

# LCD Readout Digital Pressure Switch

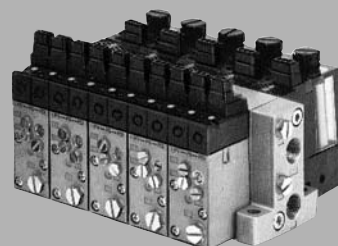
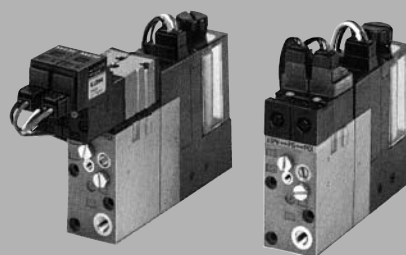
Series **ZSE3** (For Vacuum) / **ISE3** (For Positive Pressure)

For General Pneumatics



Easy pressure setting with the digital display

Can be integrated with a vacuum unit, Series ZX



ZSE
ISE
ZSP
PS
ISA
PSE
IS
ISG
ZSM

## Built-in failure prediction output function

When system performance declines due to filter element clogging, worn vacuum pads, piping leakage, etc., the switch can detect and indicate an oncoming problem before failure occurs.

## Two independent outputs

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

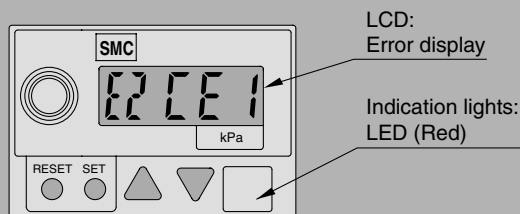
## Self-diagnostic function

- Excessive current
- Excessive 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.

