LED Readout

Digital Pressure Switch

Series ZSE4E

(For vacuum)

ISE4E

(For positive pressure)

For General Pneumatics

Push-button calibration with easy to read LED Readout.

Auto preset function

By pressing the set button, the sensor response to air fluctuations, calculates an average and the switch displays the calculated pressure.

Two independent outputs

Allows the calibration of 2 different setpoints. (e.g. Change of vacuum pad size requiring different setpoints or two different supply pressures requiring different pressure confirmation points.)

Choice of display units

Display units can be easily selected and changed, making these switches globaly acceptable.

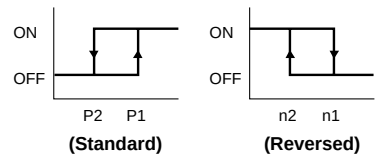
Vacuum	**kPa ⇔ mmHg ⇔ PSI ⇔ bar ⇔ InHg ⇔ kgf/cm²**
Positive press. (High)	**MPa ⇔ kgf/cm² ⇔ PSI ⇔ bar**
Positive press. (Low)	**kPa ⇔ kgf/cm² ⇔ PSI ⇔ bar**

Lock out mode

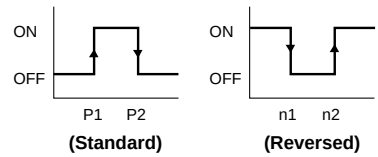
Prevents unauthorized changes to the calibration parameters.

Variety of switch output modes

Hysteresis mode



Window comparator mode



Exact detection of atmospheric pressure (For vacuum)

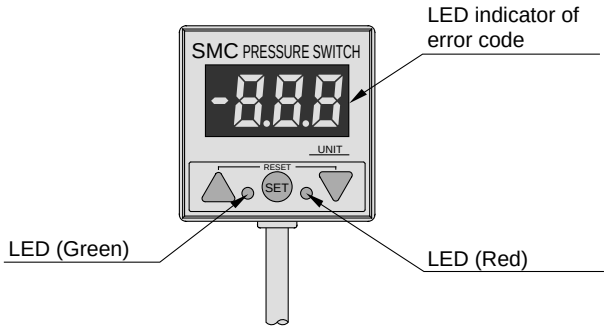
Atmospheric pressure can be immediately detected after vacuum release pressure is applied.

Self-diagnostic function

■**Over-voltage**

■**Over-pressure**

■**Data error**



Calibration data

The calibration data is stored in an EEPROM. The EEPROM is rated to keep its memory for 100,000 hours (approx. 11 years) without having power supplied.

Panel mounting available

A special adaptor permits panel mounting.

Dust/Splash proof cover (Optional)

Refer to the p.3.2-21 to 3.2-24.

How to Order

Setting pressure range

—	–0.1 to 1MPa
L	–10 to 100kPa

Positive pressure ISE4 □ E □ — □ — □ □

Vacuum ZSE4 E □ — □ — □ □

Style

—	Standard
D*	Dust/Splash proof

*Refer to p.3.2-24 for the dust/splash proof specifications(IP66).

Lead wire length (Grommet)

—	0.6m
L	3m

Port size

01	R 1/8
T1	NPTF 1/8

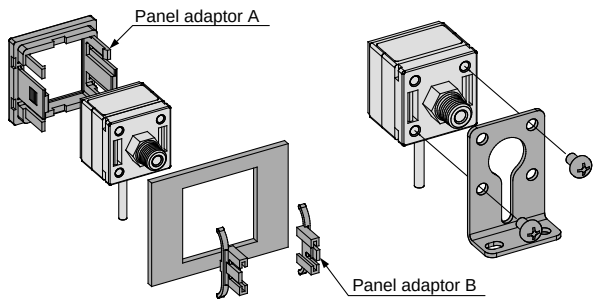
Note) Standard: M5 x 0.8 (Female)

Output specifications

26	Analog output (1 to 5V)
27	NPN Open collector/2 outputs
67	PNP Open collector/2 outputs

Panel mount adaptor No.
(Panel adaptor A + Panel adaptor B)
ZS-22-A
Panel adaptor A ·····ZS-22-01
Panel adaptor B ·····ZS-22-02

