3-Screen Display

High-Precision Digital Pressure Switch

Air 1.0 MPa ISE70 / 1.6 MPa ISE71

General Fluids 1.0 MPa ISE70G / 2.0 MPa ISE75G / 5.0 MPa ISE76G / 10 MPa ISE77G

IO-Link

CE c UL US

RoHS

IP67

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)

For general fluids Gray
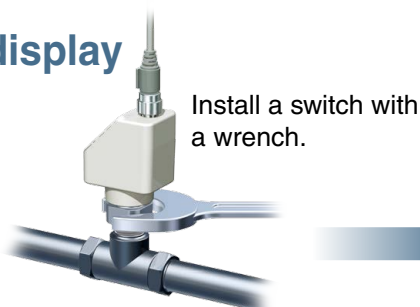
For air Blue

Visualization of Settings

Set value (Threshold value)	P_1
Hysteresis value	H_1
Peak value	H_Hi
Bottom value	H_Lo

Angled display   Good visibility from various mounting positions

Front

Top

Bottom

Rotating display

Install a switch with a wrench.

336°

After installation, the display can be rotated to an easy-to-see direction by securing the body by hand.
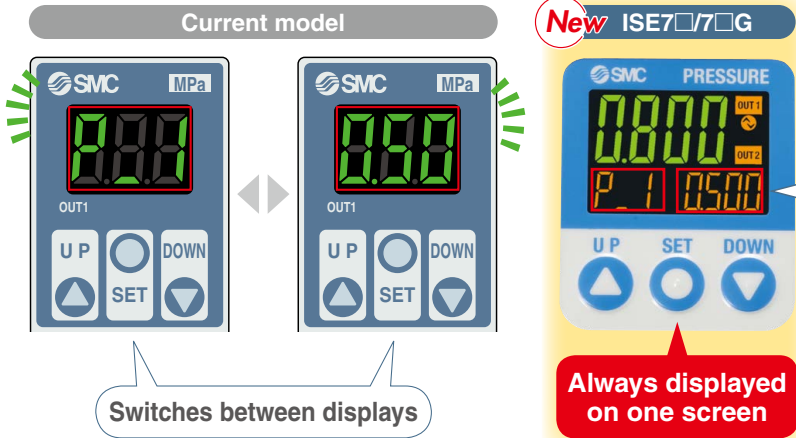
ISE7□/7□G Series

⊙ SMC

CAT.ES100-123B Ⓐ

Visualization of Settings

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

Current model

| Switches between displays |

New **ISE7□/7□G**

Always displayed on one screen

Mode Examples

Hysteresis mode

Normal output	Set value (Threshold value)	Reversed output	Set value (Threshold value)
P_1	0500	n_1	0500

Hysteresis	Set hysteresis value
H_1	0050

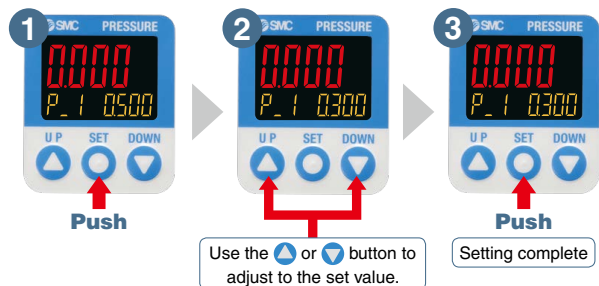#### Window comparator mode

Normal output/ Lo side	Set value (Threshold value)	Normal output/ Hi side	Set value (Threshold value)
P1L	0300	P1H	0600

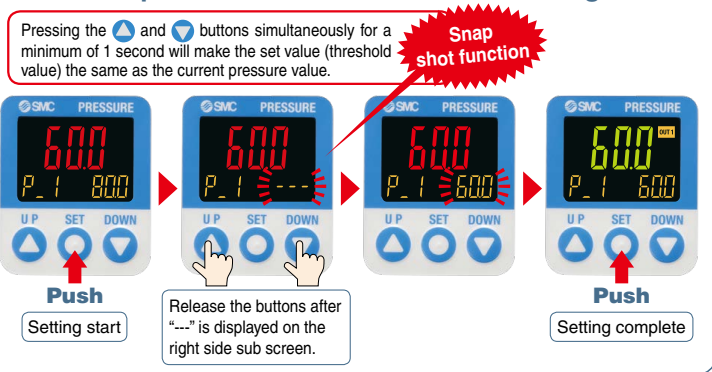| Reversed output/ Lo side	Set value (Threshold value)	Reversed output/ Hi side	Set value (Threshold value)
n1L	0300	n1H	0600

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.

1. **Push**
2. Use the △ or ▽ button to adjust to the set value.
3. **Push** — Setting complete

With a snap shot function for set value reading

Pressing the △ and ▽ buttons simultaneously for a minimum of 1 second will make the set value (threshold value) the same as the current pressure value.

Snap shot function

Push — Setting start

Release the buttons after "---" is displayed on the right side sub screen.

Push — Setting complete

NPN/PNP Switch Function

Both NPN and PNP are available.
The number of stock items can be reduced.

Select NPN or PNP

NPN   **PNP**
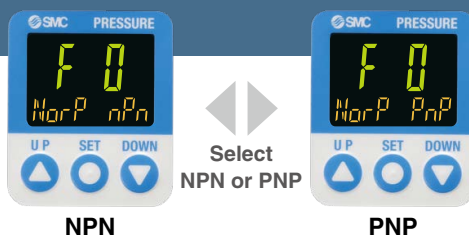
Other Sub Screen Display

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.

