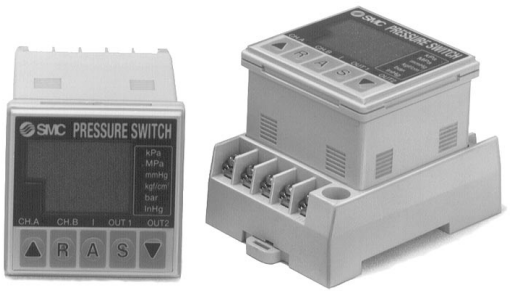
Controller
Series PSE100



How to Order

PSE10 □ — □ □

Output specifications

0	NPN output
1	PNP output

Option

—	Without cover
C	With cover

Mounting

A	Panel mounting
B	Wall mounting, DIN rail*

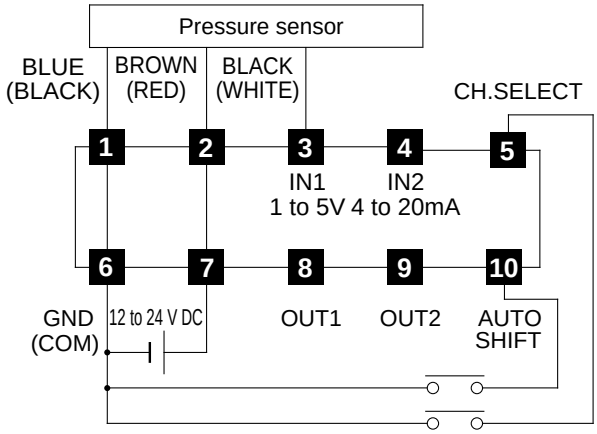
∗Refer to p.3.1-14 for DIN rail part number.

Controller Specifications

Model		**PSE100-□**	**PSE101-□**
Output specifications		NPN Open Collector 30V 80mA max.	PNP Open Collector 80mA max.
Number of outputs		2CH X 2 outputs	
Pressure display range		–101 to 10kPa (For vacuum), –10 to 100kPa (For low press.), –0.1 to 1MPa (For high press.)	
Display resolution		0.1kPa (For vacuum, low pressure), 1kPa (For high pressure)	
Display unit	**For vacuum pressure and low pressure**	kPa, mmHg, kgf/cm^2, bar, InHg	
	For high pressure	kPa, MPa, kgf/cm^2, bar	
Operating display		Light at ON. (Switch output 1: Green, Switch output 2: Red)	
Frequency response		100Hz (10ms)	
Hysteresis		Hysteresis mode: Variable, Window comparator mode: Fixed (2% F.S.)	
Temp characteristics (25°C standard)	**25 ± 10°C**	±0.3% F.S. or less	
	0 to 50°C	±0.5% F.S. or less	
Repeatability		±0.2% F.S. or less	
Supply voltage		12 to 24V DC (Ripple ±10% or less)	
Current consumption		250mA or less	
Error display		Error display at 7 segment LED	
Display specifications		4 figures X 2, 7 segment LED dispay, Sampling cycle 4 times/sec.	
Self diagnostic function		Excess pressure, Excess current, NO sensor connection, Data error (Pressure presence at zero clear)	
Additional function		Auto preset: Possible to set adsorption confirmation by pressing button only.	
		Auto shift: Possible to zero clear by input terminal	
Operating temperature range		0 to 50°C (No condensation)	
Noise resistance		500Vp-p, Pulse width 1μs, Standing 1ns	
Voltage resistance		Between external terminal and case 1000V AC, 50/60Hz for 1 min.	
Insulation resistance		Between external terminal and case 2MΩ (500V DC by megameter)	
Vibration resistance		10 to 500Hz Width: 1.5mm or acceleration 98m/s^2 (at the smaller vibration) to X, Y, Z direction (2 hours)	
Shock resistance		980m/s^2 to X, Y, Z direction (3 times for each direction)	
Protective construction		Panel mounting type: IP66 (Used gasket at panel mount part only), Wall mounting, DIN rail type: IP40	
Mounting		A: Panel mounting, B: Wall mounting, DIN rail	
Weight		A: Approx. 90g B: Approx. 110 g	
Sensor connection	**Supply voltage**	Same as power supply	
	Voltage input	1 to 5V (Input impedance 100KΩ)	
	Current input	4 to 20mA (Input impedance 250Ω)	

