

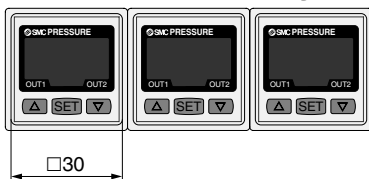
# High Precision, Remote Type, 2-color Display Digital Pressure Sensor Series *PSE540/560*



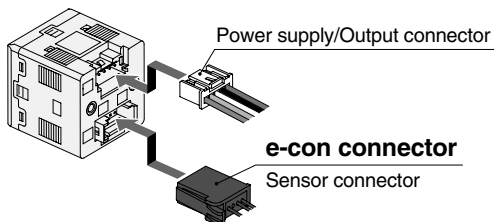
## Pressure Sensor Controller Series *PSE300*

- Response Time **1 ms**
- Set Pressure Resolution **1/1000**

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



### Connection

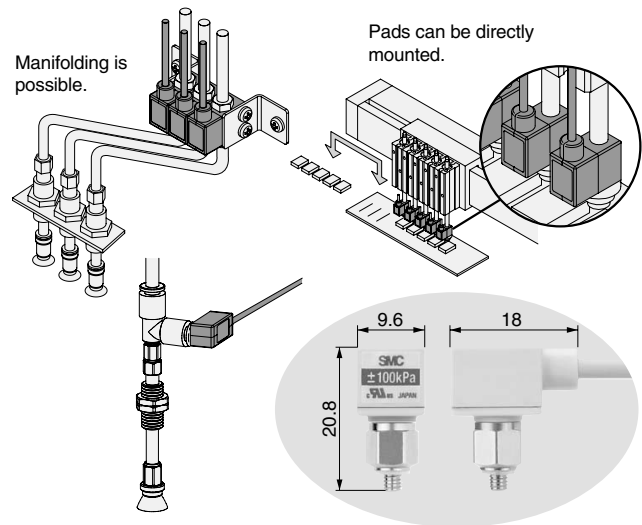


2 outputs + Analog output or auto shift input

## Compact Pressure Sensor for Pneumatics

### Series *PSE540*

- Weight **2.9 g**
- Dimension **9.6 x 20.8 x 18 mm**

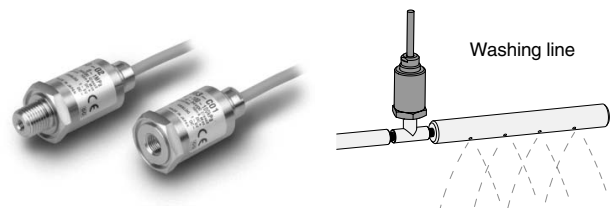


## Pressure Sensor for General Purpose Fluids

### Series *PSE560*

- IP65**
- Wetted Material  
**Stainless steel 316L**

- Copper-free • Oil-free (Single diaphragm)



ZSE   
ISE

**PSE**

ZSE3

PS

ZSE1

ZSP

ISA2

IS

ZSM

PF2

IF

Data

# Variations

## Compact Pressure Sensor for Pneumatics

Series **PSE540**

P. 16-3-25

### Male thread type



M3 x 0.5 R 1/8 (With M5 female thread)  
M5 x 0.8 NPT 1/8 (With M5 female thread)

### Plug-in reducer type



ø4 plug-in reducer  
ø6 plug-in reducer

### M5 female thread, through type



M5 x 0.8

M5 x 0.8 (With mounting hole)

## Pressure Sensor for General Purpose Fluid

Series **PSE560**

P. 16-3-27

### Male thread type



R 1/8, 1/4 (With M5 female thread)  
NPT 1/8, 1/4 (With M5 female thread)  
URJ 1/4, TSJ 1/4

### Female thread type



Rc 1/8

### Applicable fluid example

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

## Controller

Series **PSE300**

P. 16-3-36



### Functions

- Auto shift function
- Auto preset function
- Precision indicator setting
- Peak and bottom display function
- Key lock function
- Reset function
- Error indication function
- Unit display switching function
- Anti-chattering function

