

### 3-Screen Display

# High-Precision Digital Pressure Switch

Air	1.0	ISE70	MPa	1.6	ISE71	MPa
General fluids	1.0	ISE70G	MPa	2.0	ISE75G	MPa
	5.0	ISE76G	MPa	10	ISE77G	MPa
	16	ISE78G	New MPa	50	ISE79S	MPa

It is possible to change the settings while checking the measured value.

Main screen

Measured value (Current pressure value)

Sub screen

Label (Display item), Set value (Threshold value)

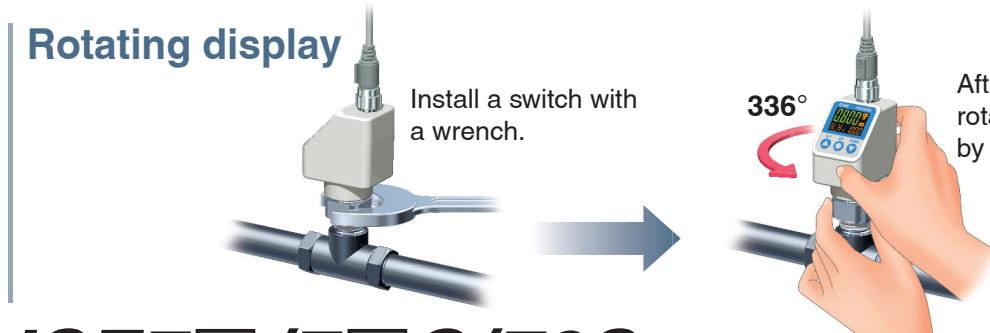
Visualization of Settings	
Set value (Threshold value)	P_U
Hysteresis value	H_U
Peak value	H_H_U
Bottom value	H_Lo



### Angled display Good visibility from various mounting positions



### Rotating display



After installation, the display can be rotated to an easy-to-see direction by securing the body by hand.

**ISE7□/7□G/79S Series**

 **SMC**

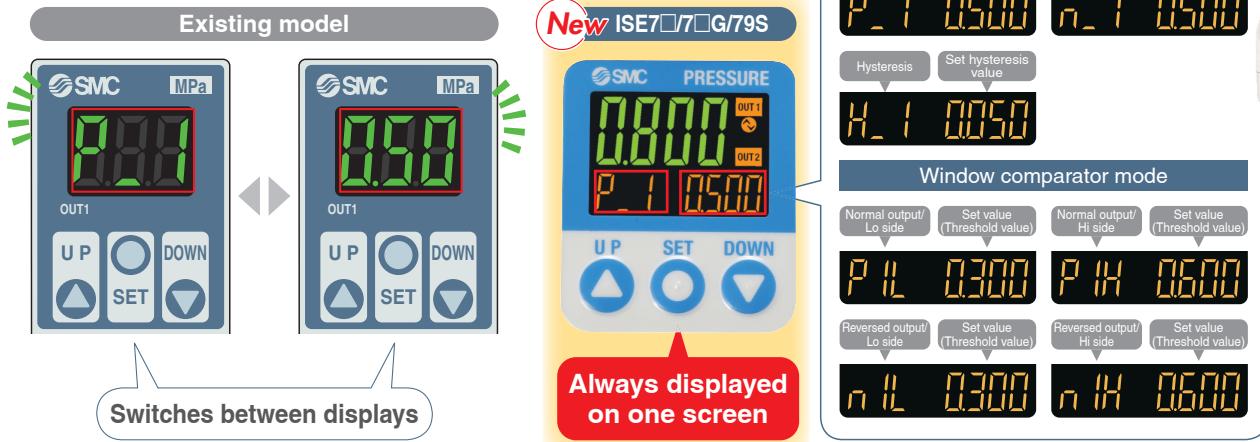
CAT.EUS100-123C-UK

\* The ISE78G is not in compliance with UL standards.



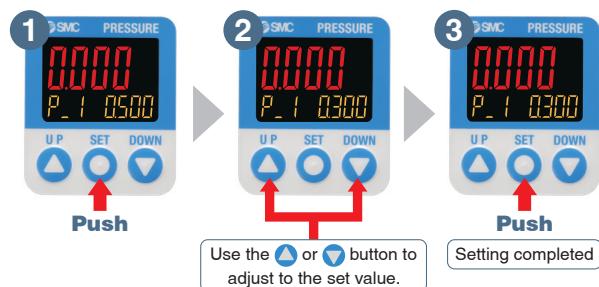
## Visualization of Settings

The sub screen (label) shows the item to be set.



## Simple 3-Step Setting

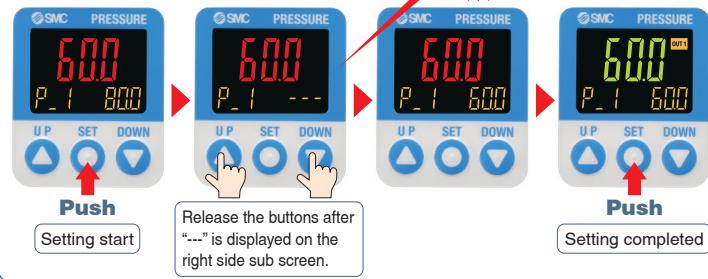
When the SET button is pressed and the set value ( $P_{-1}$ ) is being displayed, the set value (threshold value) can be set. When the SET button is pressed and the hysteresis value ( $H_{-1}$ ) is being displayed, the hysteresis value can be set.



### Now with a snap shot function for set value reading

Pressing the  $\Delta$  and  $\nabla$  buttons simultaneously for at least 1 s will make the set value (threshold value) the same as the current pressure value.

**Snap shot function**



## NPN/PNP Switch Function

Both NPN and PNP are available.

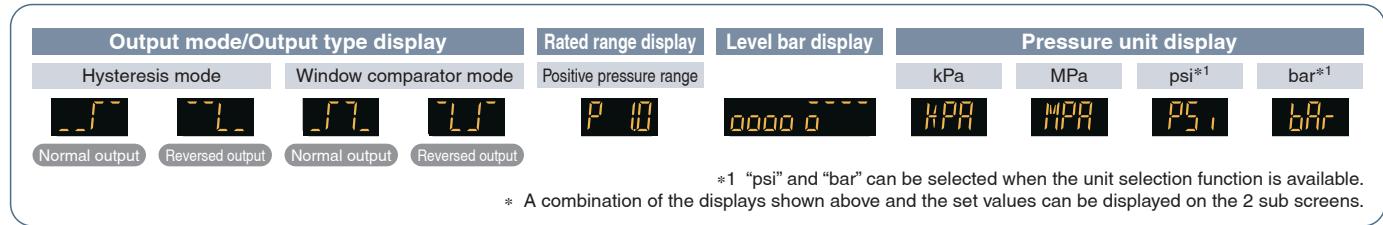
The number of stock items can be reduced.



## Other Sub Screen Display

The peak value, bottom value, or both values can be displayed on one screen!

\* Peak and bottom values are maintained even if the power supply is cut.



## Convenient Functions

### Security code

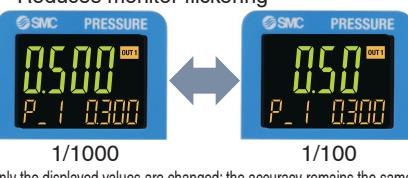
The key-lock function keeps unauthorized persons from tampering with the settings.

### Power saving mode

Power consumption is reduced by turning OFF the monitor. (Reduce power consumption by approx. 60 %.)

### Resolution switch function

Reduces monitor flickering



(Only the displayed values are changed; the accuracy remains the same.)

### Applied pressure error

When the applied pressure exceeds the rated pressure, the pressure application is counted as an applied pressure error (the max. number of applied pressure errors is 1000 counts).



## 3 Setting Modes

Select the setting mode that best meets your needs.

### 3-Step Setting Mode

#### Simple

- Threshold value setting or
- Hysteresis value setting

### 1 Mode selection

Press the button once.

### 2 Output mode selection

Select from
 

- Hysteresis mode
- Window comparator mode
- Error output • Output OFF

### 3 Normal or reversed output selection

Select from
 

- Normal output
- Reversed output

### 4 Set value (Threshold value) setting

• Adjust the numerical value.

### 5 Hysteresis value setting

• Adjust the numerical value.

### 6 Delay time selection

• Variable from 0 to 60 s/0.01 s increments

### 7 Display colour selection

Select from
 

- ON /OFF
- ON /OFF
- Normally /Normally

### Simple Setting Mode

#### Settings

- Threshold value setting
- Hysteresis value setting
- Delay time selection

Press the button for between 1 and 3 s.

