

2-Color Display High-Precision Digital Pressure Switch

Series ZSE40A(F)/ISE40A



RoHS

IP65

New
M8 connector type



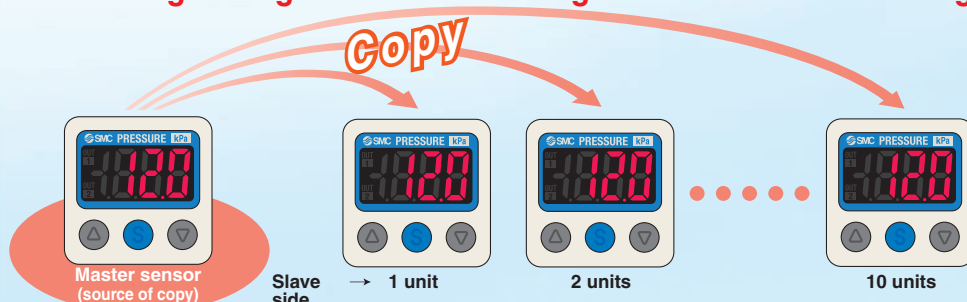
Applicable
fluid

Air, Non-corrosive gas, Non-flammable gas

Can **copy** to up to **10** switches simultaneously.

The settings of the master sensor (source of copy) can be copied to the slave sensors.

- Reducing setting labor
- Minimizing risk of mistakes in setting

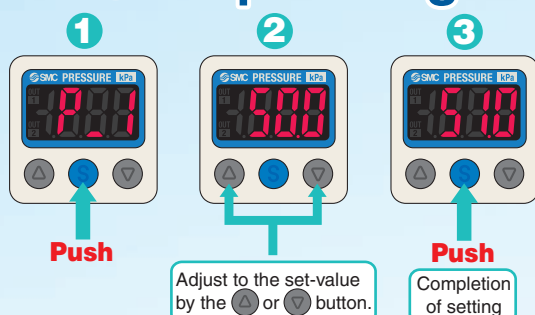


Easy handling!



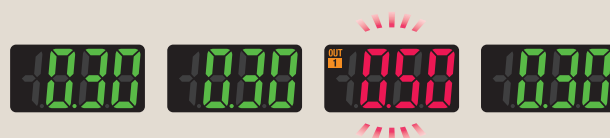
Raised rubber switch buttons for easy and comfortable operation

3-step setting

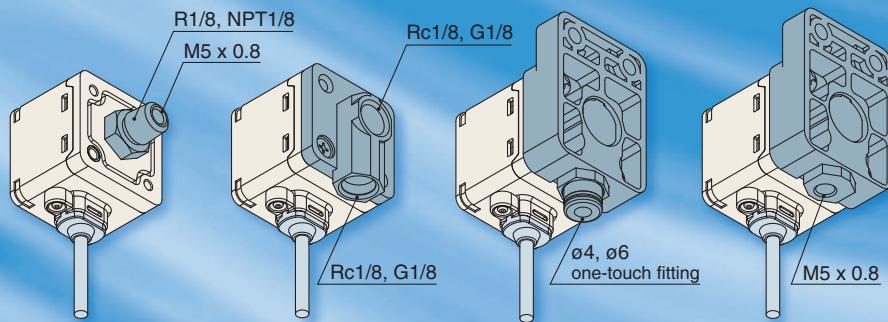


2-color display

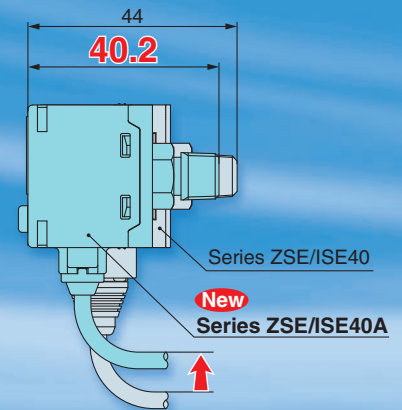
See abnormal values at a glance.



Piping Variations



Space-saving



Mounting Variations

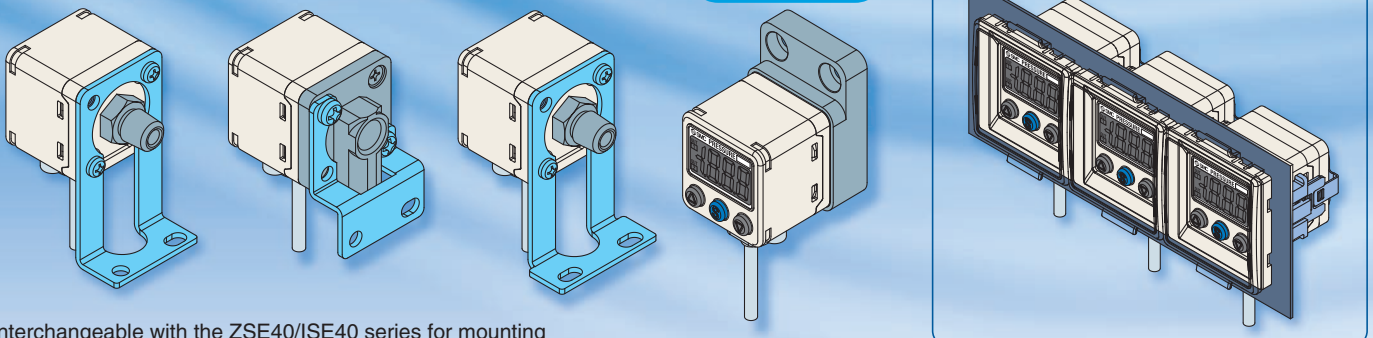
Bracket A

Bracket B

Bracket D

Direct mounting
(Wall mounting)

Panel mounting



Interchangeable with the ZSE40/ISE40 series for mounting

Series

Series	ZSE40A (vacuum pressure)	ZSE40AF (compound pressure)	ISE40A (positive pressure)
Rated pressure range	0.0 to -101.3 kPa 	-100.0 to 100.0 kPa 	-0.100 to 1.000 MPa
Set pressure range	10.0 to -105.0 kPa	-105.0 to 105.0 kPa	-0.105 to 1.050 MPa
Withstand pressure	500 kPa	500 kPa	1.5 MPa
Min. unit setting	0.1 kPa	0.1 kPa	0.001 MPa
Output	<ul style="list-style-type: none"> • NPN or PNP open collector 2 outputs (with copy function) • NPN or PNP open collector 2 outputs + Analog output (voltage or current)/Auto-shift input 		
Piping	R1/8, NPT1/8 (With M5 female thread), Rc1/8, G1/8, M5 female thread ø4, ø6 one-touch fitting		

Secret code setting function.....

A function to prevent operation by anyone other than the designated operator while the keys are locked.



An optional 3-digit value is entered.

* The set-value can be checked while the keys are locked.

Power-saving function.....

The display can be turned off to save the power consumption. (Power consumption reduced by max. 20%)



The value disappears and decimal points start flashing.

Resolution conversion function.....

The flickering on the display can be eliminated.



1/1000



1/100

(Only the displayed value is changed, and there is no effect on the accuracy.)

MPa/kPa switching function.....

The indication unit for vacuum, compound pressure and positive pressure can be integrated into either MPa or kPa.



kPa Stick the label (enclosed with the product) of a desired unit seal.

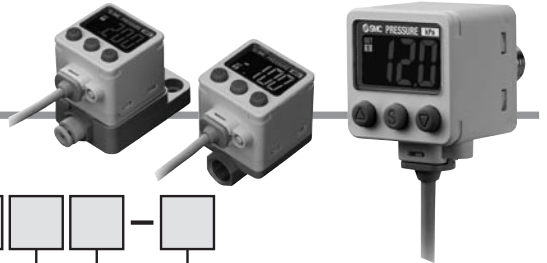
2-Color Display High-Precision Digital Pressure Switch



RoHS

Series ZSE40A(F)/ISE40A

How to Order



Rated pressure range

ISE40A -0.1 to 1.000 MPa

For positive pressure

ISE40A - **01** - **X** - **M** [] [] - []

For vacuum/
compound pressure

ZSE40A - **01** - **Y** - **M** [] [] - []

Rated pressure range

ZSE40A 0.0 to -101.3 kPa

ZSE40AF -100.0 to 100 kPa

Piping specifications

01	R1/8 (With M5 female thread)	
N01	NPT1/8 (With M5 female thread)	
W1	Rc1/8	
WF1*	G1/8*1	
M5*	M5 x 0.8 (Female thread)	
C4*	ø4 One-touch fitting	
C6*	ø6 One-touch fitting	

* Made to Order

* 1 ISO228-1 compliant

Combination of piping specifications with option 1 and part numbers of options

Option 1			Piping						
Description	Symbol	Part no.	01	N01	W1	WF1	M5	C4	C6
Bracket A	A	ZS-24-A	○	○	○	○	×	×	×
Bracket B	B	ZS-24-B	×	×	○	○	×	×	×
Bracket D	D	ZS-24-D	○	○	○	○	×	×	×
Panel mount adapter	E	ZS-35-C	○	○	×	×	×	×	×
		ZS-35-D	×	×	○	○	○	○	○
Panel mount adapter + Front protective cover	F	ZS-35-F	○	○	×	×	×	×	×
		ZS-35-G	×	×	○	○	○	○	○

Output specifications

X	NPN open collector 2 outputs (with copy function)
Y	PNP open collector 2 outputs (with copy function)
R	NPN open collector 2 outputs + Analog voltage/Auto-shift switching
T	PNP open collector 2 outputs + Analog voltage/Auto-shift switching
S	NPN open collector 2 outputs + Analog current/Auto-shift switching
V	PNP open collector 2 outputs + Analog current/Auto-shift switching

When optional parts are required separately,
use the following part numbers to place an order.

Part no.	Option
ZS-24-A	Bracket A Mounting screw M3 x 5L, M4 x 5L (2 pcs. for each)
ZS-24-B	Bracket B Mounting screw M4 x 5L (2 pcs.)
ZS-24-D	Bracket D Mounting screw M3 x 5L, M4 x 5L (2 pcs. for each)
ZS-35-C	Panel mount adapter (Piping: For 01/N01)
ZS-35-D	Panel mount adapter (Piping: For W1/WF1/M5/C4/C6)
ZS-35-F	Panel mount adapter + Front protective cover (Piping: For 01/N01)
ZS-35-G	Panel mount adapter + Front protective cover (Piping: For W1/WF1/M5/C4/C6)

Unit specifications

Nil	With unit switching function (Note 1)
M	Fixed SI unit (Note 2)
P	With unit switching function (Note 1) (Initial value psi)

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

Note 2) Unit: kPa, MPa

Made to Order

Symbol	Specifications/Description
X501	Lead wire length 3 m
X531	M12 4-pin pre-wired connector (Lead wire length 100 mm)

Refer to page 36 for details.

Option 2

Symbol	Calibration certificate
Nil	—
K	○

Note) All texts in both English and Japanese

Option 1*

Nil	None
A	Bracket A
B	Bracket B
D	Bracket D
E	Panel mount adapter 01/N01 W1/WF1/M5/C4/C6
F	Panel mount adapter + Front protective cover 01/N01 W1/WF1/M5/C4/C6

* Some options are unavailable depending on the piping specifications. Refer to "Combination of piping specifications with option 1 and part numbers of options".

How to Order [For M8 (3-pin) connector]



Rated pressure range

ISE40A	-0.1 to 1.000 MPa
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For positive pressure **ISE40A** - **01** - **N** - **M** **L**

For vacuum pressure **ZSE40A** - **01** - **N** - **M** **L**

Rated pressure range

ZSE40A	0.0 to -101.3 kPa
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Piping specifications

01	R1/8 (With M5 female thread)
N01	NPT1/8 (With M5 female thread)

Output specifications

N	NPN open collector 1 output
P	PNP open collector 1 output

Unit specifications

Nil	With unit switching function ^{Note 1)}
M	Fixed SI unit ^{Note 2)}
P	With unit switching function (Initial value psi) ^{Note 1)}

Note 1) Under the New Measurement Law, sales of switches with the unit switching function are not allowed for use in Japan.
Note 2) Unit: kPa, MPa

Option 2

Symbol	Operation manual ^{Note)}	Calibration certificate ^{Note)}
Nil	●	—
Y	—	—
K	●	●
T	—	●

Note) All texts in both English and Japanese

Option 1

Nil	None
A	Bracket A
D	Bracket D

M8 connector type*

L	 M8 connector
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* Lead wire is not attached.

