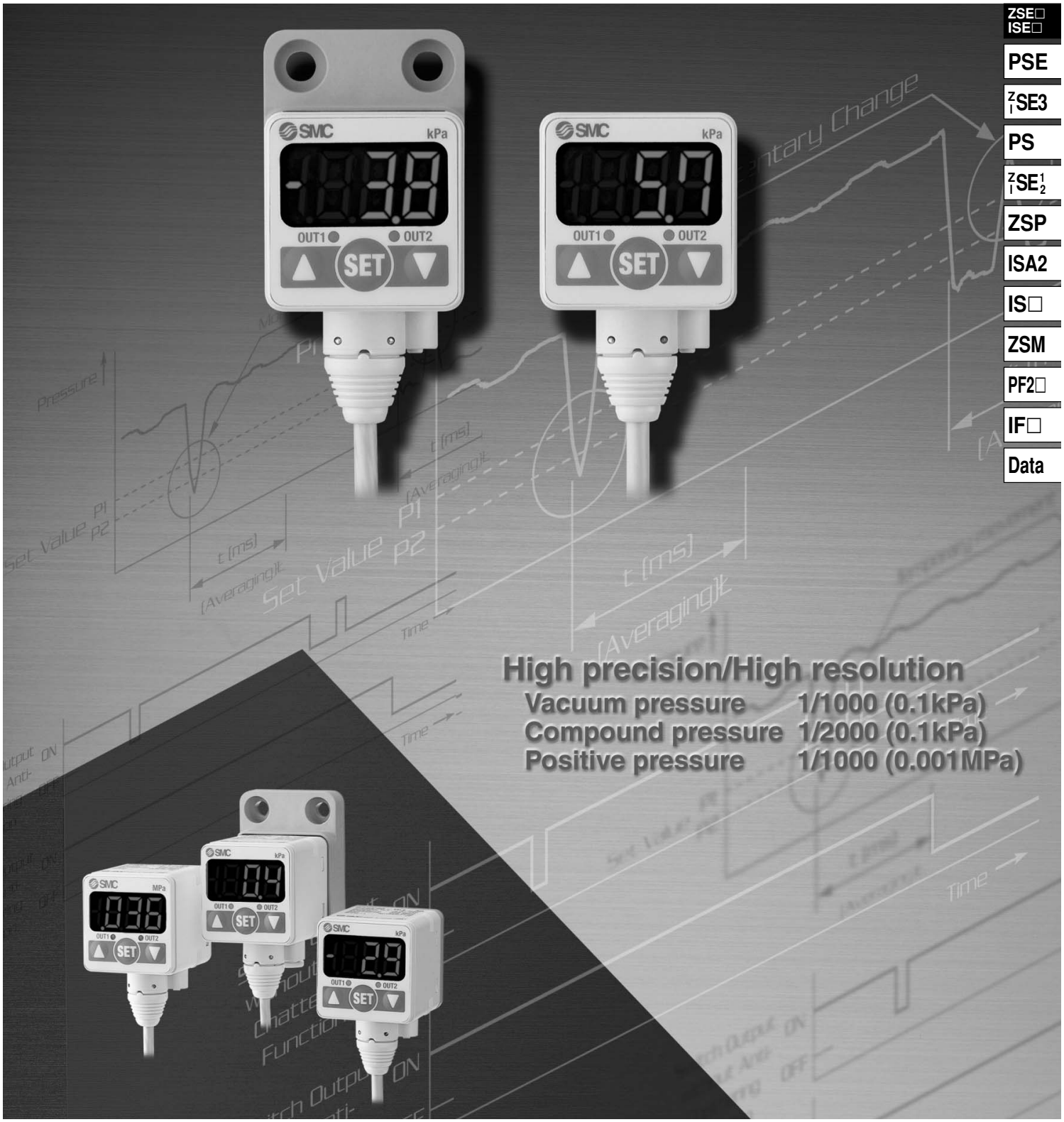
High Precision, Digital Pressure Switch

Series ZSE40/ISE40

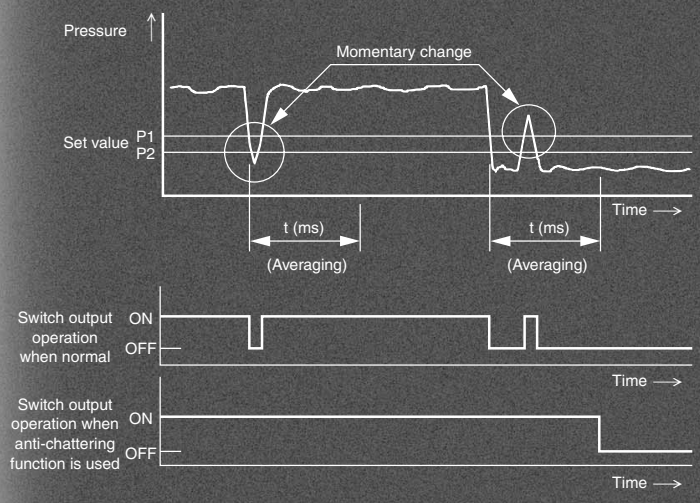


High speed response: 2.5 ms or less
With anti-chattering function
Stable switch output is possible even with sudden

Anti-chattering function
Devices such as large bore cylinders and high-flow vacuum ejectors consume a large volume of air when they operate, and this may cause a momentary drop in the primary pressure. This function prevents such momentary pressure drops from being detected as abnormal pressures by allowing the response time selection to be changed.

[Selectable response times: t]
2.5 ms (normal), 24 ms, 192 ms or 768 ms