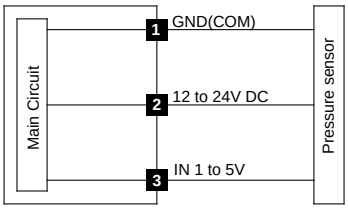
Input/Output Circuit and Connection

Connection diagram

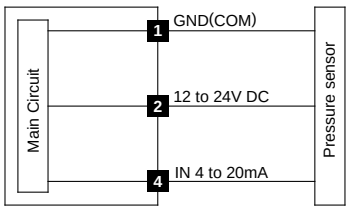


Sensor connection

Voltage input type

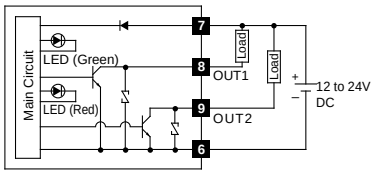


Current input type

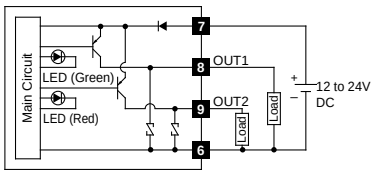


Input/Output circuit diagram

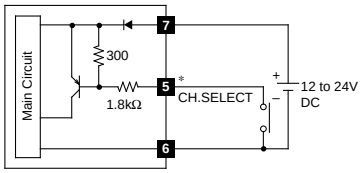
NPN output circuit diagram



PNP output circuit diagram



Input circuit diagram (Autoshift, channel selection)



∗Same as **10** AUTO SHIFT.

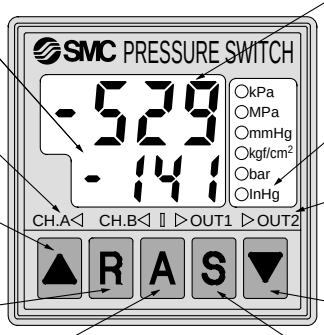
How to use the auto shift function

Connect the autoshift terminal **10** to GND **6**. This forces the unit to accept a new zero point, the display will indicate "0". After disconnecting the autoshift terminal from GND, the display will indicate relative pressure based on the new zero point.
Note) To invoke the autoshift function the autoshift terminal has to be connected to GND for at least 10 msec. LED1 will display "0" during connection to GND.

How to select channel

When CH.SELECT terminal **5** is open, channel A is selected. When it is connected to GND **6**, channel B is selected.
Note) There is a 10 msec. time delay from making contact and the actual selection of the channel.

Description



Display of peak, bottom and absolute pressure
(LED2)

Display of present pressure
(LED1)

Display of channels

Display of units

UP button (▲)
Increases calibration value.

Display of outputs
Light turns on when output is ON.

Reset button (R)
Clears abnormality. Displays "0".