Option 1/Part No.

When optional parts are required separately, use the following part numbers to place an order.

Part no.	Option
ZS-24-A	Bracket A Mounting screw M3 x 5L, M4 x 5L (2 pcs. for each)
ZS-24-D	Bracket D Mounting screw M3 x 5L, M4 x 5L (2 pcs. for each)

Series ZSE40A(F)/ISE40A

Refer to page 000 for Pressure Switch Precautions and operation manual on SMC's website for Specific Product Precautions.

Specifications

Model			ZSE40A (vacuum pressure)	ZSE40AF (compound pressure)	ISE40A (positive pressure)
Rated pressure range			0.0 to −101.3 kPa	−100.0 to 100.0 kPa	−0.100 to 1.000 MPa
Display/Set pressure range			10.0 to −105.0 kPa	−105.0 to 105.0 kPa	−0.105 to 1.050 MPa
Withstand pressure			500 kPa	500 kPa	1.5 MPa
Display/Minimum unit setting			0.1 kPa	0.1 kPa	0.001 MPa
Applicable fluid			Air, Non-corrosive gas, Non-flammable gas		
Power supply voltage			12 to 24 VDC ±10%, Ripple (p-p) 10% or less (with power supply polarity protection)		
Current consumption			45 mA or less		
Switch output			NPN or PNP open collector, 1 output or 2 outputs		
	Maximum load current		80 mA		
	Maximum applied voltage		28 V (at NPN output)		
	Residual voltage		1 V or less		
	Response time		2.5 ms (with anti-chattering function: 20, 100, 500, 1000, 2000 ms)		
	Short circuit protection		Yes		
Repeat accuracy			±0.2% F.S. ±1 digit		
Hysteresis	Hysteresis mode		Variable (0 or above) ^{Note 1)}		
	Window comparator mode				
Analog output	^{Note 2)} Voltage output	Output voltage (Rated pressure range)	1 to 5 V ±2.5% F.S.		0.6 to 5 V ±2.5% F.S.
		Linearity	±1% F.S.		
		Output impedance	Approx. 1 kΩ		
	^{Note 3)} Current output	Output current (Rated pressure range)	4 to 20 mA ±2.5% F.S.		2.4 to 20 mA ±2.5% F.S.
		Linearity	±1% F.S.		
		Load impedance	Maximum load impedance: 300 Ω (Power supply voltage 12 V) 600 Ω (Power supply voltage 24 V)		
			Minimum load impedance: 50 Ω		
Auto-shift input			Non-voltage input (Reed or Solid state), Low level: 0.4 V or less, 5 ms or longer input		
Display			3 1/2-digit, 7-segment, 2-color LCD (Red/Green)		
Display accuracy			±2% F.S. ±1 digit (Ambient temperature of 25 ±3°C)		
Indicator light			Lights up when output is turned ON. OUT1, OUT2: Orange		
Environment	Enclosure		IP65		
	Operating temperature range ^{Note 4)}		Operating: −5 to 50°C, Stored: −10 to 60°C (No freezing or condensation)		
	Operating humidity range		Operating/Stored: 35 to 85% RH (No condensation)		
	Withstand voltage		1000 VAC for 1 minute between terminals and housing		
	Insulation resistance		50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing		
Temperature characteristics			±2% F.S. (25°C reference)		
Lead wire ^{Note 5)}			Oil proof heavy-duty vinyl cable 5 cores		
			ø3.5, 2 m Conductor area: 0.15 mm ² (AWG26) Insulator O.D.: 0.95 mm		
Standards			CE, UL, CSA, RoHS		

Note 1) If the applied pressure fluctuates around the set-value, the hysteresis must be set to a value more than the fluctuating width, otherwise chattering will occur.

Note 2) When the analog voltage output is selected, the analog current output cannot be selected.

Note 3) When the analog current output is selected, the analog voltage output cannot be selected.

Note 4) UL temperature rating: maximum ambient temperature is 50 $^\circ\text{C}$.

Note 5) Refer to operation manual on SMC's website (<http://www.smcworld.com>) for wiring and thread standards.

Piping Specifications

Part no.		01	N01	W1	WF1	M5	C4	C6
Port size		R1/8 (With M5 female thread)	NPT1/8 (With M5 female thread)	Rc1/8	G1/8 ^{Note 5)}	M5 x 0.8 female thread	$\phi 4$ One-touch fitting	$\phi 6$ One-touch fitting
Material of parts in contact with fluid	Sensor pressure receiving area	Silicon						
	Piping port	C3602 (Electroless nickel plating) O-ring: HNBR		ZDC2 O-ring: HNBR		ZDC2, POM, Stainless steel 304, C3604 (Electroless nickel plating) O-ring: HNBR		
Weight		78 g	79 g	97 g	104 g	101 g		
M8 connector		45 g	46 g	—			—	

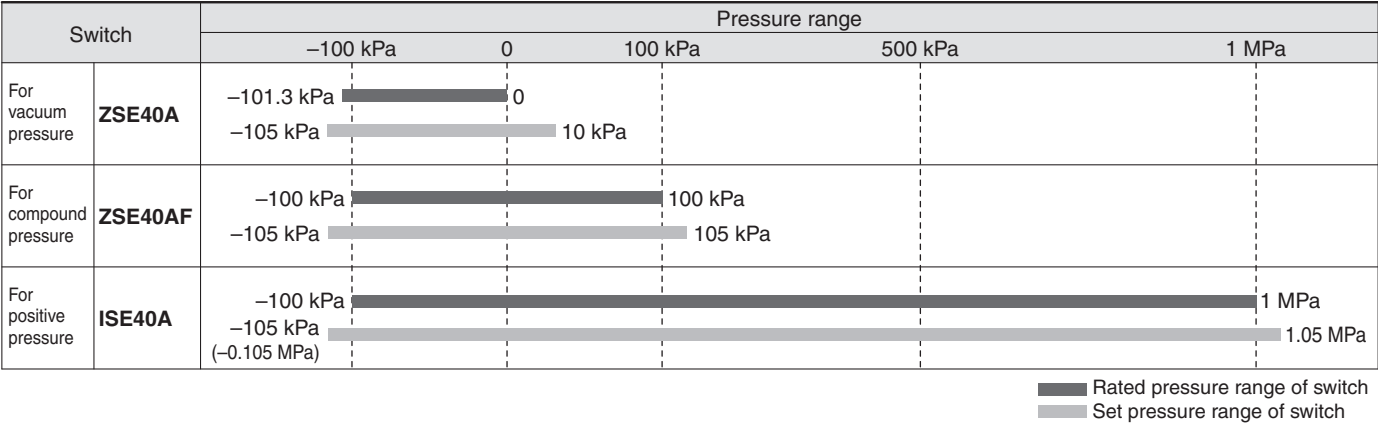
Set Pressure Range and Rated Pressure Range

Set the pressure within the rated pressure range.

The set pressure range is the range of pressure that is possible in setting.

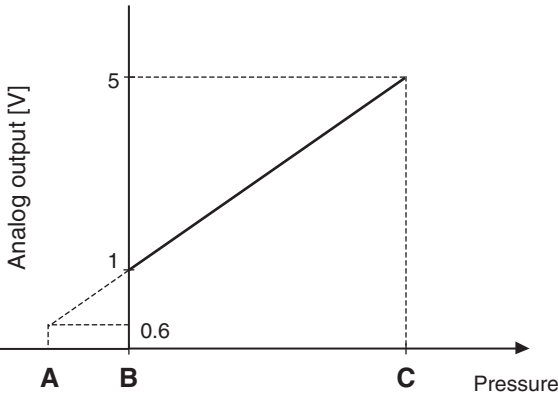
The rated pressure range is the range of pressure that satisfies the specifications (accuracy, linearity, etc.) on the switch.

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 set pressure range.

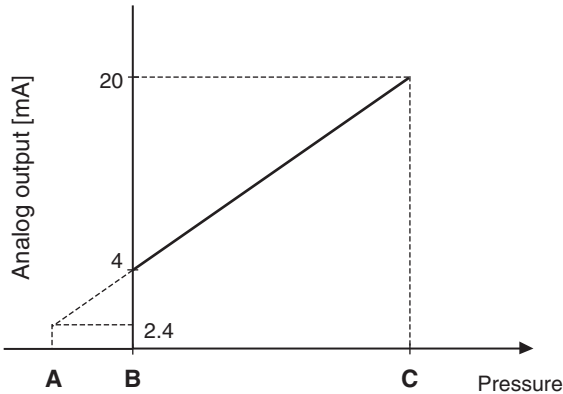


Analog Output

Voltage output



Current output



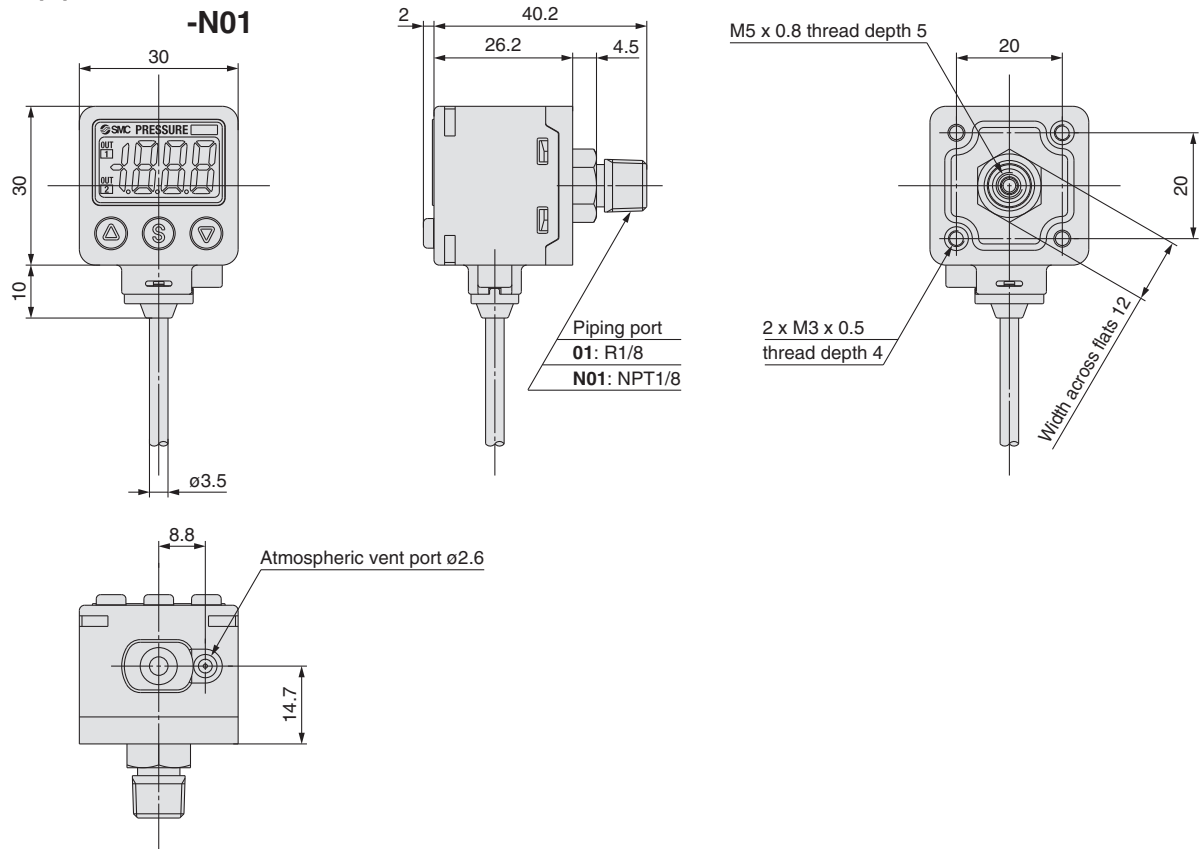
Range	Rated pressure range	A	B	C
For vacuum pressure	0.0 to -101.3 kPa	10.1 kPa	0	-101.3 kPa
For compound pressure	-100.0 to 100.0 kPa	—	-100.0 kPa	100.0 kPa
For positive pressure	-0.100 to 1.000 MPa	-0.100 MPa	0	1.000 MPa

2-Color Display High-Precision Digital Pressure Switch *Series ZSE40A(F)/ISE40A*

Dimensions (For details about lead wires, refer to the product specifications.)