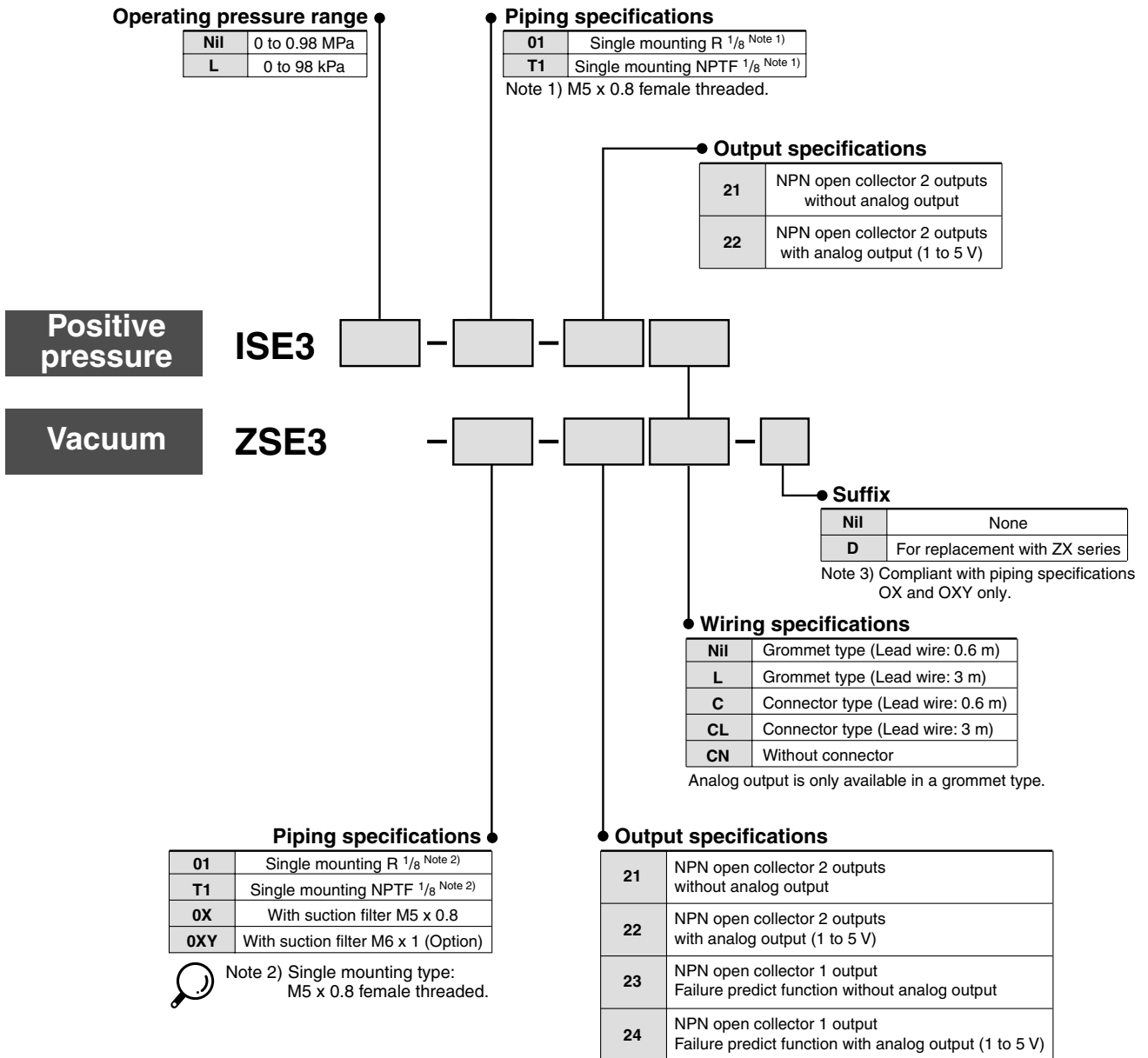
## Suction filter comes as standard



# LCD Readout Digital Pressure Switch

## Series ZSE3/ISE3

### How to Order



- ZSE
- ISE
- ZSP
- PS
- ISA
- PSE
- IS
- ISG
- ZSM

# Series ZSE3/ISE3

## Specifications

Model		Vacuum <b>ZSE3</b>	Positive pressure 100 kPa <b>ISE3L</b>	Positive pressure 1 MPa <b>ISE3</b>
<b>Operating pressure range</b>		0 to -101 kPa	0 to 98 kPa	0 to 0.98 MPa
<b>Max. operating pressure</b>		200 kPa <sup>(1)</sup>		1 MPa
<b>Min. display unit</b>	kPa	1	1	—
	MPa	—	—	0.01
<b>Indicator light<sup>(2)</sup></b>		N: When Green LED (OUT1) or Red (OUT2) turns on		
<b>Frequency response</b>		200 Hz		
<b>Hysteresis<sup>(3)</sup></b>	<b>Hysteresis mode</b>	Adjustable (Variable from 0)		
	<b>Window comparator mode</b>	Fixed (3 digits)		
<b>Fluid</b>		Air, Non-corrosive gases		
<b>Temperature characteristics</b>		±3% F.S. or less		
<b>Repeatability</b>		±1% F.S. or less		
<b>Power supply voltage</b>		12 to 24 VDC ±10%, Ripple (p-p) 10% or less (With power supply polarity protection)		
<b>Switch output</b>		NPN open collector 30 V 80 mA or less		
<b>Current consumption</b>		25 mA or less		
<b>Error display</b>		Red light blinks. Display the error code on LCD.		
<b>Pressure indication</b>		3 1/2 digits (5 mm-size numerals)		
<b>Self-diagnostic function</b>		Overcurrent, Overpressure, Data error Pressure during 0 clear		
<b>Operating temperature range</b>		0 to 60°C (No dewing)		
<b>Noise resistance</b>		1000 Vp-p, Pulse width 1 μs, Rise time 1 ns		
<b>Withstand voltage</b>		1000 VAC in 50/60 Hz for 1 minute between live parts and case		
<b>Insulation resistance</b>		2 MΩ or more (at 500 VDC by megameter) between live parts and case		
<b>Vibration resistance</b>		10 to 500 Hz Pulse width 1.5 mm or acceleration 98 m/s <sup>2</sup> (at the smaller vibration) to X, Y, Z direction (2 hours) (De-energized)		
<b>Impact resistance</b>		980 m/s <sup>2</sup> to X, Y, Z direction (3 times for each direction)		
<b>Lead wire</b>	<b>Connector type</b>	Heat-resistant vinyl electric wire, 4-wire, Cross section: 0.31 mm <sup>2</sup> , Insulator O.D.: 1.55 mm		
	<b>Grommet type</b>	Oil-resistant vinyl cable code -21, -23: 4 cores, ø3.5, Cross section: 0.14 mm <sup>2</sup> , Insulator O.D.: 1.0 mm -22, -24: 5 cores, ø3.5, Cross section: 0.15 mm <sup>2</sup> , Insulator O.D.: 1.0 mm		
<b>Mass</b>		40 g (including 0.6 m-long lead wire)		
<b>Port size</b>		R 1/8, M5 x 0.8, NPTF 1/8, M5 x 0.8 ZX ejector mounted type: M5 x 0.8	R 1/8, M5 x 0.8 NPTF 1/8, M5 x 0.8	
<b>Enclosure</b>		IP40		
<b>Standard</b>		Compliant with CE marking		