Series		Rated pressure range			
For pneumatics	<b>PSE541</b>	0 to -101 kPa	Vacuum	-101 kPa	0
	<b>PSE543</b>	-100 to 100 kPa	Compound pressure	-100 kPa	100 kPa
For general purpose fluids	<b>PSE560</b>	0 to 1 MPa	Positive pressure	0	1 MPa
	<b>PSE561</b>	0 to -101 kPa	Low pressure	-101 kPa	0
	<b>PSE563</b>	-100 to 100 kPa	Compound pressure	-100 kPa	100 kPa
	<b>PSE564</b>	0 to 500 kPa	Positive pressure	0	500 kPa

# Compact Pressure Sensor For General Air Series *PSE540*

## How to Order



Pressure sensing range	
1	Vacuum (0 to -101 kPa)
3	Compound pressure (-100 to 100 kPa)

**PSE54** **1** - **M3** - **Option (Connector)**

### Option (Connector)

Nil	C1	C2
Without	Connector for PSE200 multiple channel pressure controller 1 pc. 	Connector for PSE300 multiple channel pressure controller 1 pc. 

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

### Port size

<b>M3</b>	M3 x 0.5		<b>IM5</b>	M5 female thread, through type	
<b>M5</b>	M5 x 0.8		<b>IM5H</b>	M5 female thread, through type (With mounting hole)	
<b>O1</b>	R 1/8 (With M5 female thread)				
<b>N01</b>	NPT 1/8 (With M5 female thread)				
<b>R04</b>	ø4 plug-in reducer				
<b>R06</b>	ø6 plug-in reducer				

### Option/Part No.

Description	Part no.	Note
Connector for PSE200	ZS-26-E-4	1 pc.
Connector for PSE300	ZS-28-C	1 pc.

ZSE□  
ISE□

**PSE**

ZSE3

PS

ZSE<sub>1</sub>  
ZSE<sub>2</sub>

ZSP

ISA2

IS□

ZSM

PF2□

IF□

Data

## Specifications

Conforms to CE marking and UL (CSA) standards.

Model		PSE541	PSE543
Rated pressure range		0 to -101 kPa	-100 to 100 kPa
Proof pressure		500 kPa	
Fluid		Air, No-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 (Within rated pressure range), Output impedance: Approx. 1 kΩ	
Accuracy (Ambient temperature of 25°C)		±2% F.S. or less	
Linearity		±0.4% F.S. or less	
Repeatability		±0.2% F.S. or less	
Power supply voltage effect		±0.8% F.S. or less	
Resistance	Enclosure	IP40	
	Operating temperature range	Operating: 0 to 50°C, Stored: -20 to 70°C (No condensation or freezing)	
	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 between live parts and case (at 500 VDC)	
	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-energized)	
Impact resistance	980 m/s <sup>2</sup> in X, Y, Z directions, 3 times each (de-energized)		
Temperature characteristics		±2% F.S. or less (based on 25°C)	

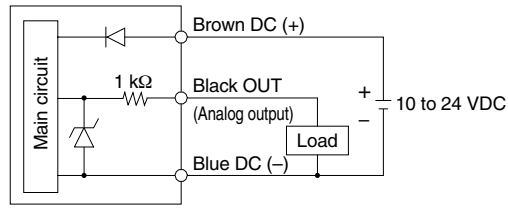
## Piping Specifications

Model		M3	M5	O1	N01	R04	R06	IM5	IM5H
Port size		M3 x 0.5	M5 x 0.8	R1/8 M5 x 0.8	NPT1/8 M5 x 0.8	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 oval 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	

# Series PSE540

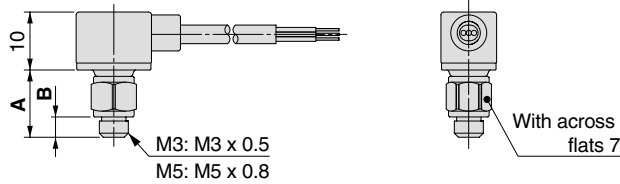
## Internal Circuit

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



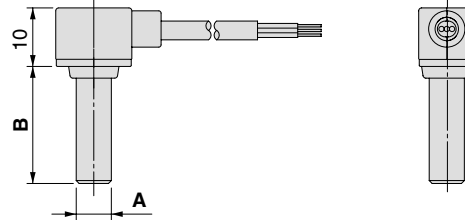
## Dimensions

**PSE54□-M3**  
 M5



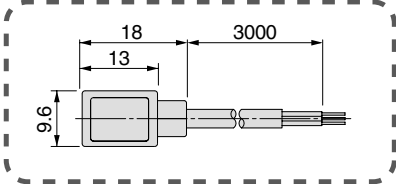
	PSE54□-M3	PSE54□-M5
A	10.8	11.5
B	3	3.5