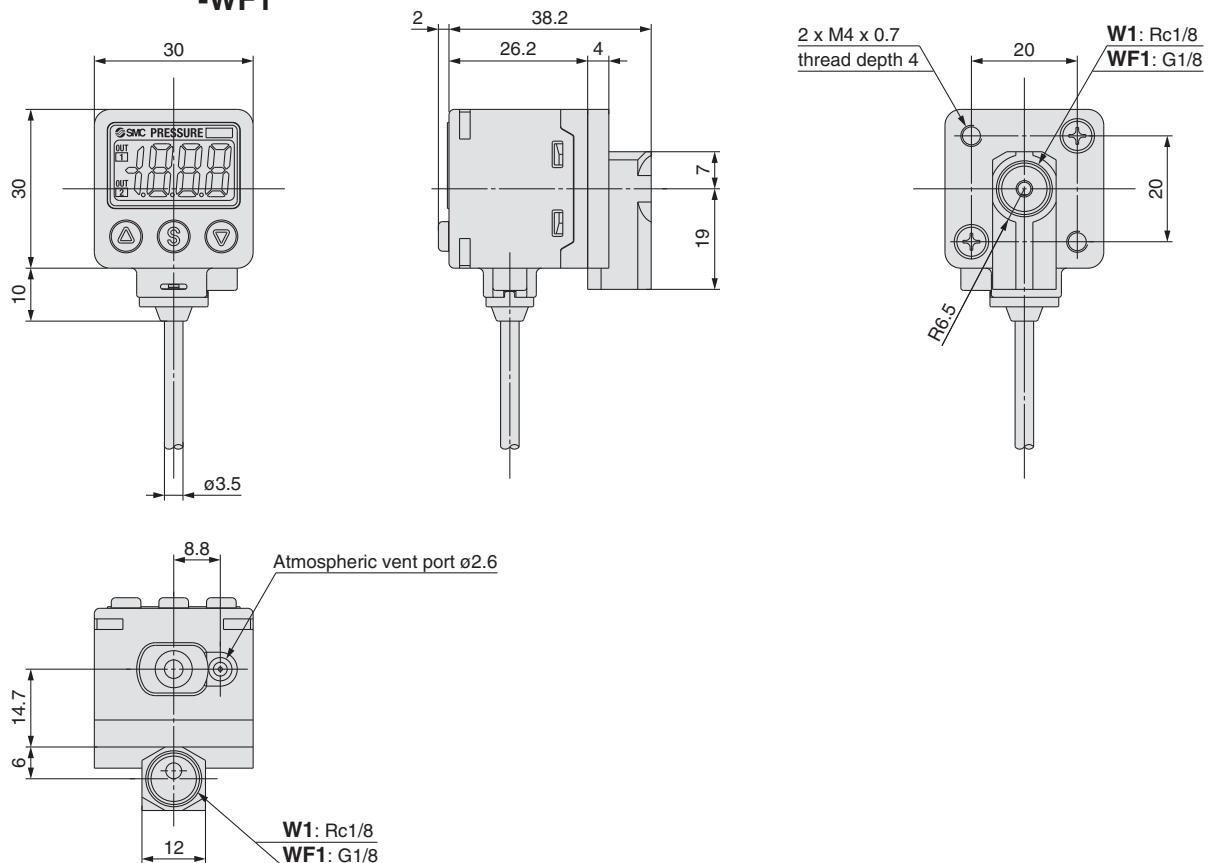
ZSE40A(F)/ISE40A-01

-N01



ZSE40A(F)/ISE40A-W1

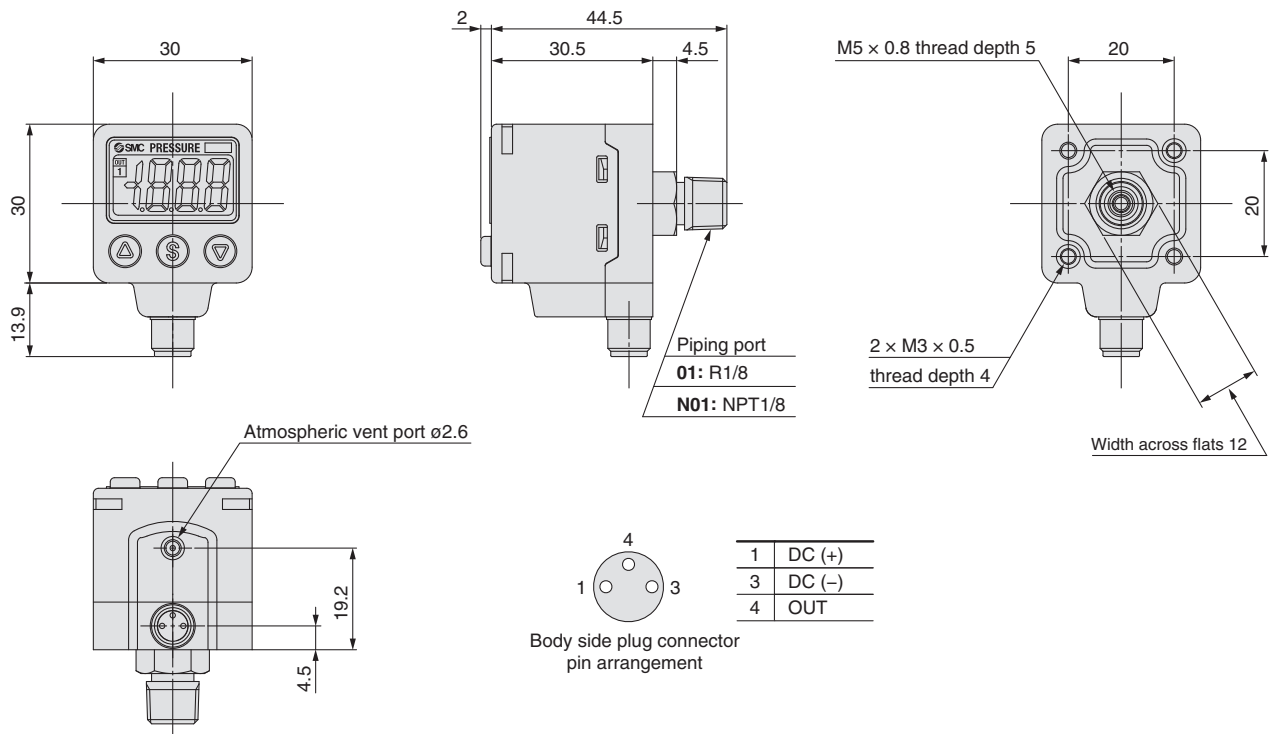
-WF1



Series ZSE40A(F)/ISE40A

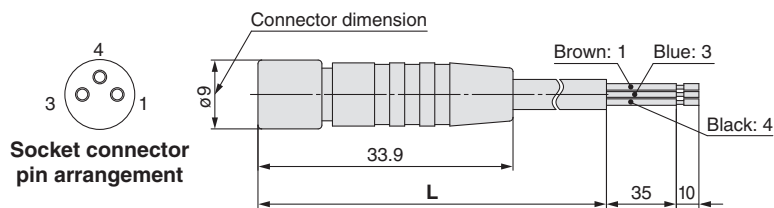
Dimensions: For M8 (3-pin) connector

ZSE40A/ISE40A-01-□-□L
-N01-□-□L



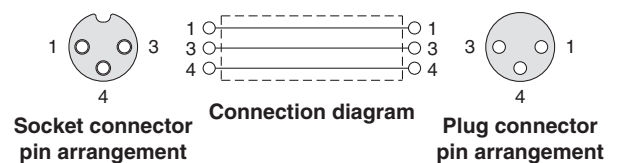
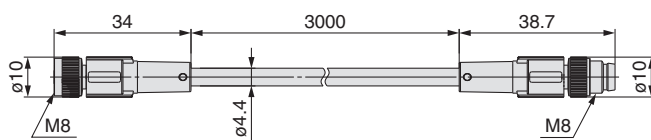
Cable with M8 (3-pin) connector

V100-49-1-□



Cable length (L)	Part no.
300mm	V100-49-1-1
500mm	V100-49-1-2
1000mm	V100-49-1-3
2000mm	V100-49-1-4
5000mm	V100-49-1-7

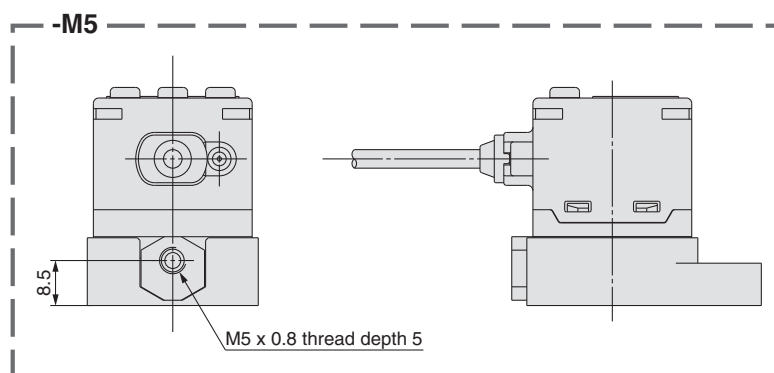
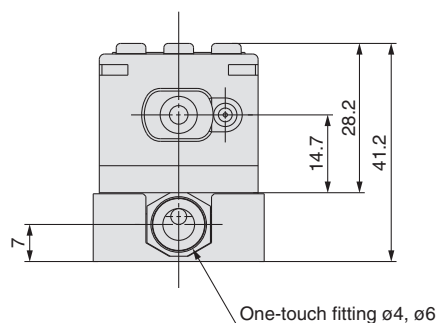
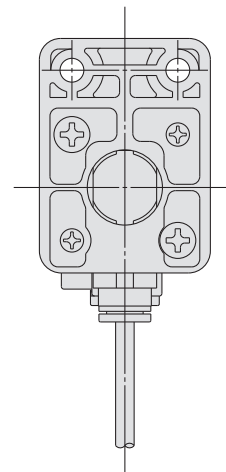
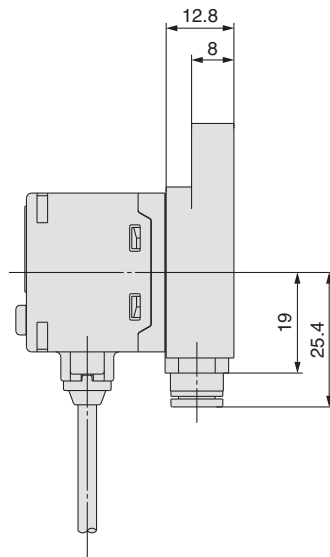
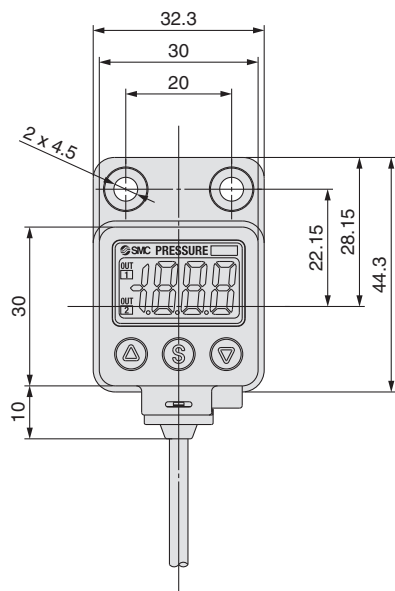
PCA-1557772



Series ZSE40A(F)/ISE40A

Dimensions (For details about lead wires, refer to the product specifications.)