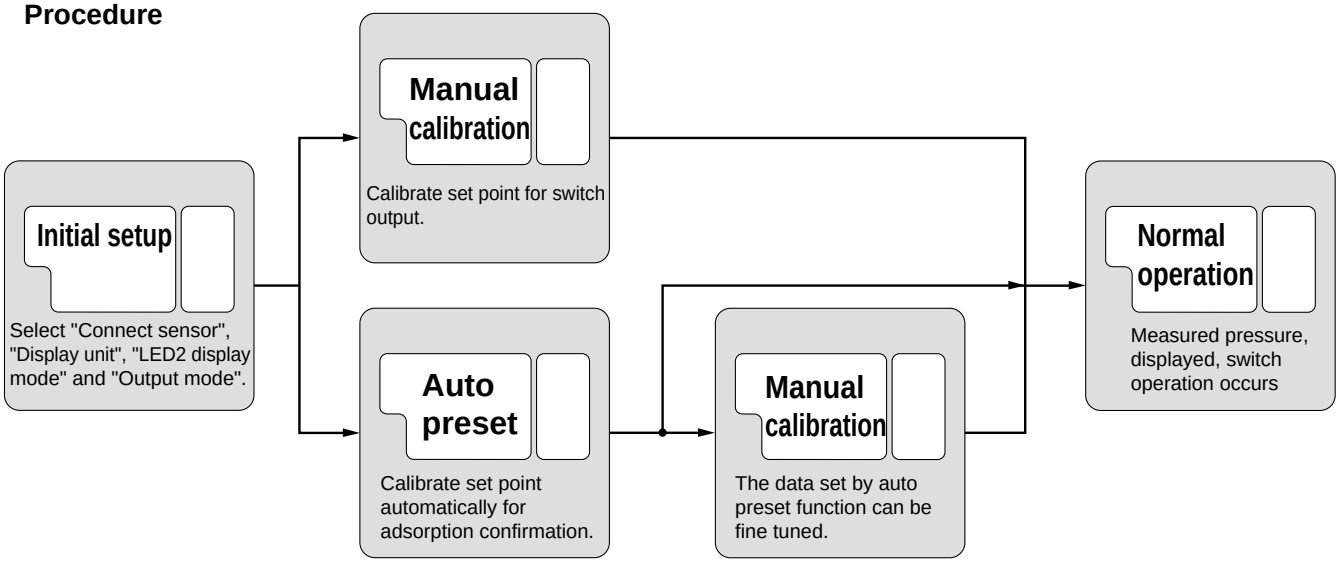
DOWN button (▼)
Decreases calibration values.

Auto preset button (A)
Reads present pressure directly.

Set button (S)
Changes calibration value and modes.

Calibration Procedure

Procedure



Method of calibration/1, 2, 3

Table 1 Sensor types and min. display unit

Sensor type \ Display unit	kPa	MPa	mmHg	kgf/cm²	bar	InHg
PSE511(–100kPa)	–0.1	–	–1	–0.001	–0.001	–0.1
PSE512(100kPa)	0.1	–	1	0.001	0.001	0.1
PSE510, 520(1MPa)	1	0.001	–	0.01	0.01	–

Table 2 LED2 display

LED2 (green) display indicates the following 3 mode options.

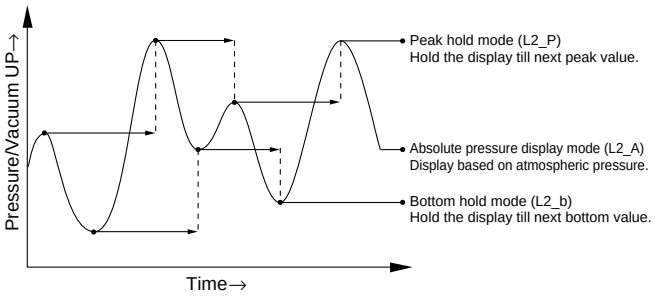
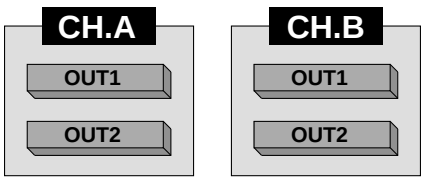


