

With Backlight
Digital Pressure Switch

Series ZSE6B

(For vacuum)

ISE6B

(For positive pressure)

For General Purpose Fluids



Atmospheric pressure detection and vacuum pressure measurement for load lock chamber in semiconductor production equipment.

Leakage rating: 1×10^{-9} atm cc/s

Sensor and fitting section are electron beam welded. 2 kinds of metal gasket seal style fitting connections provide for a high integrity seal. Applicable for pressure detection of fluids and gases where leakage is unacceptable.

Stainless steel diaphragm and fitting

Diaphragm design prevents sensor from directly contacting fluid media. Non-corrosive stainless steel is used for diaphragm (SUS630) and fitting (SUS304).

Two independent outputs

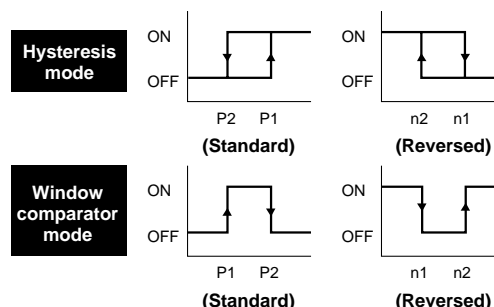
Allows the calibration of 2 different setpoints. e.g. change of vacuum pad size requiring different setpoints or two different supply pressures requiring different pressure confirmation points.

Choice of display units

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

| | |
|--------------------------|--|
| Vacuum | mmHg \leftrightarrow kPa \leftrightarrow PSI \leftrightarrow kgf/cm ² \leftrightarrow bar |
| Positive pressure | MPa \leftrightarrow PSI \leftrightarrow kgf/cm ² \leftrightarrow bar |

Variety of switch output modes



Exact detection of atmospheric pressure (For vacuum)

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

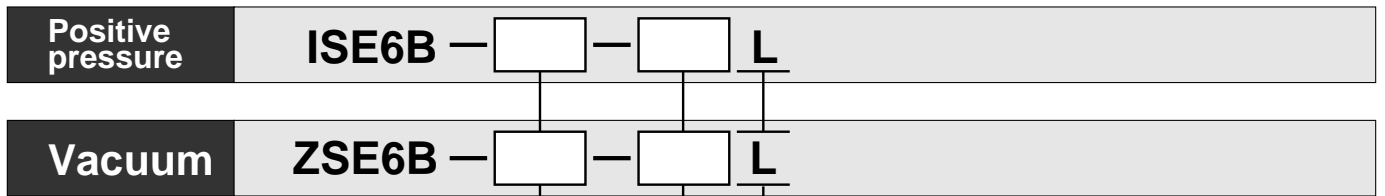
Calibration data

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.

How to Order



Port size

| | |
|-----------|---------|
| A2 | URJ 1/4 |
| B2 | TSJ 1/4 |

Note)URJ 1/4 and TSJ 1/4 are special fittings used in semiconductor production equipment.

Lead wire length

| | |
|----------|----|
| L | 3m |
|----------|----|

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 + Mounting bracket)

ZS-22-E

Panel adaptor A.....**ZS-22-03**

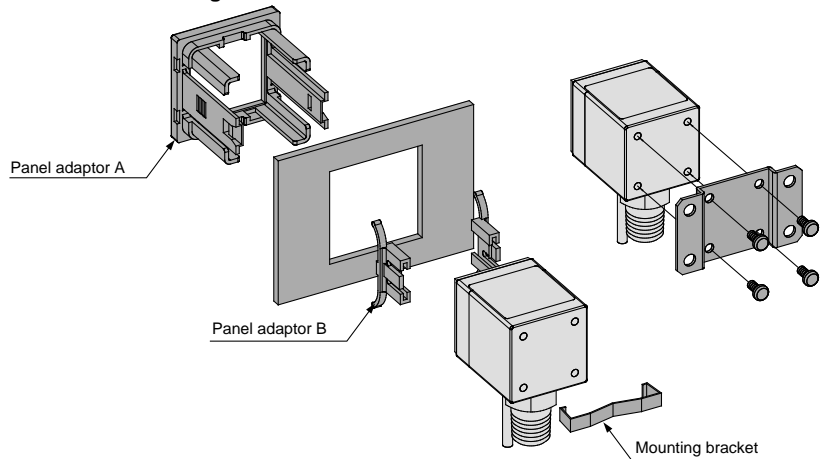
Panel adaptor B.....**ZS-22-02**

Mounting bracket...**ZS-22-04**

ZS-22-D

(With four M3 mounting threads)