Peak value	**Bottom value**	**Peak/Bottom value**

Peak value:
- Label (Peak)
- Peak value

Bottom value:
- Label (Bottom)
- Bottom value

Peak/Bottom value:
- Peak value
- Bottom value
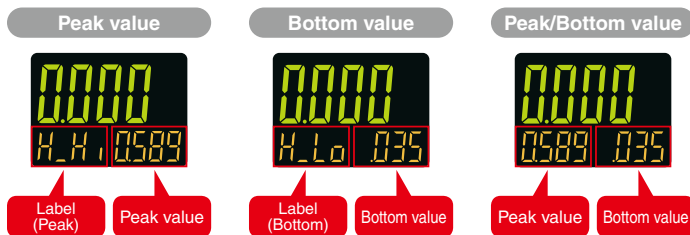
Output mode/Output type display				**Rated range display**	**Level bar display**	**Pressure unit display**			
Hysteresis mode		Window comparator mode		Positive pressure range		kPa	MPa	psi[1]	bar[1]
Normal output	Reversed output	Normal output	Reversed output	PoS1	0000 0	KPA	MPA	PSi	bAr

∗1 "psi" and "bar" can be selected when the unit selection function is available.
∗ A combination of the displays shown above and the set values can be displayed on the 2 sub screens.

Convenient Functions
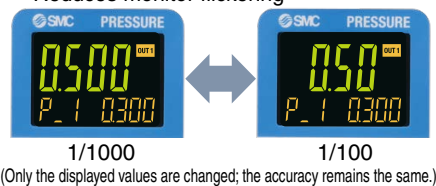
■ Security code
The key-lock function keeps unauthorized persons from tampering with the settings.

■ Power-saving mode
Power consumption is reduced by turning off the monitor. (Reduce power consumption by approx. 60%.)

■ Resolution switch function
Reduces monitor flickering

1/1000   1/100

(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 maximum number of applied pressure errors is 1000 counts).

The number of applied pressure errors
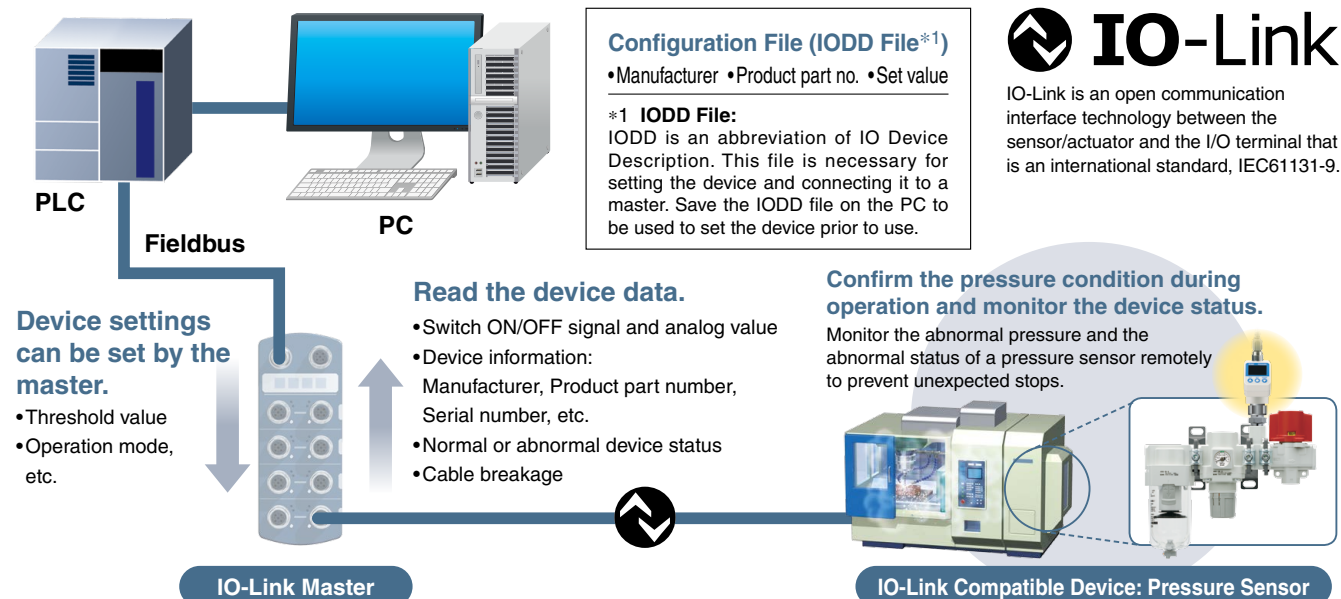

3 Setting Modes

Select the setting mode that best meets your needs.

	3-Step Setting Mode	Simple Setting Mode	Function Selection Mode
	Simple	**Settings**	**Higher function**
	•Threshold value setting or •Hysteresis value setting	•Threshold value setting •Hysteresis value setting •Delay time selection	•Output mode selection •Selection of normal or reversed •Threshold value setting •Hysteresis value setting •Delay time selection •Display color selection

1 Mode selection

Press the ◯ button once.	Press the ◯ button for between 1 and 3 seconds.	Press the ◯ button for between 3 and 5 seconds.