Bracket No.
(With two M4 mounting threads)
ZS-22-B



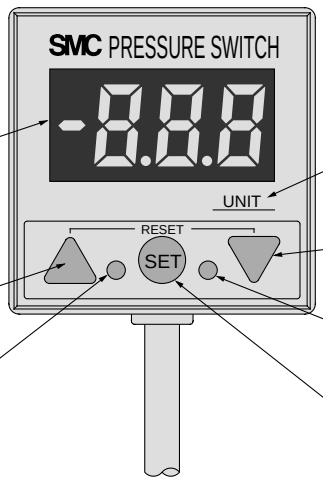
Specifications

Model		Vacuum ZSE4E	Positive pressure: 100kPa ISE4LE	Positive pressure: 1MPa ISE4E
Operating pressure		10 to –101kPa	–10 to 100kPa	–0.1 to 1MPa
Max. pressure		200kPa		1.0MPa
Min. display unit	kPa	1	1	–
	MPa	–	–	0.01
	mmHg	5	–	–
	kgf/cm²	0.01	0.01	0.1
	InHg	0.2	–	–
	PSI	0.1	0.1	1
	bar	0.01	0.01	0.1
Indicator light		ON: When Green (LED: OUT1 or Red: OUT2) turns on		
Frequency response		200Hz (5ms)		
Hysteresis	Hysteresis mode	Adjustable (Setting available from Hysteresis 0)		
	Window comparator mode(1)	Fixed (3 digits)		

Fluid	Air, Non corrosive gases
Temperature characteristics	±3% F.S. or less
Repeatability	±1% F.S. or less
Supply voltage	12 to 24V DC (Ripple ±10% or less)
Output specification	NPN open collector 30V, 80mA or less PNP open collector 80mA or less
Current consumption	–26, –27: 50mA or less, –67: 60mA or less
Error display	Green/Red light blinks. Display the error code on LED.
Pressure display	3 1/2 digits (8mm-size numerals)
Self diagnostic function	Over current(2), Over pressure, Data error, Pressure applied during zero out
Operating temperature range	0 to 50°C (No condensation)
Noise resistance	500Vp-p, Pulse width: 1μS, Standing: 1nS
Voltage resistance	Between external terminals and housing 1000V AC, 50/60Hz for 1 min.
Insulation resistance	Between external terminals and housing 2MΩ(500V DC by megameter)
Vibration resistance	10 to 500Hz Pulse width 1.5mm or acceleration 98m/s² (smaller vibrations) to X, Y, Z directions (2 hrs)
Shock resistance	980m/s² to X, Y, Z direction (3 times for each direction)
Lead wire	Grommet oil-resistant vinyl cabtire code -26 ø3.4 0.2mm² 3 core, -27, -67 ø35 0.14 mm² 4 core
Weight(3)	Standard: 45g(including 0.6m-long lead wire), Dust/Splash proof: 110g
Port size	01: R(PT)1/8, M5 X 0.8 T1: NPTF1/8, M5 X 0.8
Protective construction(3)	Standard: IP40, Dust/Splash proof: IP66

Note 1) ●Window comparator mode:
The hysteresis is 3 digits, separate P1 from P2 by 7 digits or more and set them.
1 digit is the minimum pressure display unit. (See the table above.)
Note 2) ●Analog output has no overcurrent detection function.
Note 3) ●Refer to the p.3.2-21 to 3.2-24 for the details about the dust/splash proof specifications.

Description



RESET key
Press the UP and DOWN buttons simultaneously to reset the switch. Clears abnormalities. Display is "0".

LED
Displays mode.
Displays present pressure.
Displays error code.

UP key
Increases ON/OFF set point.
Switches to the peak holding mode.

LED (Green)
Displays switch operation condition at OUT1. Blinks on and off when an error occurs.

UNIT
After selecting a unit, place a unit sticker here.