The normal setting is selected when shipped from the factory.

(Operating principle)
The pressure values measured within the user-selected response time are averaged, and switch output (ON/OFF) is determined by comparing this averaged pressure value with the set pressure.



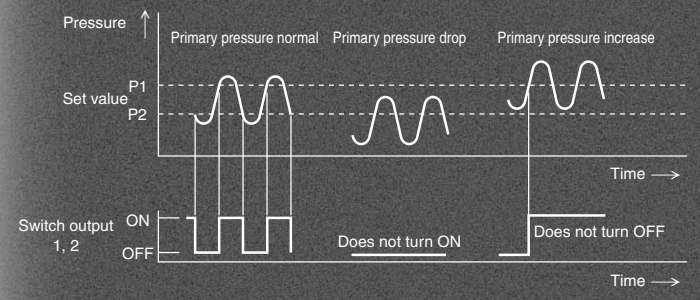
With auto shift function
Allows switch output unaffected by variations in primary pressure.

Auto shift function

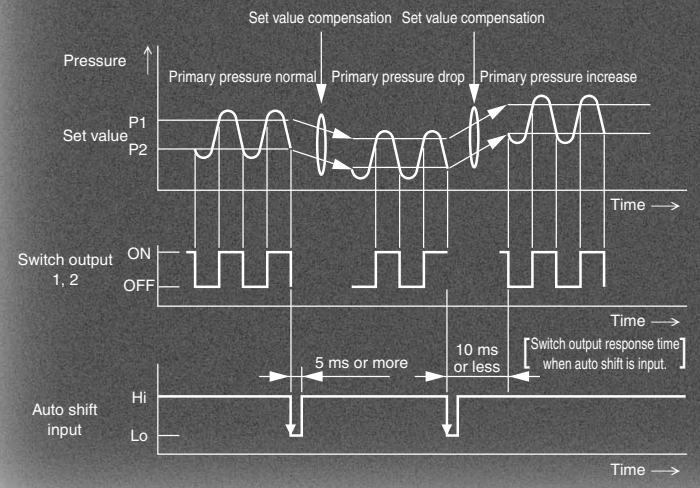
Erroneous operation may occur if there is fluctuation in the primary pressure.
The auto shift function compensates for pressure changes to ensure proper ON/OFF switch response during such fluctuations.