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 color selection

Select from • ON Green /OFF Red
• ON Red /OFF Green
• Normally Red /Normally Green

Setting Complete	**Setting Complete**	**Setting Complete**

∗ 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/equipment status/Remote monitoring and control by communication

Configuration File (IODD File[1])
• Manufacturer • Product part no. • Set value

*1 **IODD File:**
IODD is an abbreviation of IO Device Description. This file is necessary for setting the device and connecting it to a master. Save the IODD file on the PC to be used to set the device prior to use.

IO-Link

IO-Link is an open communication interface technology between the sensor/actuator and the I/O terminal that is an international standard, IEC61131-9.

PLC

Fieldbus

PC

Device settings can be set by the master.
• Threshold value
• Operation mode, etc.

Read the device data.
• Switch ON/OFF signal and analog value
• Device information: Manufacturer, Product part number, Serial number, etc.
• Normal or abnormal device status
• Cable breakage

Confirm the pressure condition during operation and monitor the device status.
Monitor the abnormal pressure and the abnormal status of a pressure sensor remotely to prevent unexpected stops.

IO-Link Master

IO-Link Compatible Device: Pressure Sensor

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 (cycle) 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

SIO mode	Start-up mode	Preoperate mode	Operate mode
⌂SMC PRESSURE 0.000 OUT1 OUT2 ModE S io	⌂SMC PRESSURE 0.000 OUT1 COM OUT2 ModE Strt	⌂SMC PRESSURE 0.000 OUT1 COM OUT2 ModE PrE	⌂SMC PRESSURE 0.000 OUT1 COM OUT2 ModE oPE
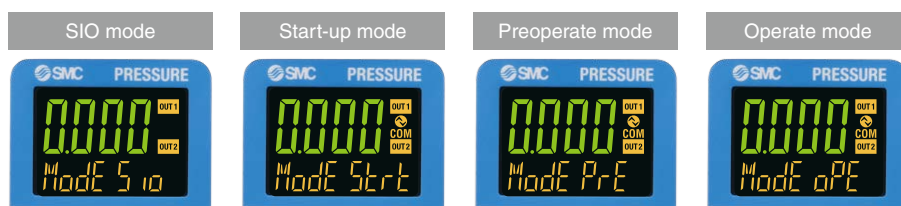
Operation and Display

Communication with master	IO-Link status indicator light		Status			Screen display*3	Description
Yes	COM*1	⟳*2	Normal		Operate	ModE oPE	Normal communication status (readout of measured value)
					Start up	ModE Strt	At the start of communication
					Preoperate	ModE PrE	
		⟳*2 (Flashing)	IO-Link mode	Abnormal	Version does not match	Er 15 1.0	IO-Link version does not match that of the master. The master uses version 1.0.
					Lock	ModE LoC	Back-up and re-store required due to data storage lock
					Communication disconnection	ModE oPE ModE Strt ModE PrE	Normal communication was not received for 1 second or longer.
No	OFF						
	OFF		SIO mode			ModE S io	General switch output

*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

⌂SMC

Introduction of Series

	ISE70/71 p. 6		ISE70G/75G/76G/77G p. 8			
	Blue		Gray			
Applicable fluid	Air		General fluids			
Series	ISE70	ISE71	ISE70G	ISE75G	ISE76G	ISE77G
Rated pressure range	1.0 MPa	1.6 MPa	1.0 MPa	2.0 MPa	5.0 MPa	10 MPa
Withstand pressure	1.5 MPa	2.4 MPa	3.0 MPa	5.0 MPa	12.5 MPa	30 MPa
Power supply voltage — When used as a switch output device	12 to 24 VDC ±10% with 10% voltage ripple or less					
Power supply voltage — 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)			
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-color 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_2O_3 (Alumina 96%) / Piping port: C3604 (Electroless nickel plating) / Sensor seal: FKM + Grease (ISE70G) : FKM (ISE75G/76G/77G)			
Piping	Rc1/4, NPT1/4, 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					

For details, refer to the **Web Catalog**.

For General Fluids: Remote Type Variations

Click here for the PSE56□ series. Click here for the PSE57□ series.

■ PSE56□ Series

- Material of parts in contact with fluid: Stainless steel 316L
- Suitable for a wide variety of fluids
- Analog output (Voltage/Current)
- Select from a face seal or compression fitting.

■ PSE57□ Series

- Withstand voltage: 500 VAC
- Materials of parts in contact with fluid
  Piping port: C3604 + Nickel plating
  Pressure sensor: Al_2O_3 (Alumina 96%)
  Sensor seal: FKM + Grease (PSE570/573/574)
  : FKM (PSE575/576/577)

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

<Integrated type>

ISE7□G (With bracket B)

Steel tube piping

Hydraulic manifold

Hydraulic cylinder

<Remote type>

PSE300AC

Steel tube piping

PSE57□

Hydraulic manifold

Hydraulic cylinder

CONTENTS

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

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

© 5

Ⓢ**SMC**

High-Precision Digital Pressure Switch: For Air
ISE70/71 Series

How to Order

ISE70 − 02 − L2 − M □ □ □

Pressure range

Symbol	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 7 and 10 for details.