Bracket (Option)



PSE

ZSE4 ISE4

ZSE5 ISE5

ZSE6 ISE6

ZSE3 ISE3

GS

PS

ISA

ZSE1 ISE1

ZSE2 ISE2

ZSP

IS

ZSM

PF

IF

ZSE6B/ISE6B

Specifications

| Model | | Vacuum ZSE6B | Positive pressure ISE6B |
|-----------------------------|------------------------|--|-------------------------------|
| Operating pressure range | | -100 to 100kPa | -0.1 to 1MPa |
| Max. pressure | | 200kPa | 1.5MPa |
| Min. display unit | kPa | 2 | - |
| | MPa | - | 0.01 |
| | mmHg | 10 | - |
| | kgf/cm ² | 0.02 | 0.1 |
| | PSI | 0.2 | 1 |
| | bar | 0.02 | 0.1 |
| Indicator light | | ON: When Green LED(OUT1) or Red(OUT2) turns on | |
| Frequency response | | 200Hz (5ms) | |
| Hysteresis ⁽¹⁾ | Hysteresis mode | Adjustable (2 digits or more) | Adjustable (3 digits or more) |
| | Window comparator mode | Fixed (2 digits) | Fixed (3 digits) |
| Fluid | | Fluid that will not corrode SUS304 and SUS630 | |
| 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 | | 45mA or less | |
| Error display | | Red light blinks. Display the error code on LCD. | |
| Pressure display | | 3 1/2 digits (10mm-size numerals) | |
| Self diagnostic function | | Over current ⁽²⁾ , Over pressure, Data error, Pressure during 0 clear | |
| 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 250V AC, 50/60Hz for 1 min. | |
| Insulation resistance | | Between external terminals and housing 2MΩ (50V DC by megameter) | |
| Vibration resistance | | 10 to 500HZ Pulse width 1.5mm or acceleration 98m/s ² (smaller vibrations) to X, Y, Z direction (2 hours) | |
| Shock resistance | | 980m/s ² to X, Y, Z direction (3 times for each direction) | |
| Lead wire | | Grommet oil-resistant vinyl cabtire code-26 ø3.4 0.2mm ² 3 core -27, -67 ø3.5 0.14mm ² 4 core 3m | |
| Weight | | 126g (including 3m-long lead wire) | |
| Port size | | A2: URJ1/4, M5 X 0.8 B2: TSJ 1/4 | |
| Protective construction | | IP40 | |



Note 1) ●Hysteresis mode:

ZSE: When the values of P1 and P2 are the same or when P1 > P2 within 2 digits, the hysteresis will be automatically 2 digits for the set value of P1.

ISE: When the values of P1 and P2 are the same or when P1 > P2 within 3 digits, the hysteresis will be automatically 3 digits for the set value of P1.

●Window comparator mode:

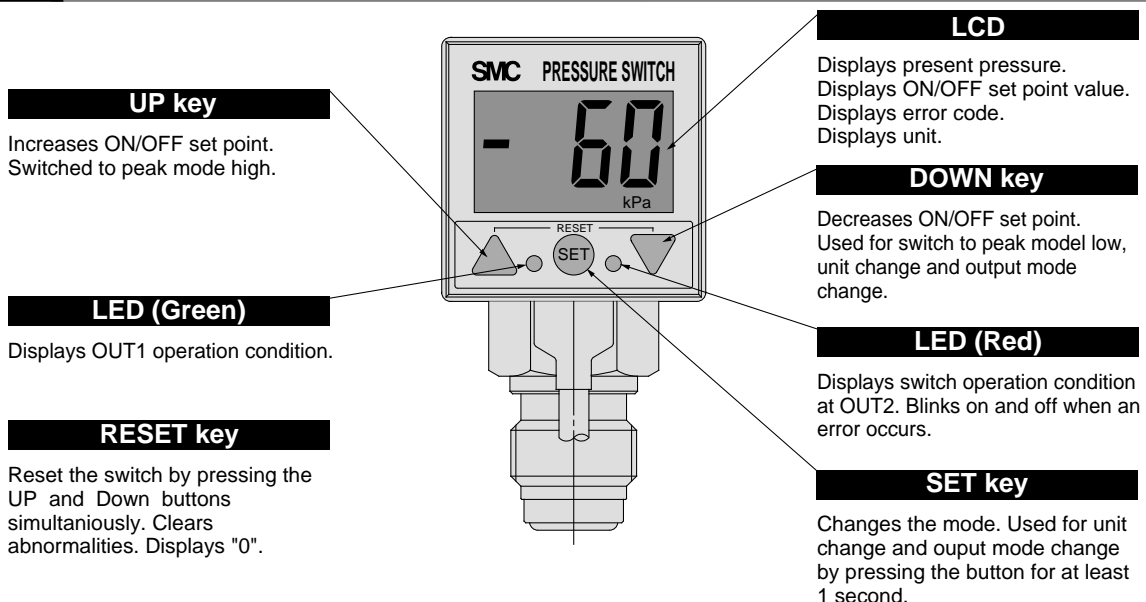
ZSE: The hysteresis is 2 digits, so separate P1 from P2 by 5 digits or more and set them.

