>	
<b>Proof pressure</b>	65 kPa	
<b>Applicable fluid</b>	Air, Non-corrosive gas, Non-flammable gas	
<b>Power supply voltage</b>	12 to 24 VDC, Ripple (p-p) 10% or less (With power supply polarity protection)	
<b>Current consumption</b>	15 mA or less	—
<b>Output specification</b>	Analogue output 1 to 5 VDC (Within rated differential pressure range) Output impedance: Approx. 1 kΩ	Analogue 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)
<b>Accuracy (Operating temperature of 25°C)</b>	±1% F.S. or less	
<b>Linearity</b>	±0.5% F.S. or less	
<b>Repeatability</b>	±0.3% F.S. or less	
<b>Indication light</b>	Orange light is on (When energised)	
<b>Environmental resistance</b>	<b>Enclosure</b>	IP40
	<b>Operating temperature range</b>	Operating: 0 to 50°C, Stored: -20 to 70°C (No freezing or condensation)
	<b>Operating humidity range</b>	Operating/Stored: 35 to 85% RH (No condensation)
	<b>Withstand voltage</b>	1000 VAC, 50/60 Hz for 1 minute between live parts and case
	<b>Insulation resistance</b>	50 MΩ or more between live parts and case (at 500 VDC Mega)
	<b>Vibration resistance</b>	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 100 m/s <sup>2</sup> acceleration, in X, Y, Z directions, for 2 hours each (De-energised)
	<b>Impact resistance</b>	300 m/s <sup>2</sup> in X, Y, Z directions, 3 times each (De-energised)
<b>Temperature characteristics</b>	±3% F.S. or less (Based on 25°C)	
<b>Port size</b>	ø4.8 (ø4.4 in the end) resin piping (Applicable to I.D. ø4 air tubing)	
<b>Material of wetted parts</b>	Resin pipe: Nylon, Piston area of sensor: Silicon	
<b>Sensor cable</b>	3-wire elliptical cable (0.15 mm <sup>2</sup> )	2-wire elliptical cable (0.15 mm <sup>2</sup> )
<b>Weight</b>	<b>With sensor cable</b>	75 g
	<b>Without sensor cable</b>	35 g

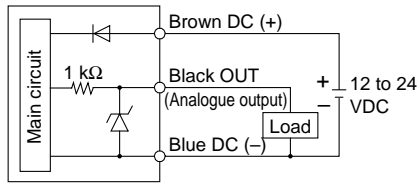
Note) Can detect differential pressure from 0 to 2 kPa within the range of -50 to 50 kPa.

# Series PSE550

## Internal Circuit

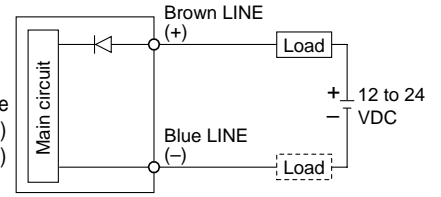
### PSE550

Voltage output type  
1 to 5 V  
Output impedance  
Approx. 1 k $\Omega$



### PSE550-28

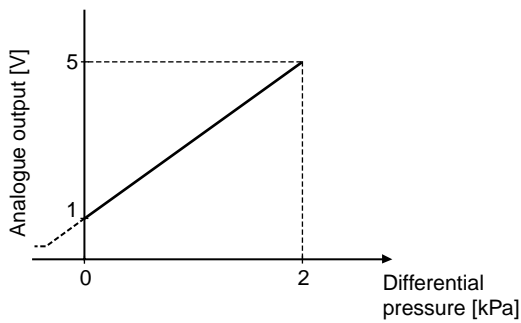
Current output type  
4 to 20 mA  
Allowable load impedance  
500  $\Omega$  or less (at 24 VDC)  
100  $\Omega$  or less (at 12 VDC)



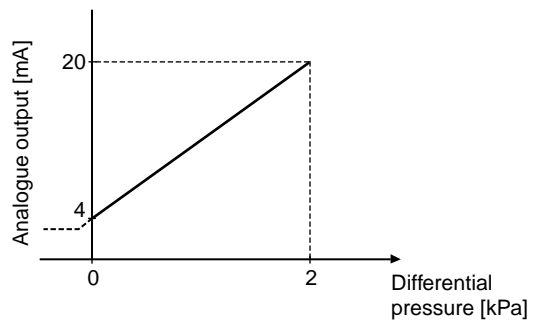
\* Install the load either on the LINE (+) or LINE (-) side.

## Analogue Output

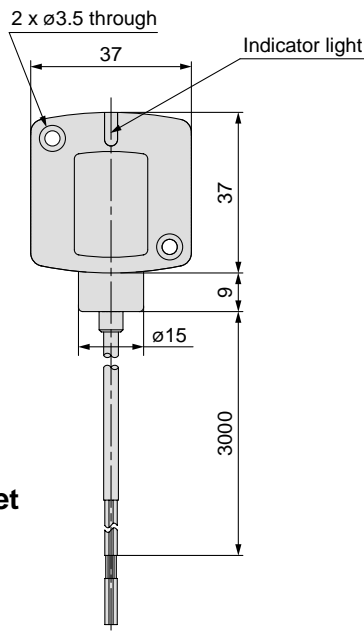
### 1 to 5 VDC



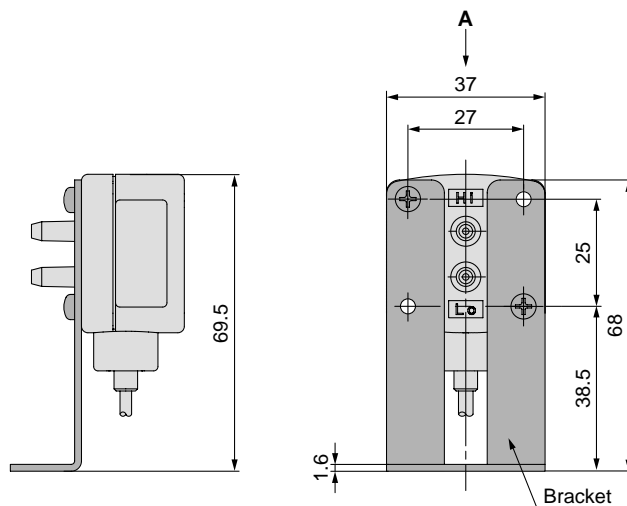
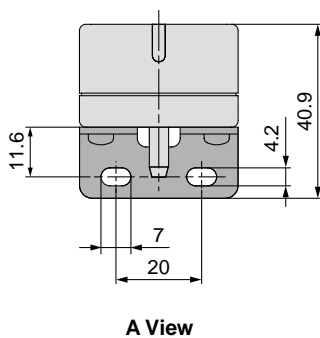
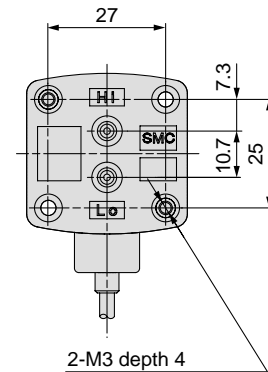
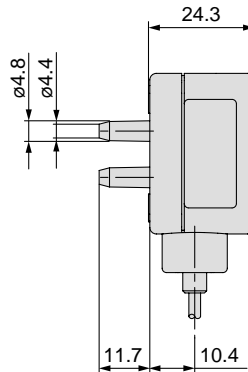
### 4 to 20 mADC



## Dimensions



With bracket





# Pressure Sensor for General Fluids

Series **PSE560**

Series	Rated pressure range				
	-100 kPa	0	100 kPa	500 kPa	1 MPa
<b>PSE560</b>		0	1 MPa		
<b>PSE561</b>	-101 kPa	0			
<b>PSE563</b>	-100 kPa		100 kPa		
<b>PSE564</b>		0		500 kPa	

## Applicable fluids example

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

Wetted parts material  
**Stainless steel 316L**

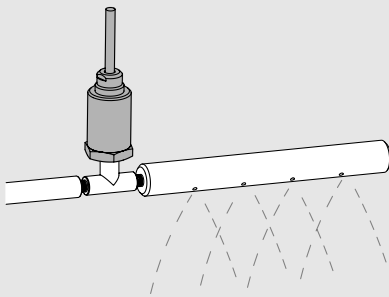
**IP65**

**Copper-free**

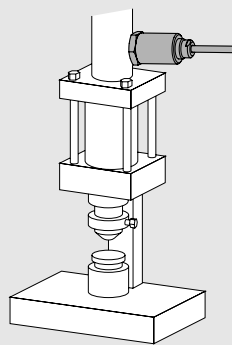
**Oil-free**  
(Single diaphragm construction)

## Application Example

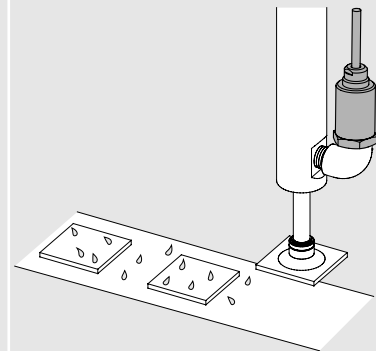
Washing line



Verification of caulking by hydraulic cylinders

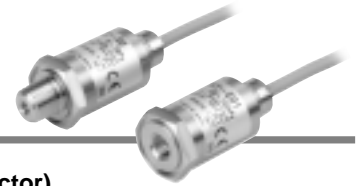


Adsorption confirmation of works with moisture

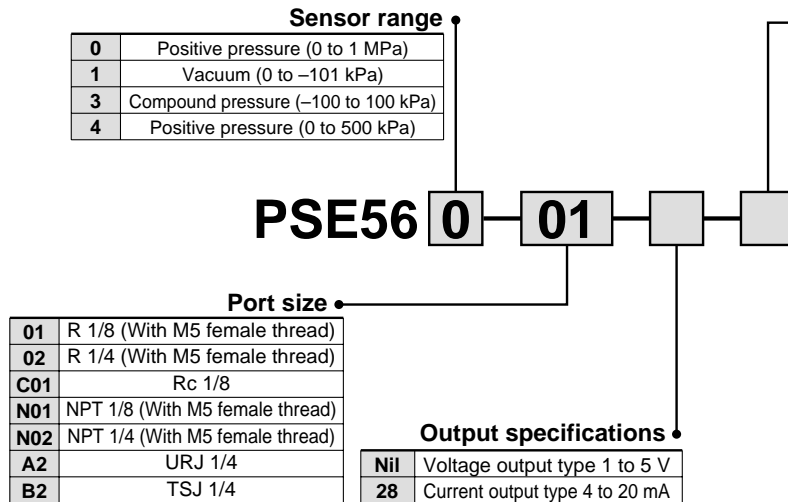


# Pressure Sensor for General Fluids

# Series PSE560



## How to Order



Note 1) Current output type cannot be connected to PSE20□ and PSE30□.