**PSE54□-R04**  
 R06

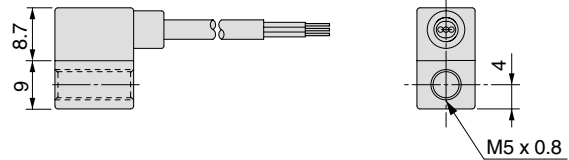


	PSE54□-R04	PSE54□-R06
A	∅4	∅6
B	18	20

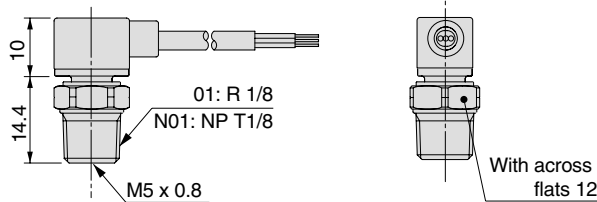
Common dimensions



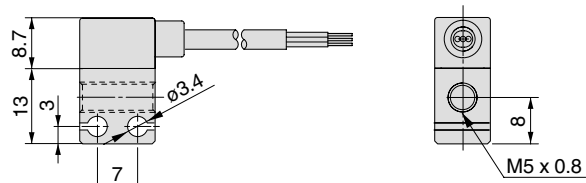
**PSE54□-IM5**



**PSE54□-01**  
 N01



**PSE54□-IM5H**



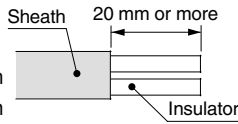


## Pressure Sensor Handling

### Warning

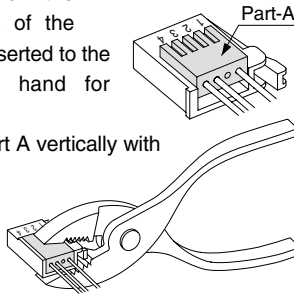
- Do not drop, bump, or apply excessive impact (PSE540: 980 m/s<sup>2</sup>, PSE560: 500 m/s<sup>2</sup>) while handling. Although the body of the sensor may not be damaged, the inside of the sensor could be damaged and lead to malfunction.
- The tensile strength of the cord is 50 N. Applying a greater pulling force to it can cause malfunction. When handling, hold the body of the sensor—do not dangle it from the cord.
- Do not use pressure sensors with corrosive and/or flammable gases or liquids.

- 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.



Connector no.	Wire core color	
	For PSE200 (ZS-26-E)	For PSE300 (ZS-28-C)
1	Brown (DC (+))	Brown (DC (+))
2	Black (OUT: 1 to 5 V)	Not connected
3	Blue (DC (-))	Blue (DC (-))
4	Not connected	Black (OUT: 1 to 5 V)

- 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.
- 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 Series PSE300 pressure switches, use sensor connectors (ZS-28-C) or e-con connectors listed below.



Manufacturer	Part no.
Sumitomo 3M	37104-3101-000FL
Tyco Electronics AMP	1-1473562-4

- For detailed information about e-con connectors, please consult the manufacturers of the respective connectors.

## Operating Environment

### Warning

- The pressure sensors 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.
- The pressure sensors do not have an explosion proof rating. Never use pressure sensors in the presence of flammable or explosive gases.

## Air Supply

### Warning

- Use of toxic, corrosive or flammable gases
 

Since the switch uses stainless steel 316L as the material of the pressure sensor and fittings, do not use toxic or corrosive gases.
- Fluid compatibility
 

Since the switch uses stainless steel 316L as the wetted material (for the pressure sensor and fittings), use fluids that will not corrode this material.

