

Installation & Maintenance Manual

Compact Pressure Sensor

Series PSE540



EMC Directive 89/336/EEC
EN61000-6-2:2001 Electromagnetic Compatibility (EMC). Generic standards - Immunity for industrial environments.
EN55011+A1:1998 Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical radio-frequency equipment and light industrial environments.

Safety Instructions

The Pressure Sensor and this manual contain essential information for the protection of users and others from possible injury and property damage and to ensure correct handling.
Please check that you fully understand the definition of the following messages (signs) before going on to read the text, and always follow the instructions.

IMPORTANT MESSAGES

Read this manual and follow its instructions. Signal words such as **WARNING** and **NOTE** will be followed by important safety information that must be carefully reviewed.

▲WARNING Indicates a potentially hazardous situation that could result in death or serious injury if you do not follow instructions.

NOTE Gives you helpful information.

▲WARNING

Do not disassemble, modify (including change of printed circuit board) or repair.
An injury or failure can result.

Do not operate outside of the specification range.

Fire, malfunction or sensor damage can result.
Please use after confirming the specification.

Do not operate in atmosphere of an inflammable, explosive or corrosive gas.

Fire, an explosion and corrosion can result.
This pressure sensor is not an explosion proof type.

NOTE

Follow the instructions given below when handling the pressure sensor. **Otherwise, the sensor may be damaged or may fail, thereby resulting in malfunction.**

- Do not drop, bring into collision with other objects or apply excessive shock to the unit (980m/s² or more).
- Do not pull the lead wire with force or lift the main unit by holding the lead wire. (Pulling strength less than 50N)
- Do not insert wire or other articles into the pressure port.
- Connect wires and cables correctly.
- Do not perform wiring while power is on.
- Do not wire with power cable or high-voltage cable in the same wire route.
- Connect Terminal FG to ground when using a switching regulator obtained on the commercial market.
- Install the air tube correctly in a safe area away from water and dust.

Model Indication Method

PSE54 □ 1 □ M3

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

Accuracy
Nil ±2%F.S.
A ±1%F.S.

Port size

M3	M3 × 0.5	
M5	M5 × 0.8	
01	R1/8 (With M5 female thread)	
N01	NPT1/8 (With M5 female thread)	
R04	φ4 plug-in reducer	
R06	φ6 plug-in reducer	
IM5	M5 female thread, through type	
IM5H	M5 female thread, through type (With mounting hole)	

Option (Connector)

Option (Connector)	Without
Nil	Without
C2	With e-con connector (ZS-28-C) for PSE200/PSE300 controller.

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

Specification

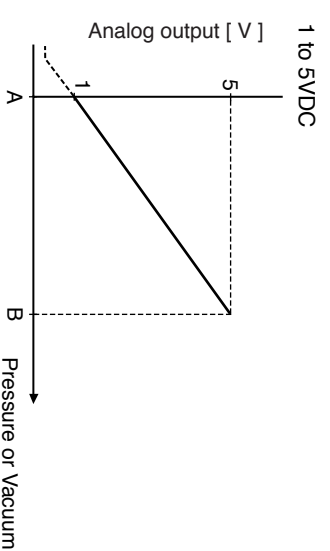
Rated Pressure Range	PSE540(A) 0 to 1MPa	PSE541(A) 0 to -101kPa	PSE543(A) -100 to 100kPa
Withstand Pressure	1.5MPa	Air, Non-corrosive gases, Non-flammable gases	500kPa
Fluids	1 to 5VDC (Rated Pressure range)		
Analog Output	Approx. 1kΩ		
Output Impedance	12 to 24VDC, ripple (P-P) ±10% or less (Protection against inverse connection)		
Power Supply Voltage	15mA or less		
Current Consumption	PSE54 □ : ±2%F.S. or less PSE54 □A: ±1%F.S. or less		
Accuracy (Ambient Temp. 25°C)	±0.7%F.S. or less ±0.4%F.S. or less		
Linearity	±0.2%F.S. or less		
Repeatability	Influence from power supply voltage: ±0.8%F.S. or less		
Temp. Characteristic	±2%F.S. or less (25°C)		
Enclosure	IP40 (IEC 60529)		
Ambient Temp. Range	Operation: 0 to 50°C; Storage: -20 to 70°C (No condensation or freezing)		
Ambient Humidity Range	Operation, Storage: 35 to 85%RH (No condensation)		
Withstand Voltage	1000V/AC or more, 50/60Hz, 1 minute (Between wires and case)		
Insulation Resistance	50MΩ or more (500VDC/M) (Between wires and case)		
Vibration Proof	10 to 500Hz 1.5mm or 98m/s ² acceleration, 2 hours each direction of X, Y, and Z		
Impact Proof	980m/s ² , 3 times each in directions of X, Y, and Z respectively		