Note 2) At the factory, the connector is not attached to the cable, but packed together with it for shipment.

## Option/Part No.

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

## Specifications

Conforms to CE marking and UL (CSA) standards.

Model	PSE560	PSE561	PSE563	PSE564
Rated pressure range	0 to 1 MPa	0 to -101 kPa	-100 to 100 kPa	0 to 500 kPa
Proof pressure	1.5 MPa	500 kPa	500 kPa	750 kPa

Model	PSE56□-□	PSE56□-□-28
Applicable fluid	Fluid, including gas, that will not corrode stainless steel 316L	
Power supply voltage	12 to 24 VDC, Ripple (p-p) 10% or less (With power supply polarity protection)	
Current consumption	10 mA or less	—
Output specification	Analogue output 1 to 5 V (Within rated pressure range) Output impedance: Approx. 1 kΩ	Analogue output 4 to 20 mA Allowable load impedance: 500 Ω or less (at 24 VDC) 100 Ω or less (at 12 VDC)
Accuracy (Ambient temperature of 25°C)	±1% F.S. or less	
Linearity	±0.5% F.S. or less	
Repeatability	±0.2% F.S. or less	
Power supply voltage effect	±0.3% F.S. or less	
Environmental resistance	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 live parts and case
	Insulation resistance	50 MΩ or more between live parts and case (at 50 VDC Mega)
	Vibration resistance	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 20 m/s <sup>2</sup> acceleration, in X, Y, Z directions, for 2 hours each (De-energised)
	Impact resistance	500 m/s <sup>2</sup> in X, Y, Z directions, 3 times each (De-energised)
Temperature characteristics	±2% F.S. or less (0 to 50°C: Based on 25°C), ±3% F.S. or less (-10 to 60°C: Based on 25°C)	

## Piping Specifications

Model	01	02	N01	N02	C01	A2	B2	
Port size	R 1/8 M5	R 1/4 M5	NPT 1/8 M5	NPT 1/4 M5	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 3-wire heavy-duty vinyl cable with air tube (0.2 mm <sup>2</sup> ) PSE56□-□-28: Oil proof 2-wire heavy-duty vinyl cable with air tube (0.2 mm <sup>2</sup> )							
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





# Multi-channel, Digital Pressure Sensor Controller

Series PSE200

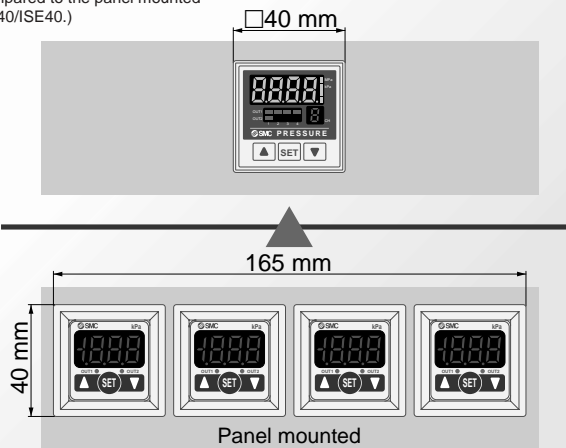
Applicable sensors				Rated pressure range			
PSE53□	PSE54□	PSE55□	PSE56□	-100 kPa	0	100 kPa	1 MPa
PSE531	PSE541	—	PSE561	-101 kPa	0		
PSE533	PSE543	—	PSE563	-100 kPa		100 kPa	
PSE530	PSE540	—	PSE560		0		1 MPa
PSE532	—	—			0	100 kPa	

● 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**

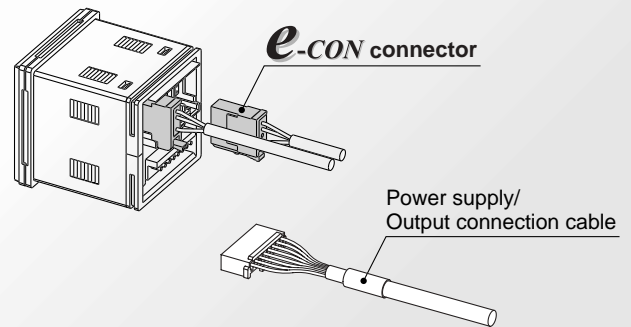
(Compared to the panel mounted ZSE40/ISE40.)



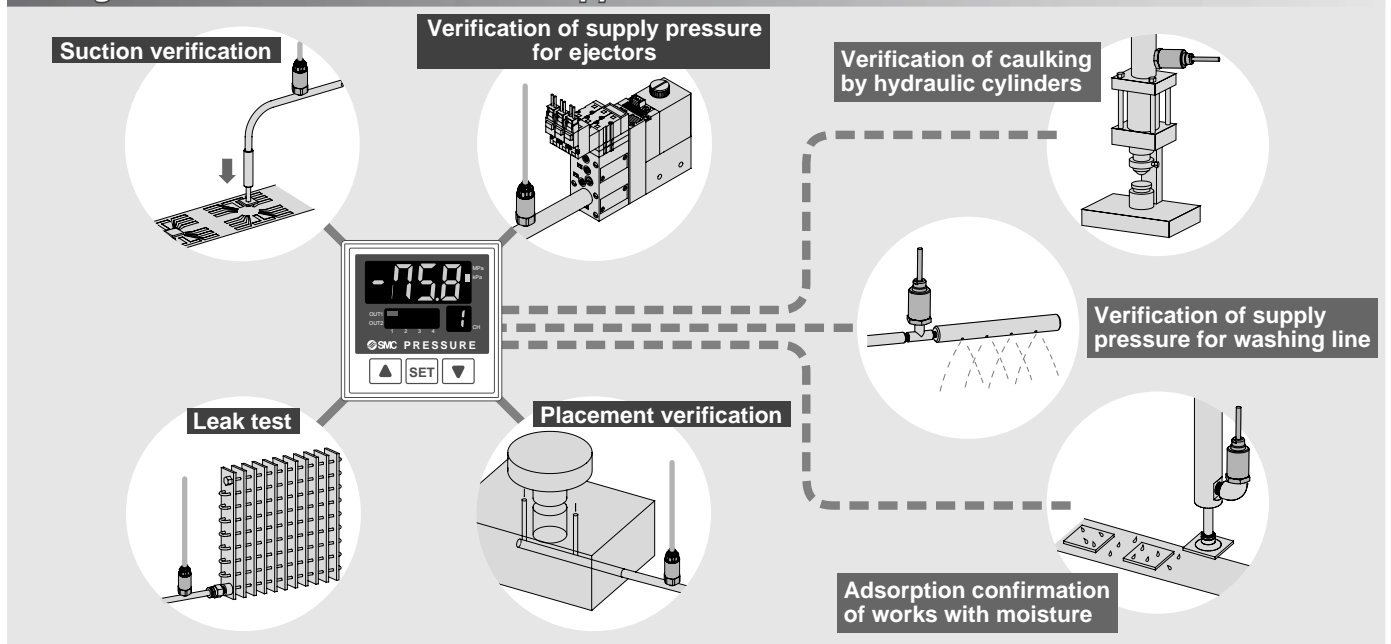
● Functions

- Auto shift function
- Auto preset function
- Auto identification function
- Copy function
- Channel scan function
- Reset function
- Key lock function
- Peak/Bottom values display function
- Unit display 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

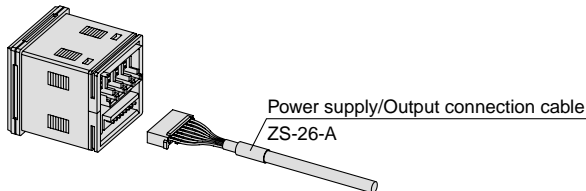
Nil	With unit display switching function <small>Note 1)</small>
M	Fixed SI unit <small>Note 2)</small>

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

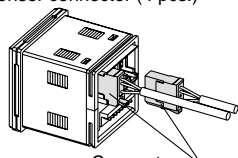
Note 2) Fixed unit  
For vacuum low pressure & compound pressure: kPa  
For high pressure: MPa

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

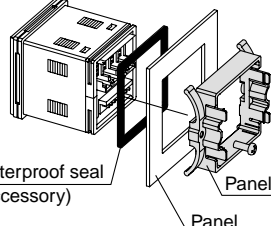
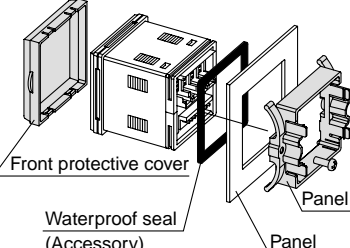
Included with the controller.