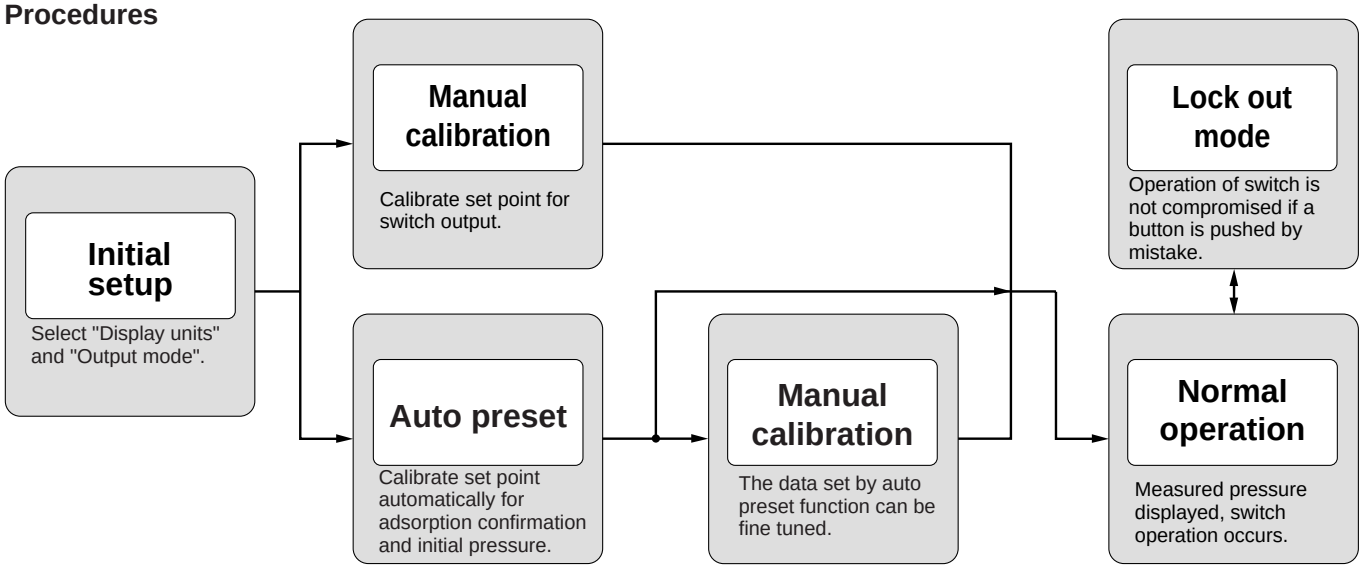
DOWN key
Decreases ON/OFF set point.
Used for unit change and output mode change.

LED (Red)
Displays switch operation condition at OUT2. Blinks on and off when an error occurs.

SET key
Changes the mode of operation.

Calibration Procedures

Procedures

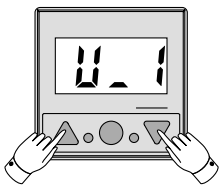


Initial setup

1. Initial setup mode

Press the "SET" button for 1 to 2 seconds until "U- □"is displayed.

2.Selection of "Display units"

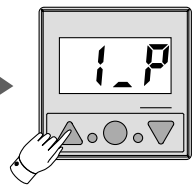


Select "Display units" by pressing the ▲ button or the ▼ button.

U- □ └ Units

(Refer to **Table1**.)

3. Selection of "OUT1 output mode"



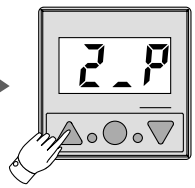
Select "OUT1 output mode" by pressing the ▲ button.

1-P: Normal mode

1-n: Reversed output mode

(Refer to **Table2**)

4. Selection of "OUT2 output mode"



Select "OUT2 output mode" by pressing the ▲ button.