(For the corrosiveness of the fluids, please consult with the manufacturers of the respective fluids.)

### Helium leakage test

Helium leakage test is conducted on the welded parts. Use ferrules by Crawford Fittings (Swagelok® fittings) as TSJ fittings, seals and glands by Cajon (VCR® fittings) as URJ fittings. If ferrules, seals, or glands of other brands are to be used, be sure to conduct helium leakage test before using those products.

## Controller Handling

### Warning

- Do not drop, bump, or apply excessive impact (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.
- 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—do not dangle it from the cord.

## Connection

### Warning

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

ZSE□  
ISE□

PSE

ZSE<sub>1</sub>

PS

ZSE<sub>2</sub>

ZSP

ISA2

IS□

ZSM

PF2□

IF□

Data



# Specific Product Precautions 2

Be sure to read before handling.

## Controller

### 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.
2. Our pressure sensor controllers do not have an explosion proof rating. Never use pressure sensors in the presence of flammable or explosive gases.
3. Enclosure "IP65" applies only to the front face of the panel when mounting. Do not use in an environment where oil splashing or spraying is anticipated.

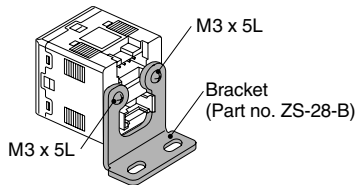
### Mounting

#### Caution

##### 1. Mounting with bracket

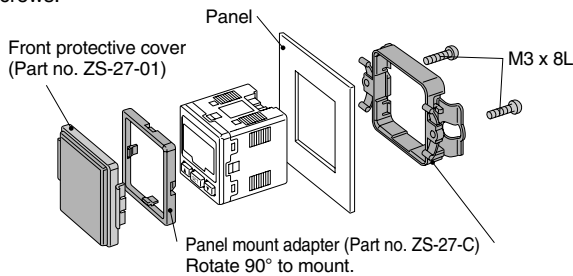
Mount the bracket on the body with two M3 x 5L mounting screws.

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.



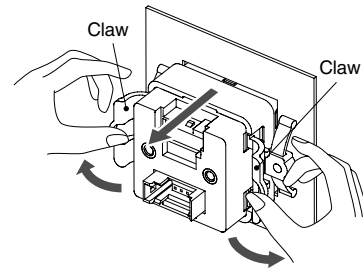
### Mounting

#### Caution

##### 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.

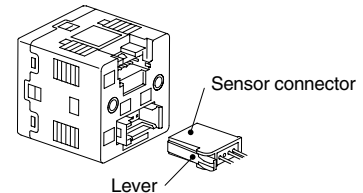


### Wiring

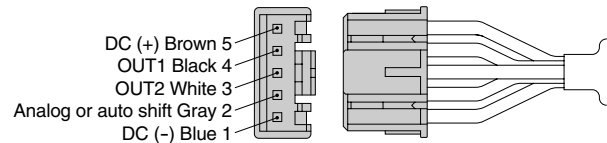
#### Caution

##### 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.



##### 2. Connector pin numbers for power supply/output cable





# Specific Product Precautions 3

Be sure to read before handling.

## Regulating Pressure Range and Rated Pressure Range

### ⚠ Caution



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

The regulating pressure range is the range of pressure that can be set on the controller.

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

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

Sensor	Pressure range				
	-100 kPa	0	100 kPa	500 kPa	1 MPa
For vacuum	<b>PSE541</b>	-101 kPa	0 kPa		
	<b>PSE561</b>	-101 kPa	10 kPa		
For compound pressure	<b>PSE543</b>	-100 kPa	100 kPa		
	<b>PSE563</b>	-101 kPa	101 kPa		
For positive pressure	<b>PSE560</b>	-100 kPa (-0.1 MPa)	0		1 MPa
	<b>PSE564</b>		0	500 kPa	

 Rated pressure range of sensor  
 Regulating pressure range of controller

ZSE   
ISE

**PSE**

ZSE3

PS

ZSE1   
SE2

ZSP

ISA2

IS

ZSM

PF2

IF

Data