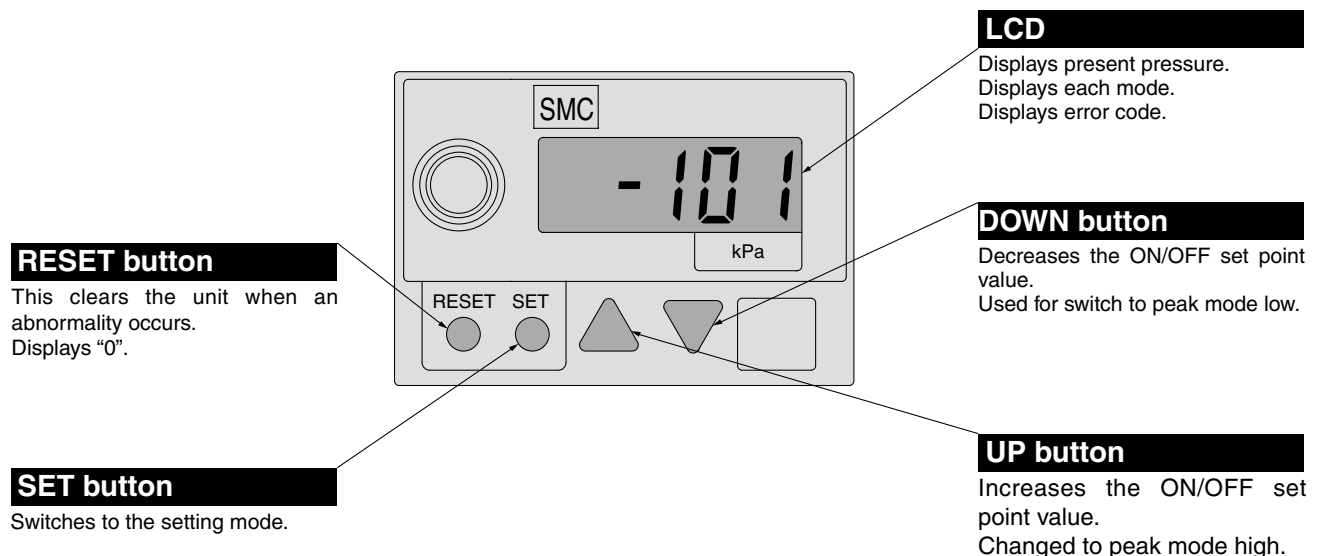
Note 1) • Instant pressure supply of 0.5 MPa has no influence on the switch.

Note 2) • ZSE3-□-□: Failure predictive output is Red.

Note 3) • 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.)