### Option 2

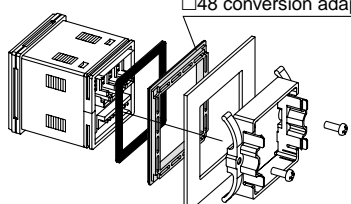
Nil	None
4C	Sensor connector (4 pcs.)  Connector

### Option 1

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

## Option/Part No.

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
<input type="checkbox"/> 48 conversion adapter This adapter is used to mount Series PSE200 on the panel fitting of Series PSE100.	ZS-26-D  Order panel mount adapter separately.	
Connector	ZS-28-C (1 pc. per set)	

# Series PSE200

## Specifications

Model	PSE200	PSE201	
<b>Output specification</b>	12 to 24 VDC, Ripple (p-p) 10% or less (With power supply polarity protection)		
<b>Power supply voltage</b>	55 mA or less (Current consumption for sensor is not included.)		
<b>Power supply voltage for sensor</b>	[Power supply voltage] -1.5 V		
<b>Power supply current for sensor</b> <sup>Note 1)</sup>	40 mA maximum (100 mA maximum for the total power supply current when 4 sensors are input.)		
<b>Sensor input</b>	1 to 5 VDC (Input impedance: Approx. 800 kΩ)		
	<b>No. of inputs</b>	4 inputs	
	<b>Input protection</b>	With excess voltage protection (Up to 26.4 V)	
<b>Switch output</b>	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)	
	<b>Maximum load current</b>	80 mA	
	<b>Maximum load voltage</b>	30 V	
	<b>Residual voltage</b>	1 V or less (With load current of 80 mA)	
	<b>Response time</b>	5 ms or less (Response time selections with anti-chattering function: 20 ms, 160 ms, 640 ms)	
	<b>Short circuit protection</b>	With short circuit protection function	
<b>Repeatability</b>	±0.1% F.S. ±1 digit or less		
<b>Hysteresis</b>	<b>Hysteresis mode</b>	Adjustable (can be set from 0)	
	<b>Window comparator mode</b>	Fixed (3 digits)	
<b>Display</b>	For measured value display: 4-digit, 7-segment indicator, Display colour: Orange (Sampling frequency: 4 times/sec) For channel display: 1-digit, 7-segment indicator, Display colour: Red		
<b>Display accuracy (Operating temperature of 25°C)</b>	±0.5% F.S. ±1 digit or less		
<b>Indication light</b>	Red (Lights up when output is ON.)		
<b>Auto shift input</b>	Non-voltage input (Reed or Solid state), Input 10 ms or more, Independently controllable auto shift function ON/OFF		
<b>Auto identification function</b>	With auto identification function <sup>Note 2)</sup>		
<b>Environmental resistance</b>	<b>Enclosure</b>	Front face: IP65 (when panel-mounted), Other: IP40	
	<b>Ambient temperature range</b>	Operating: 0 to 50°C, Stored: -10 to 60°C (No freezing or condensation)	
	<b>Ambient humidity range</b>	Operating/Stored: 35 to 85% RH (No condensation)	
	<b>Vibration resistance</b>	10 to 500 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s <sup>2</sup> acceleration, in X, Y, Z directions for 2 hrs. each (De-energised)	
	<b>Impact resistance</b>	980 m/s <sup>2</sup> in X, Y, Z directions, 3 times each (De-energised)	
<b>Temperature characteristics</b>	±0.5% F.S. or less (Based on 25°C)		
<b>Connection</b>	Power supply/Output connection: 8P connector, Sensor connection: e-con connector		
<b>Material</b>	Housing: PBT; Display: Transparent nylon; Back rubber cover: CR		
<b>Weight</b>	Approx. 60 g (Power supply/output connecting cable not included)		

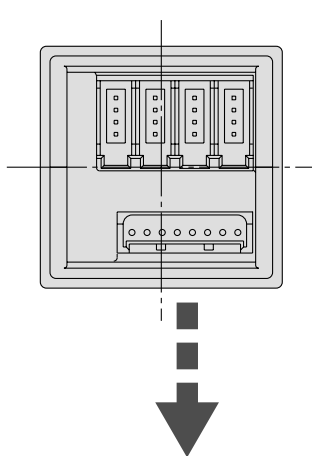
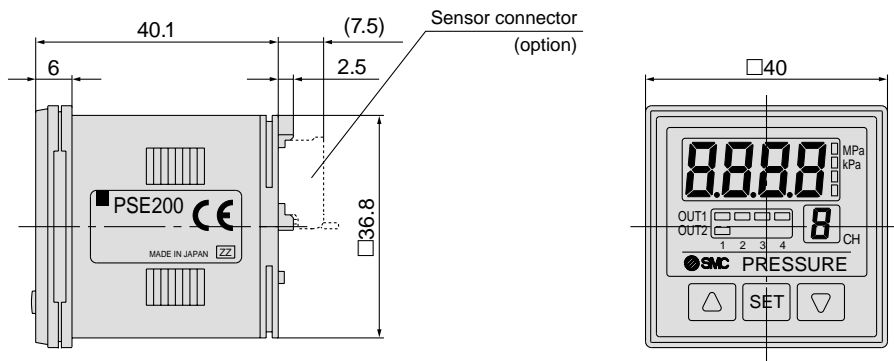
Pressure range	For compound pressure	For vacuum	For low pressure	For positive pressure
<b>Applicable pressure sensor</b>	<b>PSE533</b> <b>PSE543</b> <b>PSE563</b>	<b>PSE531</b> <b>PSE541</b> <b>PSE561</b>	<b>PSE532</b>	<b>PSE530</b> <b>PSE560</b>
<b>Set pressure range</b>	-101 to 101 kPa	10 to -101 kPa	-10 to 101 kPa	-0.1 to 1 MPa
<b>Set pressure resolution</b>	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.

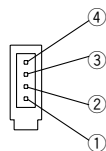
Note 2) Auto identification function comes with "Series PSE53□" pressure sensor only. Other SMC series (PSE510, 520, 540 and 560) are not equipped with this function.

**Dimensions**

**PSE200/201**

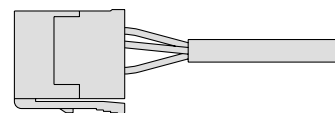


**Sensor connector (4P x 4)**

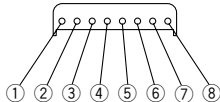


PIN no.	Terminal
①	DC (+)
②	N.C
③	DC (-)
④	IN (1 to 5 V)

**Connector (Option)**

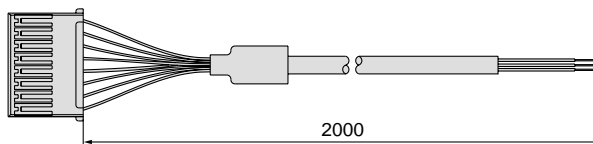


**Power supply/Output connector (8P)**



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)**

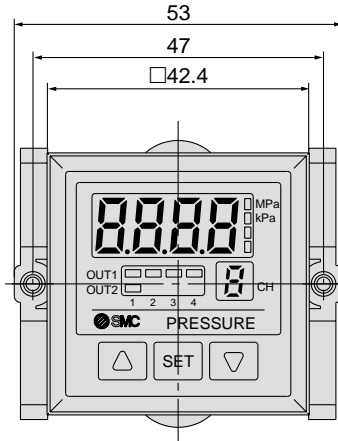
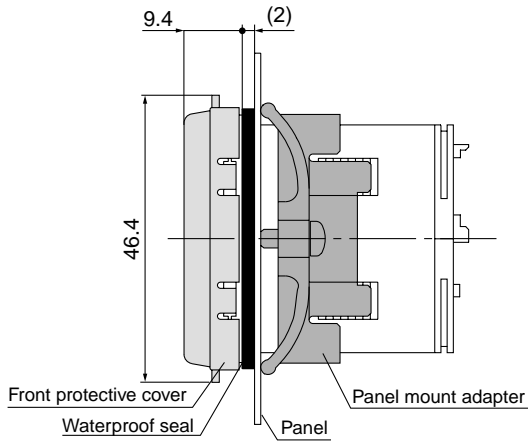


- Pin no.
- 8 Yellow : Auto shift input
  - 7 Green : CH4\_OUT1
  - 6 Red : CH3\_OUT1
  - 5 Gray : CH2\_OUT1
  - 4 White : CH1\_OUT2
  - 3 Black : CH1\_OUT1
  - 2 Blue : DC (-)
  - 1 Brown : DC (+)

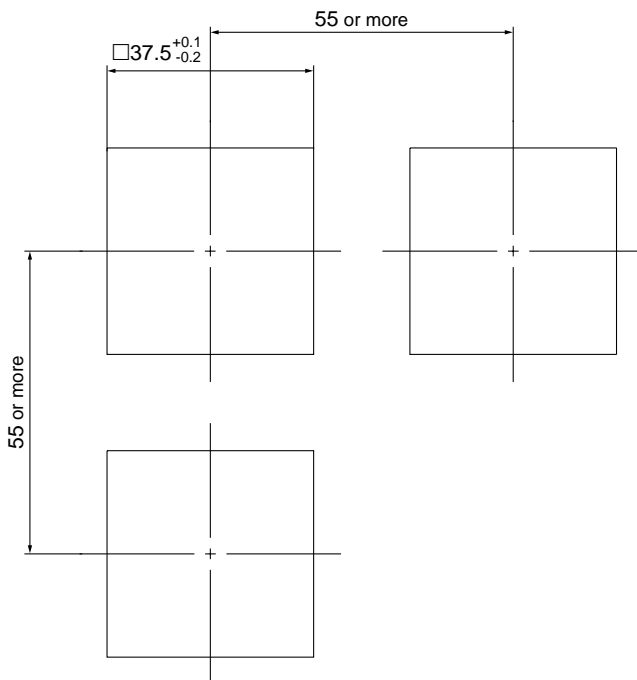
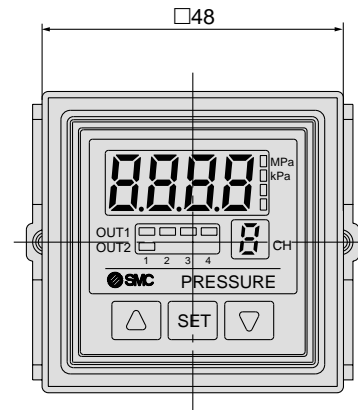
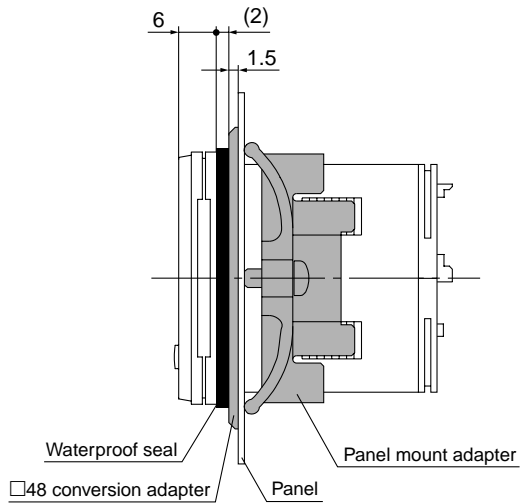
# Series PSE200