Material Specification

Model No.	M3	M5	01	N01	R04	R06	IM5	IM5H
Port size	M3 x 0.5/M5 x 0.8	R1/8	NPT1/8	φ4	φ6	M5 female screw, through type*1		
Case	PBT	PBT	PBT	PBT	PBT	PBT	PBT	PBT
Piping port:	SUS303	SUS303	SUS303	SUS303	SUS303	SUS303	SUS303	SUS303
Pressure Sensor:	silicon, O-ring: NBR							
Lead wire	Elliptical cable 2.7 x 3.2mm, 0.15mm ² 3-cores 3m							
Mass (Weight)*2	2.9g	3.2g	9.8g	1.9g	2.1g	3.8g	4.6g	

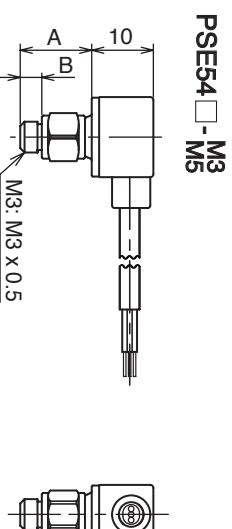
*1 IM5H contains setting hole. *2 N/A lead wire

Analog output

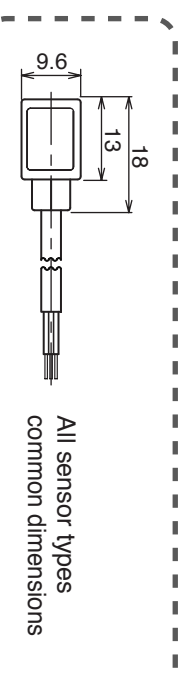


Model No.	PSE540(A)-※	PSE541(A)-※	PSE543(A)-※
Rated pressure range	0 to 1MPa	0 to -101kPa	-100 to 100kPa
A	0MPa	0kPa	-100kPa
B	1MPa	-101kPa	100kPa

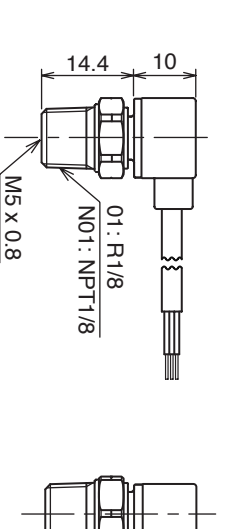
Outline with Dimensions (in mm)



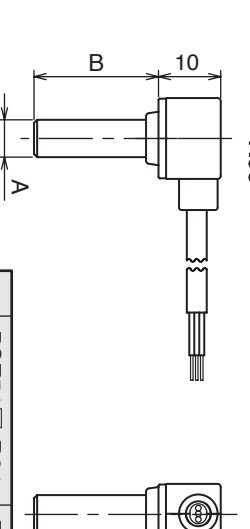
	PSE54 □ -M3	PSE54 □ -M5
A	10.8	11.5
B	3	3.5



PSE54 □ - 01

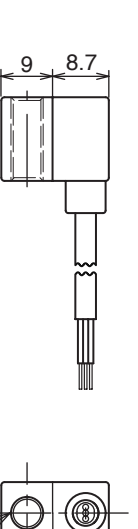


PSE54 □ - R04

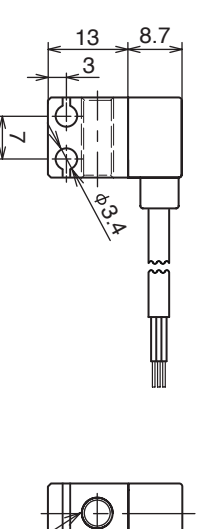


	PSE54 □ -R04	PSE54 □ -R06
A	φ4	φ6
B	18	20

PSE54 □ - IM5



PSE54 □ -IM5H

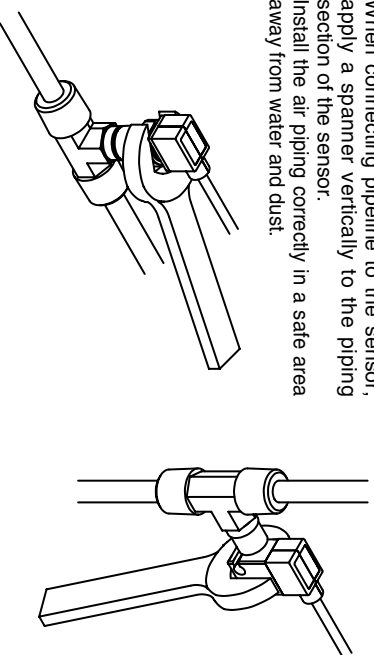


Installation

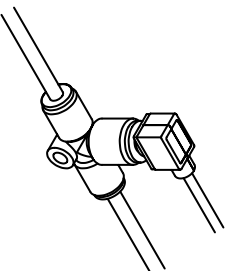
Observe the specified tightening torque when connecting pipes. Refer to the following table for the appropriate torque values.