ISE: The hysteresis is 3 digits, so 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.


Description



Calibration Procedure

 Same as Series ZSE5B/ISE5B. Refer to the p.3.3-4 and 3.3-5.

Other Functions

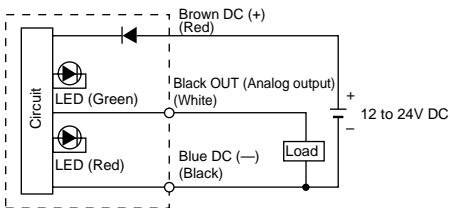
 Same as Series ZSE5B/ISE5B. Refer to the p.3.3-6.

Internal Circuit and Wiring

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

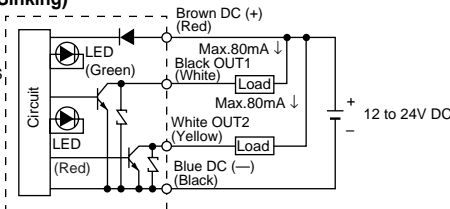
"-26" Analog Output

1 to 5V ($\pm 5\%$ F.S.)
Load impedance: 1k Ω



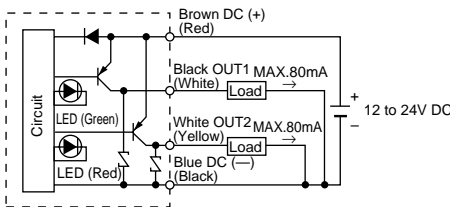
"-27" NPN Open Collector (Sinking)

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

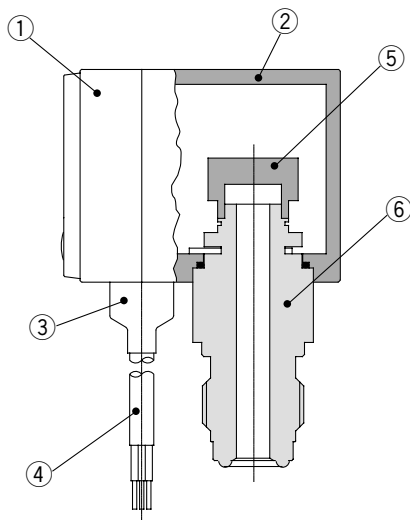


"-67" PNP Open Collector

80mA



Construction









Component List

| No. | Description | Materials |
|-----|-----------------|-------------------------------|
| ① | Indicator panel | Denatured PPO |
| ② | Body | PBT |
| ③ | Seal | NBR |
| ④ | Lead wire | Vinyl chloride (Vinyl sheath) |
| ⑤ | Pressure sensor | Stainless steel (SUS630) |
| ⑥ | Fittings | Stainless steel (SUS304) |

Error Codes

Error codes

| Display | Cause | Solution |
|---|--|---|
|  | Calibration was changed by accident, reason unknown. | Push Up and Down buttons to reset all the data. |
|  | Output 1 output current exceeds 80mA. | Turn off the power and verify the load connected output 1. |
| | Output 1 (Black wire) could be shorted out. | Verify that the output is not shorted out and then reset the switch. |
|  | Output 2 output current is exceeds 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. |
|  | Max. operating pressure has been exceeded for more than 2 seconds. 1.5 X Max. operating press. 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 ± 0.07 MPa for ISE6B and ± 7 kPa for ZSE6B have occurred. | Apply atmospheric pressure and then reset the switch. |

 Note 1) Does not apply to Analog output style.

PSE

ZSE4
ISE4

ZSE5
ISE5

ZSE6
ISE6

ZSE3
ISE3

GS

PS

ISA

ZSE1
ISE1

ZSE2
ISE2

ZSP

IS

ZSM

PF

IF

ZSE6B/ISE6B

⚠ 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 precautions on every series.