## Dimensions

### Front protective cover + Panel mount



### □48 conversion adapter + Panel mount



**Panel fitting dimension**  
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

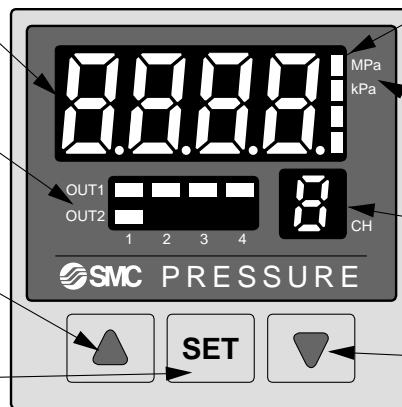
Displays the output status of OUT1 (CH1 to CH4), OUT2 (CH1 only). Lights up when it is ON.

### 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/cm<sup>2</sup> bar PSI inHg mmHg

### Channel display

Displays the selected channel.

### DOWN button

Use this button to change the mode or set value.

## Error Code & Solution

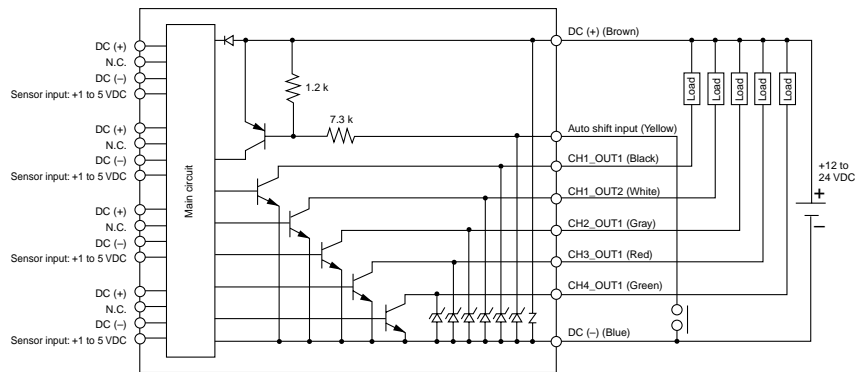
Error name	LED display	Contents	Solution
Overcurrent error	Er 1	Excess current is flowing into the switch output of OUT1.	Shut off the power supply. After eliminating the output factor that caused the excess current, turn the power supply back on.
	Er 2	Excess current is flowing into the switch output 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: $\pm 2.5\%$ F.S. or more. When pressure other than compound pressure is used: $\pm 5\%$ 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 setting pressure range may be applied.	Confirm the connection and wiring of the sensor and get the applied pressure back to within the setting pressure range.
	----	The sensor may be disconnected or mis-wired, or pressure exceeding the lower limit of the setting pressure range may be applied.	
System error	Er 5	Internal data error.	Please contact SMC.
	Er 6	Internal data error.	Shut off the power supply and turn it back on.
	Er 7	Internal data error.	
	Er 8	Internal data error.	

\* In the case where the product cannot be returned to the normal state, even though the described measures were taken, please contact us for investigation.

## Internal Circuit and Connection

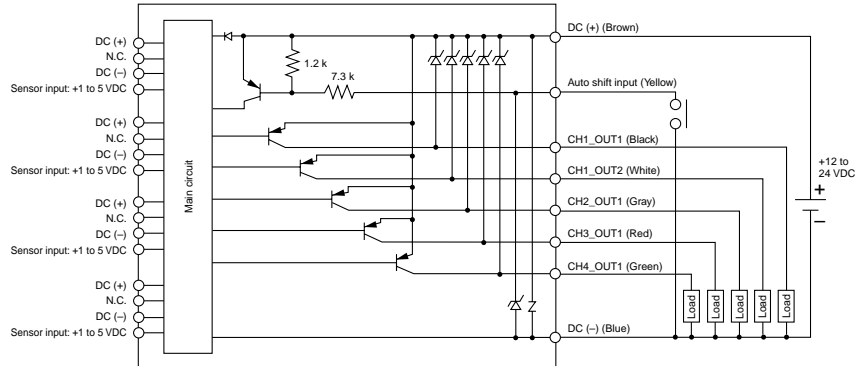
### PSE200-(M) □

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



### PSE201-(M) □

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





# 2-colour Display, Digital Pressure Sensor Controller

Series **PSE300**

Applicable sensors				Rated pressure range				
PSE53□	PSE54□	PSE55□	PSE56□	-100 kPa	0	100 kPa	500 kPa	1 MPa
PSE531	PSE541	—	PSE561	-101 kPa	0			
PSE533	PSE543	—	PSE563	-100 kPa		100 kPa		
PSE530	PSE540	—	PSE560		0			1 MPa
PSE532	—	—	—		0	100 kPa		
—	—	—	PSE564		0			500 kPa
—	—	PSE550	—		0	2 kPa		

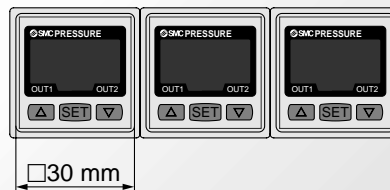
## 2-colour display (Red/Green)

Able to set the 4 patterns of the display colour.

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.

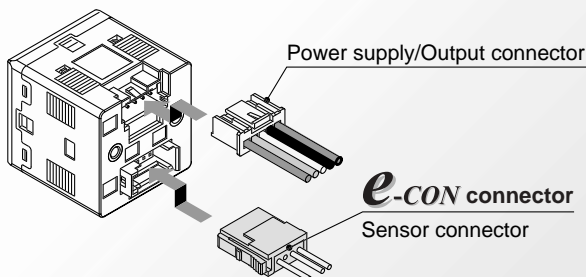
Reduced panel fitting labor



Response time

**1 ms**

## Connection



## ● Functions

- Auto shift function
- Auto preset function
- Display calibration function
- Peak/Bottom values display function
- Key lock function
- Reset function
- Error indication function
- Unit display switching function
- Anti-chattering function

# Pressure Sensor Controller

## Series PSE300



### How to Order

#### 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 Note 1)
M	Fixed SI unit Note 2)

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

Note 2) Fixed unit

For vacuum & low pressure & low differential pressure & compound pressure: kPa  
 Positive pressure: MPa (For 1 MPa)  
 kPa (For 500 kPa)

**PSE30 0 M** [ ] [ ] [ ]

#### Option 1

Nil	None
L	Power supply/Output connection cable  Power supply/Output connection cable ZS-28-A

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

#### Option 3

Nil	None
C	Sensor connector  Sensor connector (e-con 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  M3 x 5L Bracket
B	Panel mount adapter  Panel Panel mount adapter Mounting screw (M3 x 8L)
D	Panel mount adapter + Front protective cover  Panel Front protective cover Panel mount adapter Mounting screw (M3 x 8L)

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

#### Option/Part No.

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.)

# Series PSE300

## Specifications

Model	PSE30□					
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 <sup>Note 1)</sup>	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
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	1 to 5 VDC (Input impedance: 1 MΩ)					
No. 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)					
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. or less					
Analogue output	Voltage output <sup>Note 2)</sup>	Output voltage: 1 to 5 V (Within rated pressure range (Differential pressure)), 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. or less		±1.0% F.S. or less		±1.5% F.S. or less
	Current output <sup>Note 2)</sup>	Output current: 4 to 20 mA (Within rated pressure 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. or less		±1.5% F.S. or less		±2.0% F.S. or less
Display accuracy (Ambient temperature of 25°C)	±0.5% F.S. ±2 digits or less		±0.5% F.S. ±1 digit or less			
Display	3 + 1/2 digit, 7 segment indicator, 2-colour display (Red/Green), Sampling frequency: 5 times/sec					
Indicator light	OUT1: Lights up when ON (Green), OUT2: Lights up when ON (Red)					
Auto shift input <sup>Note 2)</sup>	Non-voltage input (Reed or Solid state), Low level input: 5 ms or more, Low level: 0.4 V or less					
Environmental resistance	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 live parts and case				
	Insulation resistance	50 MΩ or more between live parts and case (at 500 VDC Mega)				
	Vibration resistance	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s <sup>2</sup> acceleration, in X, Y, Z directions, for 2 hours each (De-energised)				
Impact resistance	100 m/s <sup>2</sup> in X, Y, Z directions, 3 times each (De-energised)					
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/output connection cable					85 g
	Without power supply/output connection cable					30 g

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

Note 2) Auto shift function is not available when analogue output option is selected.

Also, analogue output option is not available when auto shift function is selected.