ZSE40A(F)/ISE40A-C4 -C6

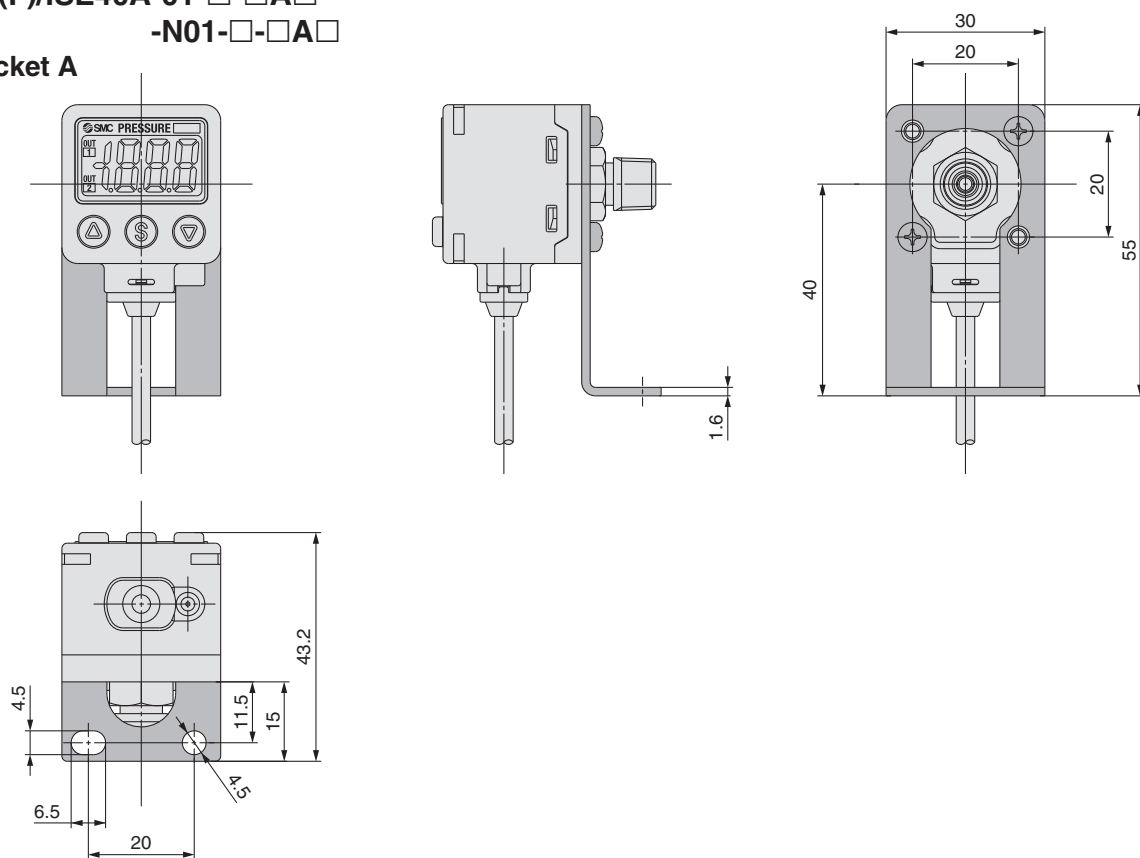


2-Color Display High-Precision Digital Pressure Switch *Series ZSE40A(F)/ISE40A*

Dimensions (For details about lead wires, refer to the product specifications.)

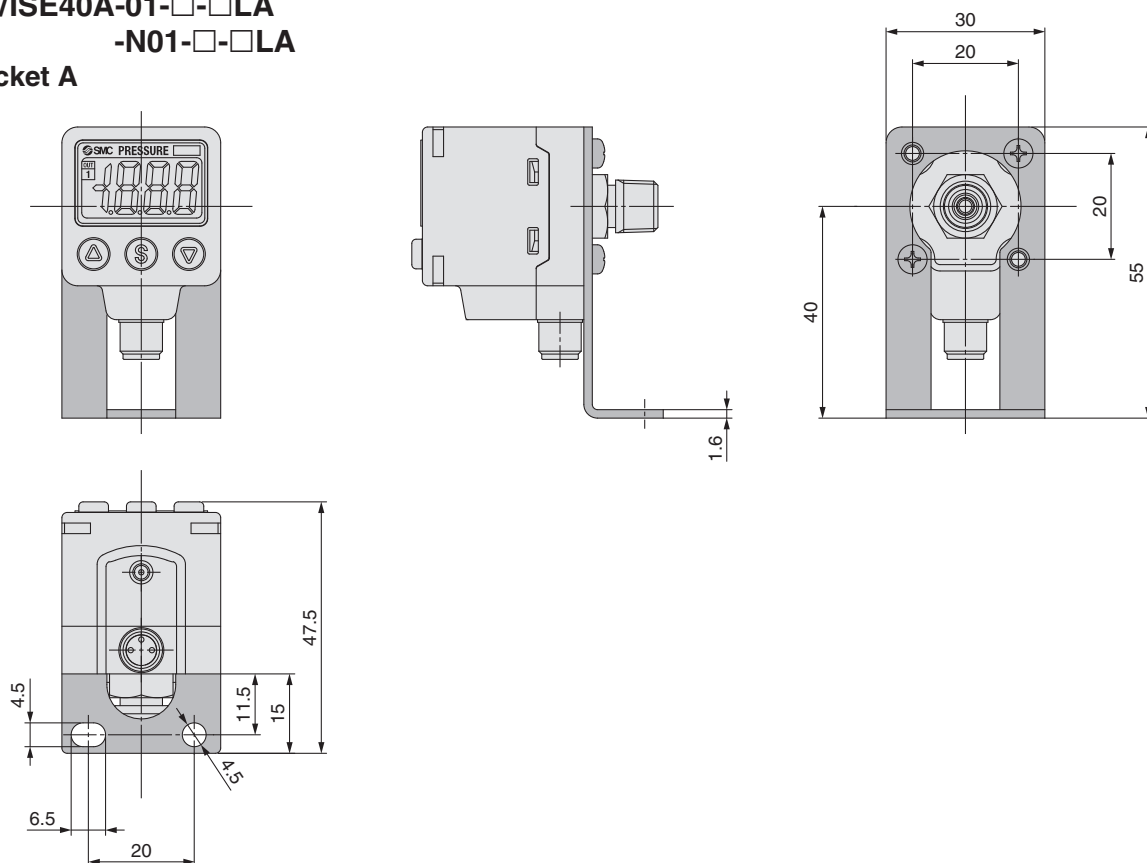
ZSE40A(F)/ISE40A-01-□-□A□
-N01-□-□A□

With bracket A



For M8 (3-pin) connector
ZSE40A/ISE40A-01-□-□LA
-N01-□-□LA

With bracket A



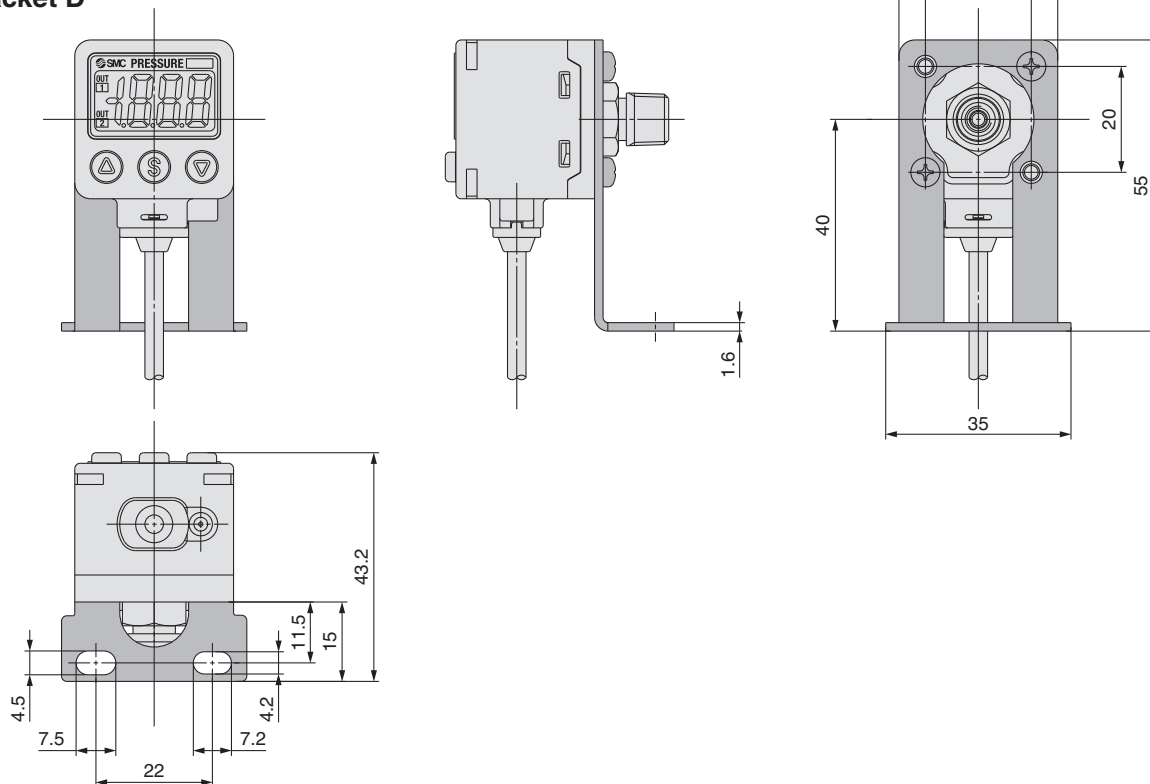
2-Color Display High-Precision Digital Pressure Switch *Series ZSE40A(F)/ISE40A*

Dimensions (For details about lead wires, refer to the product specifications.)