(Operating principle)
At the point when the primary pressure fluctuates, the set pressure value is compensated by setting the auto shift input (external input) to low (no-voltage) input, using the pressure measured at that point as a standard.

Without using auto shift
When the primary pressure fluctuates, a correct determination becomes impossible.



When using auto shift



Compound pressure (ZSE40F)
Able to detect suction pressure (vacuum pressure) and release pressure (positive pressure) with a single pressure switch.

3 types of piping
Different piping methods are possible to accommodate the installation location.

Repeatability
±0.2% F.S. ±1 digit or less

IP65 compatible
Dusttight/Splash proof type

How to Order

Set pressure range

Nil	–0.100 to 1.000 MPa	For positive pressure

For positive pressure **ISE40** — **01** **22** □ □ □

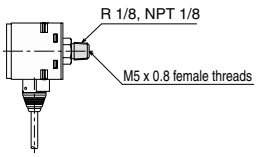
For vacuum/compound pressure **ZSE40** □ — **01** **22** □ □ □

Set pressure range

Nil	10.0 to –101.3 kPa	For vacuum pressure
F	–100.0 to 100.0 kPa	For compound pressure

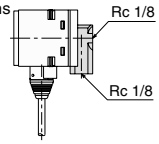
Piping specifications

01: R 1/8 (With M5 female threads)
T1: NPT 1/8 (With M5 female threads)



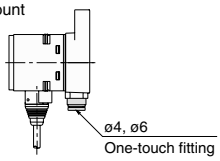
W1: Rc 1/8

Reverse pressure two directions



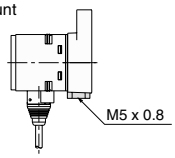
∗ **C4:** With ø4 One-touch fitting
∗ **C6:** With ø6 One-touch fitting

Wall mount



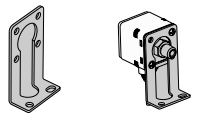
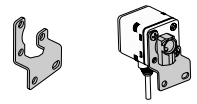
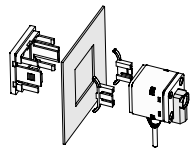
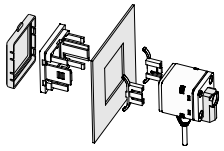
∗ **M5:** M5 x 0.8 (Female threads)

Wall mount



∗ Option

Option

Nil	None	
A	Bracket A (ZS-24-A)	
B	Bracket B (ZS-24-B)	
E	Panel mount (ZS-22-A)	
F	Panel mount (ZS-24-C) + Front protective cover	

∗ When optional parts only are required, order with the part numbers inside ( ).

Input/Output specifications

22	NPN open collector 2 outputs + analog output
30 ∗	NPN open collector 2 outputs + auto shift input
62 ∗	PNP open collector 2 outputs + analog output
70 ∗	PNP open collector 2 outputs + auto shift input

∗ Option

Note

When equipped with auto shift function, the following ranges can be set.

Set pressure range	Setting range
–100.0 to 100.0 kPa	–100.0 to 100.0 kPa
10.0 to –101.3 kPa	–101.3 to 101.3 kPa
–0.1 to 1.000 MPa	–1.000 to 1.000 MPa

Unit specifications

Nil	With unit switching function Note1)
M	SI unit only Note 2)

Note 1) This will no longer be sold for use in Japan after the new Weight and Measure Act is implemented (October,1999).
Note 2) Fixed unit
For vacuum/compound pressure: kPa
For positive pressure: MPa