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

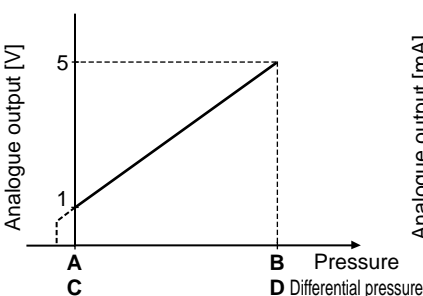
For vacuum & compound pressure: kPa·kgf/cm<sup>2</sup>·bar·psi·mmHg·inHg

For positive pressure & low pressure: MPa·kPa·kgf/cm<sup>2</sup>·bar·psi

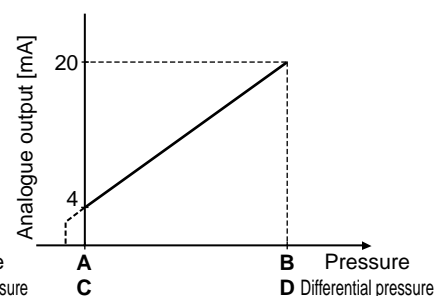
For low differential pressure: kPa·mmH<sub>2</sub>O

## Analogue Output

1 to 5VDC



4 to 20 mADC



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

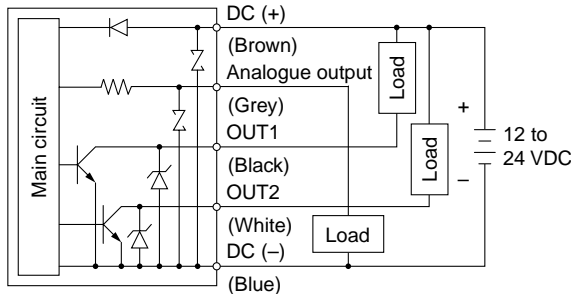
Range	Rated differential pressure range	C	D
For low differential pressure	0 to 2 kPa	0	2 kPa



## Internal Circuit

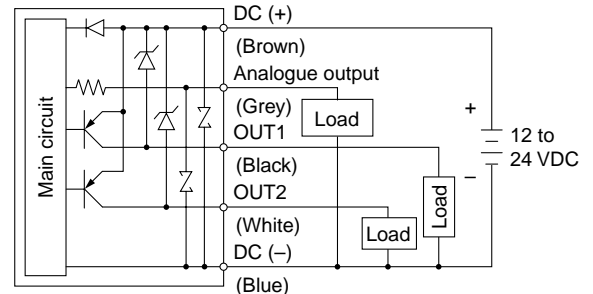
### PSE300

NPN open collector output (2 outputs), Max. 30 V or 80 mA, residual voltage 1 V or less  
Analogue output: 1 to 5 V  
Output impedance: Approx. 1 k $\Omega$



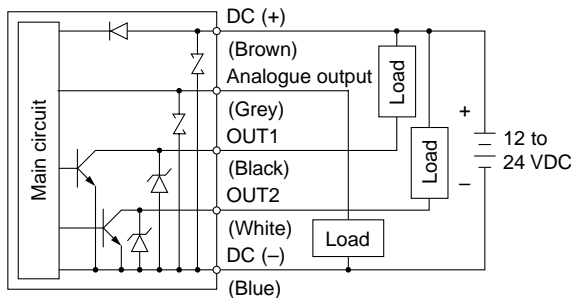
### PSE303

PNP open collector output (2 outputs), Max. 80 mA, residual voltage 1 V or less  
Analogue output: 1 to 5 V  
Output impedance: Approx. 1 k $\Omega$



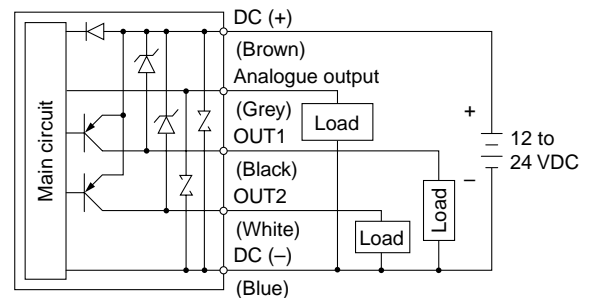
### PSE301

NPN open collector output (2 outputs), Max. 30 V or 80 mA, residual voltage 1 V or less  
Analogue output: 4 to 20 mA  
Maximum load impedance: 300  $\Omega$  (12 VDC), 600  $\Omega$  (24 VDC)  
Minimum load impedance: 50  $\Omega$



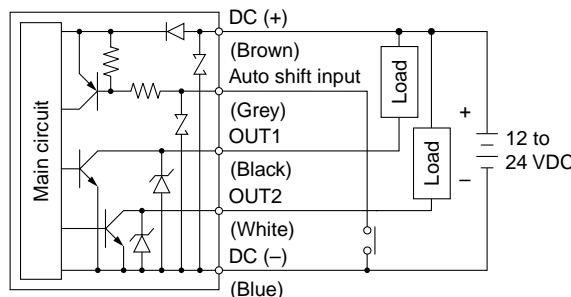
### PSE304

PNP open collector output (2 outputs), Max. 80 mA, residual voltage 1 V or less  
Analogue output: 4 to 20 mA  
Maximum load impedance: 300  $\Omega$  (12 VDC), 600  $\Omega$  (24 VDC)  
Minimum load impedance: 50  $\Omega$



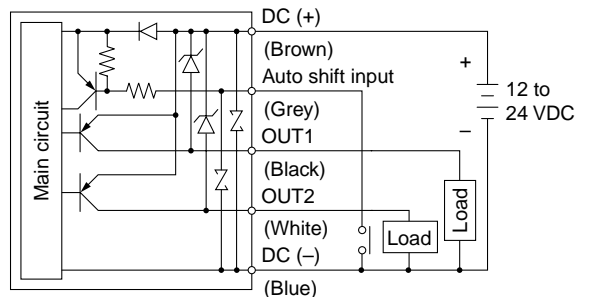
### PSE302

NPN open collector output with auto shift input (2 outputs),  
Max. 30 V, 80 mA, residual voltage 1 V or less



### PSE305

PNP open collector output with auto shift input (2 outputs),  
Max. 80 mA, residual voltage 1 V or less



## Descriptions

### LCD

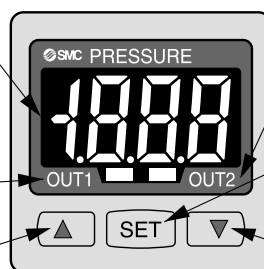
Displays the current pressure, set mode, selected display unit, and error code. Four different display settings are available. Always use red or green display; or switch between green and red according to the output.

### Output (OUT1) display (Green)

Lights up when OUT1 is 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 ON.

### SET button

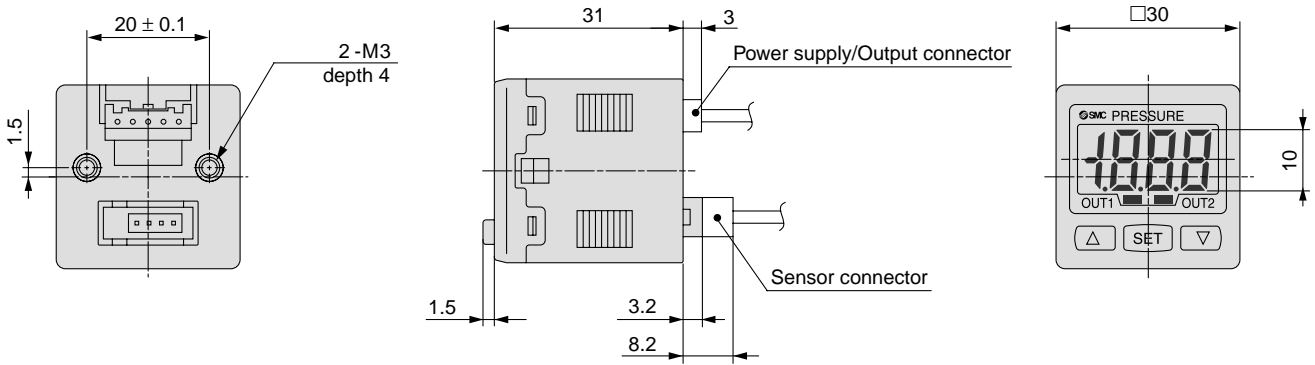
Use this button to change the mode or confirm the set value.

### Down button

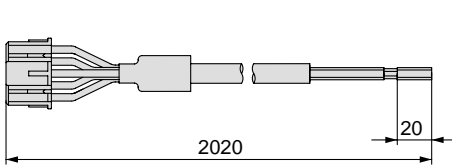
Use this button to select the mode or decrease the ON/OFF set value.  
It is also used for switching to the bottom display mode.

# Series PSE300

## Dimensions



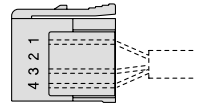
### Power supply/Output connection cable (ZS-28-A)



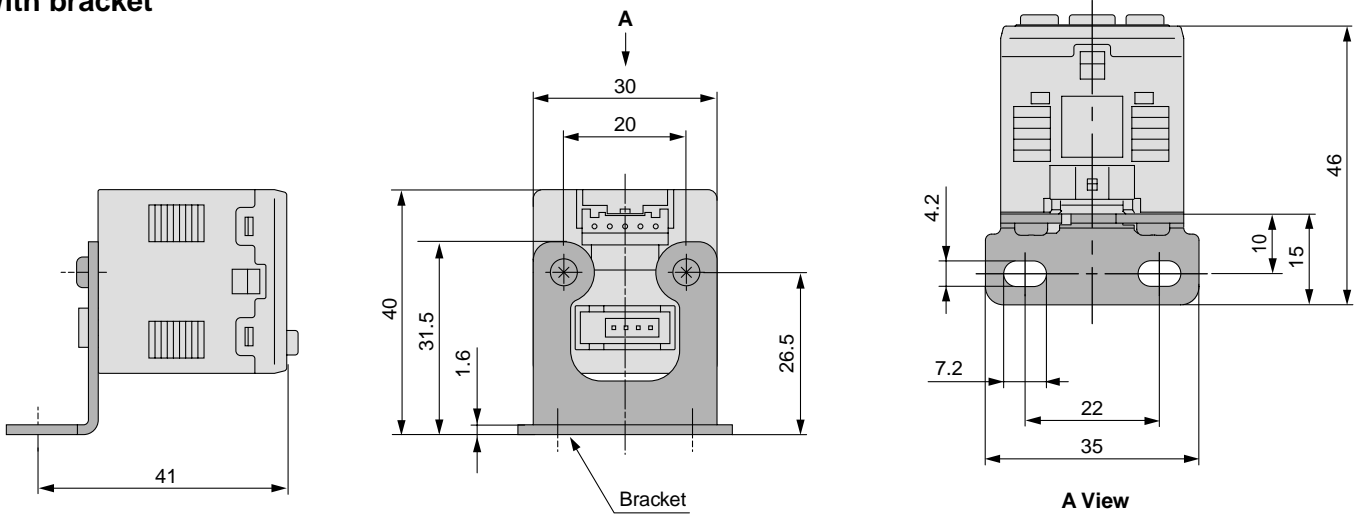
- DC (+) Brown 5
- OUT1 Black 4
- OUT2 White 3
- Analogue output or auto shift input Gray 2
- DC (-) Blue 1