Unit specification

Symbol	Description
Nil	Unit selection function*1
M	SI unit only*2

∗1 Under the New Measurement Act, switches with the unit selection function are not permitted for use in Japan.
∗2 Fixed unit: MPa, kPa

Option 3

Symbol	Description
Nil	Operation manual
Y	None
K	Operation manual + Calibration certificate
T	Calibration certificate
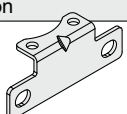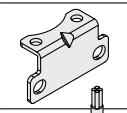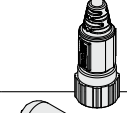
Option 2

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

Option 1

Symbol	Description
Nil	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 6L)
Bracket B		**ZS-50-B**	With 2 mounting screws (M4 x 6L)
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

ISE70/71 Series

Specifications

Model		ISE70	ISE71
Applicable fluid		Air, Non-corrosive gas, Non-flammable gas	
Pressure	Rated pressure range	0 to 1.000 MPa	0 to 1.600 MPa
	Display/Set pressure range	−0.105 to 1.050 MPa	−0.105 to 1.680 MPa
	Display/Smallest settable increment	0.001 MPa	0.001 MPa
	Withstand pressure	1.5 MPa	2.4 MPa
Power supply	Power supply voltage — When used as a switch output device	12 to 24 VDC ±10% with 10% voltage ripple or less	
	Power supply voltage — When used as an IO-Link device	18 to 30 VDC, including ripple (p-p) 10%	
	Current consumption	35 mA or less	
	Protection	Polarity protection	
Accuracy	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)	
Switch output (During SIO mode for output specifications "AB" or "L2")	Output type	Select from NPN or PNP open collector output.	
	Output mode	Hysteresis, Window comparator, Error output, Output OFF	
	Switch operation	Normal output, Reversed output	
	Maximum load current	80 mA	
	Maximum applied voltage	30 V (NPN output)	
	Internal voltage drop (Residual voltage)	1.5 V or less (at load current of 80 mA)	
	Delay time*1	1.5 ms or less, variable from 0 to 60 s/0.01 s increments	
	Hysteresis — Hysteresis mode	Variable from 0*2	
	Hysteresis — Window comparator mode		
	Short circuit protection	Yes	
Display	Unit*3	MPa, kPa, kgf/cm², bar, psi	
	Display type	LCD	
	Number of screens	3-screen display (Main screen, Sub screen x 2)	
	Display color	Main screen: Red/Green, Sub screen: Orange	
	Number of display digits	Main screen: 4 digits (7 segments), Sub screen: 4 digits (Upper 1 digit 11 segments, 7 segments for other)	
	Indicator light	Lights up when switch output is turned ON (OUT1, OUT2: Orange)	
Digital filter*4		Variable from 0 to 30 s/0.01 s increments	
Environment	Enclosure	IP67	
	Withstand voltage	1000 VAC for 1 minute between terminals and housing	
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing	
	Operating temperature range	Operating: 0 to 50°C, Stored: −10 to 60°C (No condensation or freezing)	
	Operating humidity range	Operating/Stored: 35 to 85% RH (No condensation)	
Standards		UL/CSA (E216656), CE marking (EMC directive/RoHS directive)	
Piping	Port size	Rc1/4, NPT1/4, G1/4	
	Materials of parts in contact with fluid	Sensor pressure receiving area: Silicon; Piping port: C3604 (Electroless nickel plating), Sensor seal: HNBR	
Weight	Body — Port size Rc1/4	153 g	
	Body — Port size NPT1/4	152 g	
	Body — Port size G1/4	150 g	
	Lead wire with connector	139 g	
Communication (IO-Link mode)	IO-Link type	Device	
	IO-Link version	V1.1	
	Communication speed	COM2 (38.4 kbps)	
	Configuration file	IODD file*5	
	Minimum cycle time	2.3 ms	
	Process data length	Input data: 2 bytes, Output data: 0 byte	
	On request data communication	Yes	
	Data storage function	Yes	
	Event function	Yes	
	Vendor ID	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 unit 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.smcworld.com
* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

SMC

High-Precision Digital Pressure Switch: For General Fluids

ISE70G/75G/76G/77G Series

How to Order

ISE70G – **02** ☐ – **L2** – **M** ☐ ☐ ☐

Pressure range

Symbol	Description
ISE70G	0 to 1 MPa
ISE75G	0 to 2 MPa
ISE76G	0 to 5 MPa
ISE77G	0 to 10 MPa

Piping specification

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

∗1 ISO 1179-1 compliant

Orifice

Symbol	Description
Nil	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 9 and 10 for details.

Unit specification

Symbol	Description
Nil	Unit selection function[*1]
M	SI unit only[*2]

∗1 Under the New Measurement Act, switches with the unit selection function are not permitted for use in Japan.
∗2 Fixed unit: MPa, kPa

Option 3

Symbol	Description
Nil	Operation manual
Y	None
K	Operation manual + Calibration certificate
T	Calibration certificate
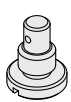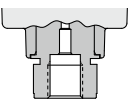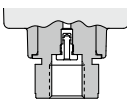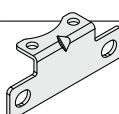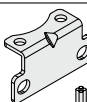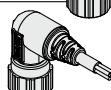
Option 2

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

Option 1

Symbol	Description
Nil	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**	Without orifice With orifice
Bracket A	**ZS-50-A**	Interchangeable with ISE75(H) With 2 mounting screws (M4 x 6L)
Bracket B	**ZS-50-B**	With 2 mounting screws (M4 x 6L)
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