Nominal size of Thread	Tightening torque N • m
R • NPT 1/8	7 to 9
M3	1/4 rotation after tightening by hand
M5	1/6 rotation after tightening by hand

When connecting pipeline to the sensor, apply a spanner vertically to the piping section of the sensor. Install the air piping correctly in a safe area away from water and dust.



Hold the sensor and insert it into the one-touch fitting carefully and securely all the way to the bottom.

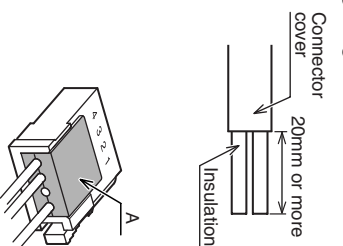


Attaching the connector to the lead wire

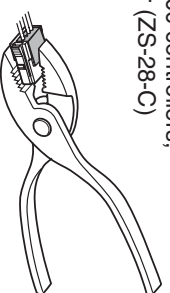
- Strip the sensor wire as shown in the right figure.

The core of the corresponding color shown in the following table is put into the pin of the number printed on the e-con connector and pushed to the back.

Pin No.	Color of Insulation
1	Brown (DC +)
2	N.C.
3	Blue (DC -)
4	Black (IN: 1 to 5VDC)



- Check that the above-mentioned preparation work has been performed correctly, then part A shown in the figure is pushed in by hand to make temporary connection.
- Part A center is pressed straight in using a tool, such as pliers.
- Re-use cannot be performed once the e-con connector has been completely crimped.
- In case of connection failure such as incorrect order of wires or incomplete insertion, please use a new e-con connector.
- When connecting to PSE200/PSE300 controllers, please use the connector for sensor (ZS-28-C) or *e-con* as detailed below.



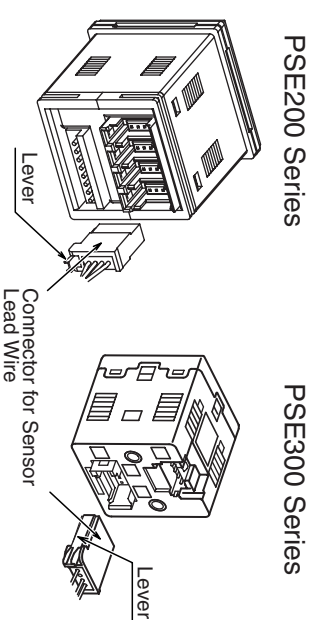
Manufacturer	Model No.
(c)Sumitomo 3M	37104-3101-000FL
Tyco Electronics AMP	1-1473562-4
OMRON	XN2A-1430

- Please contact connector manufacturer about *e-con* catalogue.

Installation (continue)

Connector Connecting/Disconnecting

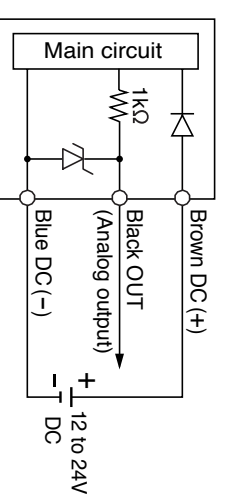
- When connecting the connector, insert it straight onto the pins holding the lever and connector body, and lock the connector by pushing the lever claw into the square groove in the housing until connector clicks.
- When disconnecting the connector, press the connector lever to disengage the lever claw from the square groove. Then pull the connector straight out.



Internal Circuit and Wiring

Output Specification

Voltage output:
1 to 5V
Output impedance:
Approx. 1kΩ



- To enquire about the product, please contact the following:

SMC Corporation
URL <http://www.smcworld.com>

Phone

AUSTRIA / (43) 2262-62 280
BELGIUM / (32) 3-355 1464
CZECH REP. / (420) 5-414 24611
DENMARK / (45) 70 25 29 00
FINLAND / (358) 9-859 580
FRANCE / (33) 1-64 76 1000
GERMANY / (49) 6103 4020
GREECE / (30) 1-342 6076
HUNGARY / (36) 1-371 1343
IRELAND / (353) 1-403 9000
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