## Description



## Calibration Procedure

### Pressure Setting

#### ● 2 output type

**1. Input mode for set point value**

Press the "SET" button.

**2. Input set point value for OUT1 (1)**

▲ button: Increases set point value  
▼ button: Decreases set point value  
(Refer to the Table 1.)

**3. Input set point value for OUT1 (2)**

▲ button: Increases set point value  
▼ button: Decreases set point value

Press the "SET" button.

**4. Input set point value for OUT2 (1)**

▲ button: Increases set point value  
▼ button: Decreases set point value

**5. Input set point value for OUT2 (2)**

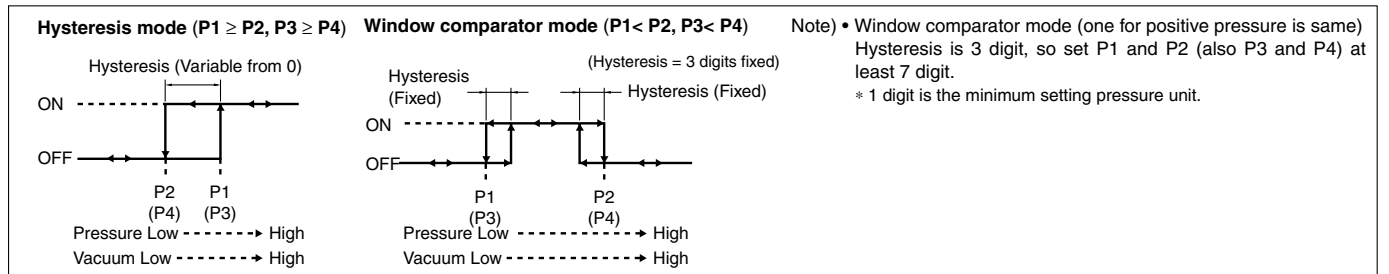
▲ button: Increases set point value  
▼ button: Decreases set point value

Press the "SET" button.

Press the "SET" button to complete the setting.

P1: Setting of OUT1  
P2: Setting of OUT1  
P3: Setting of OUT2  
P4: Setting of OUT2

**Table 1 Output type**



#### ● 1 output type with failure prediction function

**1. Input mode for set point value**

Press the "SET" button.

**2. Input set point value for OUT1 (1)**

▲ button: Increases set point value  
▼ button: Decreases set point value

**3. Input set point value for OUT1 (2)**

▲ button: Increases set point value  
▼ button: Decreases set point value

Press the "SET" button.

**4. Calibration of failure predictive pressure**

▲ button: Increases set point value  
▼ button: Decreases set point value  
(Refer to the Table 2.)

**5. Calibration of number of failure prediction occurrences**

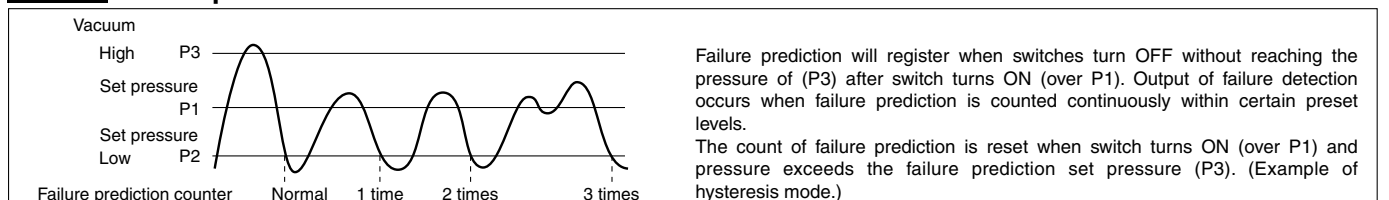
▲ button: Increases set point value  
▼ button: Decreases set point value  
Occurrence number: 1 to 16 times (0 is not available for prediction.)

Press the "SET" button.

Press the "SET" button to complete the setting.

