Series 10-ZSE60F/ISE60 High precision digital pressure switch for general fluids

How to Order

For positive pressure 10 — ISE60 — A2 — 22 — L — M □

For compound pressure 10 — ZSE60 F — A2 — 22 — L — M □

Clean series

Piping specifications

A2	URJ 1/4 Note), Piping in the backward direction
B2	TSJ1/4 Note), Piping in the backward direction

Note) URJ1/4 and TSJ1/4 are special fittings for semiconductor manufacturing equipment.

Input/output specifications

22	NPN open collector 2 outputs + analog output
30	NPN open collector 2 outputs + auto shift input
62 *	PNP open collector 2 outputs + analog output
70 *	PNP open collector 2 outputs + auto shift input

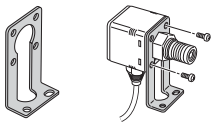
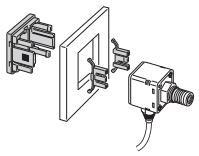
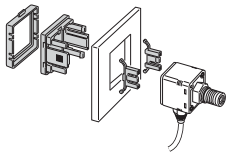
* Option

Note) Auto shift input is used for the auto shift function. For details, please refer to "Auto shift function".

Lead wire length

L	3m

Option

Nil	None
A	Bracket A 
D	Bracket D Refer to the dimensions for the difference between brackets A and D.
E	Panel mount 
F	Panel mount + Front protection cover 

Unit specifications

Nil	With unit switching function Note 1)
M	SI unit only Note 2)

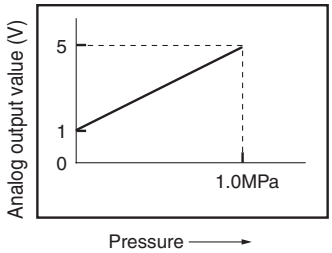
Note 1) This will no longer be sold for use in Japan after the new Weight and Measure Act is implemented.

Note 2) Fixed unit
For compound pressure: kPa
For positive pressure: MPa

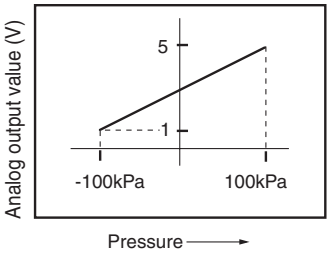
Analog output

Applicable model number: **10-ZSE60F/ISE60-□-22/62(L)-(M)**

10-ISE60 series



10-ZSE60F series



Option

When option parts are required separately, user the following part numbers to place an order.

Option	Part No.	Quantity	Note
Bracket A	10-ZS-24-A	1	With 2 pcs. of mounting screws
Bracket D	10-ZS-24-D	1	With 2 pcs. of mounting screws
Panel mount	10-ZS-24-E	1	
Panel mount + Front protection cover	10-ZS-24-F	1	

⚠ Caution

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

Specifications

			10-ZSE60F (compound pressure)	**10-ISE60** (positive pressure)
Rated pressure range			–100.0 to 100.0kPa	0.000 to 1.000MPa
Set pressure range			–100.0 to 100.0kPa	–0.100 to 1.000MPa
Proof pressure			500kPa	1.5MPa
Set pressure resolution		**kPa**	0.1	—
		MPa	—	0.001
Fluid			Fluid that will not corrode stainless steel SUS630 and stainless steel SUS304	
Power supply voltage			12 to 24 VDC, Ripple (p-p) 10% or less (with reverse connection protection)	
Current consumption			55mA or less	
Switch output			NPN or PNP open collector output: 2 output	
		Maximum load current	80mA	
		Maximum applied voltage	30V (NPN output)	
		Residual voltage	1V or less (with load current of 80 mA)	
		Response time	2.5ms or less (With anti-chattering function: Choose from 24ms, 192ms or 768ms)	
		Short circuit protection	With short circuit protection	
Repeatability			±0.2% F.S. ±1 digit or less	±0.3% F.S. ±1 digit or less
Hysteresis	**Hysteresis mode**		Variable (can be set from 0)	
	Window comparator mode		Fixed (3 digits)	
Display			3 1/2-digit, 7-segment indicator (Sampling cycle: 5 times/s)	
Display accuracy			±2% F.S. ±1 digit or less (at ambient temperature of 25°C)	
Indicator light			OUT1: Lights up when ON (green). OUT2: Lights up when ON (red).	
Analog output Note 1)			Output voltage: 1 to 5V ±5% F.S. or less (with rated pressure range) Linearity: ±1%F.S. or less Output impedance: Approx. 1kΩ	Output voltage: 1 to 5V ±2.5% F.S. or less (with rated pressure range) Linearity: ±1%F.S. or less Output impedance: Approx. 1kΩ
Auto shift input Note 2)			No-voltage input (Solid state switch or reed switch), Input 5ms or more	
Environment resistance		**Enclosure**	IP65	
		Ambient temperature range	Operating: 0 to 50°C, Stored: –10 to 60°C (no condensation or freezing)	
		Ambient humidity range	Operating/Stored: 35 to 85%RH (no condensation)	
		Withstand voltage	1000 VAC for 1 min. between lead wires and body	
		Insulation resistance	2MΩ or more (measured by 500 VDC mega meter) between lead wires and body	
		Vibration resistance	10 to 500Hz with 1.5mm amplitude or 98m/s^2, whichever is smaller, in X, Y, Z directions for 2 hours	
		Shock resistance	980m/s^2 in X, Y, Z directions, 3 times each (de-energized)	
Temperature characteristics			±3%F.S. or less (at 25°C)	
Port size			A2: URJ1/4 B2: TSJ1/4	
Wetted parts material			Pressure receiving area : stainless steel SUS630, Fittings : stainless steel SUS304	
Lead wire			5-wire oil proof vinyl cabtire cable (0.15mm^2)	
Weight			Approx. 120g (Each including 3m lead wire)	
Particle generation grade (Please refer to front matters 13 to 22 for details.)			Grade 2	