Lead wire length

Nil	0.6 m
L	3 m

Specifications

		ZSE40F (Compound pressure)	**ZSE40** (Vacuum pressure)	**ISE40** (Positive pressure)
Rated pressure range		–100.0 to 100.0 kPa	0.0 to –101.3 kPa	0.000 to 1.000 MPa
Operating pressure range/Set pressure range		–100.0 to 100.0 kPa	10.0 to –101.3 kPa	–0.100 to 1.000 MPa
Withstand pressure		500 kPa		1.5 MPa
Set pressure resolution Note 1)	kPa	0.1		—
	MPa	—		0.001
	kgf/cm²	0.001		0.01
	bar	0.001		0.01
	psi	0.02	0.01	0.1
	mmHg	1		—
	InHg	0.1		—
Applicable fluid		Air, Non-corrosive/Non-flammable gas		
Power supply voltage		12 to 24 VDC ±10%, Ripple (p-p) 10% or less		
Current consumption		55 mA or less		
Switch output		NPN or PNP 2 outputs Max. load current : 80 mA Max. applied voltage: 30 VDC (With NPN output) Residual voltage : 1 V or less (With 80 mA load current)		
Repeatability		±0.2% F.S. ±1digit or less		
Hysteresis	Hysteresis mode	Variable		
	Window comparator mode	Fixed (3 digits) Note4)		
Response time (With anti-chattering function)		2.5 ms or less (With anti-chattering function: 24 ms, 192 ms and 768 ms selections)		
Output short circuit protection		Yes		
Display		3 1/2 digit LED display (Sampling cycle: 5 times/sec.)		
Display accuracy		±2% F.S. ±1 digit or less (at ambient temperature of 25 ±3°C)		
Indicator light		Green LED (OUT1: Lights when ON), Red LED (OUT2: Lights when ON)		
Analog output Note 2)		Output voltage: 1 to 5 V ±5% F.S. or less (in rated pressure range) Linearity: ±1% F.S. or less Output impedance: Approx. 1 kΩ	Output voltage: 1 to 5 V ±2.5% F.S. or less (in rated pressure range) Linearity: ±1% F.S. or less Output impedance: Approx. 1 kΩ	
Auto shift input Note 3)		No-voltage input (Reed or solid state), input 5 ms or more		
Environmental resistance	Enclosure	IP65		
	Ambient temperature range	Operating: 0 to 50°C, Stored: –10 to 60°C (No condensation or freezing)		
	Ambient humidity range	Operating/Stored: 35 to 85% RH (No condensation)		
	Withstand voltage	1000 VAC for 1 min. between lead wires and body		
	Insulation resistance	50 MΩ or more (at 500 VDC) between lead wires and body		
	Vibration resistance	10 to 500 Hz at the smaller of amplitude 1.5 mm or acceleration 98 m/s² (10 G) in X, Y, Z directions for 2 hrs. each (De-energized)		
	Impact resistance	980 m/s² (100 G) in X, Y, Z directions 3 times each (De-energized)		
Temperature characteristics		In a temperature range of 0 to 50°C, ±2% F.S. or less of pressure measured at 25°C		
Port size		01: R 1/8, M5 x 0.8, T1: NPT1/8, M5 x 0.8, W1: Rc 1/8 C4: With ø4 One-touch fitting, C6: With ø6 One-touch fitting, M5: M5 female threads		
Lead wire		5-wire oil resistant heavy-duty cord (0.15 mm²)		
Weight		01/T1 types approx. 60 g, W1 type approx. 80 g, C4/C6/M5 types approx. 92 g (Each including 0.6 m lead wires)		

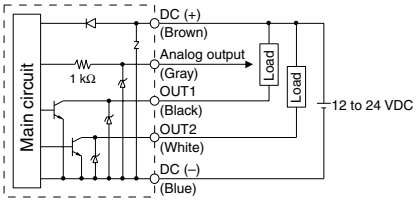
Note 1) Equipped with unit switching function
(Types without the unit switching function use SI units (kPa or MPa) only.)
Note 2) For ZSE40 (F)/ISE40-□-$^{22}_{62}$
Note 3) For ZSE40 (F)/ISE40-□-$^{30}_{70}$
Note 4) For ZSE40F (compound pressure) with "psi" indication, this is 0.03 to 0.04 psi.
Note 5) For ZSE40F (compound pressure) with "psi" indication, zero clear is in the range of ±0.01 psi.

Note)
When equipped with auto shift function, the following ranges can be set.