2-P: Normal mode

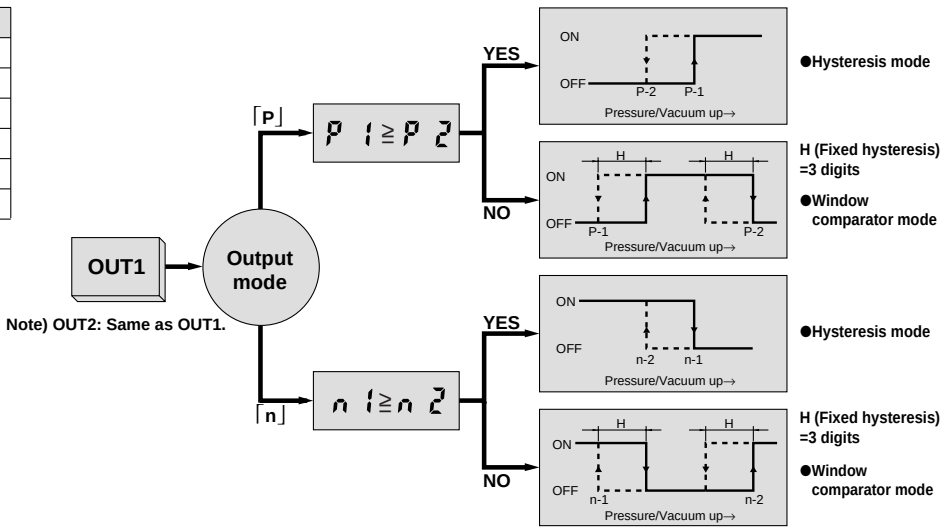
2-n: Reversed output mode

By pressing the "SET" button, the calibration is completed.

Table1

No.	ZSE4E	ISE4LE	ISE4E
1	kPa	kPa	MPa
2	kgf/cm²	kgf/cm²	kgf/cm²
3	bar	bar	bar
4	PSI	PSI	PSI
5	InHg	——	——
6	mmHg	——	——

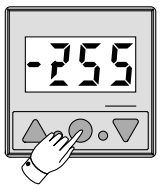
Table2 Output mode



Calibration Procedures

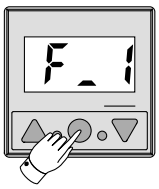
Manual calibration

1. Calibration value input mode (Manual)



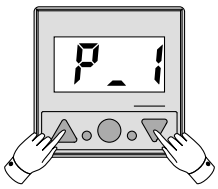
Press the "SET" button until "F_1" is displayed.

2.Preparation of manual setting



"F_1" is for manual setting, so press the "SET" button one more time.

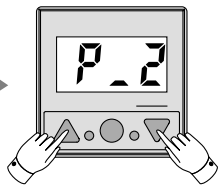
3.Input set point value for OUT1(1)



▲ button: Increase set point value
▼ button: Decrease set point value
"P_1" alternates with set point value.

4. Input set point value for OUT1(2)

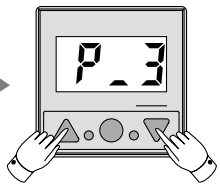
SET



▲ button: Increase set point value
▼ button: Decrease set point value
"P_2" alternates with set point value.

5. Input set point value for OUT2(1)

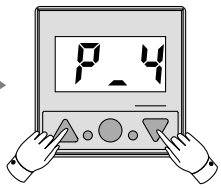
SET



▲ button: Increase set point value
▼ button: Decrease set point value
"P_3" alternates with set point value.

6. Input set point value for OUT2(2)

SET



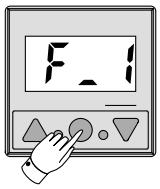
SET

By pressing the "SET" button, the calibration is completed.

▲ button: Increase set point value
▼ button: Decrease set point value
"P_4" alternates with set point value.

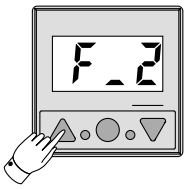
Auto preset (In case of the adsorption confirmation)

1. Calibration value input mode



Press the "SET" button until "F_1" is displayed.

2. Auto preset mode



Select "F_2" by pressing the ▲ button.

3.Preparation for auto preset

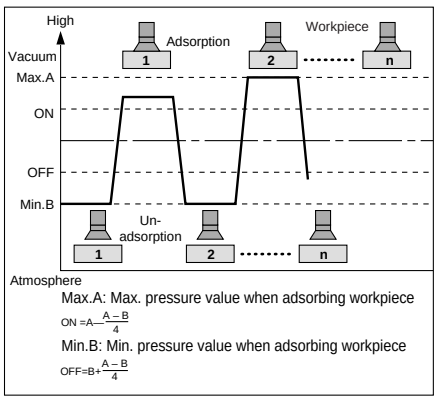
SET

When the initial condition for adsorption confirmation are met, press the "SET" button.
(Press the ▲ button and ▼ button at once when it is not required to calibrate OUT1.)

