

LCD Readout  
**Digital Pressure Switch**  
**Series ZSE4**  
 (For vacuum)  
**ISE4**  
 (For positive pressure)

For General Pneumatics



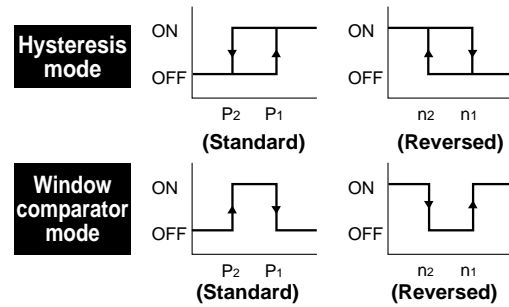
Digital Readout and  
 push-button calibration

**Choice of display units**

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

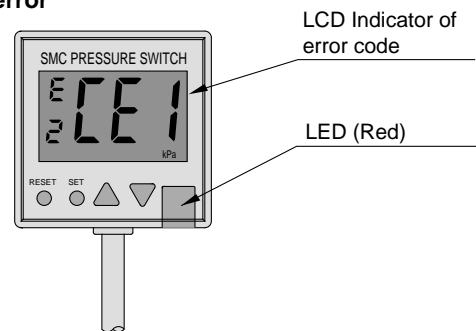
- Vacuum** kPa ↔ mmHg ↔ PSI ↔ bar
- Positive press. (High)** MPa ↔ kgf/cm<sup>2</sup> ↔ PSI ↔ bar
- Positive press. (Low)** kPa ↔ kgf/cm<sup>2</sup> ↔ PSI ↔ bar

**Variety of switch output modes**



**Self-diagnostic function**

- Over-voltage
- Over-pressure
- Data error



**Panel mounting available.**

A special adaptor permits panel mounting.