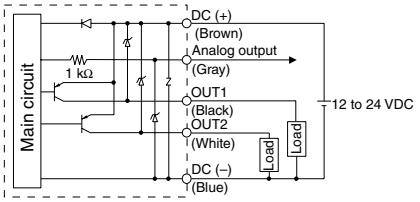
Set pressure range	Setting range
–100.0 to 100.0 kPa	–100.0 to 100.0 kPa
10.0 to –101.3 kPa	–101.3 to 101.3 kPa
– 0.1 to 1.000 MPa	–1.000 to 1.000 MPa

Example of Internal Circuit and Wiring

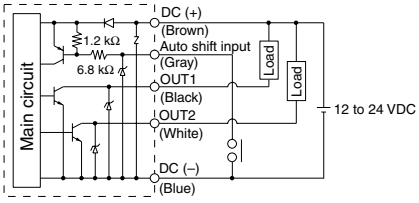
ZSE40(F)
ISE40-□-22(L)-(M)
With analog output



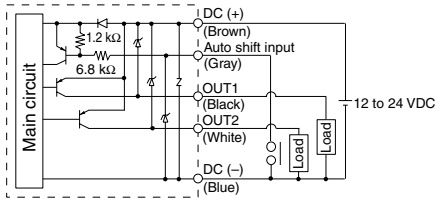
ZSE40(F)
ISE40-□-62(L)-(M)
With analog output



ZSE40(F)
ISE40-□-30(L)-(M)
With auto shift input

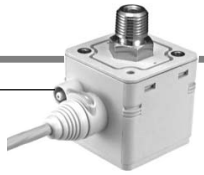


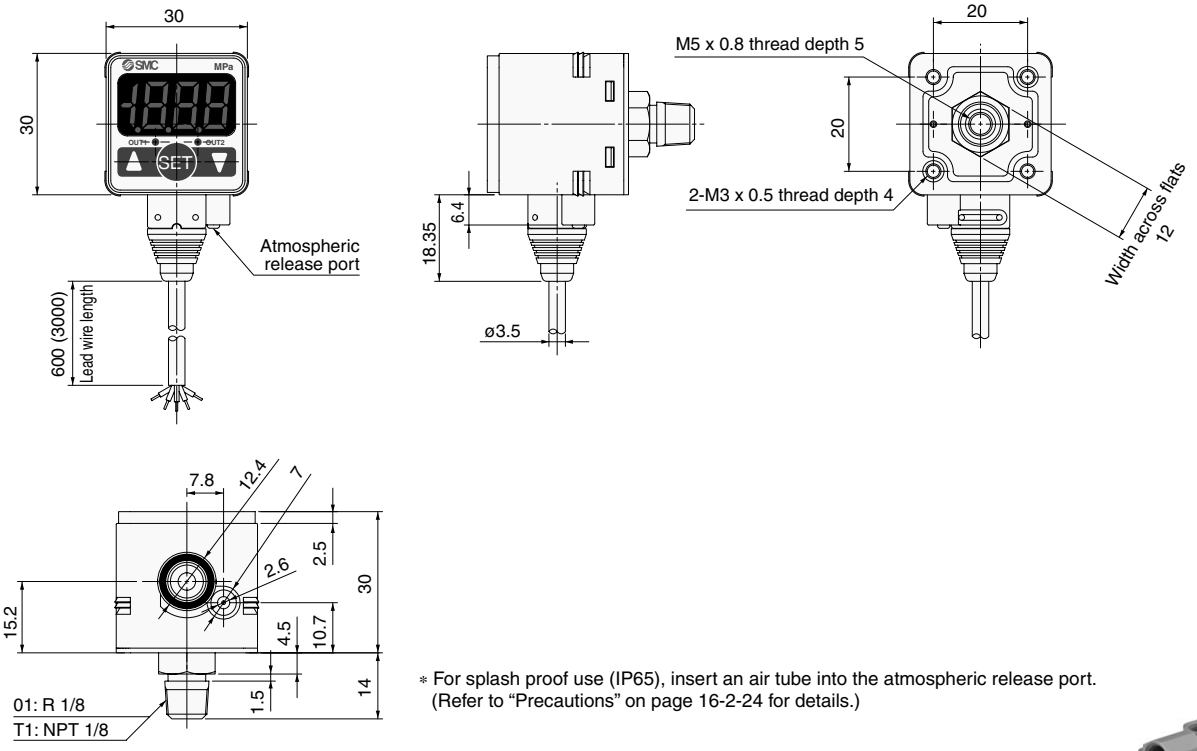
ZSE40(F)
ISE40-□-70(L)-(M)
With auto shift input