### Function Selection Mode

#### Higher function

- Output mode selection
- Normal or reversed output selection
- Threshold value setting
- Hysteresis value setting
- Delay time selection
- Display colour selection

Press the button for between 3 and 5 s.



**Setting Completed**

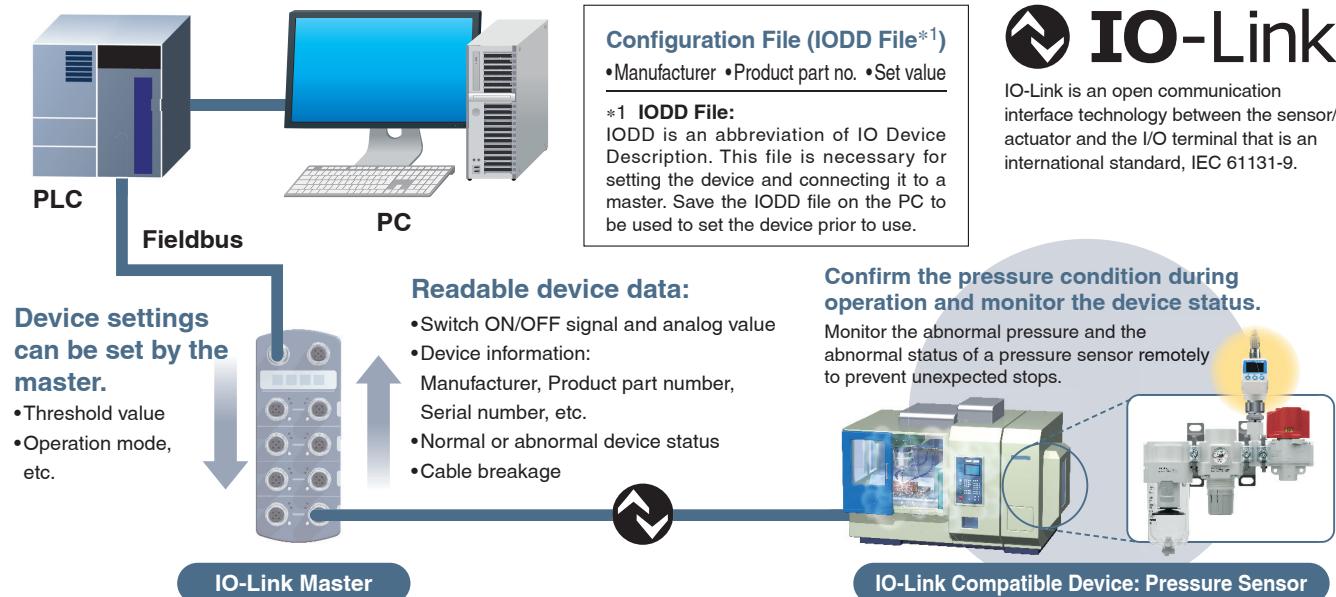
**Setting Completed**

**Setting Completed**

\* The chart above shows OUT1 operations. The Function Selection Mode for OUT2 is set using "F2." "2" will be displayed instead of "1" in the illustration above. (Example) P\_1 → P\_2

## IO-Link Compatible

Visualization of operation and equipment status/Remote monitoring and control by communication



## Implement diagnostic bits in the process data.

The diagnostic bit in the cyclic process data makes it easy to find problems with the equipment.

It is possible to find problems with the equipment in real time using the cyclic (periodic) data and to monitor such problems in detail with the noncyclic (aperiodic) data.

### Process Data

Bit offset	Item		Note	
0	OUT1 output	0: OFF	1: ON	
1	OUT2 output	0: OFF	1: ON	
2	Diagnosis	0: Normal	1: Abnormal	
3 to 15	Measured pressure value	Unsigned 13 bit		

### Diagnosis items

- Internal product malfunction
- Outside of zero-clear range
- Outside of rated pressure range
- Upper temperature limit exceeded inside the product

Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
Item	Measured pressure value														Diagnosis	OUT2	OUT1

## Display function

Displays the output communication status and indicates the presence of communication data



### Operation and Display

Communication with master	IO-Link status indicator light	Status		Screen display*3	Description
Yes	<b>COM*</b> <sup>1</sup>  	Normal   IO-Link mode	Operate		Normal communication status (readout of measured value)
			Start up		At the start of communication
			Preoperate		
		Abnormal   IO-Link mode	Version does not match	 / 10	IO-Link version does not match that of the master. The master uses version 1.0.
			Lock		Back-up and re-store required due to data storage lock
			Communication disconnection	  	Normal communication was not received for 1 s or longer.
No	OFF	SIO mode			General switch output
	OFF				

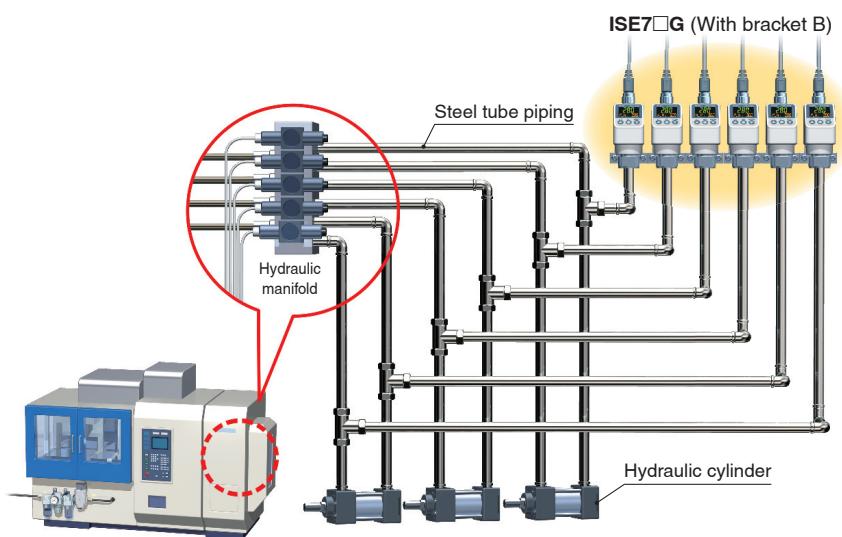
\*1 The COM indicator is ON when communication with the master is established. \*2 In IO-Link mode, the IO-Link indicator is ON or flashes. \*3 When the sub screen is set to Mode

## Introduction of Series

ISE70/71 p. 7		ISE70G/75G/76G/77G/78G/79S pp. 9, 11													
Applicable fluid	Air	General fluids													
Model	ISE70	ISE71	ISE70G	ISE75G	ISE76G	ISE77G	ISE78G	ISE79S							
Rated pressure range	1.0 MPa	1.6 MPa	1.0 MPa	2.0 MPa	5.0 MPa	10 MPa	16 MPa	50 MPa							
Withstand pressure	1.5 MPa	2.4 MPa	3.0 MPa	5.0 MPa	12.5 MPa	30 MPa	48 MPa	75 MPa							
Power supply voltage	When used as a switch output device 12 to 24 VDC ±10 % with 10 % voltage ripple or less														
	When used as an IO-Link device 18 to 30 VDC, including ripple (p-p) 10 %														
Temperature characteristics	±2 % F.S. (25 °C standard)	±3 % F.S. (ISE70G)/±5 % F.S. (ISE75G/76G/77G/78G/79S)													
Repeatability	±0.5 % F.S.														
Hysteresis	Hysteresis mode: Variable Window comparator mode: Variable														
Output type	Select from NPN or PNP open collector.														
Number of screens/Display type	3-screen/2-colour display														
Enclosure	IP67														
Materials of parts in contact with fluid	Sensor pressure receiving area: Silicon Piping port: C3604 (Electroless nickel plating) Sensor seal: HNBR	Sensor pressure receiving area: Al <sub>2</sub> O <sub>3</sub> (Alumina 96 % ) Piping port: C3604 (Electroless nickel plating) Sensor seal: FKM + Grease (ISE70G) FKM (ISE75G/76G/77G/78G)					Sensor pressure receiving area, Piping port: Equivalent to stainless steel 630								
Piping	Rc1/4, NPT1/4, G1/4 (ISO 1179-1 compliant)							Rc1/4, G1/4 (ISO 1179-1 compliant)							
Option	Lead wire with M12 connector, Bracket														
Note	Selectable pressure unit, Anti-chattering function, Display calibration function, Power saving mode, Sub screen setting function														