ZSE40A(F)/ISE40A-01-□-□D□

-N01-□-□D□

With bracket D

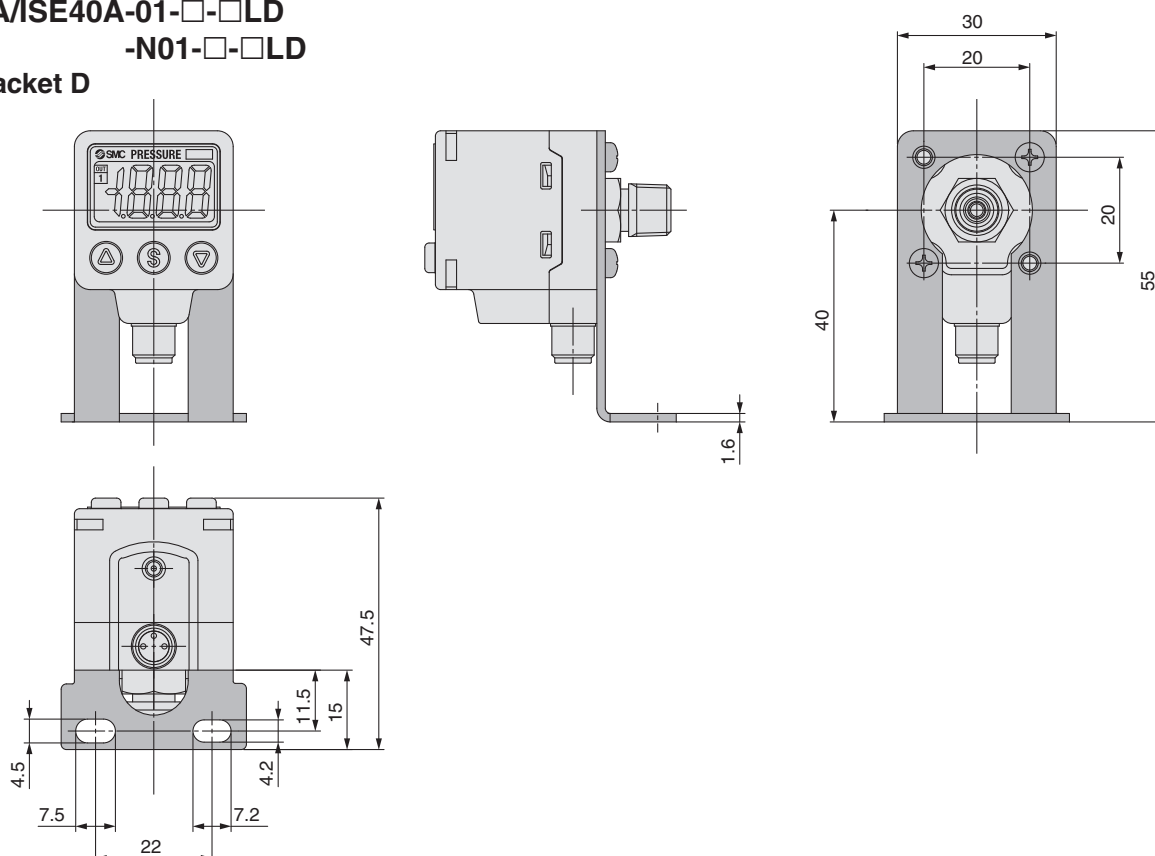


For M8 (3-pin) connector

ZSE40A/ISE40A-01-□-□LD

-N01-□-□LD

With bracket D

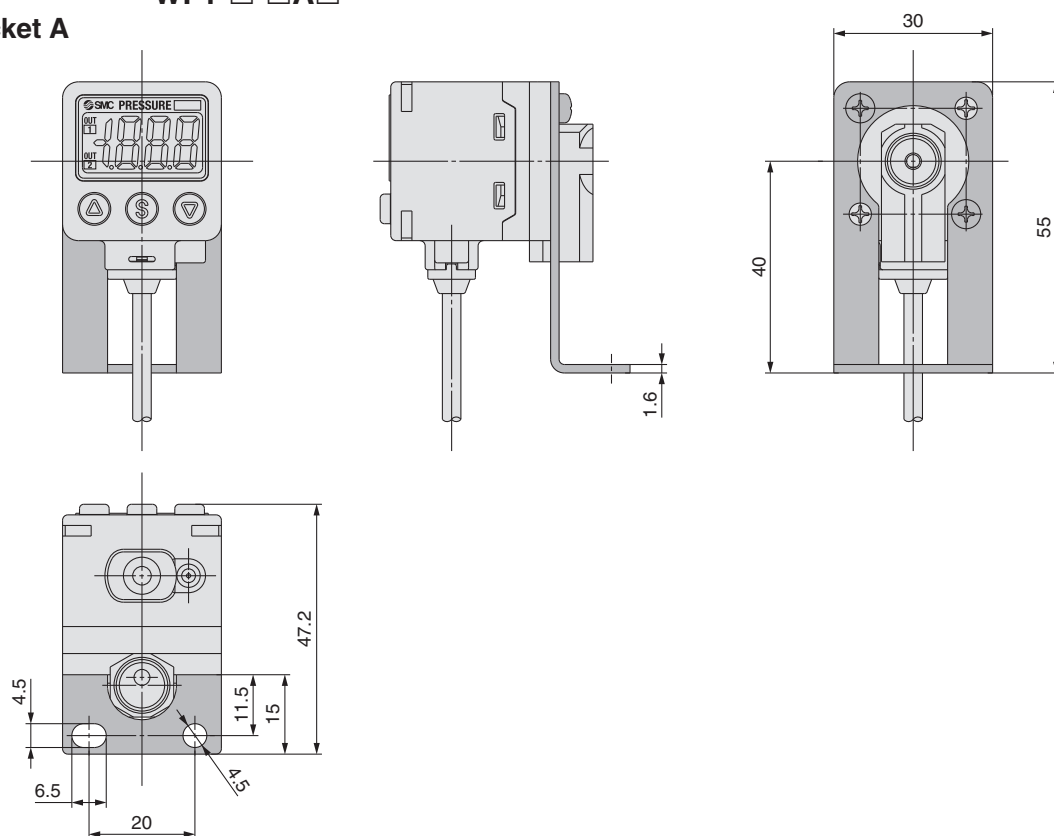


Series ZSE40A(F)/ISE40A

Dimensions (For details about lead wires, refer to the product specifications.)

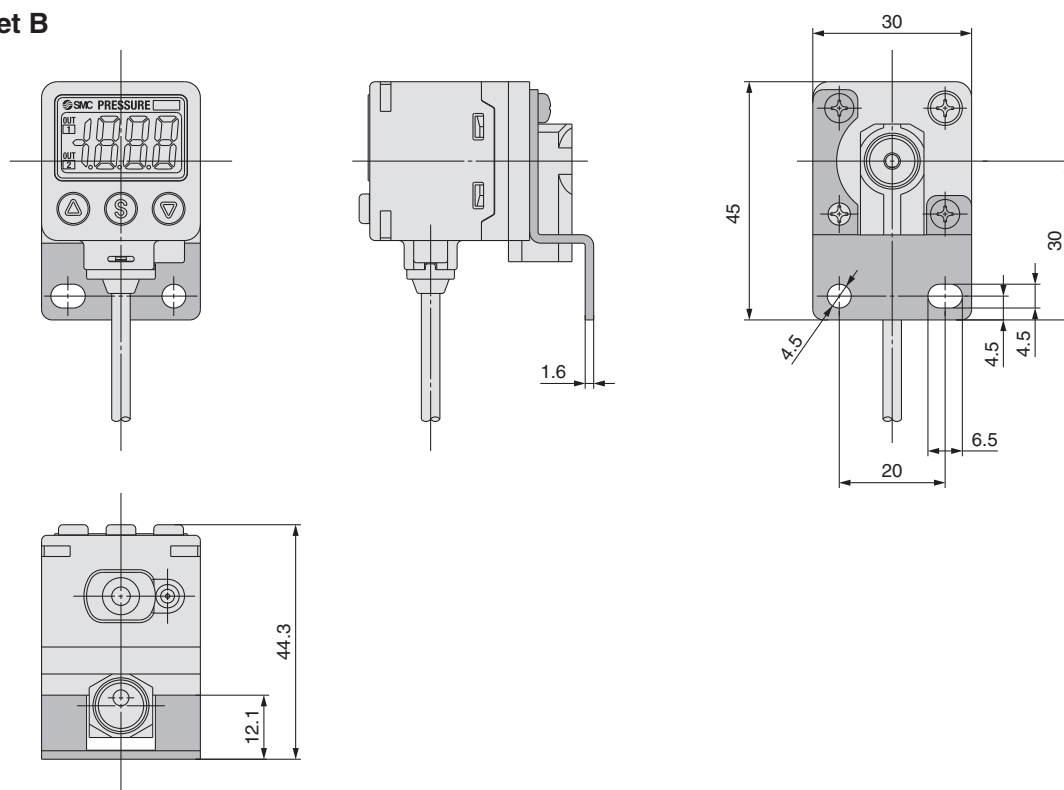
ZSE40A(F)/ISE40A-W1-□-□A□
-WF1-□-□A□

With bracket A



ZSE40A(F)/ISE40A-W1-□-□B□
-WF1-□-□B□

With bracket B

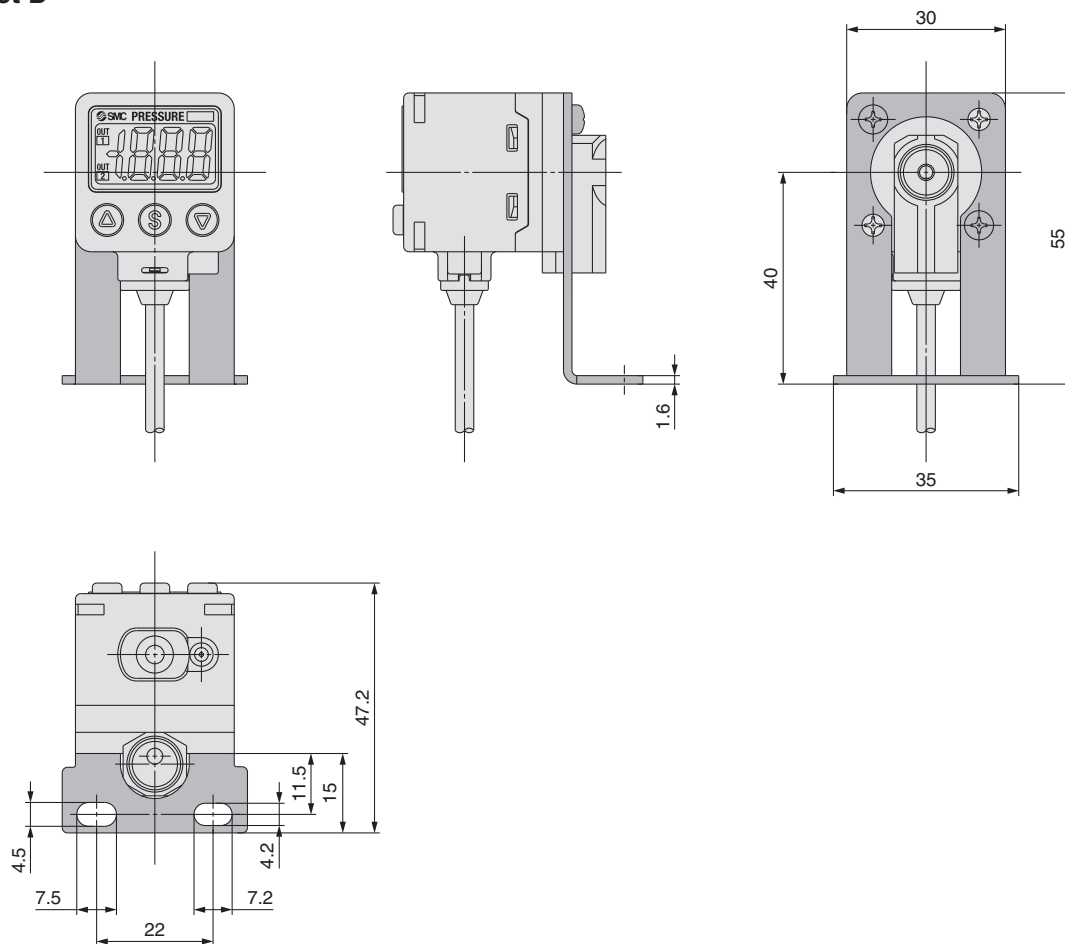


2-Color Display High-Precision Digital Pressure Switch *Series ZSE40A(F)/ISE40A*

Dimensions (For details about lead wires, refer to the product specifications.)

ZSE40A(F)/ISE40A-W1-□-□D□
-WF1-□-□D□

With bracket D



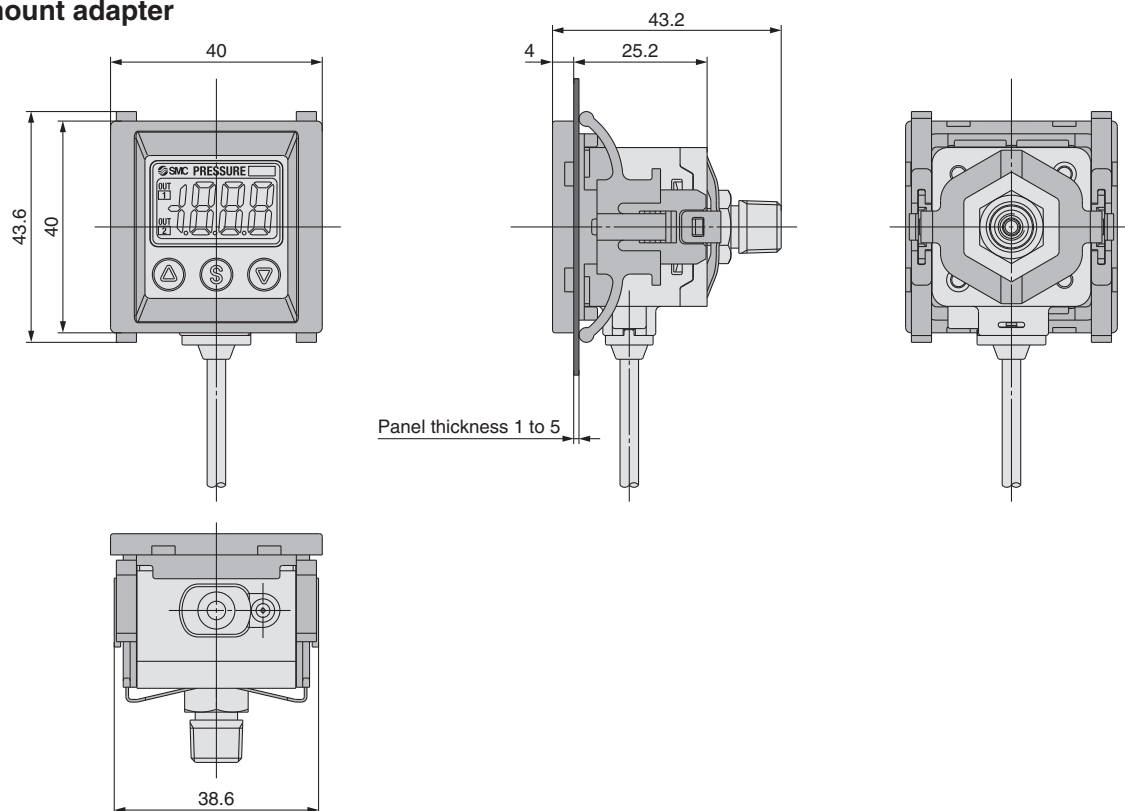
Series ZSE40A(F)/ISE40A

Dimensions (For details about lead wires, refer to the product specifications.)