4. OUT1 auto preset

SET

Repeat the steps of adsorption and no adsorption several times. This will set the best values automatically.



5. Preparation for auto preset

SET

After pressing, OUT1 auto preset is completed.

When the initial conditions for adsorption confirmation are met, press the "SET" button.
(Press the ▲ button and ▼ button at once when it is not required to calibrate OUT2.)

6. OUT2 auto preset

SET

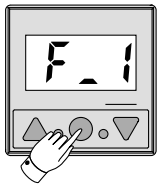
SET

After pressing the "SET" button, OUT2 auto preset is completed.

Repeat the steps of adsorption and no adsorption several times.
This will set the best values automatically.

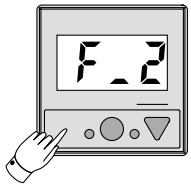
Auto preset (In case of the initial pressure confirmation)

1. Calibration value input mode



Press the "SET" button until "F_1" is displayed.

2. Auto preset mode



Select "F_2" by pressing the ▲button.

3. Preparation for auto preset

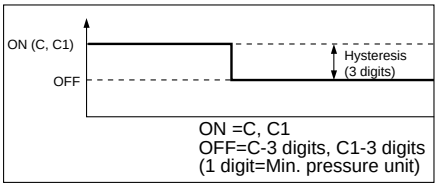
SET

When the initial conditions for adsorption confirmation are met, press the "SET" button.
(Press the ▲ button and ▼ button at once when it is not required to calibrate OUT1.)

4. OUT1 auto preset

SET

The best values can be set automatically.



5. Preparation for auto preset

SET

OUT1 auto preset is complated.

When the initial conditions for adsorption confirmation are met, press the "SET" button.
(Press the ▲ button and ▼ button at once when it is not required to calibrate OUT2.)

6. OUT2 auto preset

SET

The best values can be set automatically.

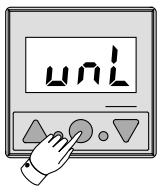
SET

After pressing the "SET" button, OUT2 auto preset is completed.

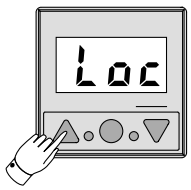
Other functions

●**Lock out mode** ---------- **Prevents the wrong operation.**

Lock out



Press the "SET" button for more than 2 seconds until the display changes to "F_1 U_1"and then "unL".

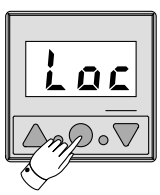


Select "Loc" by pressing the ▲ button.

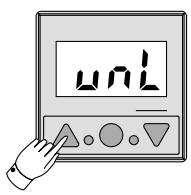
SET

Calibration is completed.

Lock out release



Press the "SET" button for more than 2 seconds until is displayed.



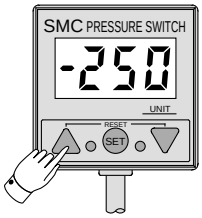
Select "unL" by pressing the ▲ button.

SET

Calibration is completed.

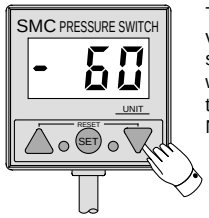
Other Functions

●Peak Mode High



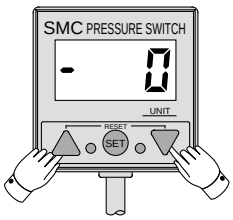
To display the high peak pressure (highest degree of vacuum), press the UP button for at least 1 second during normal operation. The LED indicator will blink. To return back to normal operation press the UP button for at least 1 second again.
Note) There is no "High" or "Low" indication on the display.

●Peak Mode Low



To display the low peak pressure (lowest degree of vacuum), press the DOWN button for at least 1 second during normal operation. The LED indicator will blink. To return back normal operation, press the DOWN button for at least 1 second again.
Note) There is no "High" or "Low" indication on the display.