**Select either the integrated type or the remote type according to the application.**

**<Integrated type>**



**<Remote type>**



+



or



**PSE56□ Series**

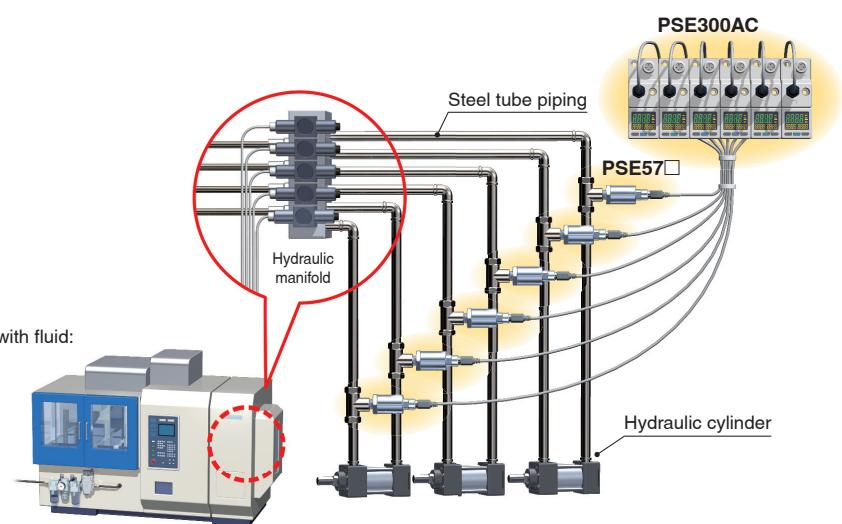
- Material of parts in contact with fluid: Stainless steel 316L
- Select from a face seal or compression fitting.

For details, refer to the [Web Catalogue](#).

**PSE57□ Series**

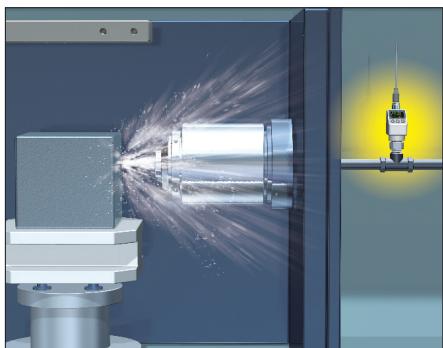
- Materials of parts in contact with fluid  
Piping port: C3604 + Nickel plating  
Pressure sensor: Al<sub>2</sub>O<sub>3</sub> (Alumina 96 %)  
Sensor seal: FKM + Grease (PSE570/573/574)  
FKM (PSE575/576/577)
- Withstand voltage: 500 VAC

For details, refer to the [Web Catalogue](#).

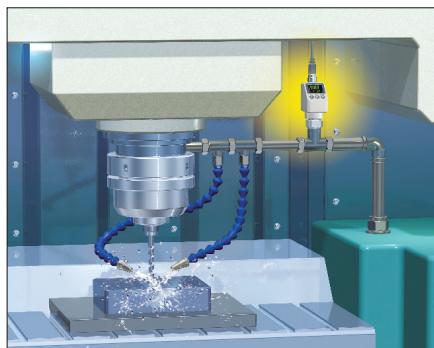


**Application Examples**

**For High pressure For the high-pressure main spindle drill pressure control**



**For the liquid coolant pressure control**



**For the PET bottle molding machine pressure control**



# ÍNDICE

## **3-Screen Display High-Precision Digital Pressure Switch ISE7□/7□G/79S Series**



### **3-Screen Display High-Precision Digital Pressure Switch: For Air ISE70/71 Series**

How to Order .....	p. 7
Options/Part Nos. ....	p. 7
Specifications .....	p. 8

### **3-Screen Display High-Precision Digital Pressure Switch: For General Fluids ISE70G/75G/76G/77G/78G Series**

How to Order .....	p. 9
Options/Part Nos. ....	p. 9
Specifications .....	p. 10

### **3-Screen Display High-Precision Digital Pressure Switch: For General Fluids ISE79S Series**

How to Order .....	p. 11
Options/Part Nos. ....	p. 11
Specifications .....	p. 12

Set Pressure Range and Rated Pressure Range .....	p. 13
Internal Circuits and Wiring Examples .....	p. 13
Dimensions .....	p. 14
Function Details .....	p. 15
Safety Instructions .....	Back cover

3-Screen Display

IO-Link CE UK CA cULus

High-Precision Digital Pressure Switch: For Air

RoHS

# ISE70/71 Series

## How to Order

ISE70-02-L2-M

Pressure range

Model	Description
ISE70	0 to 1 MPa
ISE71	0 to 1.6 MPa

Piping specification

Symbol	Description
02	Rc1/4
N02	NPT1/4
F02	G1/4*1

\*1 ISO 1179-1 compliant

Output specification\*1

Symbol	Description
L2	IO-Link: Switch output 1 + Switch output 2 (Switch output: NPN or PNP switching type)
AB	Switch output 1 + Switch output 2 (NPN or PNP switching type)

\*1 Refer to pages 8 and 13 for details.

Unit specification

Symbol	Description
—	Units selection function

\*1 Fixed units: MPa, kPa

Option 3

Symbol	Description
—	Operation manual
Y	None
K	Operation manual + Calibration certificate
T	Calibration certificate

Option 2

Symbol	Description
—	None
A	Bracket A (Interchangeable with ISE70)
B	Bracket B

Option 1

Symbol	Description
—	None
S	Lead wire with M12 connector (Straight, 5 m)
L	Lead wire with M12 connector (Right-angled, 5 m)

## Options/Part Nos.

When only optional parts are required, order with the part numbers listed below.

Description	Part no.	Note
Bracket A	ZS-50-A	Interchangeable with ISE70 With 2 mounting screws (M4 x 6 L)
Bracket B	ZS-50-B	With 2 mounting screws (M4 x 6 L)
Lead wire with M12 connector: Straight	ZS-31-B	Lead wire length: 5 m
Lead wire with M12 connector: Right-angled	ZS-31-C	Lead wire length: 5 m

**Specifications**

For pressure switch precautions and specific product precautions, refer to the "Operation Manual" on the SMC website.

Model		ISE70	ISE71	
<b>Applicable fluid</b>		Air, Non-corrosive gas, Non-flammable gas		
<b>Pressure</b>	<b>Rated pressure range</b>	0 to 1.000 MPa	0 to 1.600 MPa	
	<b>Display/Set pressure range</b>	-0.105 to 1.050 MPa	-0.105 to 1.680 MPa	
	<b>Display/Smallest settable increment</b>	0.001 MPa	0.001 MPa	
	<b>Withstand pressure</b>	1.5 MPa	2.4 MPa	
<b>Power supply</b>	<b>Power supply voltage</b>	When used as a switch output device 12 to 24 VDC ±10 % with 10 % voltage ripple or less	When used as an IO-Link device 18 to 30 VDC, including ripple (p-p) 10 %	
	<b>Current consumption</b>	35 mA or less		
	<b>Protection</b>	Polarity protection		
	<b>Accuracy</b>	Display accuracy ±2 % F.S. ±1 digit (Ambient temperature of 25 ±3 °C) Repeatability ±0.5 % F.S. Temperature characteristics ±2 % F.S. (25 °C standard)		
<b>Switch output (During SIO mode for output specifications "AB" or "L2")</b>	<b>Output type</b>	Select from NPN or PNP open collector output.		
	<b>Output mode</b>	Hysteresis, Window comparator, Error output, Output OFF		
	<b>Switch operation</b>	Normal output, Reversed output		
	<b>Max. load current</b>	80 mA		
	<b>Max. applied voltage</b>	30 V (NPN output)		
	<b>Internal voltage drop (Residual voltage)</b>	1.5 V or less (at load current of 80 mA)		
	<b>Delay time*</b>	1.5 ms or less, variable from 0 to 60 s/0.01 s increments		
	<b>Hysteresis</b>	<b>Hysteresis mode</b> Variable from 0* <sup>2</sup>		
		<b>Window comparator mode</b>		
<b>Display</b>	<b>Short circuit protection</b>	Yes		
	<b>Unit*</b>	MPa, kPa, kgf/cm <sup>2</sup> , bar, psi		
	<b>Display type</b>	LCD		
	<b>Number of screens</b>	3-screen display (Main screen, Sub screen x 2)		
	<b>Display colour</b>	Main screen: Red/Green, Sub screen: Orange		
	<b>Number of display digits</b>	Main screen: 4 digits (7 segments), Sub screen: 4 digits (Upper 1 digit 11 segments, 7 segments for other)		
<b>Digital filter*</b>	<b>Indicator light</b>	Lights up when switch output is turned ON (OUT1, OUT2: Orange)		
		Variable from 0 to 30 s/0.01 s increments		
<b>Environmental resistance</b>	<b>Enclosure</b>	IP67		
	<b>Withstand voltage</b>	1000 VAC for 1 min between terminals and housing		
	<b>Insulation resistance</b>	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing		
	<b>Fluid temperature range</b>	0 to 50 °C (No condensation or freezing)		
	<b>Operating temperature range</b>	Operating: 0 to 50 °C, Stored: -10 to 60 °C (No condensation or freezing)		
	<b>Operating humidity range</b>	Operating/Stored: 35 to 85 % RH (No condensation)		
<b>Standards</b>		UL/CSA (E216656), CE/UKCA marking (EMC Directive, RoHS Directive)		
<b>Piping</b>	<b>Port size</b>	Rc1/4, NPT1/4, G1/4		
	<b>Materials of parts in contact with fluid</b>	Sensor pressure receiving area: Silicon Piping port: C3604 (Electroless nickel plating), Sensor seal: HNBR		
<b>Weight</b>	<b>Body</b>	<b>Port size Rc1/4</b>	153 g	
		<b>Port size NPT1/4</b>	152 g	
		<b>Port size G1/4</b>	150 g	
	<b>Lead wire with connector</b>		139 g	
<b>Communication (IO-Link mode)</b>	<b>IO-Link type</b>	Device		
	<b>IO-Link version</b>	V1.1		
	<b>Communication speed</b>	COM2 (38.4 kbps)		
	<b>Configuration file</b>	IODD file* <sup>5</sup>		
	<b>Min. cycle time</b>	2.3 ms		
	<b>Process data length</b>	Input data: 2 bytes, Output data: 0 byte		
	<b>On request data communication</b>	Yes		
	<b>Data storage function</b>	Yes		
	<b>Event function</b>	Yes		
	<b>Vendor ID</b>	131 (0 x 0083)		