ZSE40A(F)/ISE40A-01-□-□E□

-N01-□-□E□

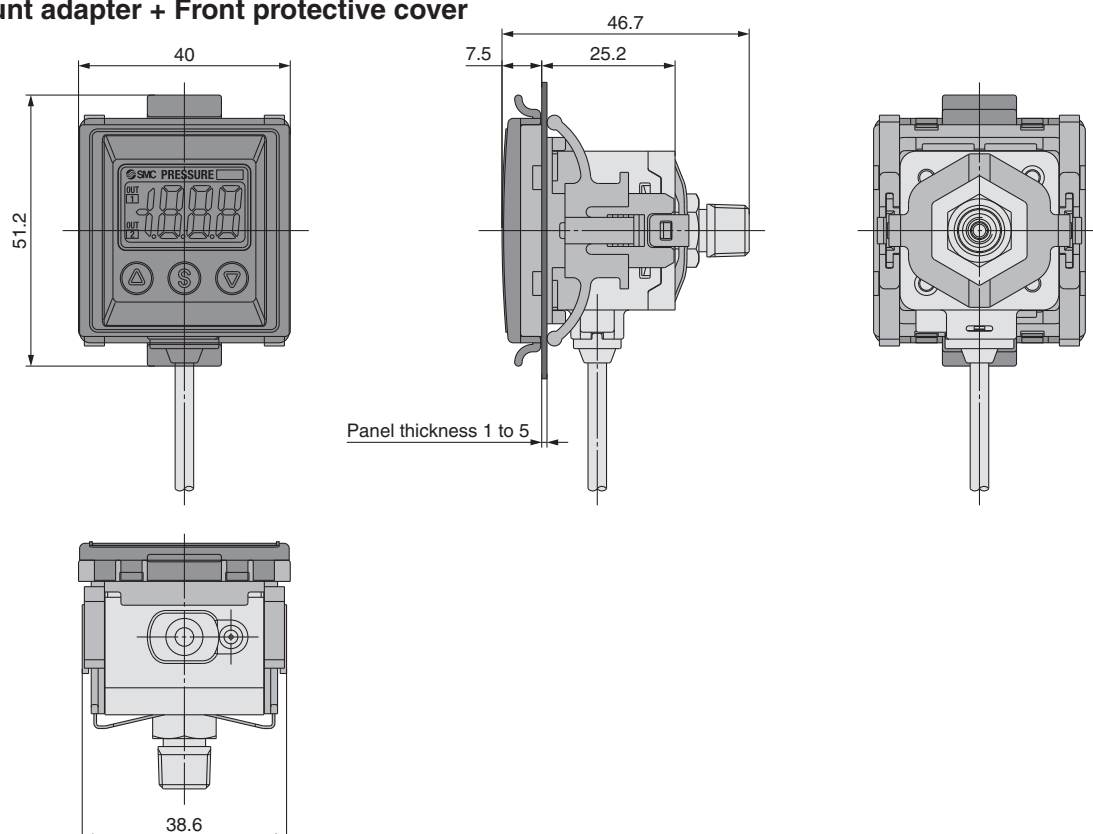
Panel mount adapter



ZSE40A(F)/ISE40A-01-□-□F□

-N01-□-□F□

Panel mount adapter + Front protective cover

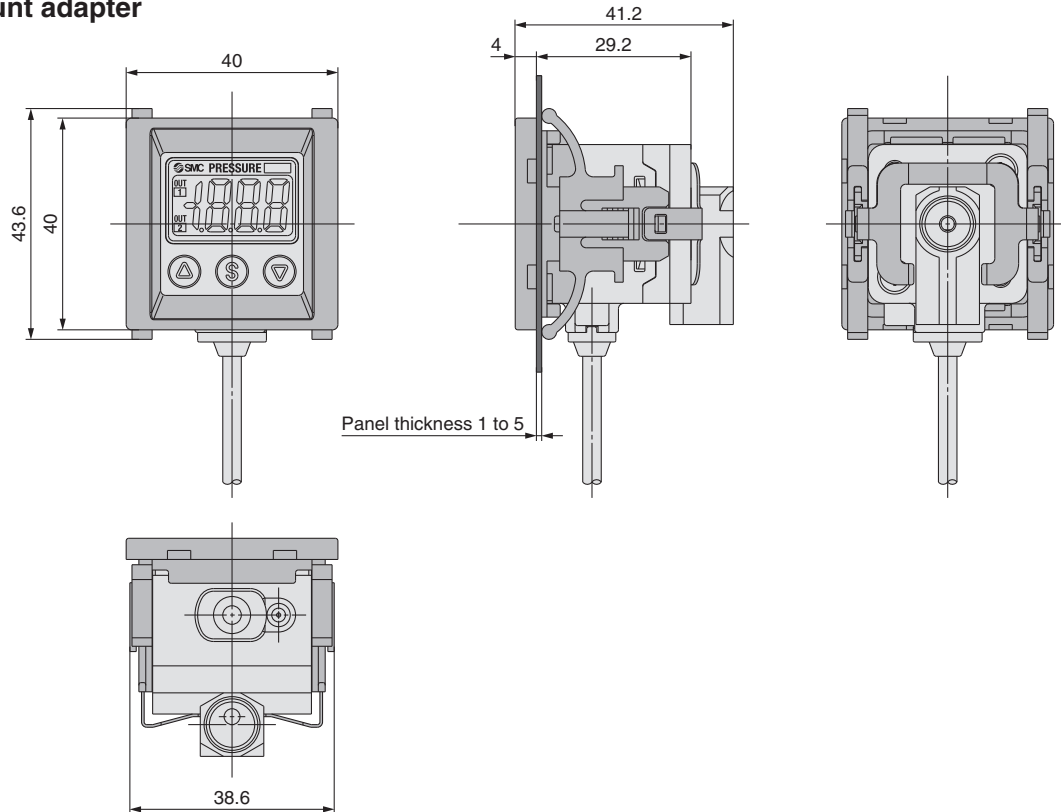


Dimensions (For details about lead wires, refer to the product specifications.)

ZSE40A(F)/ISE40A-W1-□-□E□

-WF1-□-□E□

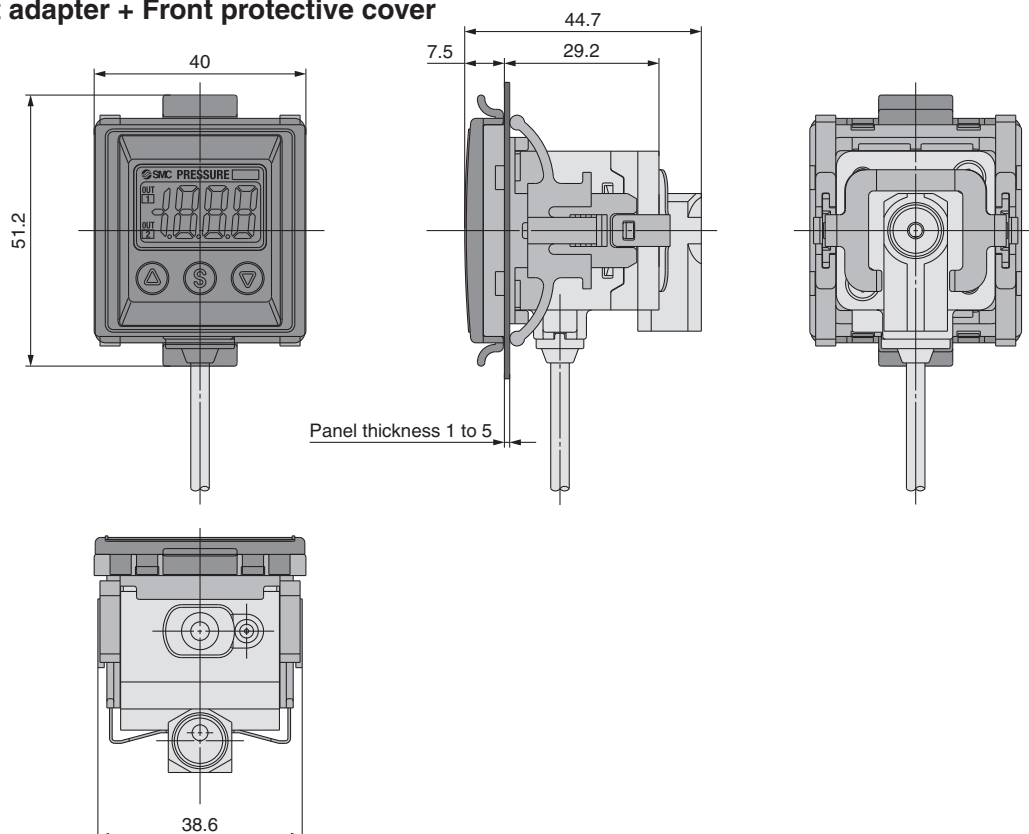
Panel mount adapter



ZSE40A(F)/ISE40A-W1-□-□F□

-WF1-□-□F□

Panel mount adapter + Front protective cover



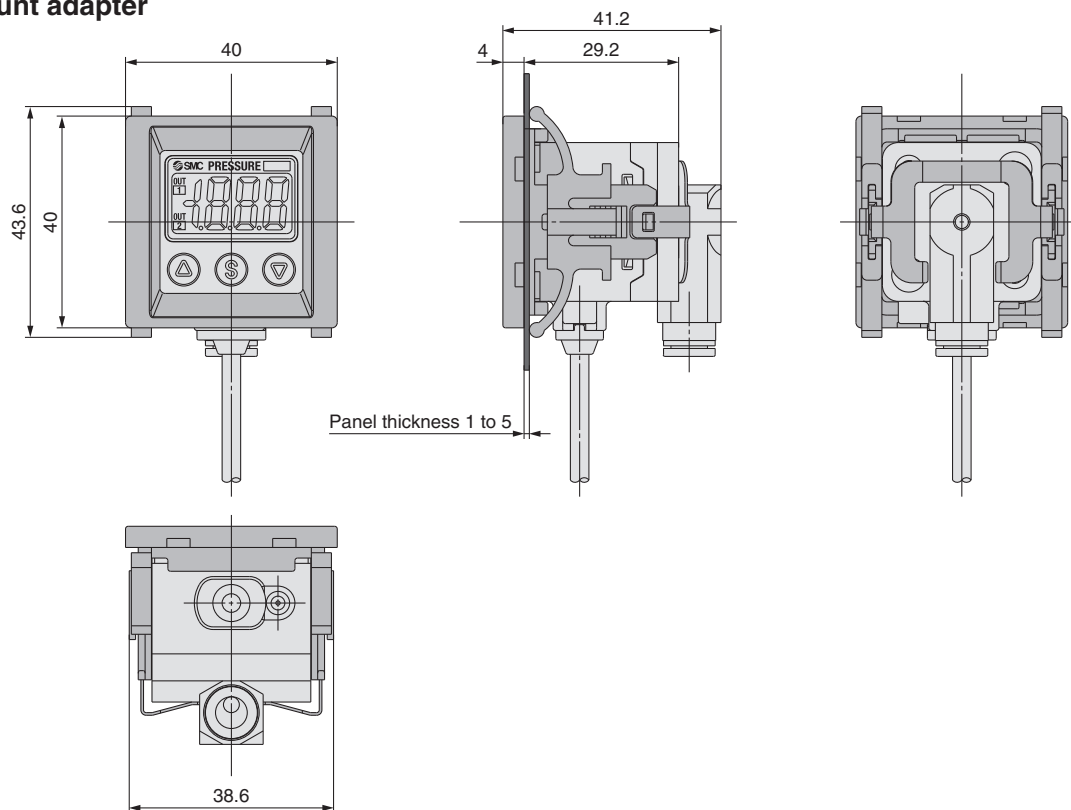
Series ZSE40A(F)/ISE40A

Dimensions (For details about lead wires, refer to the product specifications.)