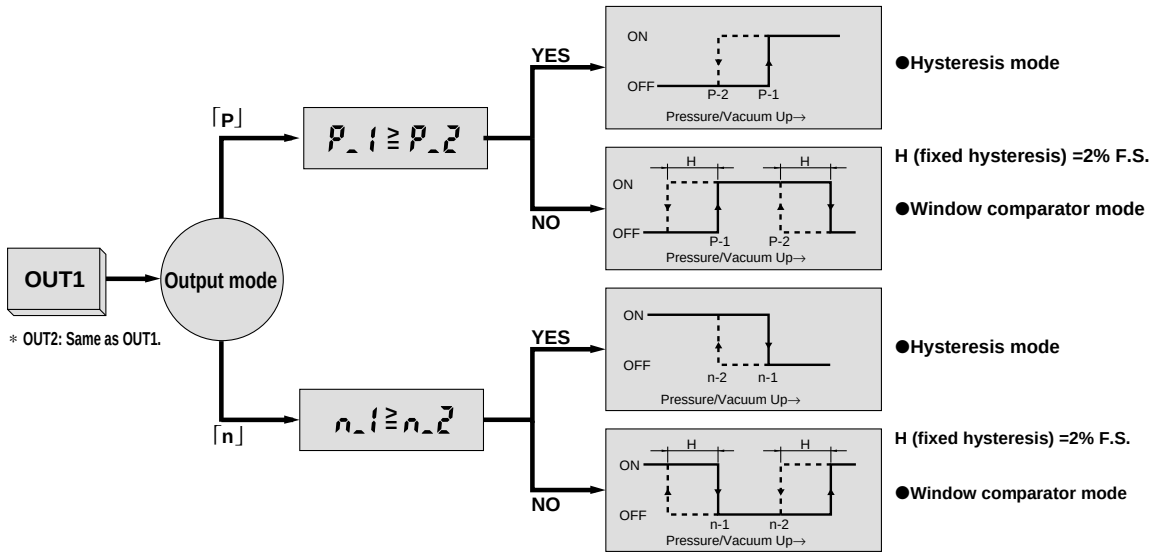
Table 3 Output type

One output type can be selected from 4 types according to output modes and relation of each calibration values.
Two separate outputs, OUT1 and OUT2, can be set per channel and two channels, A and B can be selected from outside.



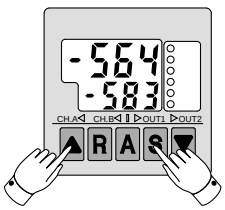
CH.A and CH.B can be selected by external signal.

Refer to p.3.1-8 "Channel selection" for further information.



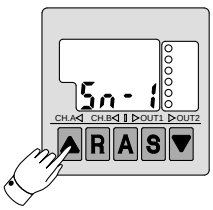
Initial setup

1. Initial setup mode



Press the button "S" at least 3 seconds while holding down the ▲ button.

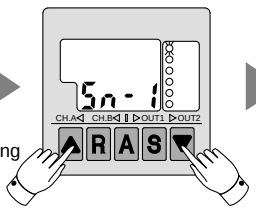
2. Selection of "Connect sensor"



Select "Connect sensor" by pressing the ▲ button.
LED2 display
- Sn -1: PSE511 (For –100kPa)
- Sn 1: PSE512 (For 100kPa)
- Sn 10: PSE510/520 (For 1MPa)

"Display unit" is entered by pressing the button "S".

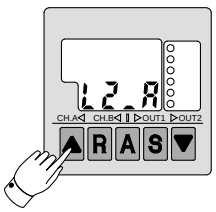
3. Selection of "Display unit"



Select "Display unit" by pressing the ▲ or ▼ button. (Refer to p.3.1-9 **Table1**.)

"LED Display mode" is entered by pressing the button "S".

4. Selection of "LED2 display mode"

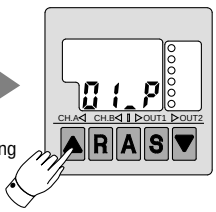


Select "LED2 display mode" by pressing the ▲ button.
LED2 display
- L2_A: Absolute pressure
- L2_P: Peak hold
- L2_b: Bottom hold

(Refer to p.3.1-9 **Table 2**.)

"Output mode" is entered by pressing the button "S".

5. Selection of "OUT1 output mode"

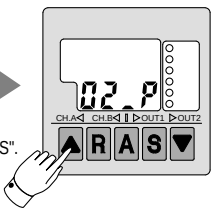


Select "OUT1 output mode" by pressing the ▲ button.
LED2 display
- O1_P: Normal mode
- O1_n: Reversed output mode

(Refer to p.3.1-9 **Table 3**.)

Press the button "S".