\*1 Value without digital filter (at 0 ms)

\*2 If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the amount of fluctuation, or chattering will occur.

\*3 Setting is only possible for models with the units selection function. Only MPa or kPa is available for models without this function.

\*4 The response time indicates when the set value is 90 % in relation to the step input.

\*5 The configuration file can be downloaded from the SMC website, <https://www.smce.eu>

\* Products with tiny scratches, marks, or display colour or brightness variations which do not affect the performance of the product are verified as conforming products.

3-Screen Display



IO-Link



\* The ISE78G is not in compliance with UL standards.



High-Precision Digital Pressure Switch: For General Fluids

# ISE70G/75G/76G/77G/78G Series

## How to Order

**ISE70G - 02 - L2 - M**

**Pressure range**

Model	Description
ISE70G	0 to 1 MPa
ISE75G	0 to 2 MPa
ISE76G	0 to 5 MPa
ISE77G	0 to 10 MPa
ISE78G	0 to 16 MPa

**Piping specification**

Symbol	Description
02	Rc1/4
N02	NPT1/4
F02	G1/4*1

\*1 ISO 1179-1 compliant

**Orifice**

Symbol	Description
—	None
T	Yes*1

\*1 Orifice is shipped together with the product.

**Output specification\*1**

Symbol	Description
L2	IO-Link: Switch output 1 + Switch output 2 (Switch output: NPN or PNP switching type)

\*1 Refer to pages 10 and 13 for details.

**Unit specification**

Symbol	Description
—	Units selection function
M	SI units only*1

\*1 Fixed units: MPa, kPa



**Option 3**

Symbol	Description
—	Operation manual
Y	None
K	Operation manual + Calibration certificate
T	Calibration certificate

**Option 2**

Symbol	Description
—	None
A	Bracket A (Interchangeable with ISE75(H))
B	Bracket B

**Option 1**

Symbol	Description
—	None
S	Lead wire with M12 connector (Straight, 5 m)
L	Lead wire with M12 connector (Right-angled, 5 m)

## Options/Part Nos.

When only optional parts are required, order with the part numbers listed below.

Description	Part no.	Note
Orifice	ZS-48-A	
Bracket A	ZS-50-A	Interchangeable with ISE75(H) With 2 mounting screws (M4 x 6 L)
Bracket B	ZS-50-B	With 2 mounting screws (M4 x 6 L)
Lead wire with M12 connector: Straight	ZS-31-B	Lead wire length: 5 m
Lead wire with M12 connector: Right-angled	ZS-31-C	Lead wire length: 5 m

**3-Screen Display High-Precision Digital Pressure Switch ISE70G/75G/76G/77G/78G Series**

**Specifications**

For pressure switch precautions and specific product precautions, refer to the "Operation Manual" on the SMC website.

Model		ISE70G	ISE75G	ISE76G	ISE77G	ISE78G				
<b>Applicable fluid</b>		Liquid or gas that will not corrode materials of parts in contact with fluid								
<b>Pressure</b>	<b>Rated pressure range</b>	0 to 1.000 MPa	0 to 2.000 MPa	0 to 5.00 MPa	0 to 10.00 MPa	0 to 16.00 MPa				
	<b>Display/Set pressure range</b>	-0.105 to 1.050 MPa	-0.105 to 2.100 MPa	-0.25 to 5.25 MPa	-0.50 to 10.50 MPa	-0.80 to 16.80 MPa				
	<b>Display/Smallest settable increment</b>	0.001 MPa	0.001 MPa	0.01 MPa	0.01 MPa	0.01 MPa				
	<b>Withstand pressure</b>	3.0 MPa	5.0 MPa	12.5 MPa	30 MPa	48 MPa				
<b>Power supply</b>	<b>Power supply voltage</b>	When used as a switch output device 12 to 24 VDC ±10 % with 10 % voltage ripple or less								
	<b>When used as an IO-Link device</b>	18 to 30 VDC, including ripple (p-p) 10 %								
	<b>Current consumption</b>	35 mA or less								
	<b>Protection</b>	Polarity protection								
<b>Accuracy</b>	<b>Display accuracy</b>	±2 % F.S. ±1 digit (Ambient temperature of 25 ±3 °C)								
	<b>Repeatability</b>	±0.5 % F.S.								
	<b>Temperature characteristics (25 °C standard)</b>	±3 % F.S.	±5 % F.S.							
	<b>Output type</b>	Select from NPN or PNP open collector output.								
<b>Switch output (SIO mode)</b>	<b>Output mode</b>	Hysteresis, Window comparator, Error output, Output OFF								
	<b>Switch operation</b>	Normal output, Reversed output								
	<b>Max. load current</b>	80 mA								
	<b>Max. applied voltage</b>	30 V (NPN output)								
	<b>Internal voltage drop (Residual voltage)</b>	1.5 V or less (at load current of 80 mA)								
	<b>Delay time*1</b>	2 ms or less, variable from 0 to 60 s/0.01 s increments								
	<b>Hysteresis</b>	<b>Hysteresis mode</b>	Variable from 0*2							
		<b>Window comparator mode</b>								
	<b>Short circuit protection</b>		Yes							
	<b>Unit*3</b>	MPa, kPa, kgf/cm², bar, psi								
<b>Display</b>	<b>Display type</b>	LCD								
	<b>Number of screens</b>	3-screen display (Main screen, Sub screen x 2)								
	<b>Display colour</b>	Main screen: Red/Green, Sub screen: Orange								
	<b>Number of display digits</b>	Main screen: 4 digits (7 segments), Sub screen: 4 digits (Upper 1 digit 11 segments, 7 segments for other)								
	<b>Indicator light</b>	Lights up when switch output is turned ON (OUT1, OUT2: Orange)								
<b>Digital filter*4</b>		Variable from 0 to 30 s/0.01 s increments								
<b>Environmental resistance</b>	<b>Enclosure</b>	IP67								
	<b>Withstand voltage</b>	500 VAC for 1 min between terminals and housing								
	<b>Insulation resistance</b>	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing								
	<b>Fluid temperature range</b>	-5 to 70 °C (No condensation or freezing)								
	<b>Operating temperature range</b>	Operating: -5 to 50 °C, Stored: -10 to 60 °C (No condensation or freezing)								
	<b>Operating humidity range</b>	Operating/Stored: 35 to 85 % RH (No condensation)								
<b>Standards</b>			UL/CSA (E216656), CE/UKCA marking (EMC Directive, RoHS Directive)			CE/UKCA marking (EMC Directive, RoHS Directive)				
<b>Piping</b>	<b>Port size</b>		Rc1/4, NPT1/4, G1/4							
	<b>Materials of parts in contact with fluid</b>		Sensor pressure receiving area: Al <sub>2</sub> O <sub>3</sub> (Alumina 96 % ), Piping port: C3604 (Electroless nickel plating), Sensor seal: FKM + Grease (1 MPa), FKM (2, 5, 10, 16 MPa)							
<b>Weight</b>	<b>Body</b>	<b>Port size Rc1/4</b>	184 g							
		<b>Port size NPT1/4</b>	183 g							
		<b>Port size G1/4</b>	181 g							
	<b>Option</b>	<b>Lead wire with connector</b>	139 g							
		<b>Bracket A</b>	17.7 g							
		<b>Bracket B</b>	14.2 g							
		<b>Orifice</b>	1.2 g							
<b>Communication (IO-Link mode)</b>	<b>IO-Link type</b>	Device								
	<b>IO-Link version</b>	V1.1								
	<b>Communication speed</b>	COM2 (38.4 kbps)								
	<b>Configuration file</b>	IODD file*5								
	<b>Min. cycle time</b>	2.3 ms								
	<b>Process data length</b>	Input data: 2 bytes, Output data: 0 byte								
	<b>On request data communication</b>	Yes								
	<b>Data storage function</b>	Yes								
	<b>Event function</b>	Yes								
	<b>Vendor ID</b>	131 (0 x 0083)								

\*1 Value without digital filter (at 0 ms)

\*2 If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the amount of fluctuation, or chattering will occur.