P1: setting of OUT1  
P2: setting of OUT2  
P3: setting of failure prediction pressure  
EC: Number of failure prediction

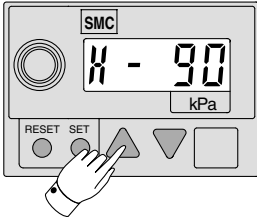
**Table 2 Failure prediction**



# Series ZSE3/ISE3

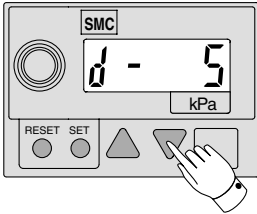
## Other Functions

### ● Peak mode high



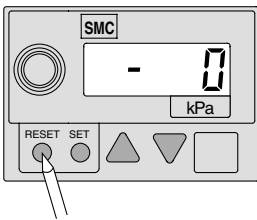
To display the high peak pressure (highest degree of vacuum), press the ▲ button during normal operation. The LCD displays "H". To return back to the normal operation, press the ▲ button again.

### ● Peak mode low



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

### ● Reset function



A RESET operation leads to the following results.

- Reset will cause the following during normal operation:
    - Peak high is cleared. Peak low is cleared.
    - Failure prediction counter is cleared.
    - Failure predictive output is reset.
  - Reset will cause the following when an error has occurred:
    - Data set in setting mode will remain stored and will return to the same state as when the power is applied. (All calibration data has retained.)
    - In the case of data error, reset the setup mode and then switch will assume normal operation. (All calibration data has retained.)
- Note) Reset Function does not work during setup mode.

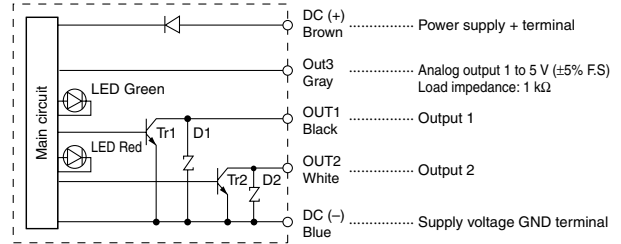
## Error Correction

Take the following corrective solutions when errors occur.

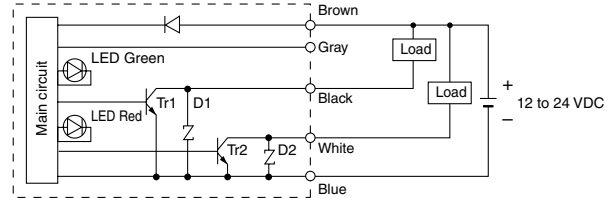
Display	Description	Solution
E1 dE	Set data was changed by accident, reason unknown.	Perform the RESET operation, and reset all data again.
E2 CE1	OUT1 is short-circuited. Overcurrent is being applied to the load.	Turn off the power and replace the load connected with OUT1 (Black wire).
E2 CE2	OUT 2 is short-circuited. Overcurrent is being applied to the load.	Turn off the power and replace the load connected with OUT2 (White wire).
E3 PE	Pressure exceeding 0.5 MPa is being applied. (The pressure over rated pressure is being applied in case of positive pressure.)	Reset the supply pressure less than 0.5 MPa. (Reduce the supply pressure to below rated pressure in case of rated voltage.)
E4 HP	When performing zero clear, compared with the atmospheric pressure, pressure of more than ±0.07 MPa for 1 MPa and ±7 kPa for vacuum is being	Apply atmospheric pressure and then reset the switch.