6. Selection of "OUT2 output mode"

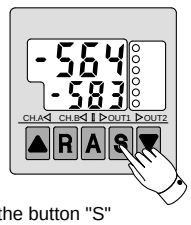


Select "OUT2 output mode" by pressing the ▲ button.
LED2 display
- O2_P: Normal mode
- O2_n: Reversed output mode

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

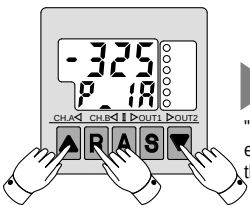
Manual calibration

1. Calibration value input mode (manual)



Press the button "S"
3 seconds or less: Selected channel
3 seconds or more: Not selected channel

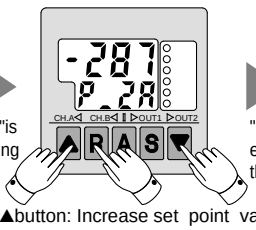
2. Input set point value for OUT1 (1)



▲button: Increase set point value
▼button: Decrease set point value
R button: Reads the pressure value at that moment
(Refer to p.3.1-9 **Table 3**.)

"OUT1(2) mode"is enterd by pressing the button "S"

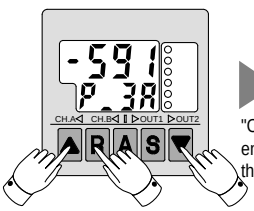
3. Input set point value for OUT1 (2)



▲button: Increase set point value
▼button: Decrease set point value
R button: Reads the pressure value at that moment

"Out2(3) mode" is enterd by pressing the button "S"

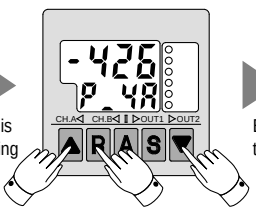
4. Input set point value for OUT2 (3)



▲button: Increase set point value
▼button: Decrease set point value
R button: Reads the pressure value at that moment

"OUT2(4) mode" is entered by pressing the button "S".

5. Input set point value for OUT2 (4)



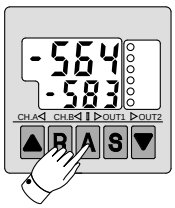
▲button: Increase set point value
▼button: Decrease set point value
R button: Reads the pressure value at that moment

By pressing the button "S" the calibration is completed.

Calibration Procedure

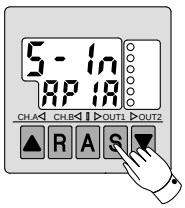
Auto preset

1. Auto preset mode



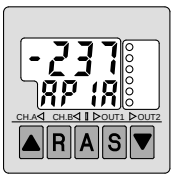
Press the button "A" for 3 to 6 seconds for selected channel, and for more than 6 seconds for not selected channel.

2. Preparation for auto preset



When the initial conditions for adsorption confirmation are met, press the button "S". Press the ▼ button when it is not required to calibrate OUT1.

3. OUT1 auto preset



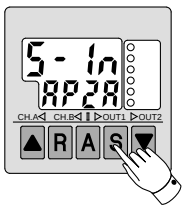
Repeat the steps adsorption and no adsorption several times. This will set the best values automatically.

After pressing button "S", OUT1 auto preset is completed.

(When the button "A" is pressed, calibration is not completed.)

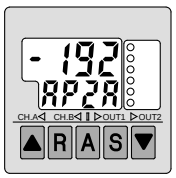
∗ Initial condition for adsorption confirmation means that conditions are met for operation to begin.

4. Preparation for auto preset



When the initial condition for adsorption confirmation are met, press the button "S". Press the ▼ button when it is not required to calibrate OUT2.

5. OUT2 auto preset



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

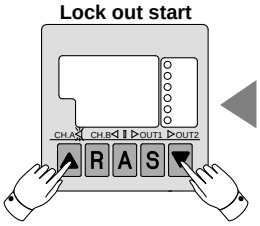
After pressing button "S", OUT2 auto preset is completed.

(When the button "A" is pressed, calibration is not completed.)

Other function

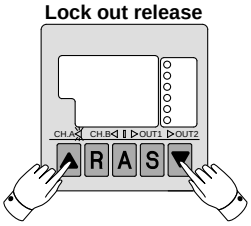
Lock out

Lock out start



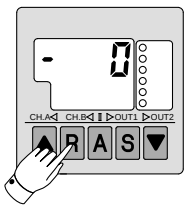
Press the ▼and ▲buttons simultaneously for at least 3 seconds. Display starts to blink.