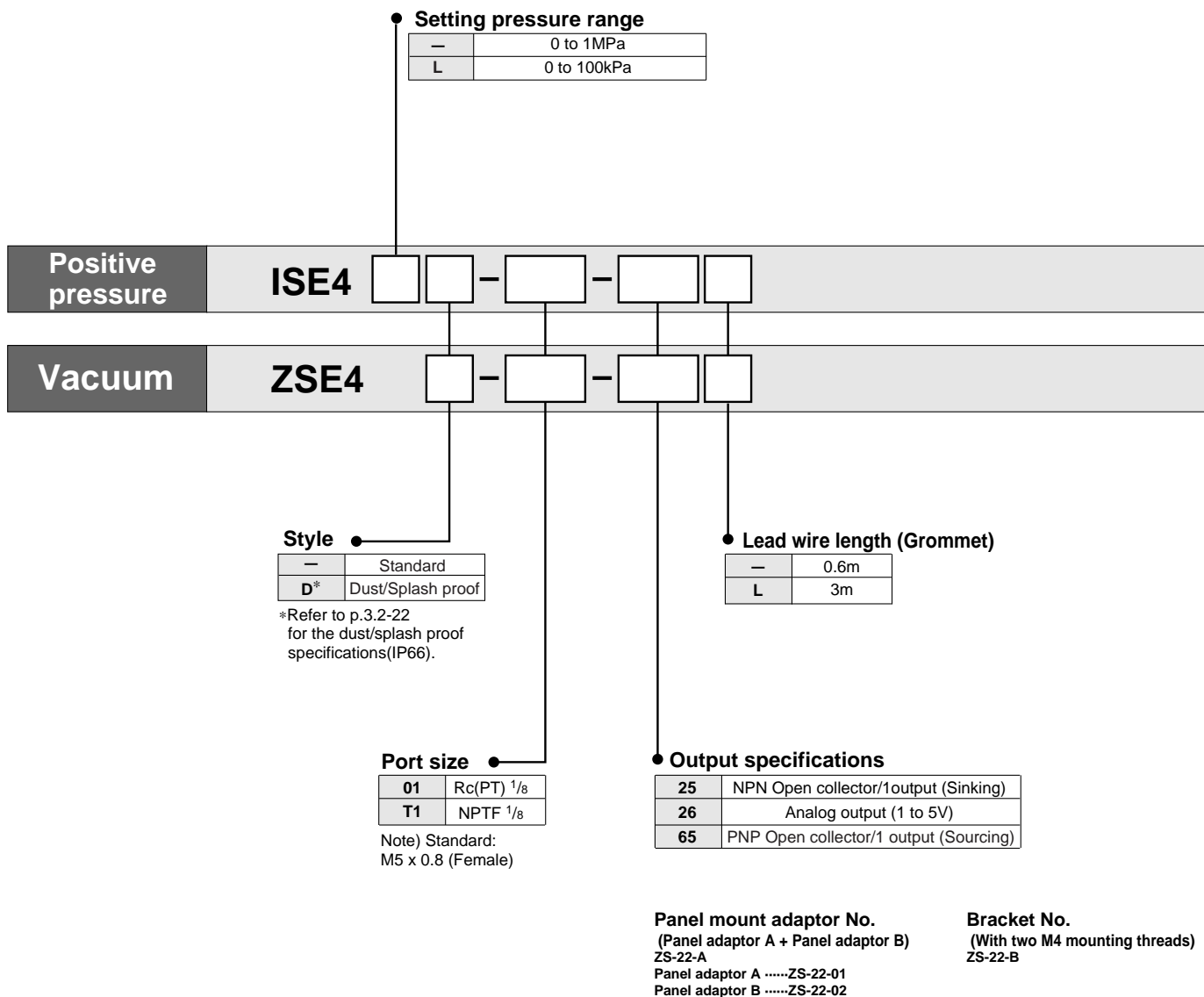
**Dust/Splash proof cover (Optional)**

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

**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.

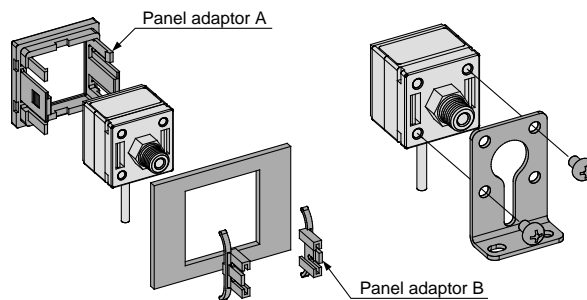
## How to Order



- PSE
- ZSE4 ISE4**
- ZSE5 ISE5
- ZSE6 ISE6
- ZSE3 ISE3
- GS
- PS
- ISA
- ZSE1 ISE1
- ZSE2 ISE2
- ZSP
- IS□
- ZSM
- PF□
- IF□

### **Caution**

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.



# ZSE4/ISE4

## Specifications

Model		Vacuum ZSE4	Positive pressure: 100kPa ISE4L	Positive pressure: 1MPa ISE4
Operating pressure range		0 to -101kPa	0 to 100kPa	0 to 1MPa
Max. pressure		200kPa		1MPa
Min. display unit	kPa	1	1	-
	MPa	-	-	0.01
	mmHg	5	-	-
	kgf/cm <sup>2</sup>	-	0.01	0.1
	PSI	0.1	0.1	1
		0.01	0.01	0.1
Indicator light		ON: When Green LED turns on		
Frequency response		200Hz (5ms)		
Hysteresis <sup>(1)</sup>	Hysteresis mode	Adjustable (3 digits or more)		
	Window comparator mode	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		25mA or less		
Error display		Red light blinks. Display the error code on LCD		
Pressure display		3 1/2 digits (10 mm-size numerals)		
Self-diagnostic function		(Over current <sup>(2)</sup> ), Over pressure, Data error, Pressure during zero out		
Operating temperature range		0 to 50°C (No condensation)		
Noise resistance		1000Vp-p, Pulse width: 1μ S-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 500 Hz Pulse width 1.5mm or acceleration 98m/s <sup>2</sup> (smaller vibrations) to X, Y, Z direction (2 hrs)		
Shock resistance		980m/s <sup>2</sup> to X, Y, Z direction ( 3 times for each direction)		
Lead wire		Grommet oil-resistant vinyl cable code ø3.4 0.2 mm <sup>2</sup> 3 core		
Weight		Standard: 40g (including 0.6m-long lead wire), Dust/Splash proof: 110g		
Port size <sup>(2)</sup>		01: R(PT)1/8, M5 X 0.8 T1: NPTF1/8, M5 X 0.8		
Protective construction <sup>(3)</sup>		Standard: IP40, Dust/Splash proof: IP66		



Note 1) ● Hysteresis mode: 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: 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.