## Internal Circuit and Wiring Example

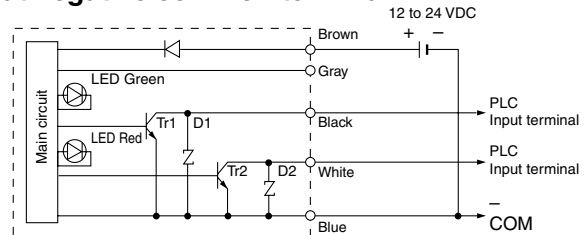
### Circuit and connection



### Regular connection



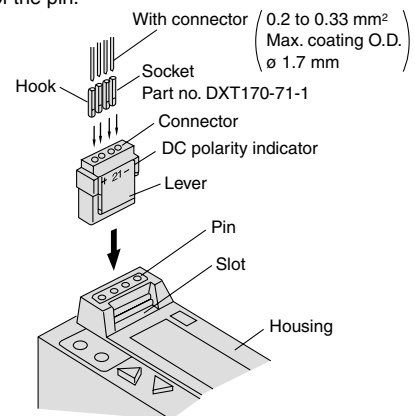
### Connection example with a PLC at negative common terminal



## How to Use Connector

### 1. Attaching and detaching connectors

- When assembling the connector to the switch housing, push the connector straight onto the pins until that lever locks into the housing slot.
- When removing the connector from the switch housing, push the lever down to unlock it from the slot and then withdraw the connector straight off of the pin.



### 2. Crimping of lead wires and socket

Strip 3.2 to 3.7 mm of the lead wire end, insert each stripped wire into a socket and crimp contact it using special crimping tool. Be careful that the outer insulation of the lead wires does not interfere with socket contact part. (Crimping tool: DXT170-75-1)

### 3. Attaching and detaching lead wires with sockets

#### ● Attaching

Push the socket into the square holes of the connector (with +, 1, 2, - indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in their hooks open and they are locked automatically.) Then confirm that they are locked by pulling lightly on the lead wires.

#### ● Detaching

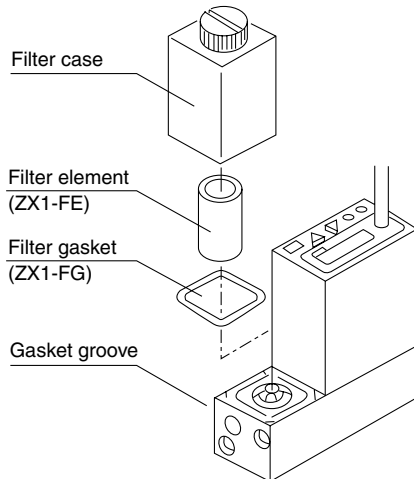
To detach a socket from connector, pull out lead wire while pressing the socket's hook with a stick having a thin tip (about. 1 mm). If the socket will be used again, first spread the hook outward.

## How to Replace Filter Element

Replace the filter element when clogging causes deterioration of the adsorption force or slow response time.

(Element part number: ZX1-FE)

Confirm that the filter gasket is seated in the groove and then reassemble the parts. (Filter gasket part no.: ZX1-FG)



### ● Regarding the filter case

#### **⚠ Caution**

1. The case is made of polycarbonate. Therefore, do not operate it in an environment that is exposed to chemicals such as thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, or water-soluble cutting oil (alkalinic).
2. Operate it away from direct sunlight.

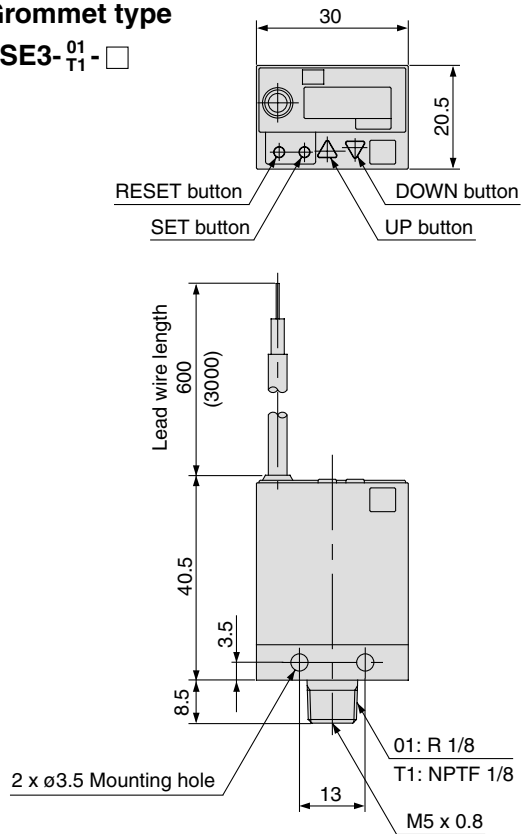
ZSE
ISE
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ZSM