### Sensor connector

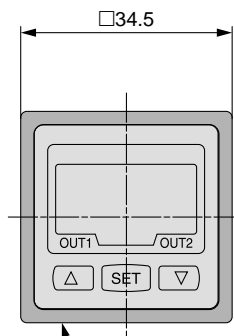
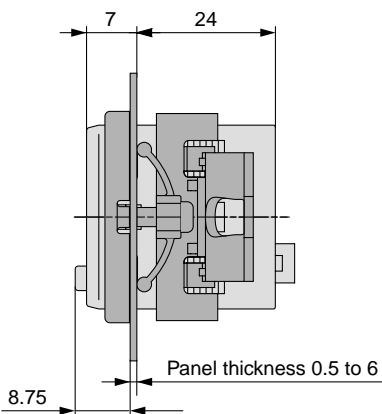
PIN no.	Terminal
1	DC (+)
2	N.C.
3	DC (-)
4	IN (1 to 5 V)



### With bracket

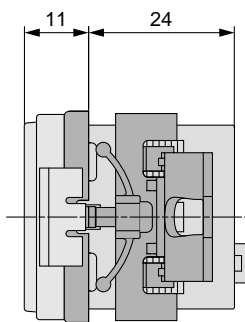


### With panel mount adapter

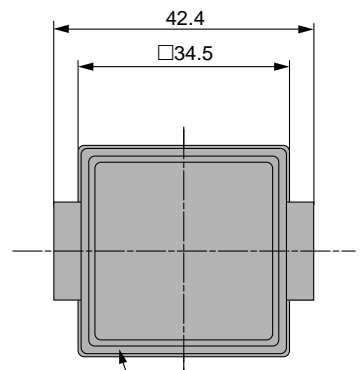


Panel mount adapter

### With panel mount adapter + Front protective cover

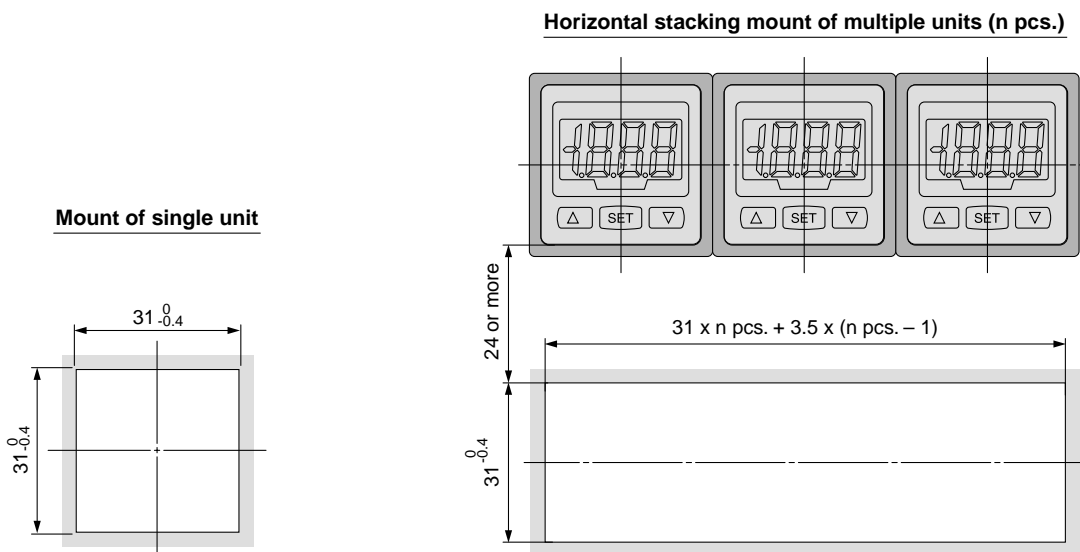


Panel mount adapter + Front protective cover

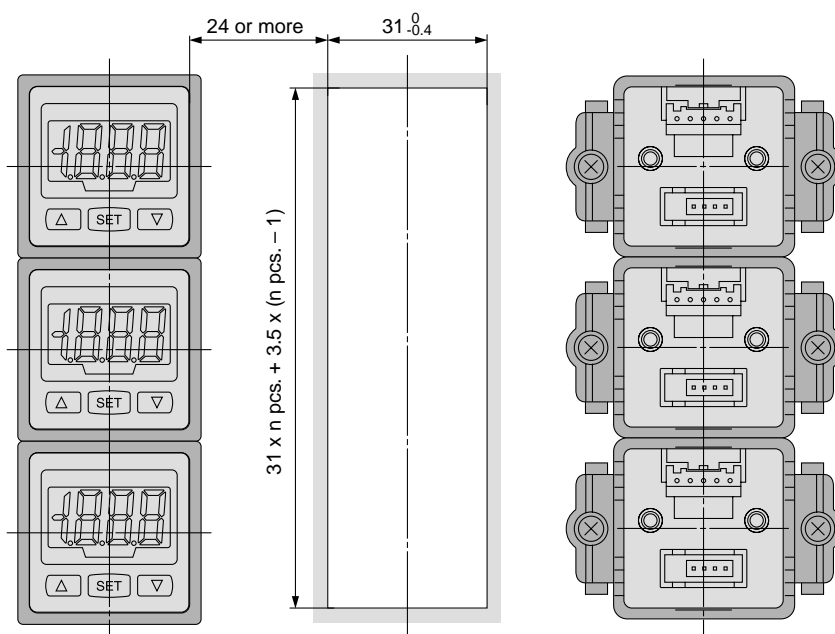


## Dimensions

### Panel cut out dimensions



### Vertical stacking mount of multiple units (n pcs.)

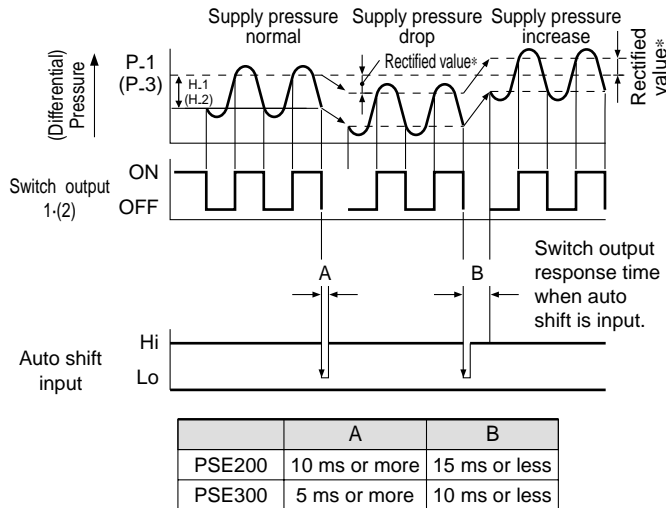


## Function Details

### 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



#### \* 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.

#### Possible Set Range For Auto Shift Input

PSE200	Regulating pressure (Differential pressure) range	Possible set 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	Regulating pressure (Differential pressure) range	Possible set 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

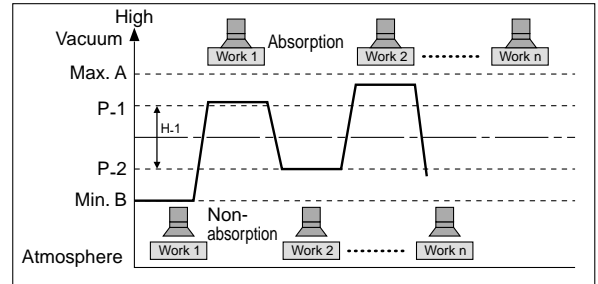
#### Auto shift zero (Series PSE300 only)

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.

#### Adsorption Verification

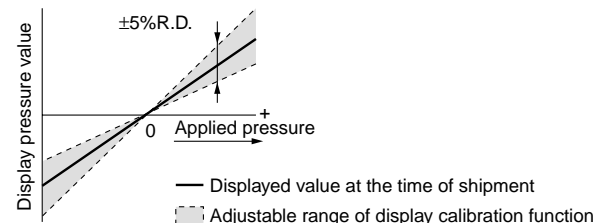


#### Formula for obtaining the set value

	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 Precision indicator setting

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  $\pm 5\%$ .



Note) When the precision indicator setting function is used, the set (differential) pressure value may change  $\pm 1$  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  $\uparrow \downarrow$  are simultaneously pressed for 1 second or longer, while "holding", the hold value will be reset.

### 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 within  $\pm 7\%$  F.S. of the factory adjusted value.

## Function Details

### G Error indication function

Error name	Error code		Description
	PSE200	PSE300	
Overcurrent error	Er 1	Er 1	Load current of switch output (OUT1) exceeds 80 mA.
	Er 2	Er 2	Load current of switch output (OUT2) exceeds 80 mA.
Residual pressure error	Er 3	Er 3	Pressure applied during the zero reset operation exceeds $\pm 7\%$ 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 $\pm 4$ 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 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 one second, the switch returns to the measuring mode.
System error	Er 5	Er 4	Internal data error
	Er 6	Er 6	Internal data error
	Er 7	Er 7	Internal data error
	Er 8	Er 8	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  $\pm 1$  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.