Note 3) ● Refer to p.3.2-21 to p.3.2-24 for the details about the dust/splash proof specifications.

## Description

### SET key

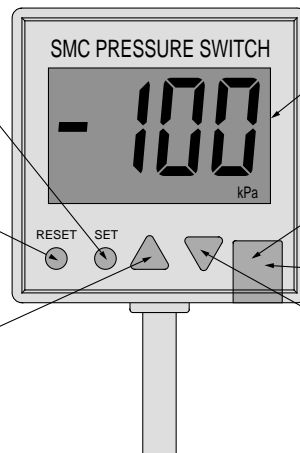
Switches the mode. Used for unit change and output mode change by pressing the button for at least 1 second.

### RESET key

Clears abnormalities. Displays "0".

### UP key

Increases ON/OFF set point. Switched to peak mode high by pressing the key during normal operation.



### LCD

Displays present pressure. Displays ON/OFF setting value. Displays error code. Displays unit.

### LED (Green)

Displays OUT1 operation condition.

### LED (Red)

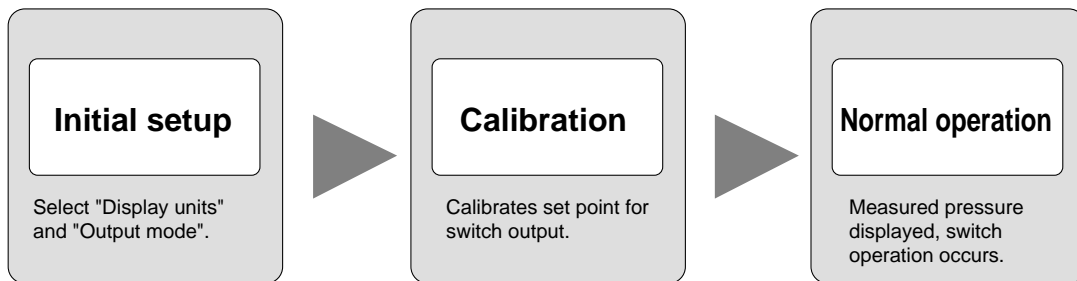
Blinks on and off when an error occurs.

### DOWN key

Decreases ON/OFF set point. Switched to peak mode low by pressing the key during normal operation. Used for unit change and output mode change.

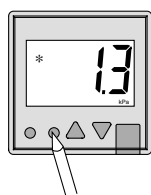
## Calibration Procedures

### Procedures



### Initial setup

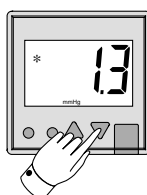
#### 1. Initial setup mode



Press the "SET" button for at least 1 second. "1.3" is displayed and the display blinks.

\*) "1.3" is a program version of micro computer.

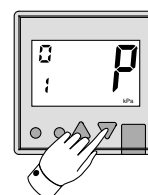
#### 2. Selection of "Display unit"



Select "Display unit" by pressing the ▼ button.