\*3 Setting is only possible for models with the units selection function. For models without this function, only MPa or kPa is available for the ISE70G/ISE75G, and only MPa is available for the ISE76G/ISE77G/ISE78G.

\*4 The response time indicates when the set value is 90 % in relation to the step input.

\*5 The configuration file can be downloaded from the SMC website, <https://www.smc.eu>

\* Products with tiny scratches, marks, or display colour or brightness variations which do not affect the performance of the product are verified as conforming products.

3-Screen Display



IO-Link



RoHS

High-Precision Digital Pressure Switch: For General Fluids

# ISE79S Series

## How to Order

ISE79S-**F02**-L2-M

## Pressure range

Model	Description
ISE79S	0 to 50 MPa

## Piping specification

Symbol	Description
02	Rc1/4
<b>F02</b>	G1/4*1

\*1 ISO 1179-1 compliant

## Output specification\*1

Symbol	Description
<b>L2</b>	IO-Link: Switch output 1 + Switch output 2 (Switch output: NPN or PNP switching type)

\*1 Refer to pages 12 and 13 for details.

## Unit specification

Symbol	Description
—	Units selection function
<b>M</b>	SI units only*1

\*1 Fixed units: MPa, kPa

## Option 3

Symbol	Description
—	Operation manual
Y	None
K	Operation manual + Calibration certificate
T	Calibration certificate

## Option 2

Symbol	Description
—	None
A	Bracket A (Interchangeable with ISE75(H))
B	Bracket B

## Option 1

Symbol	Description
—	None
S	Lead wire with M12 connector (Straight, 5 m)
L	Lead wire with M12 connector (Right-angled, 5 m)

## Options/Part Nos.

When only optional parts are required, order with the part numbers listed below.

Description	Part no.	Note
Bracket A	ZS-50-A	Interchangeable with ISE75(H) With 2 mounting screws (M4 x 6 L)
Bracket B	ZS-50-B	With 2 mounting screws (M4 x 6 L)
Lead wire with M12 connector: Straight	ZS-31-B	Lead wire length: 5 m
Lead wire with M12 connector: Right-angled	ZS-31-C	Lead wire length: 5 m

**Specifications**

For pressure switch precautions and specific product precautions, refer to the "Operation Manual" on the SMC website.

Model		ISE79S
<b>Applicable fluid</b>		Liquid or gas that will not corrode materials of parts in contact with fluid
<b>Pressure</b>	<b>Rated pressure range</b>	0 to 50.0 MPa
	<b>Display/Set pressure range</b>	-2.5 to 52.5 MPa
	<b>Display/Smallest settable increment</b>	0.1 MPa
	<b>Withstand pressure</b>	75 MPa
<b>Power supply</b>	<b>Power supply voltage</b>	12 to 24 VDC ±10 % with 10 % voltage ripple or less
	<b>When used as an IO-Link device</b>	18 to 30 VDC, including ripple (p-p) 10 %
	<b>Current consumption</b>	35 mA or less
	<b>Protection</b>	Polarity protection
<b>Accuracy</b>	<b>Display accuracy</b>	±2 % F.S. ±1 digit (Ambient temperature of 25 ±3 °C)
	<b>Repeatability</b>	±0.5 % F.S.
	<b>Temperature characteristics (25 °C standard)</b>	±5 % F.S.
<b>Switch output (SIO mode)</b>	<b>Output type</b>	Select from NPN or PNP open collector output.
	<b>Output mode</b>	Hysteresis, Window comparator, Error output, Output OFF
	<b>Switch operation</b>	Normal output, Reversed output
	<b>Max. load current</b>	80 mA
	<b>Max. applied voltage</b>	30 V (NPN output)
	<b>Internal voltage drop (Residual voltage)</b>	1.5 V or less (at load current of 80 mA)
	<b>Delay time<sup>1</sup></b>	2 ms or less, variable from 0 to 60 s/0.01 s increments
	<b>Hysteresis</b>	Hysteresis mode
		Variable from 0 <sup>2</sup>
	<b>Window comparator mode</b>	
<b>Display</b>	<b>Short circuit protection</b>	Yes
	<b>Unit<sup>3</sup></b>	MPa, kgf/cm <sup>2</sup> , bar, psi
	<b>Display type</b>	LCD
	<b>Number of screens</b>	3-screen display (Main screen, Sub screen x 2)
	<b>Display colour</b>	Main screen: Red/Green, Sub screen: Orange
	<b>Number of display digits</b>	Main screen: 4 digits (7 segments), Sub screen: 4 digits (Upper 1 digit 11 segments, 7 segments for other)
	<b>Indicator light</b>	Lights up when switch output is turned ON (OUT1, OUT2: Orange)
<b>Digital filter<sup>4</sup></b>		Variable from 0 to 30 s/0.01 s increments
<b>Environmental resistance</b>	<b>Enclosure</b>	IP67
	<b>Withstand voltage</b>	500 VAC for 1 min between terminals and housing
	<b>Insulation resistance</b>	1000 MΩ or more (50 VDC measured via megohmmeter) between terminals and housing
	<b>Fluid temperature range</b>	-5 to 70 °C (No condensation or freezing)
	<b>Operating temperature range</b>	Operating: -5 to 50 °C, Stored: -10 to 60 °C (No condensation or freezing)
	<b>Operating humidity range</b>	Operating/Stored: 35 to 85 % RH (No condensation)
<b>Standards</b>		UL/CSA (E216656), CE/UKCA marking (EMC Directive, RoHS Directive)
<b>Piping</b>	<b>Port size</b>	Rc1/4, G1/4
	<b>Materials of parts in contact with fluid</b>	Sensor pressure receiving area: Equivalent to stainless steel 630, Grease free
<b>Weight</b>	<b>Body</b>	144 g
	<b>Port size Rc1/4</b>	141 g
	<b>Port size G1/4</b>	139 g
	<b>Lead wire with connector</b>	17.7 g
	<b>Option</b>	Bracket A Bracket B 14.2 g
<b>Communication (IO-Link mode)</b>	<b>IO-Link type</b>	Device
	<b>IO-Link version</b>	V1.1
	<b>Communication speed</b>	COM2 (38.4 kbps)
	<b>Configuration file</b>	IODD file <sup>5</sup>
	<b>Min. cycle time</b>	2.3 ms
	<b>Process data length</b>	Input data: 2 bytes, Output data: 0 byte
	<b>On request data communication</b>	Yes
	<b>Data storage function</b>	Yes
	<b>Event function</b>	Yes
	<b>Vendor ID</b>	131 (0 x 0083)

\*1 Value without digital filter (at 0 ms)

\*2 If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the amount of fluctuation, or chattering will occur.

\*3 Setting is only possible for models with the units selection function.

Only MPa is available for models without this function.

\*4 The response time indicates when the set value is 90 % in relation to the step input.