Wiring

⚠ Warning

① Voltage resistance

Voltage resistance between metal fitting and lead wire of the switch is 250V.

Do not apply voltage potential in excess of 250V.

⚠ Caution

① When induction noise is expected to be generated from piping, ground the piping.

Pressure Source

⚠ Warning

① Use of Toxic, Corrosive or Flammable Gas

Pressure sensor and fitting material of this switch is SUS630 and SUS304. Do not use with toxic or corrosive gases. The switch is not rated as explosion proof.

② Quality of operating fluid

Section in contact with fluid is made of SUS630 (Pressure sensor) and SUS304 (fitting). Use fluids that will not corrode these materials. The corrosion resistance of SUS630 and that of SUS304 is almost the same. For reference, fluids and gases that will not corrode SUS304 are shown below.

| | |
|-----------------------------|---|
| Dry air | ○ |
| Drain-contained air | ○ |
| Hydraulic fluid (JIS-K2213) | ○ |
| Silicon (JIS-K2213) | ○ |
| Lubrication (JIS-K6301) | ○ |
| Freon | ○ |
| Carbon dioxide | ○ |
| Ammonia | ○ |
| Nitrogen gas | ○ |
| Chlorine gas | ○ |

③ Leakage Inspection

The welded section is helium leak tested. SMC recommends TSJ fittings (with ferrule) such as Swagelok® fittings or URJ fittings (with seal, gland, etc.) such as VCR® fittings. When using other branch fittings apply the helium leak test at the welded section.

Others

⚠ Caution

① Panel mounting

① Insert Adaptor A from the front of panel.



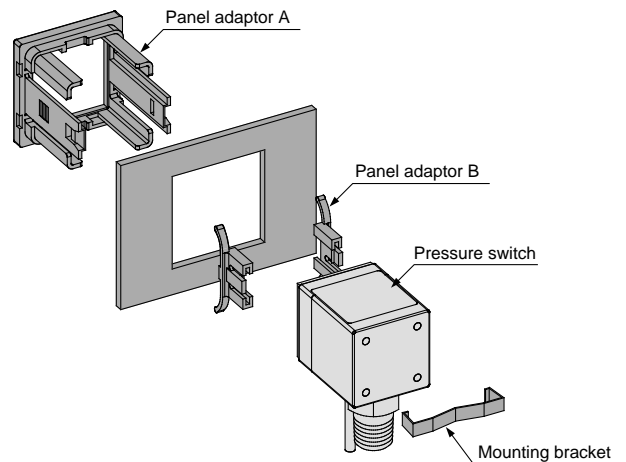
② Fix Adaptor A firmly with Adaptor B from the back of panel.



③ Insert a pressure switch to Adaptor A from the back of panel.

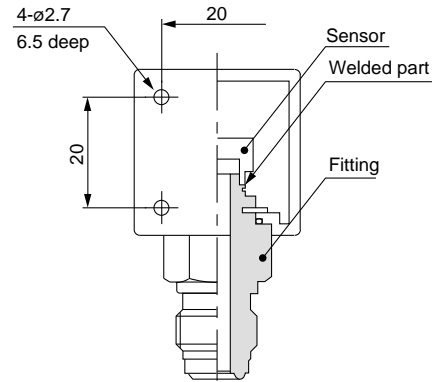
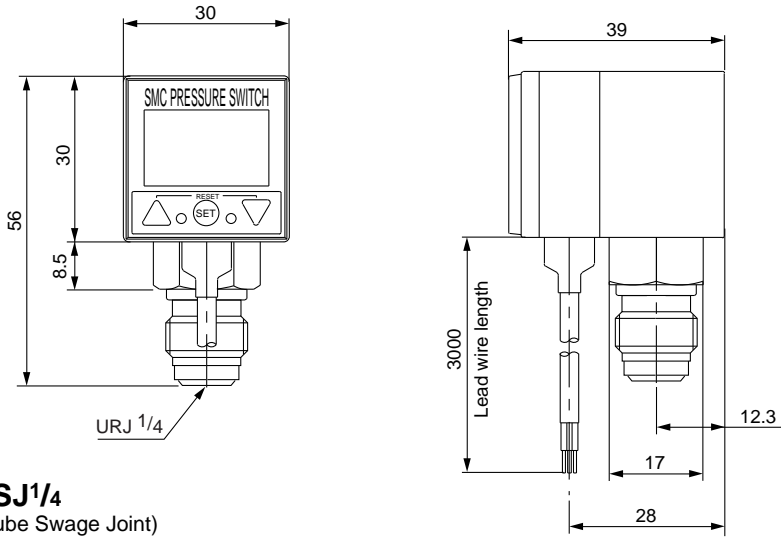


④ Fix the switch with a mounting bracket.