Note 1) In case of 10-ZSE60(F)/ISE60-□-$^{22}_{62}$

Note 2) In case of 10-ZSE60(F)/ISE60-□-$^{30}_{70}$

Note

The possible set ranges for types with auto shift function are as follows.

Model	Set pressure range
10-ZSE60F-□-$^{30}_{70}$	–100.0 to 100.0kPa
10-ISE60-□-$^{30}_{70}$	–1.000 to 1.000MPa

Function

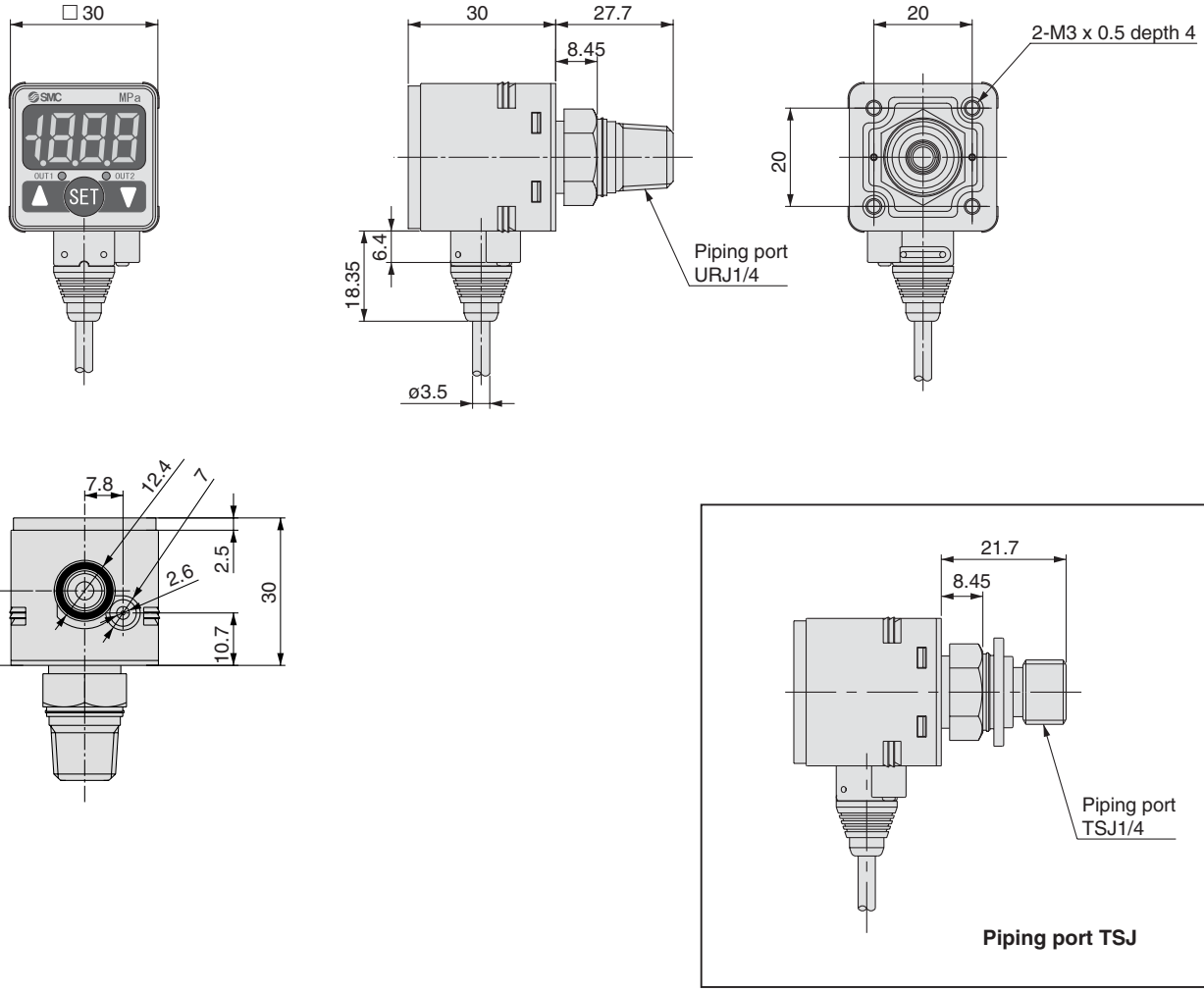
Various additional functions are available for easy measurement, switch operation and check of measured values suitable for the conditions of the measured fluid.