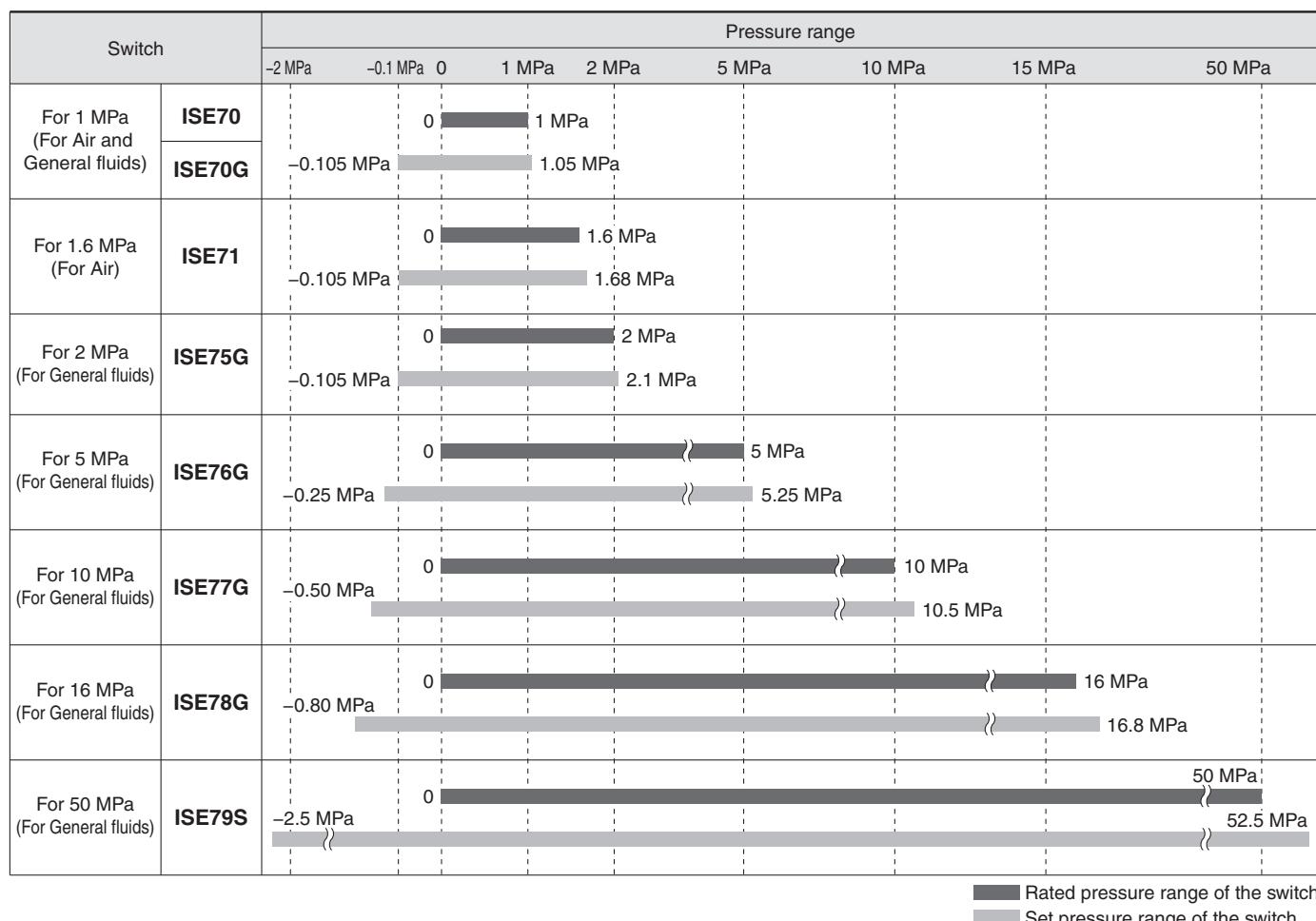
\*5 The configuration file can be downloaded from the SMC website, <https://www.smca.eu>

\* Products with tiny scratches, marks, or display colour or brightness variations which do not affect the performance of the product are verified as conforming products.

# ISE70/71 Series

## Set Pressure Range and Rated Pressure Range

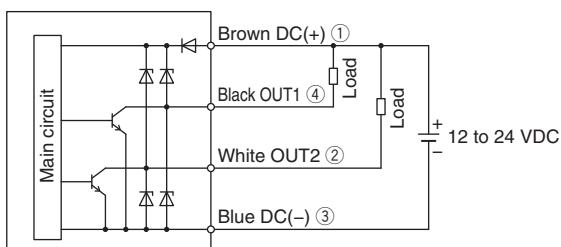
Set the pressure within the rated pressure range. The set pressure range is the range of pressure within which switch output can be set. The rated pressure range is the range of pressure that satisfies the specifications (accuracy, linearity, etc.) of the product. Although it is possible to set a value outside the rated pressure range, the specifications cannot be guaranteed even if the value stays within the set pressure range.



## Internal Circuits and Wiring Examples

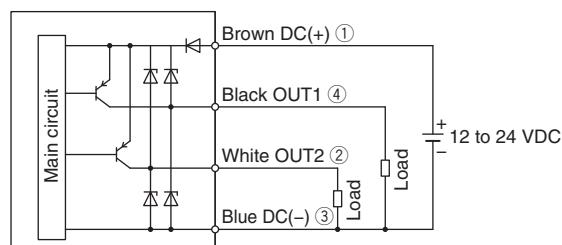
### When used as a switch output device

#### Setting of NPN open collector 2 outputs

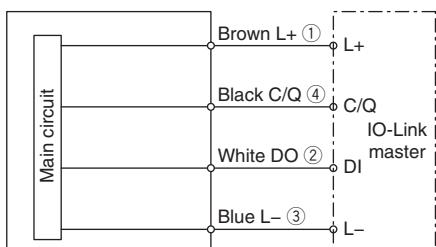


\* The numbers in the circuit diagrams show the connector pin layout.

#### Setting of PNP open collector 2 outputs

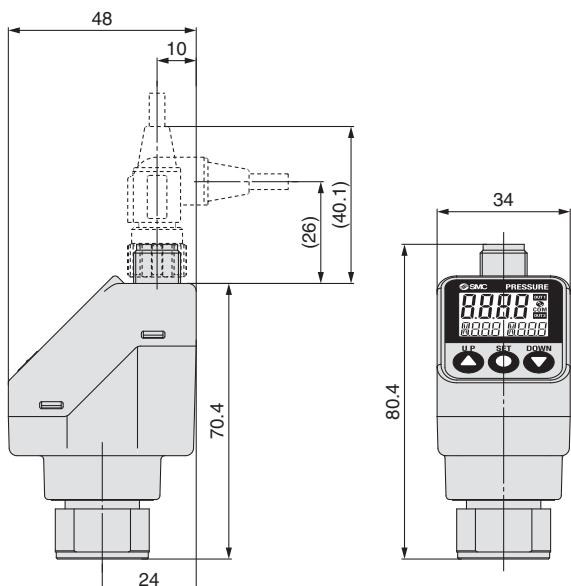
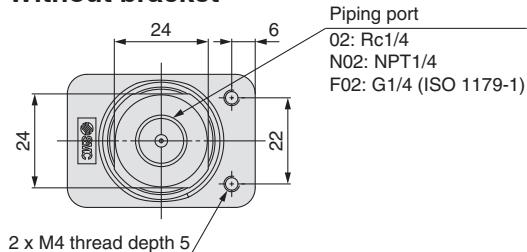


### When used as an IO-Link device

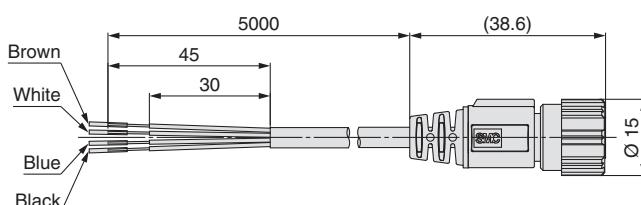
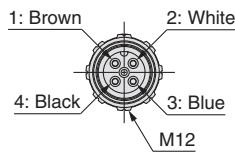


## Dimensions

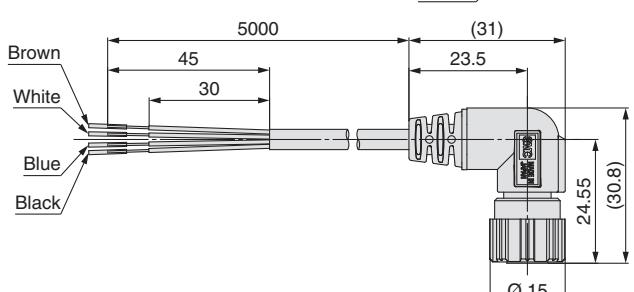
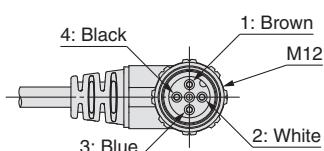
### Without bracket