For High prss. MPa → kgf/cm<sup>2</sup> → PSI → bar  
Low prss. kPa → kgf/cm<sup>2</sup> → PSI → bar  
For vacuum kPa → mmHg → PSI → bar

#### 3. Selection of "Output mode"

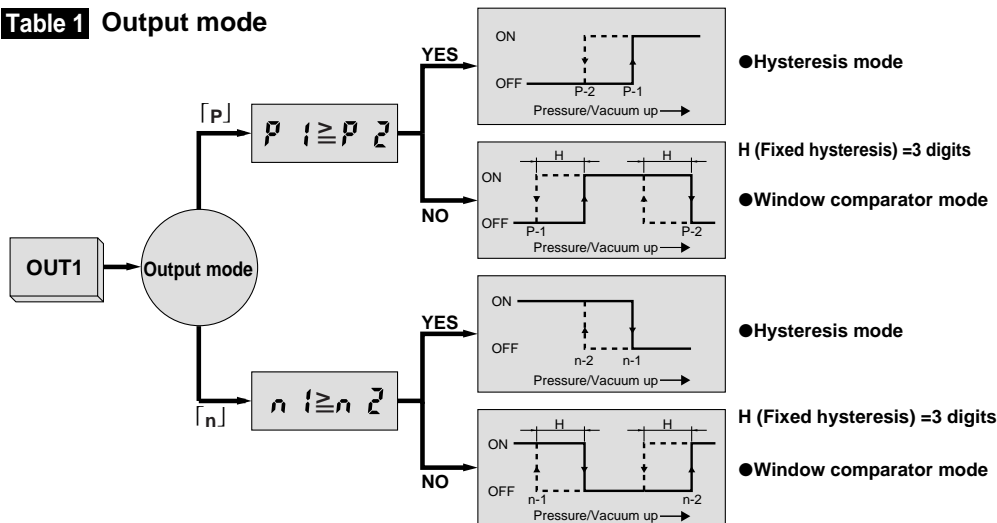


Select "Output mode" by pressing the ▼ button.

p : Normal mode  
n : Reversed output mode  
(Refer to **Table 1**.)

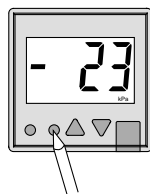
By pressing the "SET" button, the calibration is completed.

**Table 1** Output mode



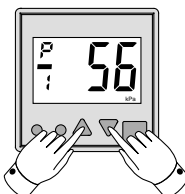
### Calibration procedures

#### 1. Set point value input mode



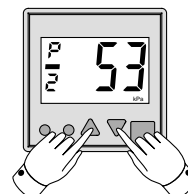
Press the "SET" button.

#### 2. Input set point value (1)



▲ button: Increase set point value  
▼ button: Decrease set point value

#### 3. Input set point value (2)



▲ button: Increase set point value  
▼ button: Decrease set point value

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

PSE

ZSE4  
ISE4

ZSE5  
ISE5

ZSE6  
ISE6

ZSE3  
ISE3

GS

PS

ISA

ZSE1  
ISE1

ZSE2  
ISE2

ZSP

IS□

ZSM

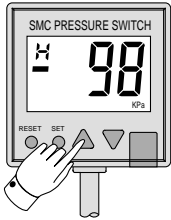
PF□

IF□

# ZSE4/ISE4

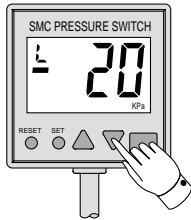
## Other Functions

### ●Peak Mode High



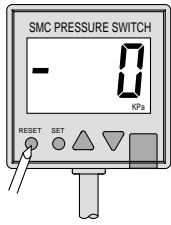
To display the high peak pressure (highest degree of vacuum), press the UP button during normal operation. The LCD displays "H". To return back to normal operation press the UP button again.

### ●Peak Mode Low



To display the low peak pressure (lowest degree of vacuum), press the DOWN button during normal operation. The LCD displays "L". To return back normal operation, press the DOWN button again.

### ●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 occurred:

- 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
	Calibration was changed by accident, reason unknown.	Push RESET to reset all the data.
	Output 1 output current is exceeding 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 reset the switch.
	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 $\pm 0.07$ MPa for ISE4 and $\pm 7$ kPa for ZSE4 have occurred.	Apply atmospheric pressure and then reset the switch.

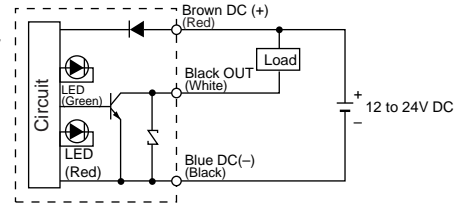
Note 1) Does not apply to Analog output.