# Series ZSE3/ISE3

## Dimensions/Switch Only

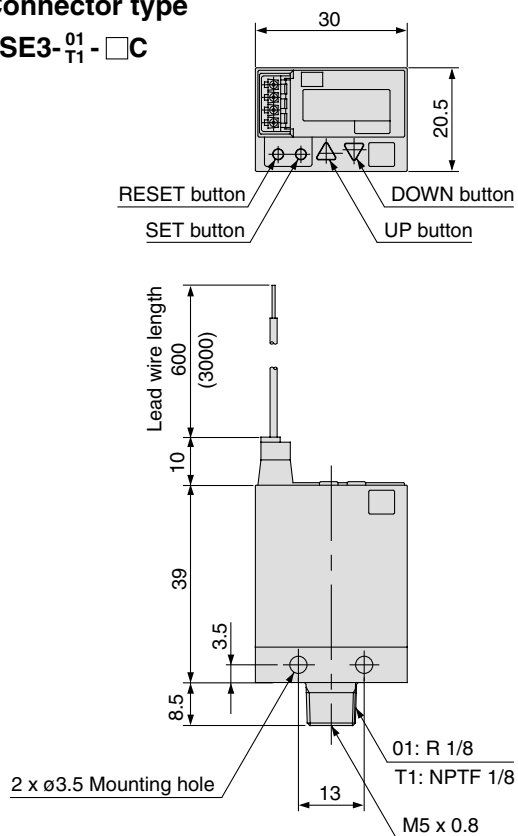
### Grommet type

$\frac{1}{2}$  SE3- $\frac{01}{T1}$  - □

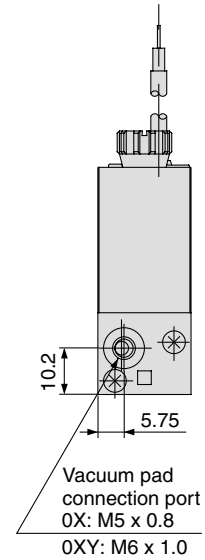
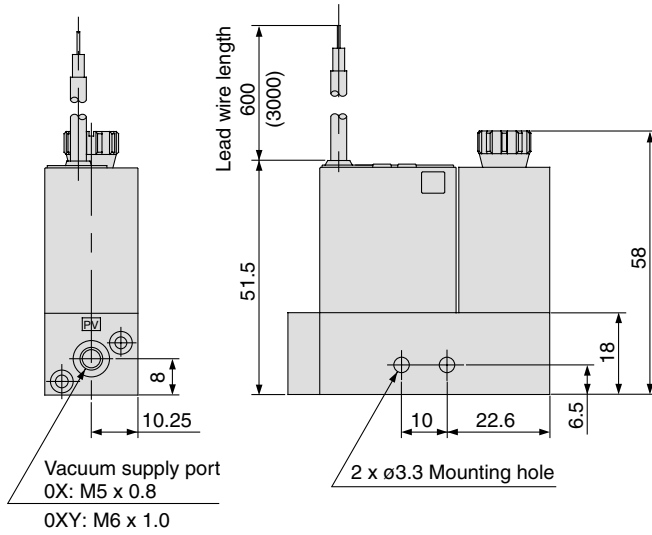
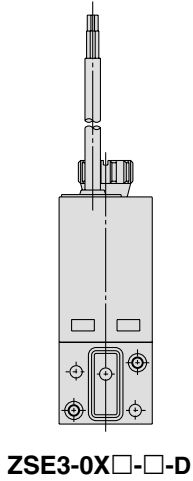
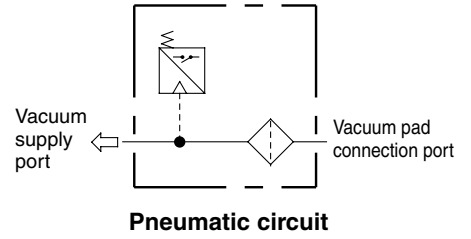
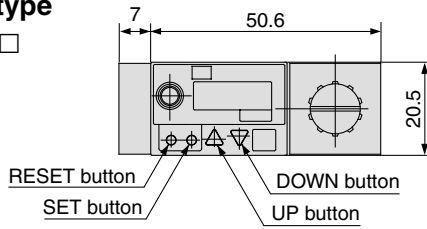