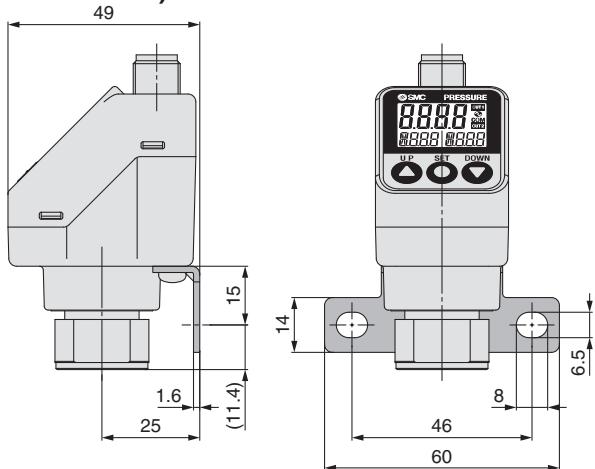
### Lead wire with M12 connector (Part no.: ZS-31-B)



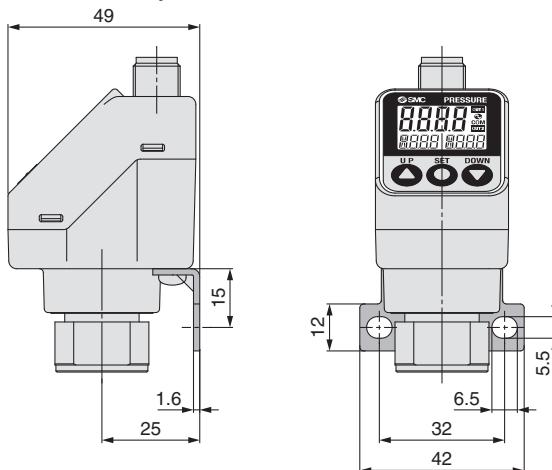
### (Part no.: ZS-31-C)



### Bracket A (Interchangeable with ISE70/ISE75(H)) (Part no.: ZS-50-A)



### Bracket B (Part no.: ZS-50-B)



### Cable Specifications

<b>Conductor</b>	Nominal cross section	AWG23
	Outside diameter	0.72 mm
<b>Insulator</b>	<b>Material</b>	Cross-linked vinyl chloride
	Outside diameter	1.14 mm
	Number of cores	4
<b>Sheath</b>	<b>Material</b>	Oil-resistant vinyl chloride
	Finished outside diameter	Ø 4

When used as a switch output device

No.	Description	Lead wire colour	Note
1	DC(+)	Brown	12 to 24 VDC
2	OUT2	White	Switch output 2
3	DC(-)	Blue	0 V
4	OUT1	Black	Switch output 1

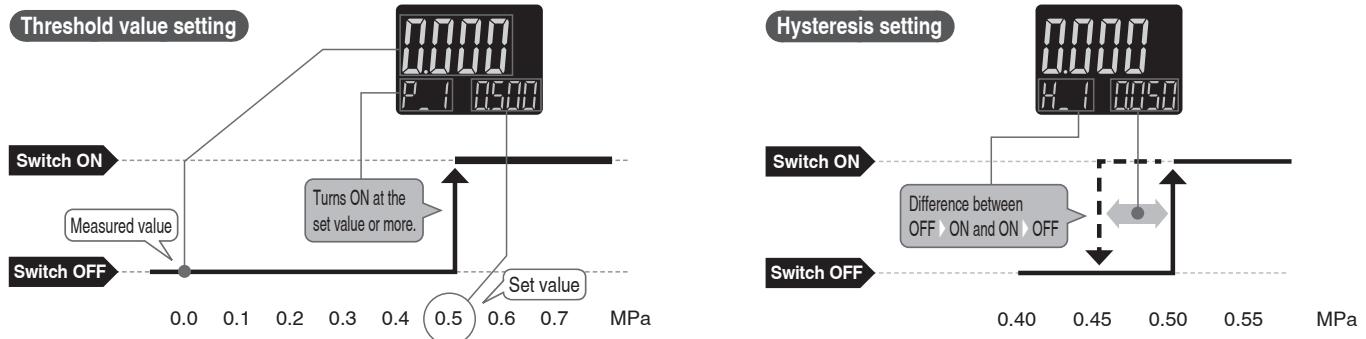
When used as an IO-Link device

No.	Description	Lead wire colour	Note
1	L+	Brown	18 to 30 VDC
2	DO	White	Switch output 2
3	L-	Blue	0 V
4	C/Q	Black	Communication data (IO-Link)/ Switch output 1 (SIO)

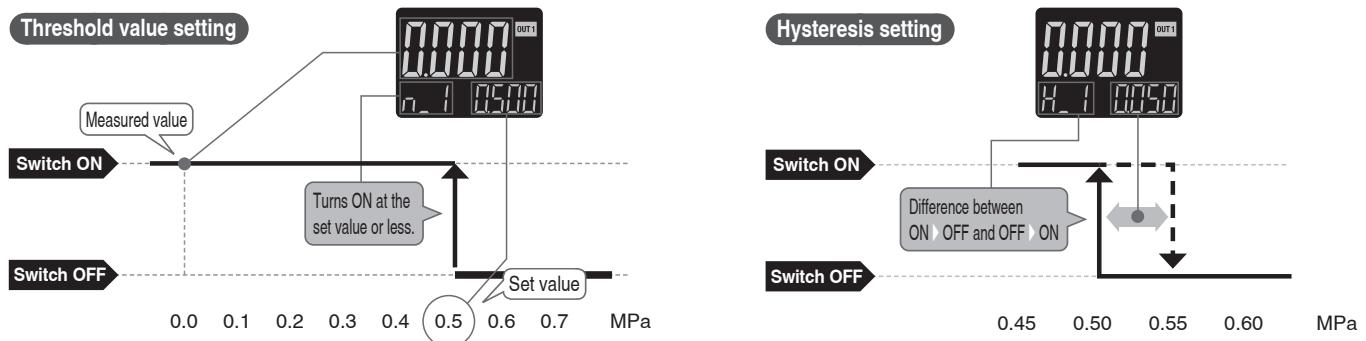
# ISE7□/7□G/79S Series Function Details

Display examples of the main and sub (set value) screens of each mode.

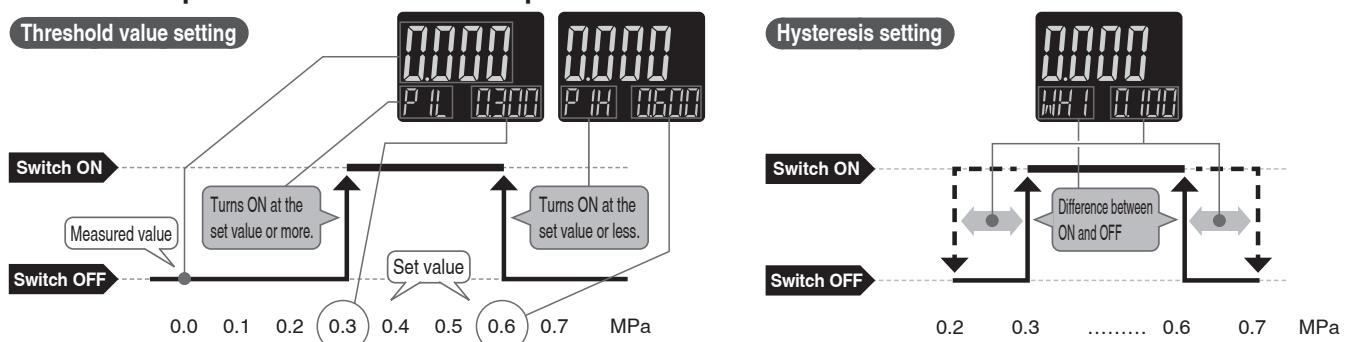
## Hysteresis mode Normal output



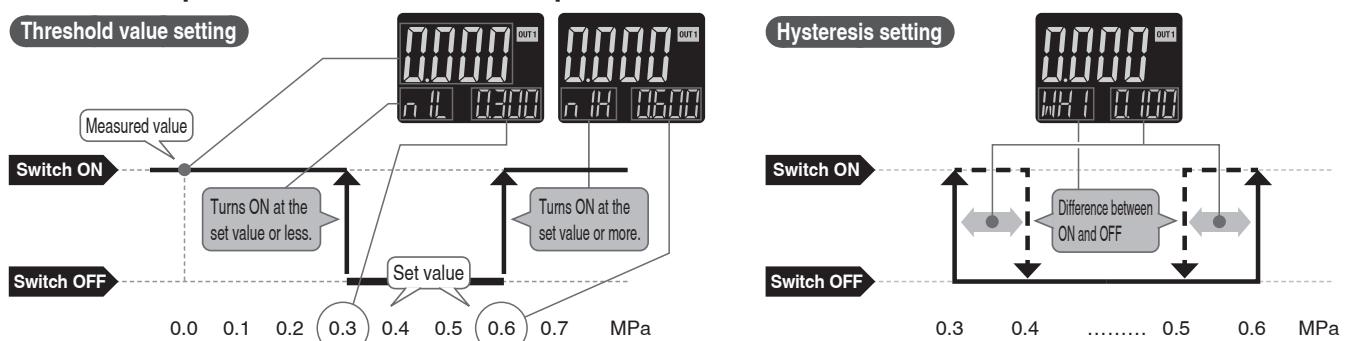
## Hysteresis mode Reversed output



## Window comparator mode Normal output



## Window comparator mode Reversed output



## Function Details

### A Auto-preset function (F4) \* When using with IO-Link, the set values cannot be changed by communication.

This function, when selected in the initial setting, calculates and stores the set value from the measured pressure.