Lock out release



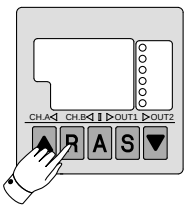
Press the ▲ and ▼buttons simultaneously for at least 3 seconds. Lock out is released. During malfunction lockout is released automatically.

Reset display to "0"



Press the button "R" for at least 3 seconds to reset the display to zero. If pressure is higher than ± 2% of rated pressure, reset of the display is not possible.

Clear auto shift



Press the button "R" for at least 2 seconds but no longer than 3 seconds. This clears the auto shift function.

Error Codes

Error codes

Display	Cause	Solution
-FFF	Sensor is not connected.	Connect sensor.
FFFF	Operating pressure over max. limit.	Lower operating pressure.
Err 1	Calibration data lost.	Contact SMC.
Err2 OU-1	Current draw on Output 1 too high (>120mA).	Check load and/or wiring for Output 1.
Err2 OU-2	Current draw on Output 2 too high (>120mA).	Check load and/or wiring for Output 2.
Err2 OU-A	Current draw on Output 1 and 2 too high (>120mA).	Check load and/or wiring for Output 1 and 2.
- - - -	Pressure is 2% above rated pressure during 0 clear.	Apply atmospheric pressure then do 0 clear.

⚠ 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

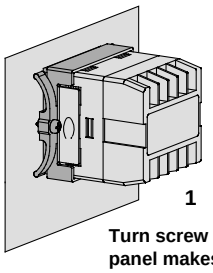
①Connect FG to ground when using switching power supply as a power source.
②Every input signal needs to be longer than 10ms to be recognized by the PSE.

Installation

⚠Caution

①Front plate of the PSE100 meets IP66 rating. However if the panel mount adaptor is used and the instrument is not seated correctly, water might enter.
②As 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 the arrow.
③Be careful not to apply excessive force to the wiring during mounting on panel or DIN rail.

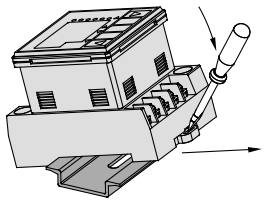
Panel mount



1

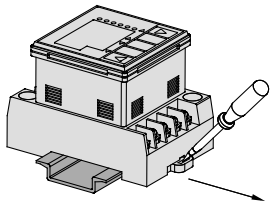
Turn screw 1/4 to 1/2 turn after panel makes contact with the sealing surface of the PSE.