Dimensions

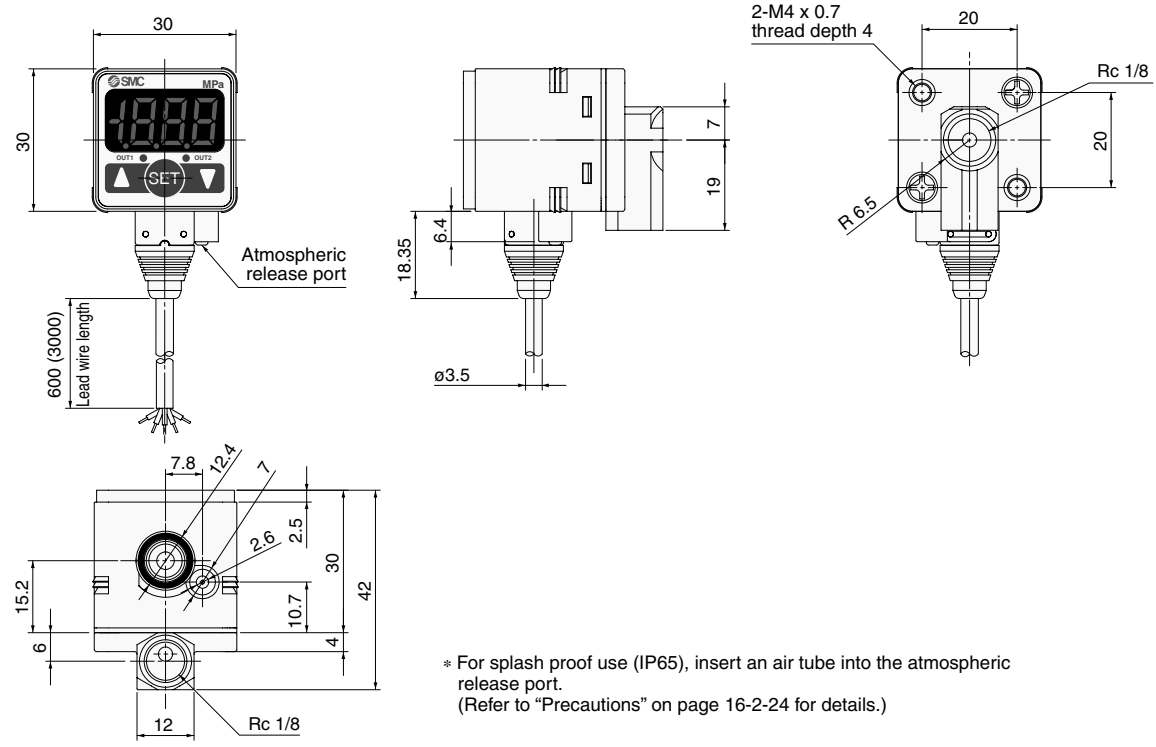
ZSE40(F)/ISE40-$^{01}_{T1}$





* For splash proof use (IP65), insert an air tube into the atmospheric release port.
(Refer to “Precautions” on page 16-2-24 for details.)

ZSE40(F)/ISE40-W1



* For splash proof use (IP65), insert an air tube into the atmospheric release port.
(Refer to “Precautions” on page 16-2-24 for details.)