## Internal Circuit and Wiring

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

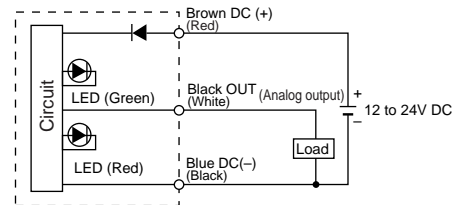
### -25 NPN Open Collector

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



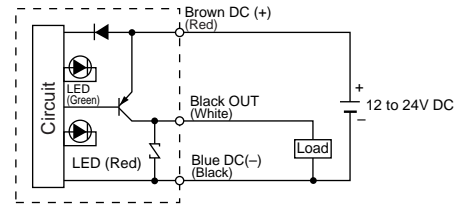
### -26 Analog Output

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



### -65 PNP Open Collector

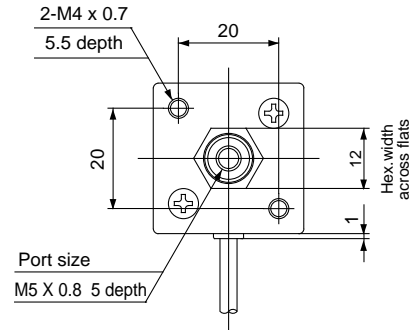
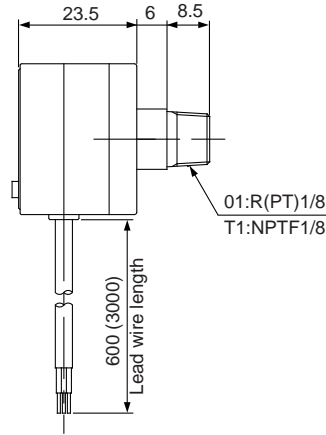
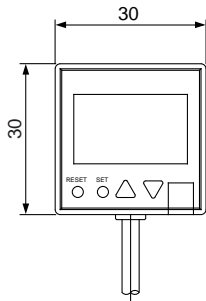
Max.80mA



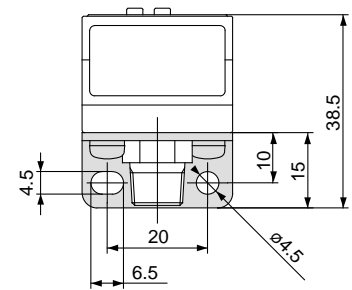
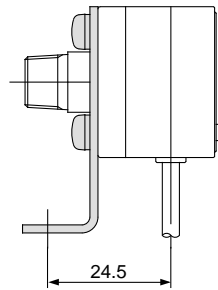
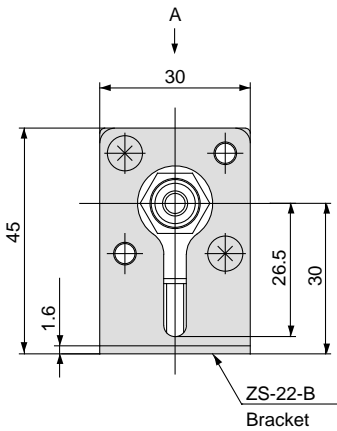
# LCD Readout Digital Pressure Switch **ZSE4/ISE4**

## Dimensions

### Standard

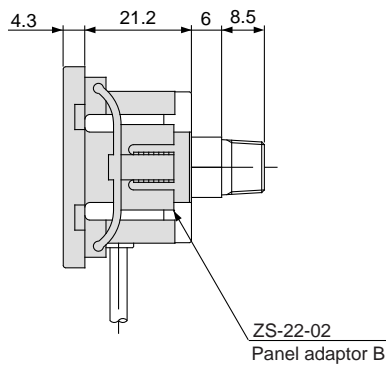
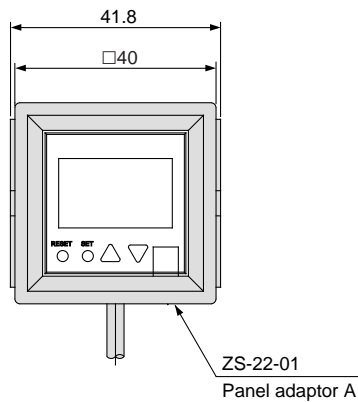