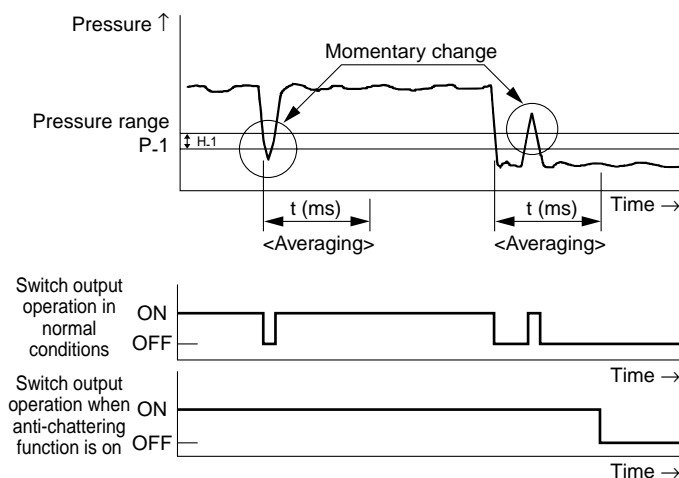
### J Anti-chattering function

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 Anti-chattering function (Series PSE200 only)

Pressure value for the selected channel is displayed.

### L Anti-chattering function (Series PSE200 only)

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

# Series PSE200/300

## Function Details

### **M** Unit display 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	PSE531		PSE530
		PSE543	PSE541	PSE532	PSE540
		PSE563	PSE561		PSE560
Set pressure (differential pressure) range		-101 to 101 kPa	10 to -101 kPa	-10 to 100 kPa	-0.1 to 1 MPa
PR	kPa	0.1	0.1	0.1	—
	MPa	—	—	—	0.001
GF	kgf/cm <sup>2</sup>	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	PSE531		PSE530		
		PSE543	PSE541	PSE532	PSE540	PSE564	PSE550
		PSE563	PSE561		PSE560		
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
PR	kPa	0.2	0.1	0.1	—	1	0.01
	MPa	—	—	—	0.001	—	—
GF	kgf/cm <sup>2</sup>	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 mmH <sub>2</sub> O





## Series PSE

# Safety Instructions

The following safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by all safety practices, including labels of "**Caution**", "**Warning**" or "**Danger**". To ensure safety, please observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

 **Caution** : Operator error could result in injury or equipment damage.

 **Warning** : Operator error could result in serious injury or loss of life.

 **Danger** : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power – General Rules relating to system

Note 2) JIS B 8370: Pneumatic system axiom

### **Warning**

#### **1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.**

Since the products specified here are used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications, post analysis and/or tests to meet a specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information and taking into consideration the possibility of equipment failure when configuring a system.

#### **2. Only trained personnel should operate pneumatically operated machinery and equipment.**

Compressed air can be dangerous if handled incorrectly. Assembly, handling or maintenance of the pneumatic system should be performed by trained and experienced operators.

#### **3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.**

1. Inspection and maintenance of machinery/equipment should only be performed after confirming the control positions are safely locked-out.
2. When equipment is to be removed, confirm the safety processes mentioned above. Cut the supply pressure for the equipment and exhaust all residual compressed air in the system.
3. Before the machinery/equipment is restarted, take measures to prevent quick extension of a cylinder piston rod, etc. (Bleed air into the system gradually, to create back pressure.)

#### **4. Contact SMC if the product is to be used in any of the following conditions:**

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having a negative effects on people, property, or animals, and therefore requires special safety analysis.



# Pressure Switch Precautions 1

Be sure to read before handling. Refer to back page 1 for Safety Instructions, and back page 5 through to 8 for Specific Product Precautions.

## Design and Selection

### Warning

- 1. Operate a switch only within the specified voltage.**  
Use of a switch outside the range of the specified voltage can cause not only malfunction and damage of a switch, but also electrocution and fire.
- 2. Do not exceed the maximum allowable load specification.**  
A load exceeding the maximum load specification can cause damage to the switch or shorten its operating life span.
- 3. Do not use a load that generates surge voltage.**  
Although surge protection is installed in the circuit at the output side of the switch, damage may still occur if a surge is applied repeatedly. When a surge generating load such as a relay or solenoid is directly driven, use a type of switch with a built-in surge absorbing element.
- 4. Since the type of applicable fluid varies depending on the product, make sure to verify the specifications.**  
Switch is not of an explosion proof construction. To prevent a possible fire hazard, do not use with flammable gases or fluids.
- 5. Operate a switch within the regulating pressure range and maximum operating pressure.**  
Using beyond the specified range may result in a malfunction. If surge pressure exceeding the maximum withstand pressure are likely to arise, take measure to prevent such surge pressures from being applied to the switch. Use of a switch beyond the maximum operating pressure may result in a breakdown.

## Mounting

### Warning

- 1. If the equipment is not operating properly, do not continue to use it.**  
Connect air and power after installation, repairs, or modifications, and verify if installed properly or not by conducting a performance and leak test properly.
- 2. Mount a switch by observing the proper tightening torque.**  
When a switch is tightened beyond the specified tightening torque, the mounting screws, mounting bracket, or switch may be damaged. On the other hand, tightening below the specified tightening torque may cause the installation screws to come loose during operation.  
Connection thread: M3, M5, Rc, R, NPT

Thread	Proper tightening torque (N·m)
M3, M5	1/6 rotation after tightening by hand
1/8	7 to 9
1/4	12 to 14

- 3. Apply a wrench only to the metal part of the main housing when installing a pressure switch in the system piping.**  
Never apply a wrench to the resin part, since it may result in damage to a switch.

## Wiring

### Warning

- 1. Verify the colour and terminal number when wiring.**  
Incorrect wiring can cause the switch to be damaged and malfunction. Verify the colour and the terminal number in the instruction manual when wiring.
- 2. Avoid repeatedly bending or stretching the lead wire.**  
Repeatedly applying bending stress or stretching force to the lead wire will cause it to break. If you believe the lead wire is damaged and likely to cause malfunctions, replace the product. (Grommet and lead wire is irreplaceable one.)
- 3. Confirm proper insulation of wiring.**  
Make sure that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

## Operating Environment

### Warning

- 1. Never use in the presence of explosive gases.**  
The switches do not have an explosion proof rating. Never use in the presence of an explosive gas as this may cause a serious explosion.

## Maintenance

### Warning

- 1. Perform periodic inspections to ensure proper operation of the switch.**  
Unexpected malfunctions may cause possible danger.
- 2. Take precautions when using a switch for an interlock circuitry.**  
When a pressure switch is used for an interlock circuit, devise a multiple interlock system to prevent trouble or malfunction. Verify the operation of the switch and interlock function on a regular basis.





# Digital Pressure Switch Precautions 1

Be sure to read before handling. Refer to back page 1 for Safety Instructions, and back page 5 through to 8 for Specific Product Precautions.

## Selection

### ⚠ Warning

#### 1. Monitor the internal voltage drop of a switch.

When operating below the specified voltage, it is possible that a load may be ineffective, even though the pressure switch functions normally. Therefore, the formula below should be satisfied after confirming the voltage of operating load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Voltage of operation load}$$

### ⚠ Caution

#### 1. Pressure switch for placement verification

Use the Air Catch Sensor/Series ISA for the purpose of placement verification of a work. The ISA series is both dustproof and drip proof.

#### 2. Data of the digital pressure switch will be stored even after the power is turned off.

Input data (set pressure, etc.) is stored in EEPROM, so that the data will not be lost after the pressure switch is turned off. (Data is stored for up to 100,000 hours after the power is turned off.)

## Mounting

### ⚠ Warning

#### 1. Do not drop or apply the excessive force to a switch when handling.

Do not drop, bump, or apply excessive impact (1000 m/s<sup>2</sup> or greater) while handling. Although the body of the switch case may not be damaged, the inside of the switch could be damaged and lead to a malfunction.

#### 2. Hold the body of the switch while handling.

If the product is held by its cable, it could lead to a breakage. Hold the body of the switch while handling.

#### 3. Operation

Refer to the instruction manual for operating by the button for the digital pressure switch.

#### 4. Do not touch the LCD readout.

Do not touch the LCD indicator face of the pressure switch during operation. Static electricity can change the readout.

#### 5. Pressure port

Do not introduce any wire or similar object to a pressure port as this may damage the pressure sensor and cause a malfunction.

## Wiring

### ⚠ Warning

#### 1. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines and high voltage lines, avoiding wiring in the same conduit with these lines. Control circuits including switches may malfunction due to noise from these other lines.

#### 2. Do not allow loads to short circuit.

(3-wire type)

Although digital pressure switches indicate excess current error if loads are short circuited, all incorrect wiring connections cannot be protected. Take precautions to avoid incorrect wiring.

As for other pressure switches, the switches will be instantly damaged if loads are short circuited. Take special care to avoid reverse wiring between the brown power supply line and the black output line.



# Digital Pressure Switch Precautions 2

Be sure to read before handling. Refer to back page 1 for Safety Instructions, and back page 5 through to 8 for Specific Product Precautions.

## Piping

### Caution

#### 1. Piping hose, etc.

When panel mounting the product, if excessive force is applied to the switch by piping material such as hose, it could lead to the connecting parts of the switch becoming damaged. Therefore, be careful not to apply such excessive force.

## Air Supply

### Warning

#### 1. Use the switch within the specified fluid and ambient temperature range.

Ambient and fluid temperature operation for the PSE560 series should be within 0 to 60°C. Meanwhile, other remote type pressure switches should be within 0 to 50°C.