### Connector type

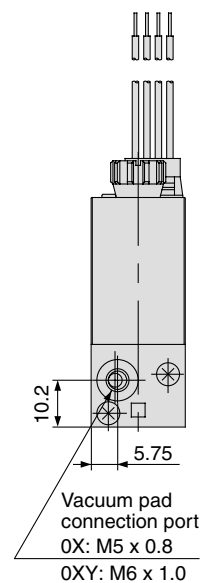
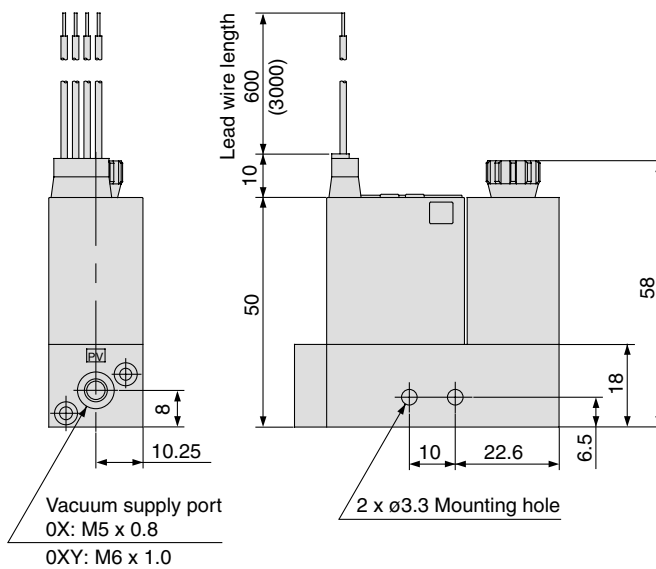
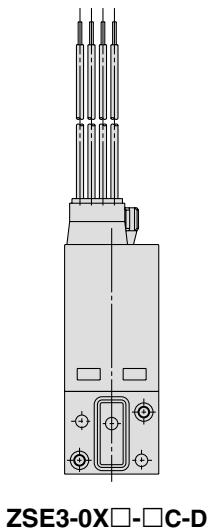
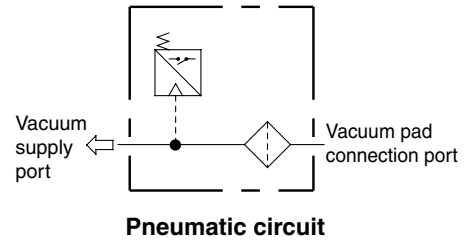
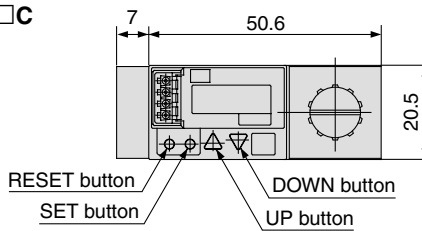
$\frac{1}{2}$  SE3- $\frac{01}{T1}$  - □C



**Grommet type**  
**ZSE3-0X□-□**



**Connector type**  
**ZSE3-0X□-□C**



- ZSE
- ISE
- ZSP
- PS
- ISA
- PSE
- IS
- ISG
- ZSM