Auto shift function Note 1)	Can correct the pressure set point value of switch output according to fluctuation in the primary pressure.
Anti-chattering function	Prevents malfunction due to sudden fluctuations in the primary pressure by adjusting the response time.
Key lock function	The key board operation can be locked to prevent incorrect operation on the operation switch.
Peak hold function	Can retain the maximum pressure value displayed during measurement.
Bottom hold function	Can retain the minimum pressure value displayed during measurement.
Zero out function	The pressure display can be set to zero when the pressure is open to the atmosphere.
Unit conversion function (for overseas use) Note 1)	Can convert the display unit (for overseas use only).

Note 1) Select and order by specifying the types and models.

Dimensions

10-ZSE60F/ISE60-$^{A2}_{B2}$

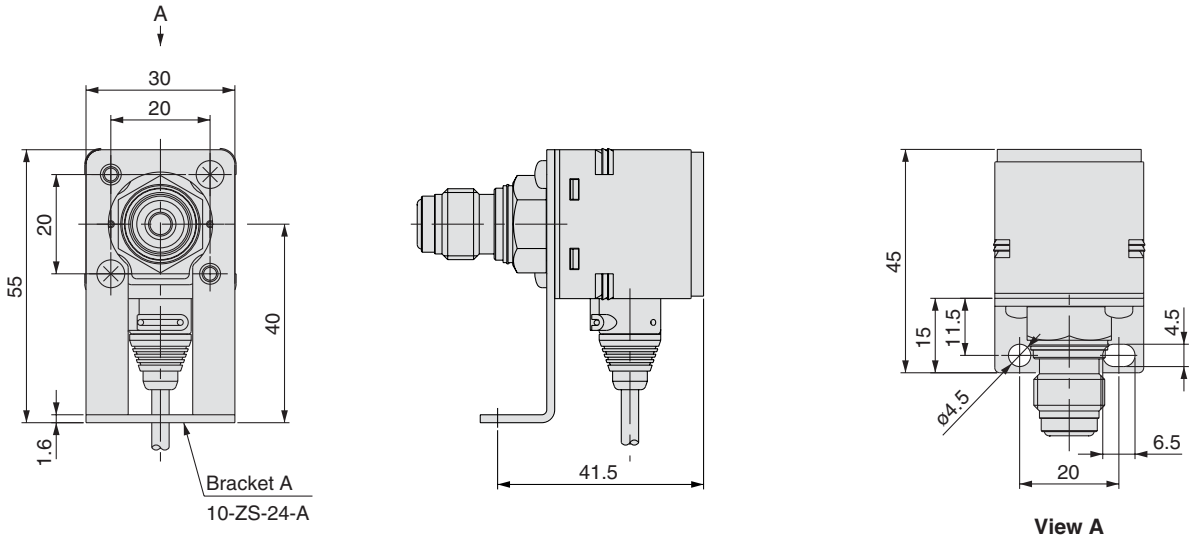


The following items are identical with those of Series 10-ZSE50F/ISE50.