### With bracket

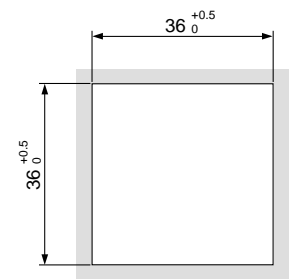


View A

### Panel mounting



### Cutout dimensions for panel mounting



Thickness of panel: 1 to 3.2mm

PSE

ZSE4  
ISE4

ZSE5  
ISE5

ZSE6  
ISE6

ZSE3  
ISE3

GS

PS

ISA

ZSE1  
ISE1

ZSE2  
ISE2

ZSP

IS

ZSM

PF

IF

Dust/Splash Proof (IP66)  
Digital Pressure Switch

**Series ZSE4□□D**  
(For vacuum)

**ISE4□□D**  
(For positive pressure)

**ZSE4E/ISE4E**  
**ZSE4B/ISE4B**  
**ZSE4/ISE4**

Dust/Splash proof specification  
is available on all the standard  
models.

(Refer to pages of every series for detailed functions.)

**Lightweight: 110g**

---

Resin construction

**DIN rail mounting**

---

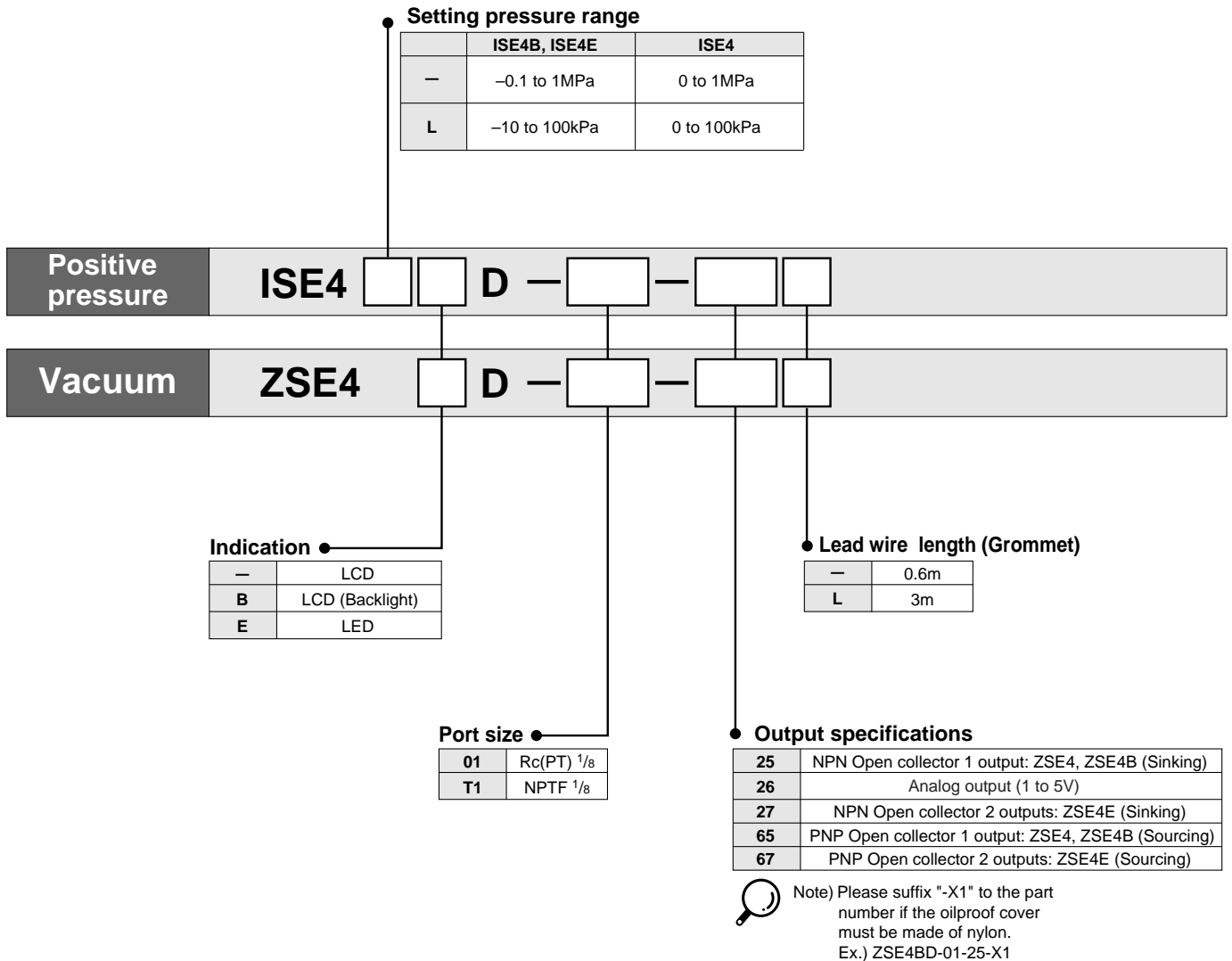
Easy mounting and removal

For General Pneumatics



For applications in adverse  
environments where  
water/dust are present.