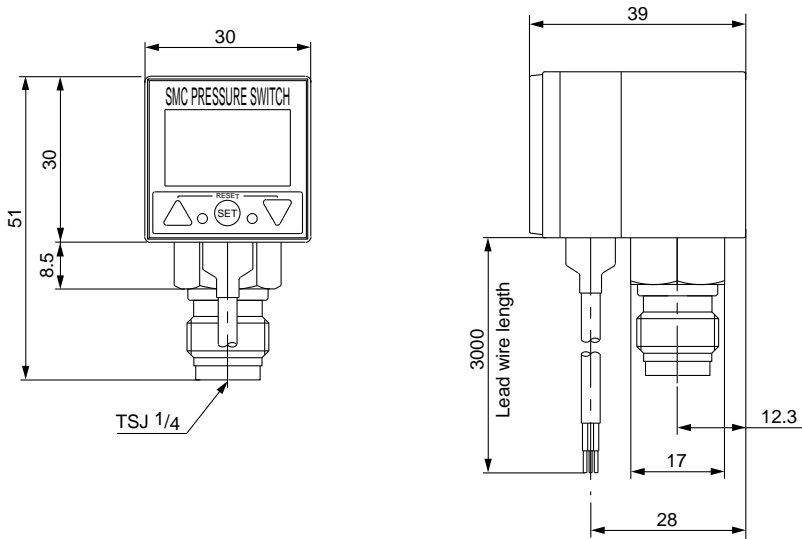


Dimensions

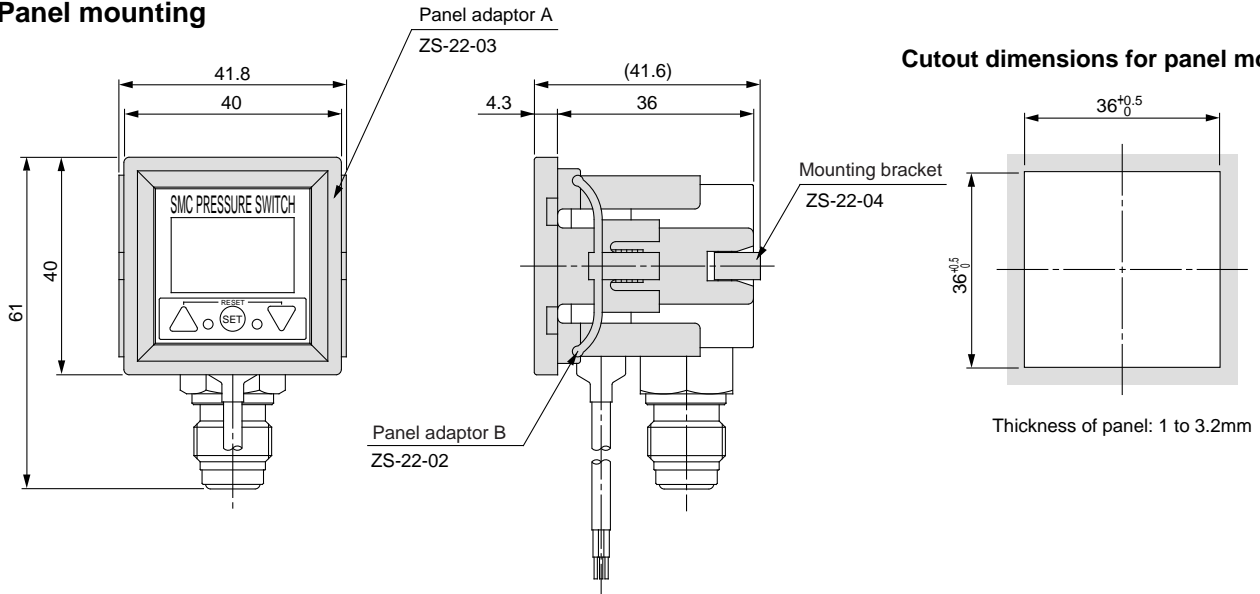
URJ^{1/4} (Union Ring Joint)



TSJ^{1/4} (Tube Swage Joint) With Bracket



Panel mounting



PSE

ZSE4
 ISE4

ZSE5
 ISE5

ZSE6
 ISE6

ZSE3
 ISE3

GS

PS

ISA

ZSE1
 ISE1

ZSE2
 ISE2

ZSP

IS

ZSM

PF

IF