Mounting on DIN rail



2a

Removal from DIN rail



2b

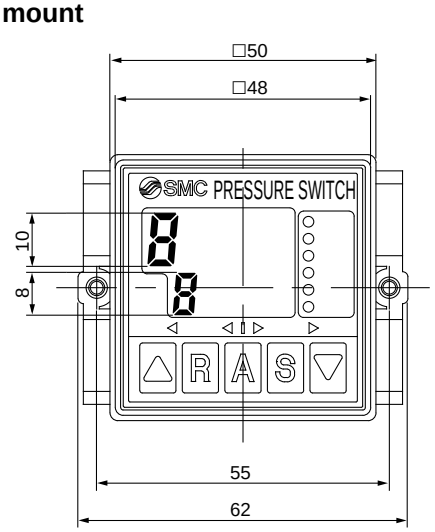
Others

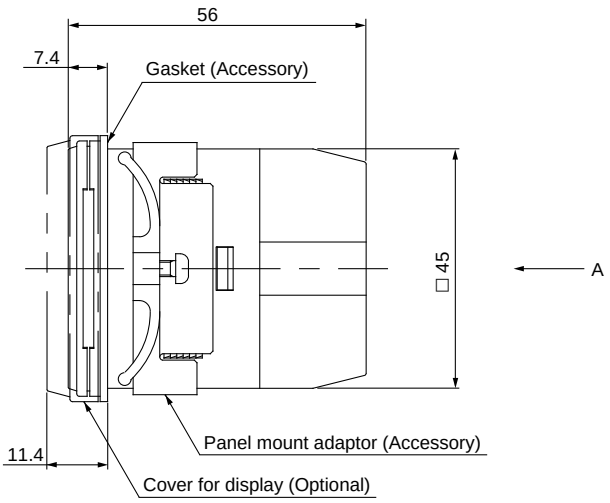
⚠Caution

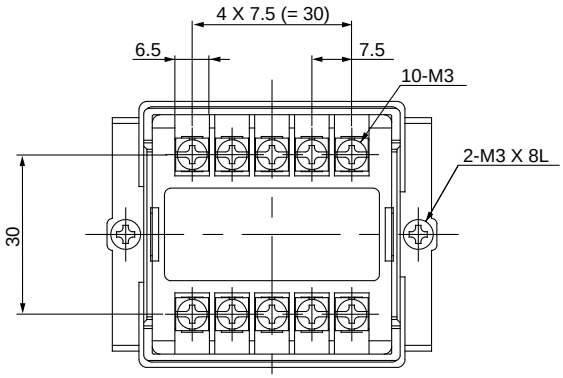
1. Time delay for power on reset of controller is 0.5 seconds. Be aware that the output circuit is not active immediately after the power is connected.