ISE70G/75G/76G/77G Series

Specifications

Model	ISE70G	ISE75G	ISE76G	ISE77G
Applicable fluid	Liquid or gas that will not corrode materials of parts in contact with fluid			
Pressure Rated pressure range	0 to 1.000 MPa	0 to 2.000 MPa	0 to 5.00 MPa	0 to 10.00 MPa
Display/Set pressure range	−0.105 to 1.050 MPa	−0.105 to 2.100 MPa	−0.25 to 5.25 MPa	−0.50 to 10.50 MPa
Display/Smallest settable increment	0.001 MPa	0.001 MPa	0.01 MPa	0.01 MPa
Withstand pressure	3.0 MPa	5.0 MPa	12.5 MPa	30 MPa
Power supply Power supply voltage — When used as a switch output device	12 to 24 VDC ±10% with 10% voltage ripple or less			
Power supply voltage — When used as an IO-Link device	18 to 30 VDC, including ripple (p-p) 10%			
Current consumption	35 mA or less			
Protection	Polarity protection			
Accuracy Display accuracy	±2% F.S. ±1 digit (Ambient temperature of 25 ±3°C)			
Repeatability	±0.5% F.S.			
Temperature characteristics (25°C standard)	±3% F.S.	±5% F.S.		
Switch output (SIO mode) Output type	Select from NPN or PNP open collector output.			
Output mode	Hysteresis, Window comparator, Error output, Output OFF			
Switch operation	Normal output, Reversed output			
Maximum load current	80 mA			
Maximum applied voltage	30 V (NPN output)			
Internal voltage drop (Residual voltage)	1.5 V or less (at load current of 80 mA)			
Delay time[*1]	2 ms or less, variable from 0 to 60 s/0.01 s increments			
Hysteresis — Hysteresis mode	Variable from 0[*2]			
Hysteresis — Window comparator mode				
Short circuit protection	Yes			
Display Unit[*3]	MPa, kPa, kgf/cm², bar, psi			
Display type	LCD			
Number of screens	3-screen display (Main screen, Sub screen x 2)			
Display color	Main screen: Red/Green, Sub screen: Orange			
Number of display digits	Main screen: 4 digits (7 segments), Sub screen: 4 digits (Upper 1 digit 11 segments, 7 segments for other)			
Indicator light	Lights up when switch output is turned ON (OUT1, OUT2: Orange)			
Digital filter[*4]	Variable from 0 to 30 s/0.01 s increments			
Environment Enclosure	IP67			
Withstand voltage	500 VAC for 1 minute between terminals and housing			
Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing			
Operating temperature range	Operating: −5 to 50°C, Stored: −10 to 60°C (No condensation or freezing)			
Operating humidity range	Operating/Stored: 35 to 85% RH (No condensation)			
Standards	UL/CSA (E216656), CE marking (EMC directive/RoHS directive)			
Piping Port size	Rc1/4, NPT1/4, G1/4			
Materials of parts in contact with fluid	Sensor pressure receiving area: Al₂O₃ (Alumina 96%), Piping port: C3604 (Electroless nickel plating), Sensor seal: FKM + Grease (1 MPa), FKM (2, 5, 10 MPa)			
Weight Body — Port size Rc1/4	184 g			
Body — Port size NPT1/4	183 g			
Body — Port size G1/4	181 g			
Option — Lead wire with connector	139 g			
Option — Bracket A	17.7 g			
Option — Bracket B	14.2 g			
Option — Orifice	1.2 g			
Communication (IO-Link mode) IO-Link type	Device			
IO-Link version	V1.1			
Communication speed	COM2 (38.4 kbps)			
Configuration file	IODD file[*5]			
Minimum cycle time	2.3 ms			
Process data length	Input data: 2 bytes, Output data: 0 byte			
On request data communication	Yes			
Data storage function	Yes			
Event function	Yes			
Vendor ID	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 unit 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.
*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.smcworld.com
* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

SMC

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.

Switch		Pressure range					
		–0.1 MPa	0	1 MPa	2 MPa	5 MPa	10 MPa
For 1 MPa (For air and general fluids)	**ISE70**	–0.105 MPa	0	1 MPa			
	ISE70G			1.05 MPa			
For 1.6 MPa (For air)	**ISE71**	–0.105 MPa	0	1.6 MPa			
				1.68 MPa			
For 2 MPa (For general fluids)	**ISE75G**	–0.105 MPa	0		2 MPa		
					2.1 MPa		
For 5 MPa (For general fluids)	**ISE76G**	–0.25 MPa	0			5 MPa	
						5.25 MPa	
For 10 MPa (For general fluids)	**ISE77G**	–0.50 MPa	0				10 MPa
							10.5 MPa

▮ Rated pressure range of the switch
▮ Set pressure range of the switch

Internal Circuits and Wiring Examples

When used as a switch output device

∗ The numbers in the circuit diagrams show the connector pin layout.