ZSE40A(F)/ISE40A-C4-□E□

-C6-□E□

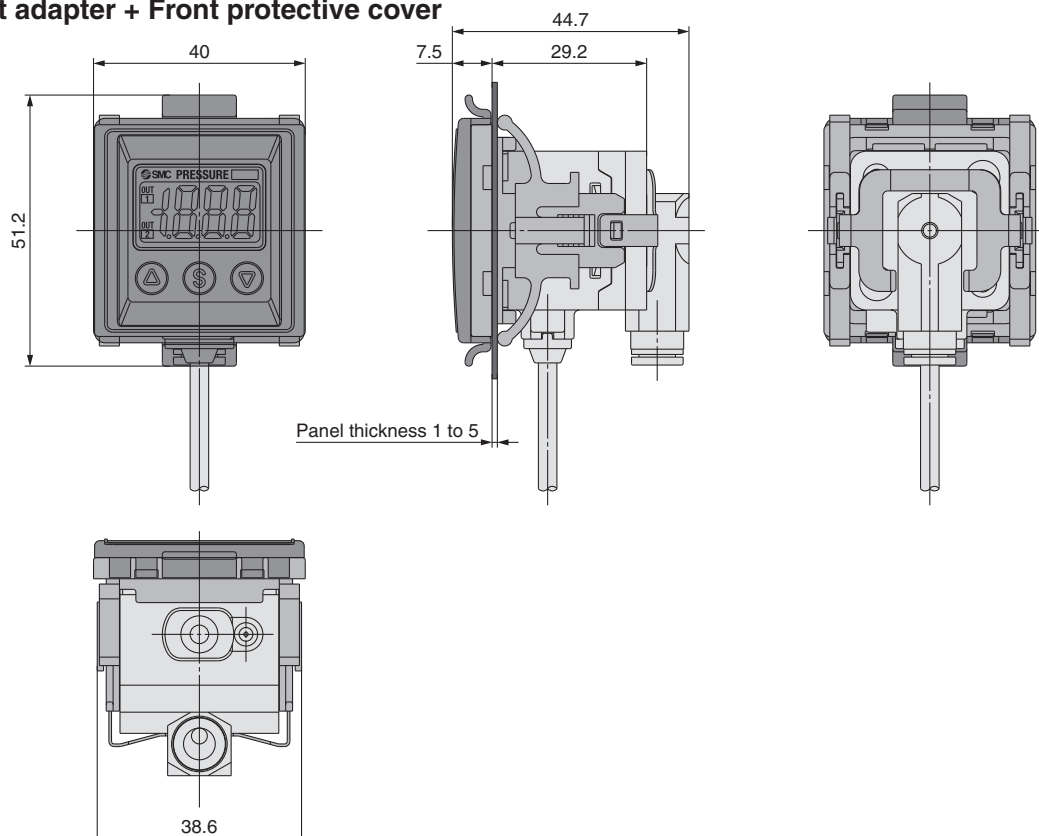
Panel mount adapter



ZSE40A(F)/ISE40A-C4-□F□

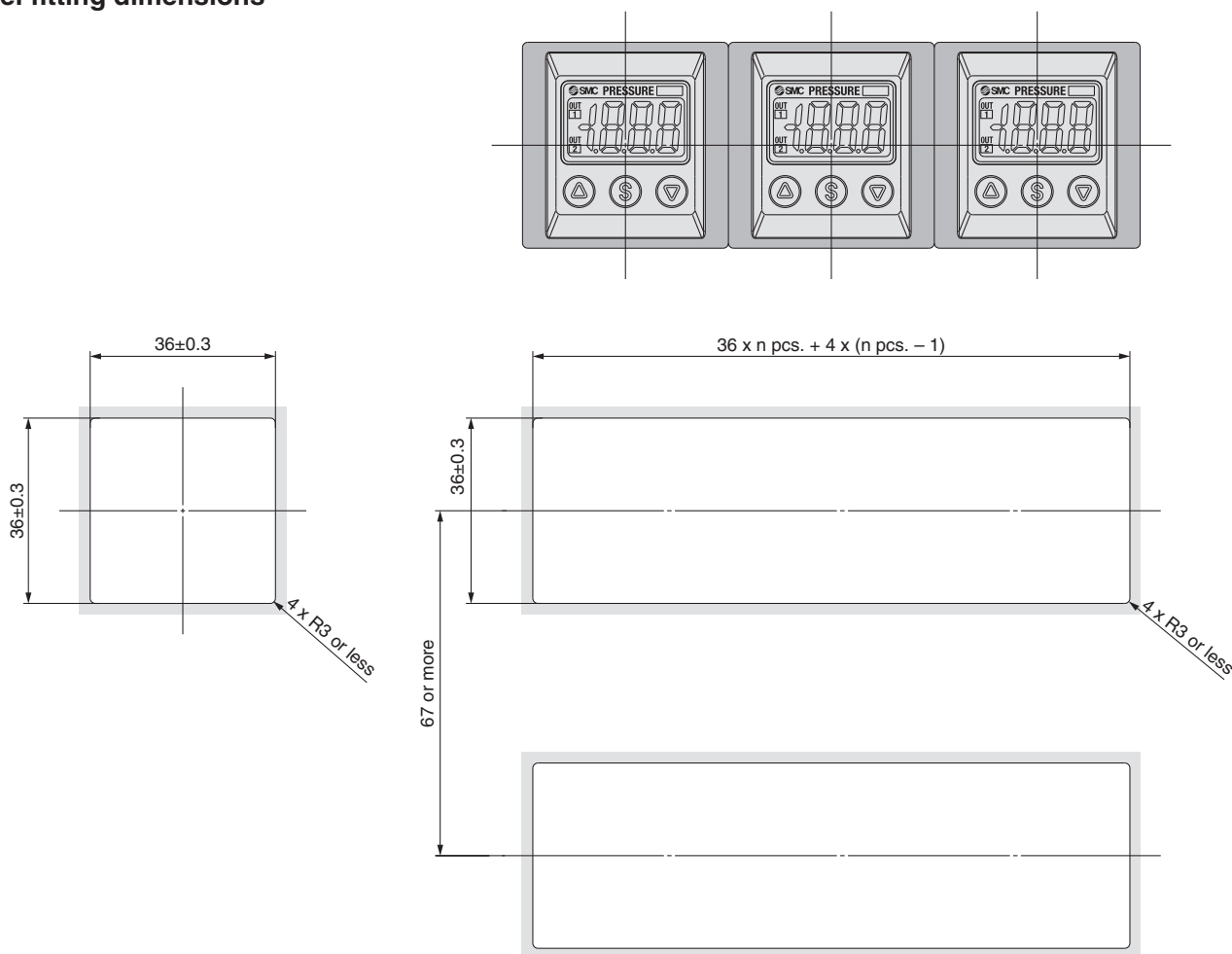
-C6-□F□

Panel mount adapter + Front protective cover



Dimensions

Panel fitting dimensions



Panel thickness 1 to 5 mm

Note) This is the minimum value for the piping method 01 or N01.

Take the piping material and tubing into account for design. When the corner is to have radius, it must be R3 or less.

The F in () shows the function code number. Refer to the operation manual for the details of operation procedures and function codes.

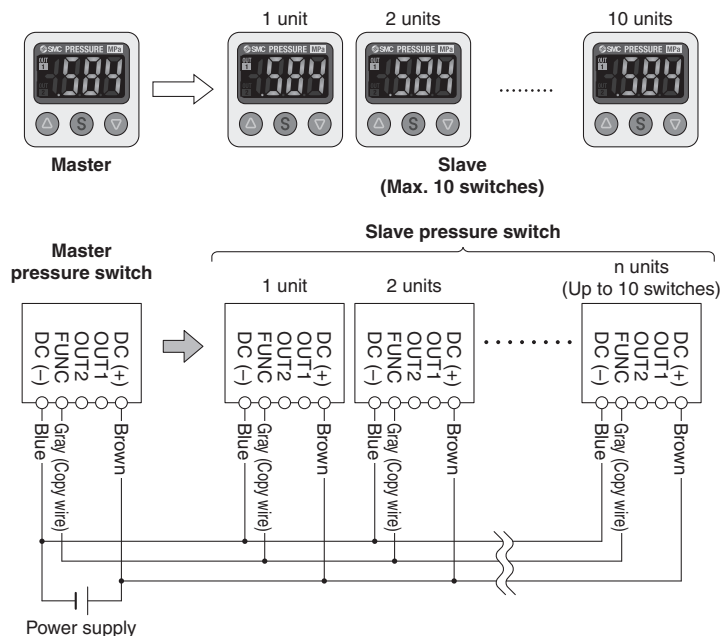
Function Details

A Copy function (F97)

The settings of the master sensor can be copied to the slave sensors, reducing setting labor and minimizing risk of mistakes in setting.

Can copy to up to 10 switches simultaneously.

(Maximum transmission distance 4 m)



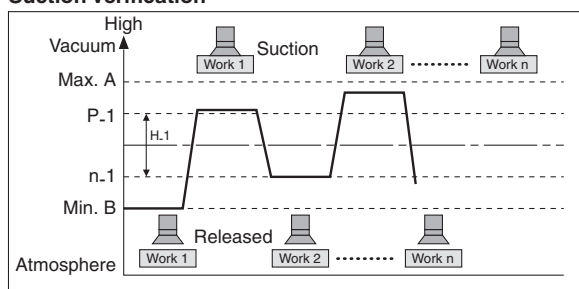
- 1) Wire as shown in the left figure.
- 2) Select the slave switch which is to be the master, and change it into a master using the buttons. (In the default setting, all switches are set as slaves.)
- 3) Press the **S** button of the master switch to start copying.

B Auto-preset function (F4)

Auto-preset function, when selected in the initial setting, calculates and stores the set-value from the measured pressure.

The optimum set-value is determined automatically by repeating vacuum and break with the target workpiece several times.

Suction Verification



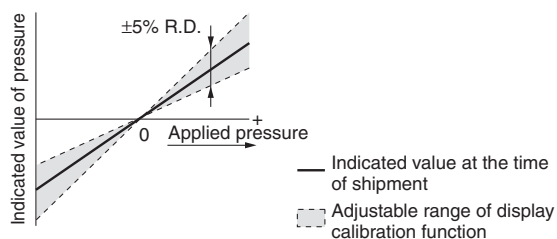
Formula for Obtaining the Set-Value

P_1 or P_2	H_1 or H_2
$P_1 (P_2) = A - (A-B)/4$	$H_1 (H_2) = (A-B)/2$
$n_1 (n_2) = B + (A-B)/4$	

C Display calibration function (F6)

Fine adjustment of the indicated value of the pressure sensor can be made within the range of $\pm 5\%$ of the read value.

(The scattering of the indicated value can be eliminated.)



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

D Peak/Bottom value indication

This function constantly detects and updates the maximum (minimum) value and allows to hold the maximum (minimum) pressure value.

When the **(Δ)** **(▽)** buttons are simultaneously pressed for 1 second or longer, while "holding", the hold value will be reset.

E Keylock function

Prevents operation errors such as accidentally changing setting values.

F Zero-clear function

This function clears and resets the zero value on the display of measured pressure.

For the pressure switch with analog output, the analog output shifts according to the indication. The indicated value can be adjusted within $\pm 7\%$ F.S. of the pressure when ex-factory. (ZSE40AF (for compound pressure) $\pm 3.5\%$ F.S.)

The F□ in () shows the function code number. Refer to the operation manual for the details of operation procedures and function codes.

G Error indication function

Error name	Error code	Description	Action
Overcurrent error	Er1	Load current of 80 mA or more is applied to the switch output (OUT1).	Eliminate the cause of the over current by turning off the power supply, and then turn on it again.
	Er2	Load current of 80 mA or more is applied to the switch output (OUT2).	
Residual pressure error	Er3	During zero-clear operation, pressure over $\pm 7\%$ F.S. is applied. (ZSE40AF (compound) $\pm 3.5\%$ F.S.) After 1 second, the mode will reset to measurement mode. $\pm 1\%$ F.S. of the zero-clear range varies between individual products.	Perform zero-clear operation again after restoring the applied pressure to an atmospheric pressure condition.
Applied pressure error	HHH	Supply pressure exceeds the maximum set pressure.	Reset applied pressure to a level within the set pressure range.
	LLL	Supply pressure is below the minimum set pressure.	
Auto-shift error	ar	The value measured at the time of auto-shift input is outside the set pressure range. * After displaying the error code for about 1 second, the switch returns to the measuring mode.	The controller does not respond to the auto-shift signal. Check the equipment and machinery for this point.
System error	Er0	Internal data error	Turn off the power supply and then turn on it again. If the failure cannot be solved, please contact SMC for investigation.
	Er4		
	Er6		
	Er7		
	Er8		
	Er9		

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

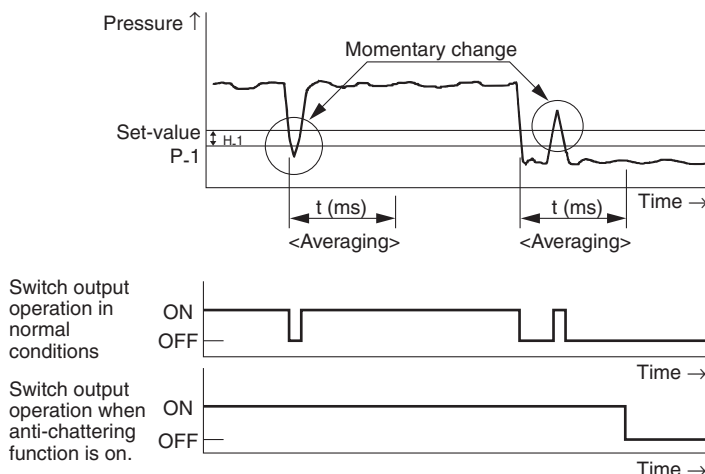
H Anti-chattering function (F3)

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
20 ms, 100 ms, 500 ms, 1000 ms, 2000 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.