●Reset Function



Simultaneously pressing the UP and DOWN button will reset the switch.
1) Reset will cause the following during normal operation:
- ●Peak high is cleared.
  Peak low is cleared.
  Zero is reset.

2) Reset will cause the following when error has occured:
- ●Switch will assume normal operation (all calibration data has retained).
- ●In case of data error, reset the setup mode and then switch will assume normal operation.

Note) In the setup mode, the reset function does not work.

Error Codes

Error codes

Display	Cause	Solution
Er 4	Calibration was changed by accident, reason unknown.	Push the Up and Down buttons to reset all the data.
(1) Er 1	Output 1 output current is exceeding 80mA.	Turn off the power and verify the load connected output 1.
	Output 1 (Back wire) could be shorted out.	Verify that the output is not shorted out and then reset the switch.
(1) Er 2	Output 2 output current is exceeding 80mA.	Turn off the power and verify the load connected output 2.
	Output 2 (white wire) Could be shorted out.	Verify that the output is not shorted out and then reset the switch.
Er 3	Max. operating pressure has been exceeded for more than 2 seconds. 1.5 X Max. operating prss. for pressure switch.0.5MPa (72psi) for vacuum switch.	Reduce the supply pressure to below the max. pressure rating and then reset the switch.
- - - -	When zeroing out the gauge, pressure differences ±0.07MPa for ISE4E and ±7kPa for ZSE4E have occured.	Apply atmospheric pressure and then reset the switch.

Note 1) Does not apply to Analog output.

⚠ Precautions

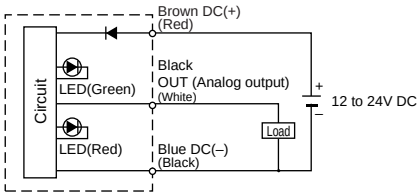
Be sure to read before handling. Refer to p.0-26 and 0-27 for Safety Instructions and common precautions on the products mentioned in this catalog, and refer to p.3.0-7 to 3.0-9 for precautoins on every series.