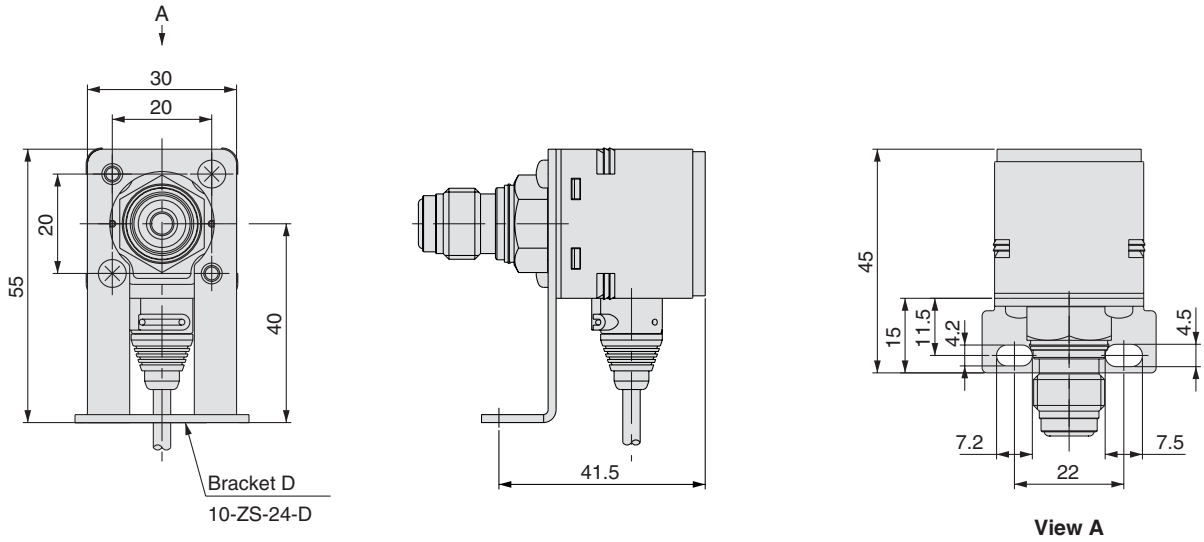
- **Item**
  Output type
  Example of internal circuit and wiring
  Auto shift function, Anti-chattering function
  Measures to be taken when error occurs

Dimensions

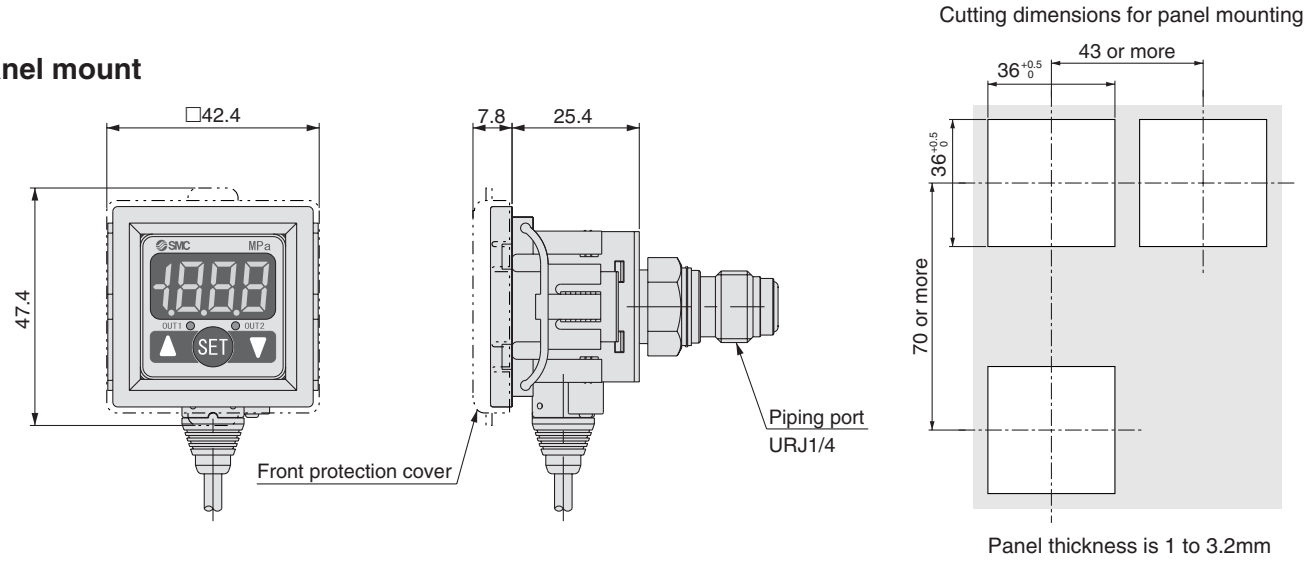
Bracket A



Bracket D



Panel mount



Specific product precautions

Be sure to read before handling.