I Display unit switching function (F0)

Display units can be switched with this function.

Display unit	PA		GF	bar	PSI	inH	mmH
Minimum unit setting	kPa	MPa*	kgf/cm ²	bar	psi	inHg	mmHg
ZSE40A (vacuum pressure)	0.1	0.001	0.001	0.001	0.01	0.1	1
ZSE40AF (compound pressure)	0.1	0.001	0.001	0.001	0.02	0.1	1
ISE40A (positive pressure)	1	0.001	0.01	0.01	0.1		

* The ZSE40A (vacuum pressure) and ZSE40AF (compound pressure) will have different setting and display resolution when the unit is set to MPa.

Function Details

The F□ in () shows the function code number. Refer to the operation manual for the details of operation procedures and function codes.

J Power-saving mode (F80)

Power-saving mode can be selected.

It shifts to the power-saving mode without button operation for 30 seconds. It is set to the normal mode (Power-saving mode is OFF.) when ex-factory. (Decimal points and operation indicator light (only when the switch output is turned ON.) blink in the power-saving mode.)

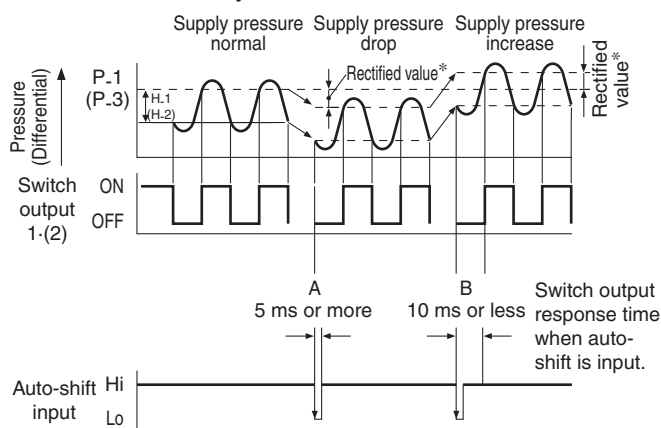
K Setting of secret code (F81)

Users can select whether a secret code must be entered to release key lock. At the time of shipment from the factory, it is set such that the secret code is not required.

L Auto-shift function (F5)

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 pressure at the time of auto-shift signal input and uses it as the reference pressure to correct the set-value on the switch.

Set-value correction by auto-shift function



* Rectified value

When the auto-shift is selected, "aaa" will be displayed for about 1 second, and the pressure value at that point will be saved as a rectified value "L_5". Based on the saved rectified values, the set-value^{Note)} of "P_1", "H_1", "P_2", and "H_2" will likewise be rectified.

Note) When an output is reversed, "n_1", "H_1", "n_2", "H_2" will be rectified.

Settable Range for Auto-Shift Input

	Set pressure range	Settable range
Compound pressure	-105.0 to 105.0 kPa	-210 to 210 kPa
Vacuum pressure	10.0 to -105.0 kPa	115.0 to -115.0 kPa
Positive pressure	-0.105 to 1.050 MPa	-1.155 to 1.155 MPa

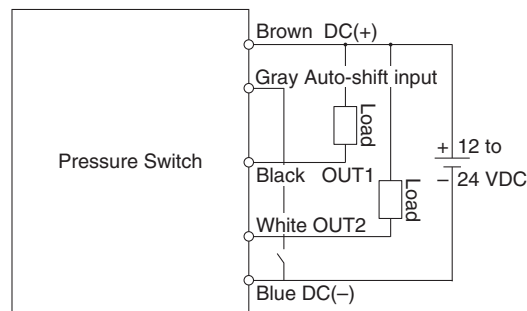
Auto-shift zero

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.

Connection examples of auto shift

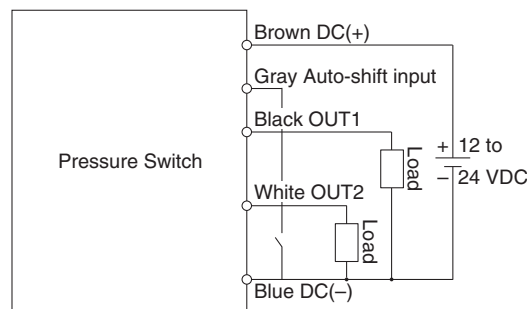
Output specification: -R/-S

NPN (2 outputs) + Auto-shift input



Output specification: -T/-V

PNP (2 outputs) + Auto-shift input



Series ZSE40A(F)/ISE40A

Made to Order

Please contact SMC for detailed dimensions, specifications, and lead times.



1 Lead wire length 3 m

Symbol
-X501

It has a lead wire extended to 3 meters.

How to Order

* Refer to "How to Order" on page 21 for standard specifications.

ZSE40A(F)/ISE40A - [] - [] - [] - X501

Piping specifications*

Output specifications*

Unit specifications/Option*

2 M12 4-pin pre-wired connector (Lead wire length 100 mm)

Symbol
-X531

How to Order

* Refer to "How to Order" on page 21 for standard specifications.

ZSE40A(F)/ISE40A - [] - [] - [] - X531

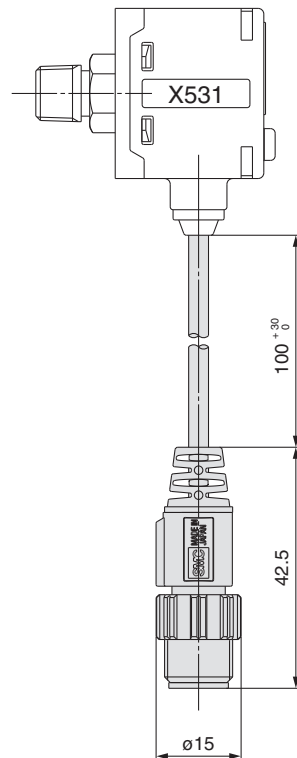
Piping specifications*

Unit specifications/Option*

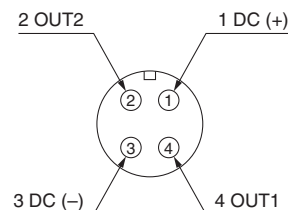
Output specifications

X: NPN open collector 2 outputs

Y: PNP open collector 2 outputs



Pin arrangement





Series ZSE40A(F)/ISE40A

Specific Product Precautions 1

Be sure to read before handling.

Refer to back page 1 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Pressure Switches Precautions.

Handling

⚠ Caution

1. Do not drop, bump, or apply excessive impacts (100 m/s²) while handling. Although the body of the sensor may not be damaged, the internal parts of the sensor could be damaged and lead to a malfunction.
2. The tensile strength of the cord is 49 N. Applying a greater pulling force on it can cause a malfunction. When handling, hold the body of the sensor—do not dangle it from the cord.
3. Do not exceed the screw-in torque of 7 to 9 N·m when connecting the pipe to the switch. Exceeding this torque may cause the switch to malfunction.
4. Do not use pressure sensors with corrosive and/or flammable gases or liquids.

Connection

⚠ Caution

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

Operating Environment

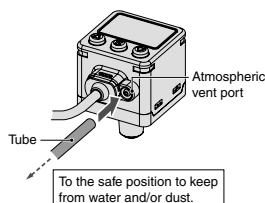
⚠ Warning

1. This pressure switch is CE marked; however, it is not equipped with surge protection against lightning. Lightning surge countermeasures should be applied directly to system components as necessary.
2. This pressure switch does not have an explosion proof rating. Never use in the presence of an explosive gas as this may cause a serious explosion.

Operating Environment

⚠ Caution

1. Do not use the product in a place where it could be splashed by oils or solvents.
2. When this pressure switch is used in a place where water and dust splash on, water and dust may enter inside the switch through the atmospheric vent port. Insert a $\phi 4$ tube (I.D. $\phi 2.5$) into the atmospheric vent port, and bring piping of the opposite side up to the safe position to keep it from water and dust. Do not bend the tube or close the hole of it. It causes malfunction with the measurement of positive pressure.



* Make sure that the tube is inserted to the end of the atmospheric vent port.

* Use SMC tubing, TU0425. (Material: Polyurethane, Tube O.D. $\phi 4$, I.D. $\phi 2.5$)

3. Take measures against static electricity with equipment when this switch is used in connection with resin piping. Also, the ground should be separate from that of the units that generate strong electromagnetic noise or high frequency, otherwise, the switch can be damaged by static electricity.



Series ZSE40A(F)/ISE40A

Specific Product Precautions 2

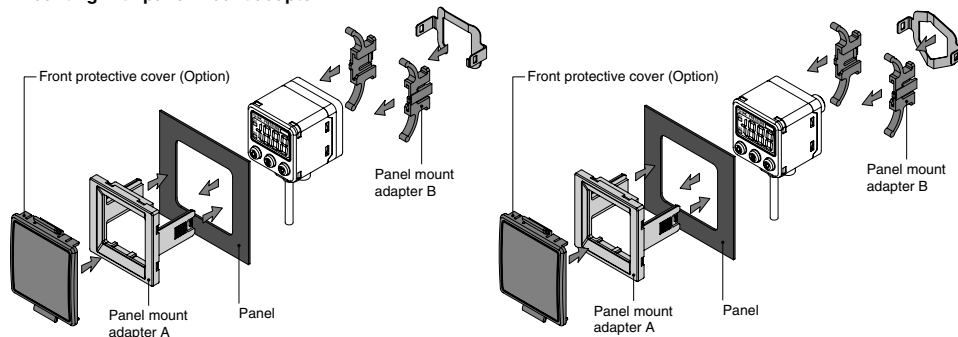
Be sure to read before handling.

Refer to back page 1 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Pressure Switches Precautions.

Mounting

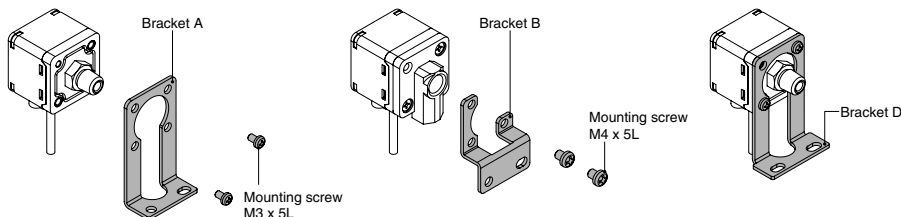
⚠ Caution

1. Mounting with panel mount adapter



2. Mounting with a bracket

Mount a bracket to the using two mounting screws and install on piping. The switch can be installed horizontally depending on the installation location.



The tightening torque for bracket mounting screw should be 0.5 to 0.7 N·m for M3 and 1.4 to 1.6 N·m for M4.

Set Pressure Range and Rated Pressure Range

⚠ Caution

Set the pressure within the rated pressure range.

The set pressure range is the range of pressure that is possible in setting.

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

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 set pressure range.

Switch	Pressure range					
	-100 kPa	0	100 kPa	500 kPa	1 MPa	
For vacuum pressure ZSE40A	-101.3 kPa	0				
	-105 kPa	10 kPa				
For compound pressure ZSE40AF	-100 kPa	100 kPa				
	-105 kPa	105 kPa				
For positive pressure ISE40A	-100 kPa				1 MPa	
	-105 kPa				1.05 MPa	
	(-0.105 MPa)					

■ Rated pressure range of switch
■ Set pressure range of switch