Setting of NPN open collector 2 outputs

Brown DC(+) ①
Black OUT1 ④
White OUT2 ②
Blue DC(–) ③
Load
Load
12 to 24 VDC
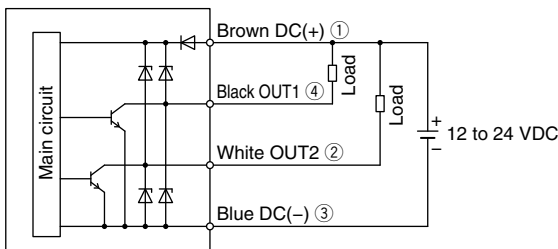
Setting of PNP open collector 2 outputs

Brown DC(+) ①
Black OUT1 ④
White OUT2 ②
Blue DC(–) ③
Load
Load
12 to 24 VDC

When used as an IO-Link device

Brown L+ ①   L+
Black C/Q ④   C/Q
White DO ②   DI   IO-Link master
Blue L– ③   L–
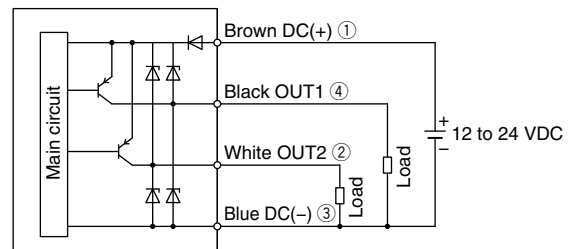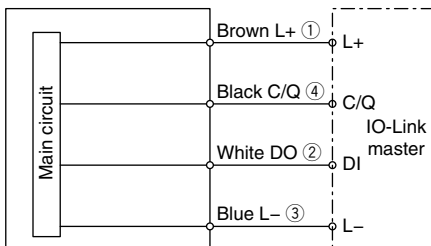
ISE7□/7□G Series

Dimensions

Without bracket

48

10

(26)

(40.1)

34

80.4

70.4

24

Piping port
02: Rc1/4
N02: NPT1/4
F02: G1/4 (ISO 1179-1)

24

6

24

22

2 x M4 thread depth 5
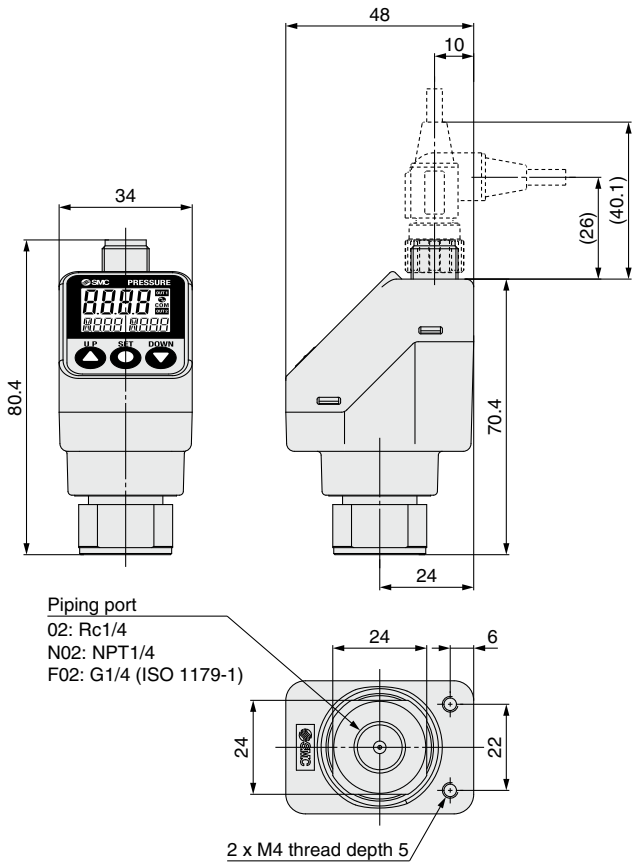
Bracket A (Interchangeable with ISE70/ISE75(H)) (Part no.: ZS-50-A)

49

14

6.5

8

46

60

15

1.6

(11.4)

25
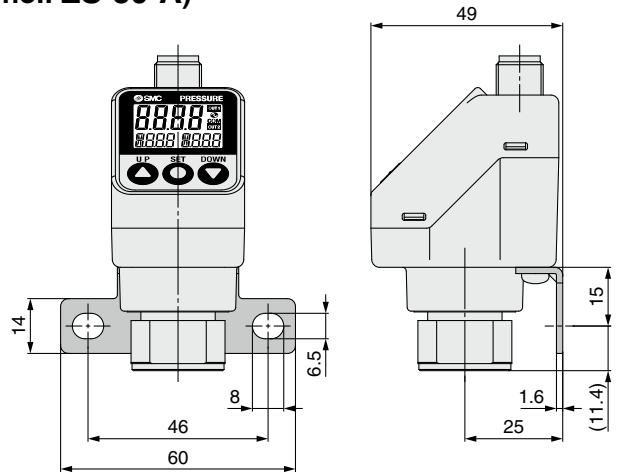
Bracket B (Part no.: ZS-50-B)

49

12

5.5

6.5

32

42

15

1.6

25
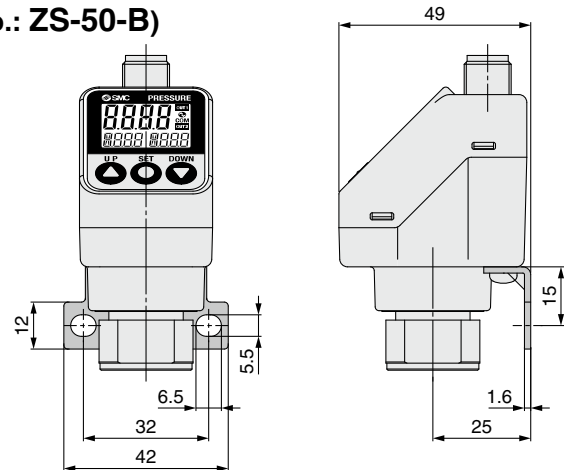
Lead wire with M12 connector (Part no.: ZS-31-B)

5000

(38.6)

45

30

Brown

White

Blue

Black

ø15

1: Brown

2: White

4: Black

3: Blue

M12

(Part no.: ZS-31-C)