Using this function is possible to automatically determine the optimum set value based on the variation in measured pressure due to the repeated operation of the device.

#### Formula for Obtaining the Set Value

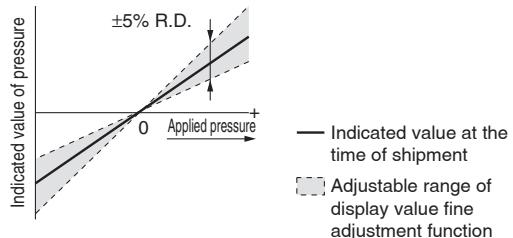
Set value (Threshold value)	Hysteresis value
$P_1(P\_2) = A - (A-B)/4$	
$n_1(n\_2) = B + (A-B)/4$	$H_1(H\_2) = /(A-B)/2/$

A: Max. pressure value in auto-preset mode

B: Min. pressure value in auto-preset mode

### B Display value fine adjustment function (F6)

Fine adjustment of the indicated value of the pressure sensor can be made within the range of  $\pm 5\%$  of the read value. (This eliminates wide variations of the indicated value.)



\* When the display value fine adjustment function is used, the set pressure value may change  $\pm 1$  digit.

### C Peak/Bottom value indication function

This function constantly detects and updates the max. (min.) pressure when the power is supplied, and allows to hold the max. (min.) pressure value.

The held value is maintained even if the power supply is cut.

When the SET and DOWN buttons are simultaneously pressed for 1 s or longer, while "holding," the held value will be reset.

### D Key-lock function

This function prevents operation errors such as accidentally changing setting values.

### E Zero-clear function

This function clears and resets the zero value on the display of the measured pressure.

The indicated value can be adjusted within  $\pm 7\%$  F.S. of the pressure at the time of shipment from the factory.

### F Error display function

When an error or abnormality arises, the location and contents are displayed.

Error name	Display	Description	Action
Over current error	 	A load current applied to the switch output has exceeded the max. value.	Eliminate the cause of the over current by turning OFF the power supply and then turn it ON again.
Residual pressure error		During zero-clear operation, a pressure over $\pm 7\%$ F.S. has been applied. Note that the mode is returned to measurement mode automatically after 1 s. The zero-clear range varies by $\pm 1\%$ F.S. due to variation between individual products.	Retry the zero-clear operation after restoring the applied pressure to an atmospheric pressure condition.
Applied pressure error		Supply pressure exceeds the max. set pressure.	Reset the applied pressure to a level within the set pressure range.
		Supply pressure is below the min. set pressure.	
System error	 	An internal data error has occurred.	Turn the power OFF and turn it ON again. If the error cannot be solved, please contact SMC for investigation.
IO-Link master version error	 	The IO-Link version does not match that of the master. The master uses version 1.0.	Ensure that the master IO-Link version matches the device version.

If the error cannot be solved after the instructions above are performed, or errors other than those above are displayed, please contact SMC for investigation.

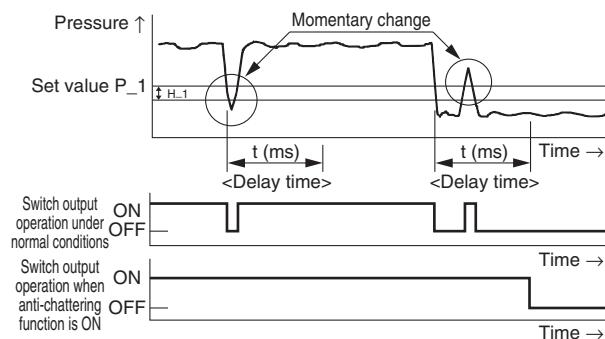
## Function Details

### G Anti-chattering function (Simple setting mode or F1, F2)

A function to delay the switch output response time to prevent chattering or prevent the detection of temporary changes in source pressure. For example, large bore cylinders and ejectors consume a large volume of air during operation and may experience a temporary drop in the supply pressure. The delay time can be set in the range of 0.00 to 60.00 [s] in 0.01 [s] increments.

<Principle>

This function averages pressure values measured during the response time set by the user and then compares the average pressure value with the pressure set point value to output the result on the switch.



### H Units selection function (F0)

Display units can be switched with this function.

Model	Rated pressure range	Smallest settable increment				
		MPa	kPa	kgf/cm <sup>2</sup>	bar	psi
ISE70/70G	0 to 1 MPa	0.001	1	0.01	0.01	0.1
ISE71	0 to 1.6 MPa					0.2
ISE75G	0 to 2 MPa	0.01	0.1	0.1	0.1	1
ISE76G	0 to 5 MPa					10
ISE77G	0 to 10 MPa	0.1	1	1	1	10
ISE78G	0 to 16 MPa					
ISE79S	0 to 50 MPa	0.1	1	1	1	10

### I Zero cut-off setting (F14)

When the pressure display value is close to zero, this function forces the display to zero.

The range to display zero can be changed within the range of 0.0 to 10.0 % .

Example: When the ISE70 (1 MPa range), zero-cut value = 1.0 % , 0 is displayed in the range of -9 to 9 kPa.

### J Power saving mode (F80)

The power saving mode can be selected.

With this function, if no buttons are pressed for 30 s, it shifts to power saving mode.

At the time of shipment from the factory, the product is set to the normal mode (the power saving mode is turned OFF).

(During power saving mode, [ECo] will flash in the sub screen and the operation light will be ON (only when the switch is ON).)

### K Setting of a security code (F81)

The user can select whether a security code must be entered to release the key lock.

At the time of shipment from the factory, it is set such that a security code is not required.

## Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>1)</sup>, and other safety regulations.

### **Danger:**

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

### **Warning:**

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

### **Caution:**

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

- 1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
- ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
- IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
- etc.

## Warning

### **1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### **2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### **3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### **4. Our products cannot be used beyond their specifications.**

**Our products are not developed, designed, and manufactured to be used under the following conditions or environments.**

**Use under such conditions or environments is not covered.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

## Caution

**We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.**

**Use in non-manufacturing industries is not covered.**

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

## Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.<sup>2)</sup> Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.
- 2) Vacuum pads are excluded from this 1 year warranty. A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

## Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

## Revision History

<b>Edition B</b>	- The ISE7 G for general fluids has been added. - Number of pages has been increased from 12 to 16. - The ISE78G for general fluids has been added. - Number of pages has been increased from 16 to 20.	WQ
<b>Edition C</b>	- The ISE79S for general fluids has been added.	AQ

## SMC Corporation (Europe)

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<b>Bulgaria</b>	+359 (0)2807670	<a href="http://www.smc.bg">www.smc.bg</a>	<a href="mailto:office@smc.bg">office@smc.bg</a>
<b>Croatia</b>	+385 (0)13707288	<a href="http://www.smc.hr">www.smc.hr</a>	<a href="mailto:office@smc.hr">office@smc.hr</a>
<b>Czech Republic</b>	+420 541424611	<a href="http://www.smc.cz">www.smc.cz</a>	<a href="mailto:office@smc.cz">office@smc.cz</a>
<b>Denmark</b>	+45 70252900	<a href="http://www.smcdk.com">www.smcdk.com</a>	<a href="mailto:smc@smcdk.com">smc@smcdk.com</a>
<b>Estonia</b>	+372 651 0370	<a href="http://www.smcee.ee">www.smcee.ee</a>	<a href="mailto:info@smcee.ee">info@smcee.ee</a>
<b>Finland</b>	+358 207513513	<a href="http://www.smc.fi">www.smc.fi</a>	<a href="mailto:smcfi@smc.fi">smcfi@smc.fi</a>
<b>France</b>	+33 (0)164761000	<a href="http://www.smc-france.fr">www.smc-france.fr</a>	<a href="mailto:supportclient@smc-france.fr">supportclient@smc-france.fr</a>
<b>Germany</b>	+49 (0)61034020	<a href="http://www.smc.de">www.smc.de</a>	<a href="mailto:info@smc.de">info@smc.de</a>
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