## How to Order



PSE

ZSE4  
ISE4

ZSE5  
ISE5

ZSE6  
ISE6

ZSE3  
ISE3

GS

PS

ISA

ZSE1  
ISE1

ZSE2  
ISE2

ZSP

IS□

ZSM

PF□

IF□

## Specifications (Mechanical specifications of optional cover)

Model	ZSE4□D/ISE4□□D
Operating temperature range	0 to 50°C (No condensation)
Vibration resistance	10 to 500Hz Pulse width 1.5mm or acceleration 98m/s <sup>2</sup> (smaller vibrations) to X, Y, Z direction (2 hrs)
Shock resistance	980m/s <sup>2</sup> to X, Y, Z direction (3 times for each direction)
Lead wire	Grommet oil-resistant vinyl cabtire code -25, -26, -65 ø3.4 0.2mm <sup>2</sup> 3core -27, -67 ø3.5 0.14mm <sup>2</sup> 4core
Weight	110g (Including 0.6m-long lead wire)
Port size	01: Rc(PT) 1/8 T1: NPTF 1/8
Protective construction	IP66



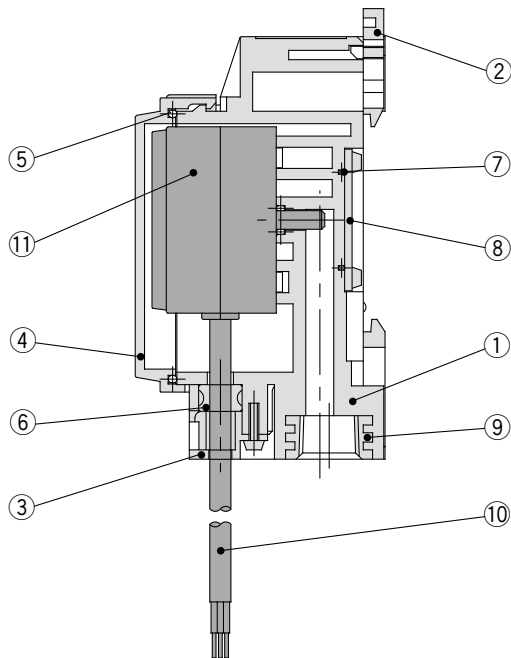
Refer to the following pages for the details of each series.