Take measures to prevent moisture from freezing in circuits when below 5°C, since this may cause damage to the O-ring and lead to a malfunction. The installation of an air dryer is recommended for eliminating condensate and moisture. Never use the switch in an environment where there are drastic temperature changes even when these temperatures are operated within the specified temperature range.

#### 2. Vacuum switch

An instant pressure pulse of up to 0.5 MPa (at the time of vacuum release) will not affect the performance of the switch. However, a constant pressure 0.2 MPa or more should be avoided.

## Operating Environment

### Warning

#### 1. Do not use in an area where surges are generated.

When there are units that generate a large amount of surge in the area around pressure switches (e.g., solenoid type lifters, high frequency induction furnaces, motors), this may cause deterioration or damage to the switches' internal circuitry. Avoid and protect against sources of surge generation and crossed lines.

#### 2. Operating environment

In general, the digital pressure switches featured here are not dust or splashproof. Avoid using in an environment where the likelihood of splashing or spraying of liquids (water, oil, etc.) exists. If used in such an environment, use a dustproof and splashproof type switch.

## Maintenance

### Caution

#### 1. Cleaning of the switch body

Wipe off dirt with a soft cloth. If dirt does not come off easily, use a neutral detergent diluted with water to dampen a soft cloth. Wipe the switch only after squeezing the excess water out of the dampened cloth. Then finish off by wiping with a dry cloth afterwards.



# Series PSE5□□

## Specific Product Precautions 1

Be sure to read before handling. Refer to back page 1 through to 4 for Safety Instructions and Pressure Switch Precautions.

### Pressure Sensor

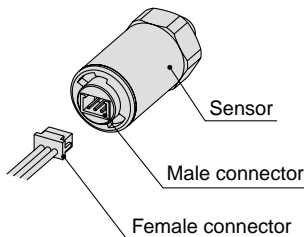
#### Handling

#### Warning

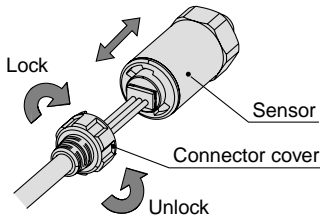
1. Do not drop, bump, or apply excessive impact (PSE530, 540: 980 m/s<sup>2</sup>, PSE560: 500 ms<sup>2</sup>, PSE550: 300 m/s<sup>2</sup>) while handling. Although the body of the sensor may not be damaged, the inside of the sensor could be damaged and lead to malfunction.
2. The tensile strength of 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 3.5N·m when installing piping. Exceeding this value may cause malfunctioning of the sensor.
2. Connecting the sensor cable (optional)  
Hold the female connector of the sensor cable with your fingers and carefully insert it into the connector.

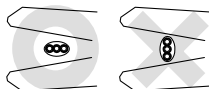


A connector cover is provided as part of the cable assembly (see the figure below). It is designed to keep the female cover in place, first make sure it is facing in the right direction as you slip it over the female connector, then lock it to the sensor body by turning it clockwise. To remove the cover, 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.

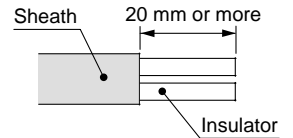


#### Wiring

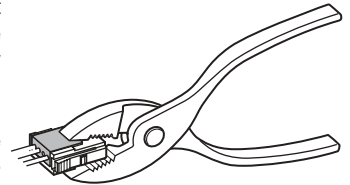
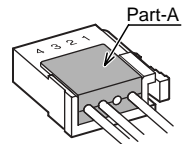
#### Caution

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



Connector no.	Wire core colour
1	Brown (DC (+))
2	Not used
3	Blue (DC (-))
4	Black (OUT: 1 to 5 V)



Series	Sumitomo 3M Ltd.	Tyco Electronic AMP K.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 through to 4 for Safety Instructions and Pressure Switch Precautions.

### Pressure Source

## ⚠ Warning

(PSE560)

### 1. Use of toxic, corrosive or flammable gas.

Do not use **toxic or corrosive gas**.

### 2. Compatible fluid

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.)

(PSE56□-<sup>A2</sup>/<sub>B2</sub> only)

### Helium leakage test

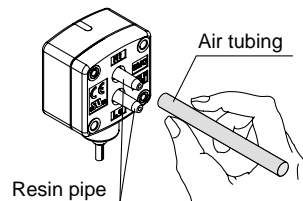
Helium leakage test is conducted on the welding parts. Use a ferrule by Crawford fitting company (Swagelok® fittings) as the TSJ fittings and packing, ground, etc. by Cajon company (VCR® fittings) as the URJ fittings. If a ferrule, packing or ground by other manufacturers are to be used, conduct helium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

### 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 tubing into “Lo” pipe, and the high-pressure tubing into “Hi” pipe.
- In cases where SMC air tubing is not used, make sure the product has similar I.D. accuracy within  $\varnothing 4 \pm 0.3$  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.)





# Series PSE200/300 Specific Product Precautions 1

Be sure to read before handling. Refer to back page 1 through to 4 for Safety Instructions and Pressure Switch Precautions.

## Controller

### Handling

#### Warning

1. Do not drop, bump, or apply excessive impact (PSE200: 980 m/s<sup>2</sup>, PSE300: 100 m/s<sup>2</sup>) 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.

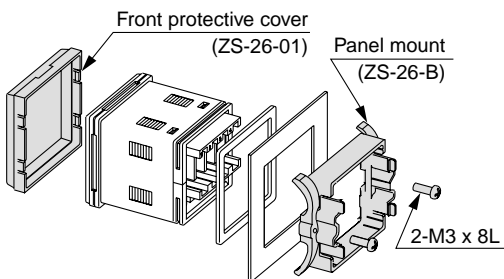
### Mounting

#### Caution

(PSE200)

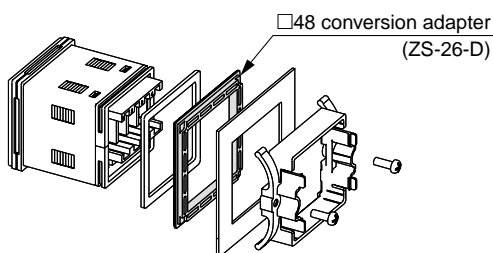
The front face of the panel mount conforms to IP65 (IP40 when using the □48 conversion adapter); however, there is a possibility of liquid filtration if the panel mount adapter is not installed securely and properly. Securely fix the adaptor with screws as shown below.

#### Standard



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

#### When using □48 conversion adapter



### Handling

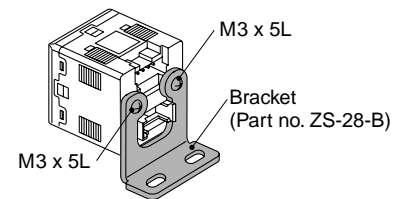
#### Caution

(PSE300)

#### 1. Mounting with bracket

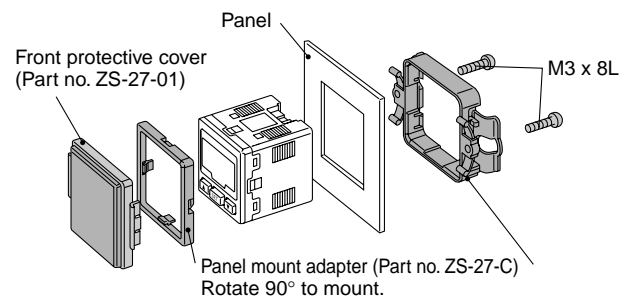
Mount the bracket on the body with two M3 x 5L mounting screws.

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



#### 2. Mounting with panel mount adapter

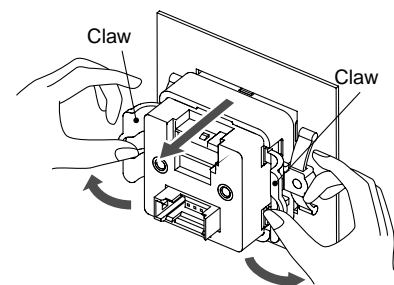
Secure the panel mount adapter with two M3 x 8L mounting screws.



#### 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.





# Series PSE200/300 Specific Product Precautions 2

Be sure to read before handling. Refer to back page 1 through to 4 for Safety Instructions and Pressure Switch Precautions.

## Connection

### Warning

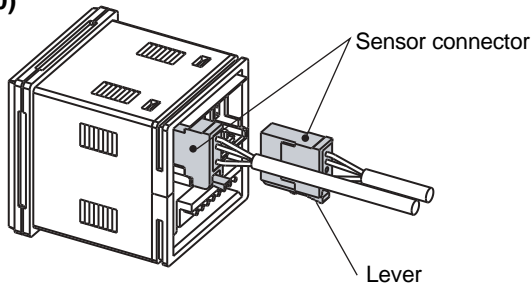
1. Incorrect wiring can damage the switch and cause malfunction or erroneous switch output. Connections should be done while the power is turned off.
2. Do not attempt to insert or pull out the pressure sensor or its connector when the power is on. Switch output may malfunction.
3. Wire separately from 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.
4. If a commercial switching regulator is used, make sure that the F.G. terminal is grounded.

## Wiring

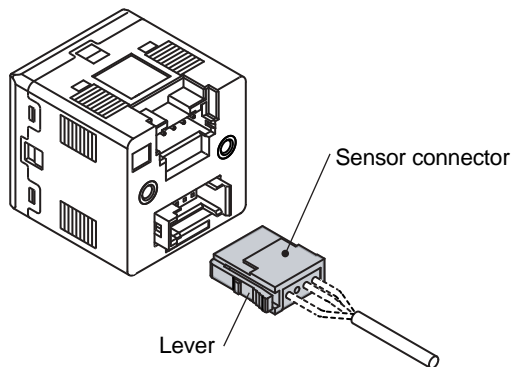
### Caution

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.

## 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. Never use pressure sensor in the presence of flammable or explosive gases.