5000

(31)

45

23.5

30

Brown

White

Blue

Black

24.55

(30.8)

ø15

4: Black

1: Brown

M12

3: Blue

2: White
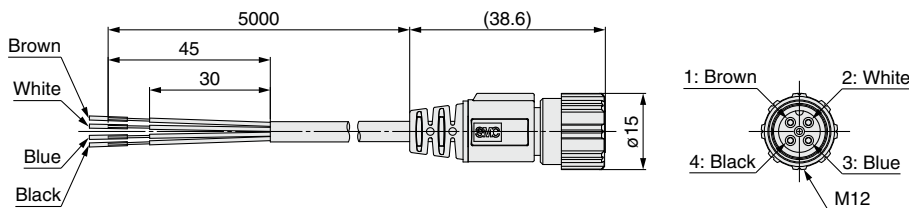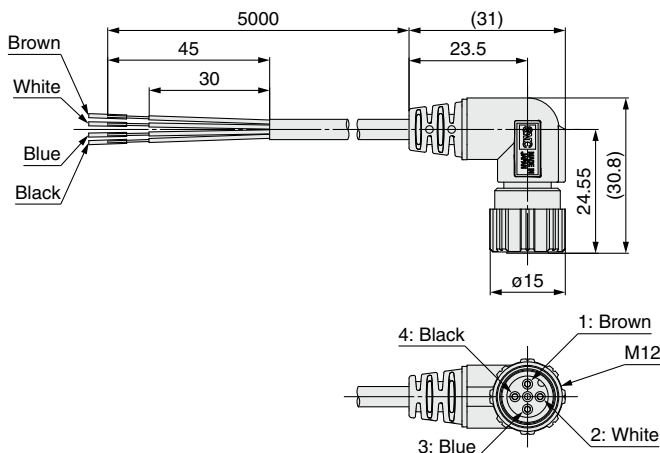
Cable Specifications

Conductor	Nominal cross section	AWG23
	Outside diameter	0.72 mm
Insulator	Material	Cross-linked vinyl chloride
	Outside diameter	1.14 mm
	Number of cores	4
Sheath	Material	Oil resistant vinyl chloride
Finished outside diameter		ø4

When used as a switch output device

No.	Description	Lead wire color	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 color	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)

SMC

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

Hysteresis mode Normal output

Threshold value setting

Switch ON

Measured value

Switch OFF

Turns ON at the set value or more.

Set value

0.0   0.1   0.2   0.3   0.4   (0.5)   0.6   0.7   MPa

Hysteresis setting

Switch ON

Difference between OFF ▶ ON and ON ▶ OFF

Switch OFF

0.40   0.45   0.50   0.55   MPa
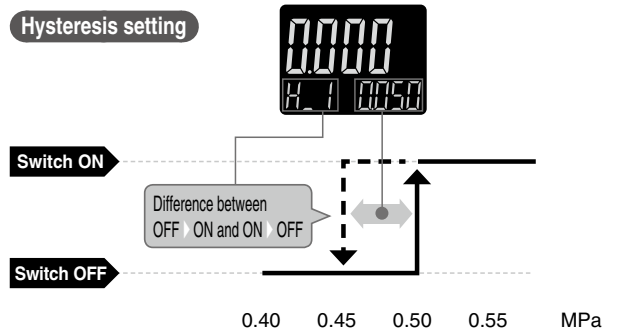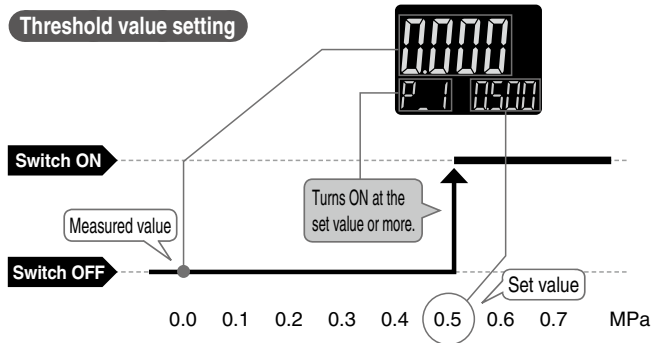
Hysteresis mode Reversed output

Threshold value setting

Measured value

Switch ON

Turns ON at the set value or less.

Switch OFF

Set value

0.0   0.1   0.2   0.3   0.4   (0.5)   0.6   0.7   MPa

Hysteresis setting

Switch ON

Difference between ON ▶ OFF and OFF ▶ ON

Switch OFF

0.45   0.50   0.55   0.60   MPa

Window comparator mode Normal output

Threshold value setting

Switch ON

Turns ON at the set value or more.

Measured value

Switch OFF

Turns ON at the set value or less.

Set value

0.0   0.1   0.2   (0.3)   0.4   0.5   (0.6)   0.7   MPa

Hysteresis setting

Switch ON

Difference between ON and OFF

Switch OFF

0.2   0.3   ....   0.6   0.7   MPa

Window comparator mode Reversed output

Threshold value setting

Measured value

Switch ON

Turns ON at the set value or less.

Turns ON at the set value or more.