- ZSE4/ISE4 Series → P.3.2-17
- ZSE4B/ISE4B Series → P.3.2-11
- ZSE4E/ISE4E Series → P.3.2-3



# ZSE4□D/ISE4□□D

## Construction



### Parts List

No.	Description	Material
①	Body	PBT
②	DIN rail stopper	PBT
③	Bush stopper	PBT
④	Cover A	PC
⑤	Gasket A	NBR
⑥	Reed bush	NBR
⑦	Gasket B	NBR
⑧	Cover B	SECC
⑨	Insert nut	A2011
⑩	Lead wire	PVC(Vinyl sheath)
⑪	Digital pressure switch (4□type)	—

## ⚠ 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.

### Selection

#### ⚠ Caution

- ① If the unit is to be used in an area where it will be exposed to oil based liquids, please order the "X1" option. (Made to Order)

### Piping

#### ⚠ Caution

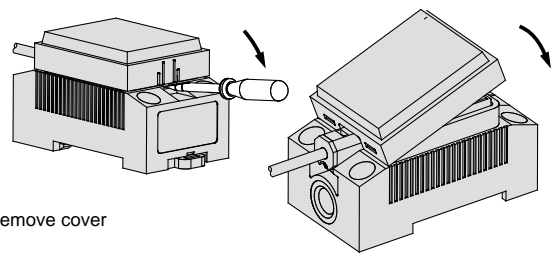
- ① If this product is to be applied in an area where water and dust might enter the atmospheric pressure port, please attach a section of  $\phi 4$  mm tubing to the port nipple and route the other end to an area where water and dust can not enter the tubing.

### Installation

#### ⚠ Caution

##### ① Apply cover.

Hook the cover on the projection parts of the body and push down as shown below. Be careful not to twist the gasket at that time. To remove the cover, lift the hook of the cover with a screw driver.

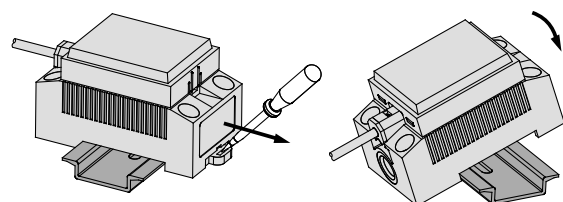


Remove cover

Apply cover

##### ② Mounting on DIN rail

As illustrated below, hook the nail located on the bottom of the body on the DIN rail and press down in the direction of the arrow. To remove from the DIN rail lift the switch up with a bladed screw driver etc. in the direction of arrow.



Removing from DIN rail

Mounting on DIN rail

Recommended DIN rail: OMRON, PFP-(50)N

# Dust/Splash Proof (IP66) Digital Pressure Switch **ZSE4□D/ISE4□□D**

## Protective Construction (IP Equivalent)

Definition: The first digit defines the amount of protection against penetration of solid objects into the housing. The second digit defines the amount of protection against liquids penetrating the housing.

**IP 6 6**

### Degree of Protection against Contact and Entrance of Solid Foreign Bodies

0	No protection
1	Protection against foreign objects > 50mm.
2	Protection against foreign objects > 12mm.
3	Protection against foreign objects > 2.5mm.
4	Protection against foreign objects > 1.0mm.
5	Protection against harmful deposits of dust.
6	Protection against penetration of dust.

### Degree of Protection against Ingress of Liquid

0	No protection	—
1	Protection against drops of condensed water.	Drip proof 1
2	Protection against drops of liquid when housing is tilted to 15° from vertical.	Drip proof 2
3	Protection against rain < 60° from vertical.	Splash proof
4	Protection against splashing.	Spray proof
5	Protection against water jets.	Jet proof
6	Protection against conditions on ships' decks. Water from heavy seas will not enter.	Water proof
7	Protection against immersion in water. Water will not enter under stated conditions of pressure and time.	Water tight
8	Protection against indefinite immersion in water under a specified pressure.	Under water

PSE

ZSE4  
ISE4

ZSE5  
ISE5

ZSE6  
ISE6

ZSE3  
ISE3

GS

PS

ISA

ZSE1  
ISE1

ZSE2  
ISE2

ZSP

IS□

ZSM

PF□

IF□

## Dimensions