Dimensions

A: Panel mount

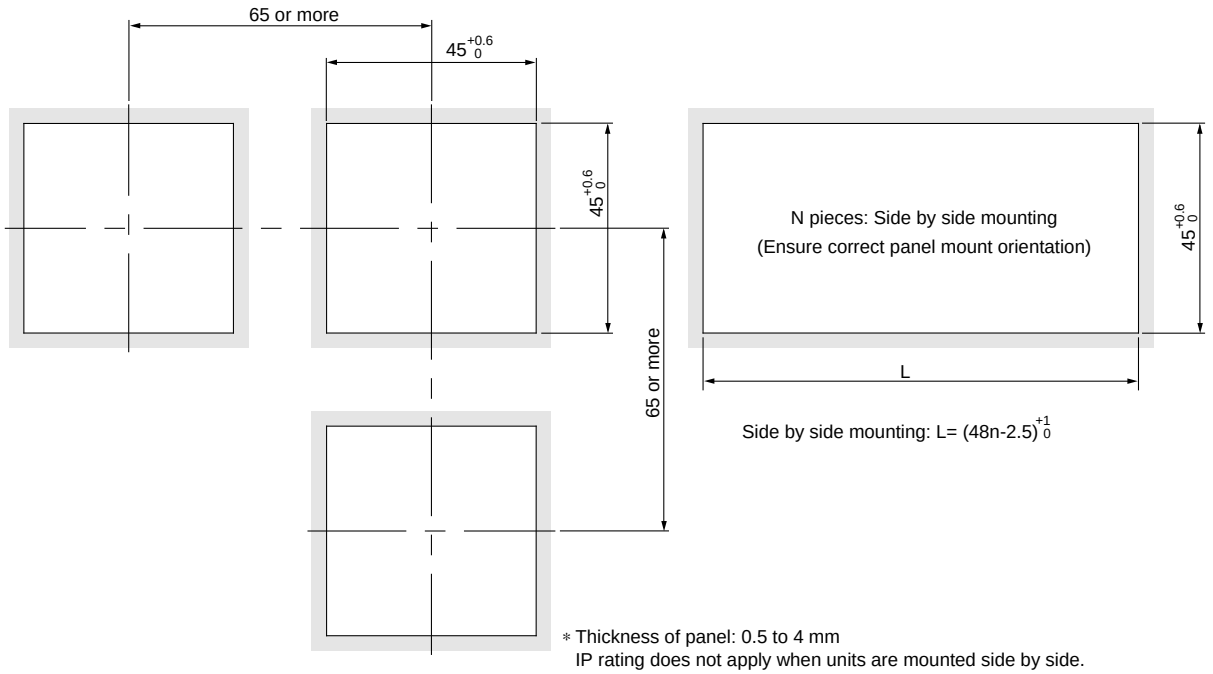






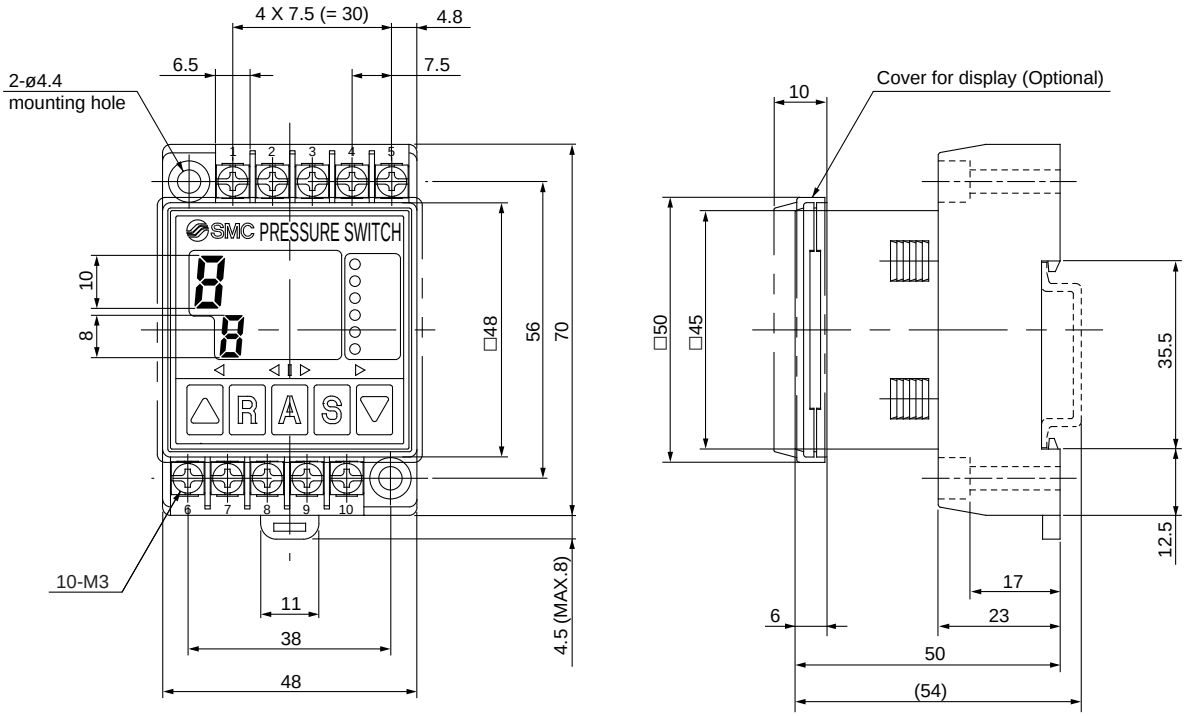
View A

Cutout dimensions for panel mount

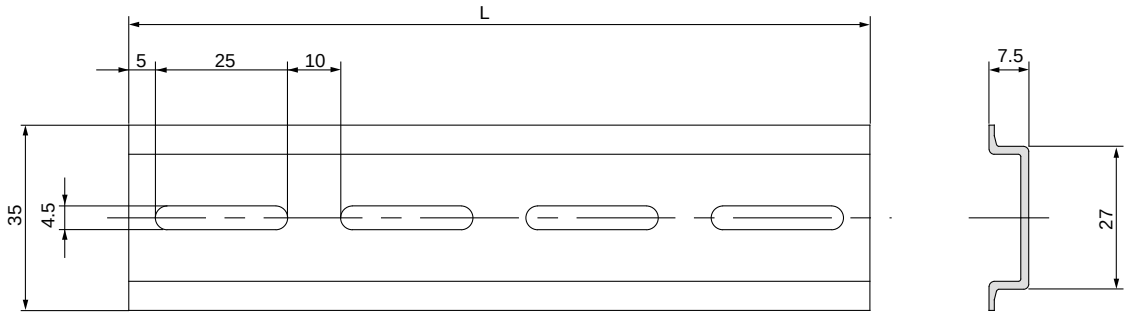


∗ Thickness of panel: 0.5 to 4 mm
IP rating does not apply when units are mounted side by side.

B: Wall mount, DIN rail



DIN rail



Material: Aluminum

Part number of DIN rail

Part number	L
ISA-2-1	105
ISA-2-2	140
ISA-2-3	175
ISA-2-4	210
ISA-2-5	245
ISA-2-6	280
ISA-2-7	315