Switch OFF

Set value

0.0   0.1   0.2   (0.3)   0.4   0.5   (0.6)   0.7   MPa

Hysteresis setting

Switch ON

Difference between ON and OFF

Switch OFF

0.3   0.4   ....   0.5   0.6   MPa

ISE7□/7□G Series
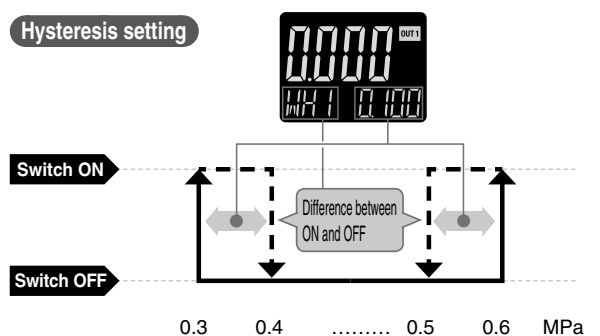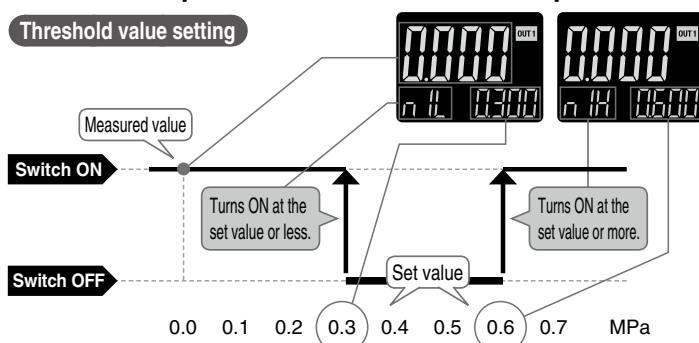
Function Details

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

Auto-preset 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
$P\_1(P\_2) = A - (A\text{-}B)/4$	$H\_1(H\_2) = |(A\text{-}B)/2|$
$n\_1(n\_2) = B + (A\text{-}B)/4$	

A: Maximum pressure value in auto preset mode
B: Minimum 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 ±5% of the read value. (The scattering of the indicated value can be eliminated.)

±5% R.D.

Indicated value of pressure

O   Applied pressure
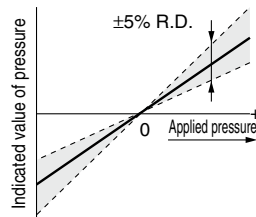
―― Indicated value at a time of shipment

▨ Adjustable range of display value fine adjustment function

∗ When the display value fine adjustment function is used, the set pressure value may change ±1 digit.

C Peak/Bottom value indication function

This function constantly detects and updates the maximum (minimum) pressure when the power is supplied, and allows to hold the maximum (minimum) 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 second or longer, while "holding", the held value will be reset.

D Keylock 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 measured pressure.
The indicated value can be adjusted within ±7% F.S. of the pressure at a time of shipment from the factory.

F Error display function

This function is to display error location and content when a problem or error has occurred.

Error name	Display	Description	Action
Over current error	Er 1 (oE1) Er 2 (oE2)	The load current applied to the switch output has exceeded the maximum value.	Eliminate the cause of the over current by turning off the power supply and then turn it on again.
Residual pressure error	Er 3 (ZEro)	During zero-clear operation, pressure over ±7% F.S. is present. Note that the mode is returned to measurement mode automatically 1 second later. The zero clear range varies by ±1% F.S. due to variation between individual products.	Perform zero-clear operation again after restoring the applied pressure to an atmospheric pressure condition.
Applied pressure error	HHH	Supply pressure exceeds the maximum set pressure.	Reset applied pressure to a level within the set pressure range.
	LLL	Supply pressure is below the minimum set pressure.	
System error	Er 0 Er 1 Er 4 Er 8 Er 6 Er 9	Internal data error	Turn the power off and then on again. If the error cannot be solved, please contact SMC for investigation.
IO-Link master version error	Er 15 (V10)	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.

SMC

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 in operation, therefore, the source pressure may decrease temporarily. 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.
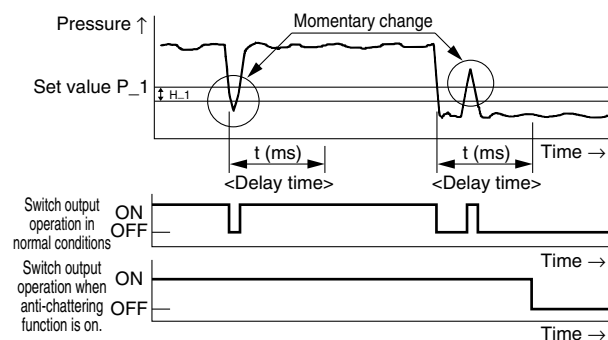
H Unit selection function (F0)

Display units can be switched with this function.

Model	Rated pressure range	Smallest settable increment				
		MPa	kPa	kgf/cm²	bar	psi
ISE70/70G	0 to 1 MPa					0.1
ISE71	0 to 1.6 MPa	0.001	1	0.01	0.01	
ISE75G	0 to 2 MPa					0.2
ISE76G	0 to 5 MPa	0.01		0.1	0.1	1
ISE77G	0 to 10 MPa					

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)

Power saving mode can be selected.
It shifts to the power-saving mode without button operation for 30 seconds.
It is set to the normal mode (Power-saving mode is OFF.) at a time of shipment from the factory.
(During power-saving mode, [ECo] will flash in the sub screen and the operation light is ON (only when the switch is ON).)

K Setting of security code (F81)

Users can select whether a security code must be entered to release key lock.
At a time of shipment from the factory, it is set such that the security code is not required.