Internal Circuit and Wiring

Lead wire colors inside ( ) are those prior to conformity with IEC standards

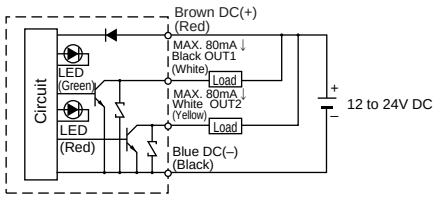
-26
Analog Output

1 to 5V (±5%F.S.)
Load impedance: 1kΩ



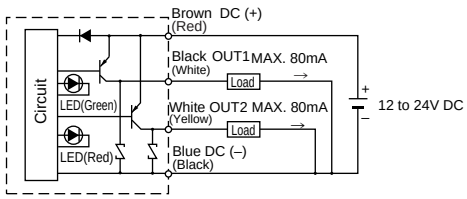
-27
NPN Open Collector

Max.30V, 80mA
Residual voltage:
1V or less



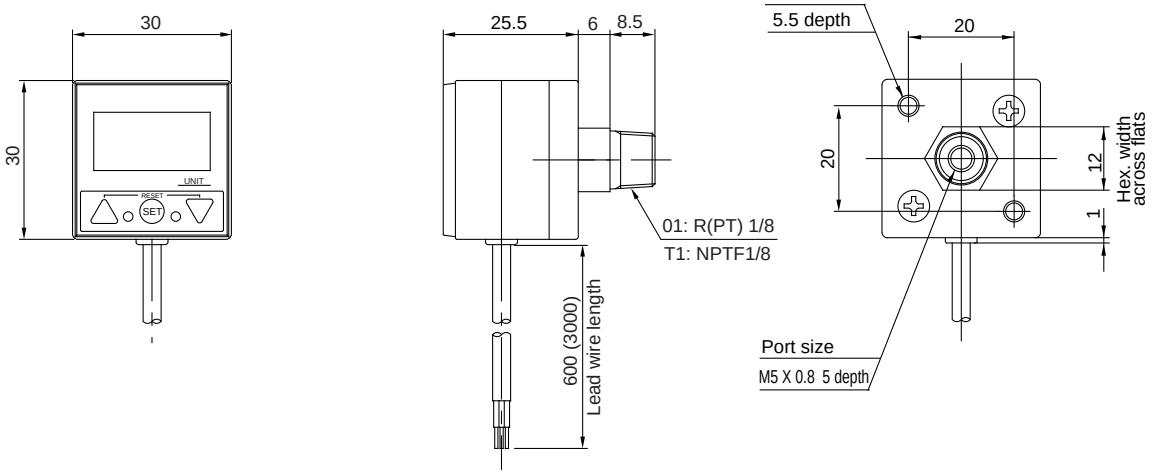
-67
PNP Open Collector

Max.80mA

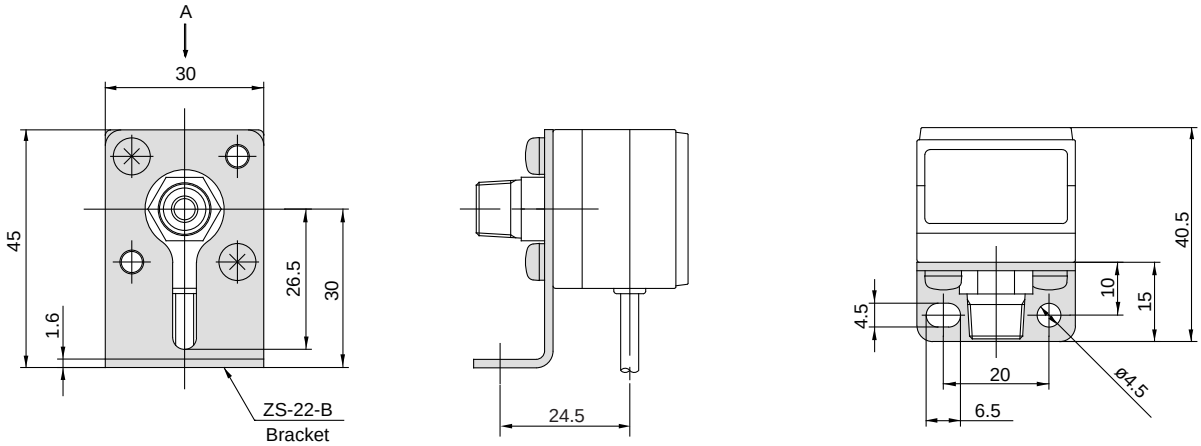


Dimensions

Standard

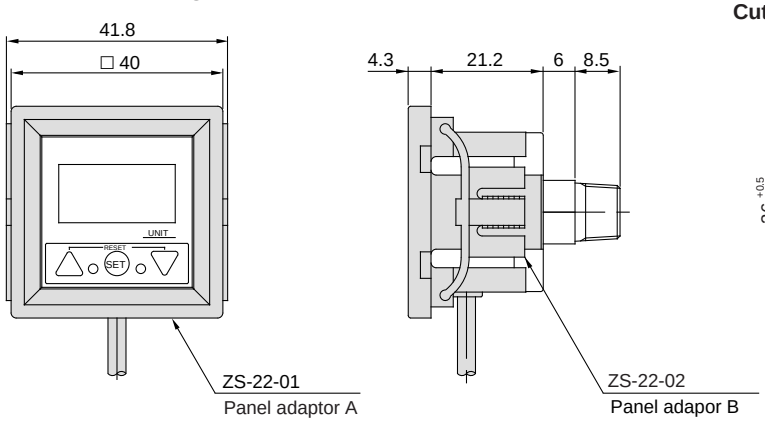


With bracket

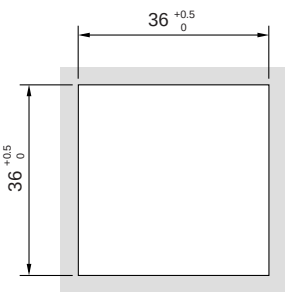


View A

Panel mounting



Cutout dimensions for panel mounting



Thickness of panel: 1 to 3.2mm