Handling

⚠ Warning

1. Do not drop, bump or apply excessive impacts (980 m/s²) while handling. Although the body of the sensor may not be damaged, the internal parts could be damaged and lead to a malfunction.

2. The tensile strength of the cord is 49N. Applying a greater pulling force on it can cause a malfunction. When handling, hold the body of the sensor.

3. Do not exceed the screw-in torque of 13.6 N·m when installing piping. Exceeding this value may cause malfunctioning of the sensor.

4. Do not use pressure sensors with corrosive and/or flammable gases or liquids.

Connection

⚠ Warning

1. Incorrect wiring can damage the switch and cause a malfunction or erroneous switch output.

2. Turn off the power before connecting the wires.

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 lines.

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

Operating environment

⚠ Warning

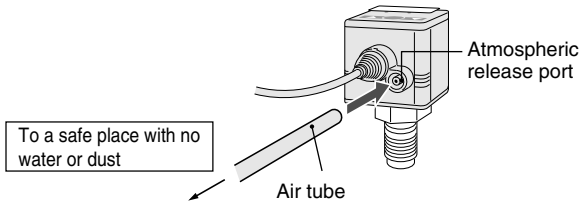
1. Our pressure switches are CE marked; however, they are not equipped with surge protection against lightning. Lightning surge countermeasures should be applied directly to system components as necessary.

2. Our pressure switches do not have an explosion proof rating. Never use it in the presence of an explosive gas as this may cause a serious explosion.

⚠ Caution

1. Do not use in an environment with spattering liquid of oil or solvent.

2. In an environment where the body of the switch is exposed to water or dust, there is possibility of water or dust invasion of the switch through the atmospheric release port. Insert a ø4 tube (with inside diameter of ø2.5) into the atmospheric release port and pipe the other end to a place with no spattering water or other liquid. Do not fold or clog the tube or the pressure cannot be measured properly.



Confirm that the air tube is inserted to the bottom of the atmospheric release port.
Use SMC TU0425 (Material: Polyurethane; O.D. ø4, I.D.; ø2.5) as the air tube.

Pressure source

⚠ Warning

1. Use of toxic, corrosive or flammable gases
The materials of the pressure sensor and fittings on the switch are stainless steel SUS630 and stainless steel SUS304. Do not use **toxic** or **corrosive gas**.
The switch is not protected against explosions. Do not use it with **flammable gas**, either.

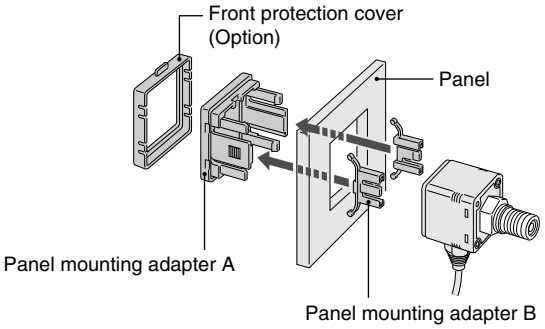
2. Fluid compatibility
The fluid contact areas are made of stainless steel SUS630 (pressure sensor) and stainless steel SUS304 (fittings). Use fluid that will not corrode these materials.
(For corrosiveness of fluid, consult with the manufacturer of the fluid.)

Helium leakage test
Helium leakage test is conducted on the welding parts. Use a ferrule (Swagelok®) by Crawford Fitting Co., for TSJ fitting and seal, ground, etc. by CAJON COMPANY (VCR® fittings) for URJ fitting. If a ferrule, seal or ground supplied by other manufactures are to be used, conduct helium leakage test before using those products.

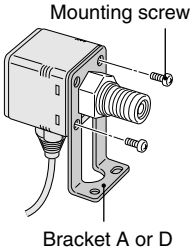
Mounting method

⚠ Caution

1. Mounting with panel mount adapter



2. Mounting with brackets
Mount a bracket to the body using two M3 x 5L mounting screws and install on piping with a hexagon socket cap screw. The switch can be installed horizontally depending on the installation location.



The tightening torque for bracket mounting screw should be 0.98 N·m or less.