

IO-Link Compatible

For General Fluids

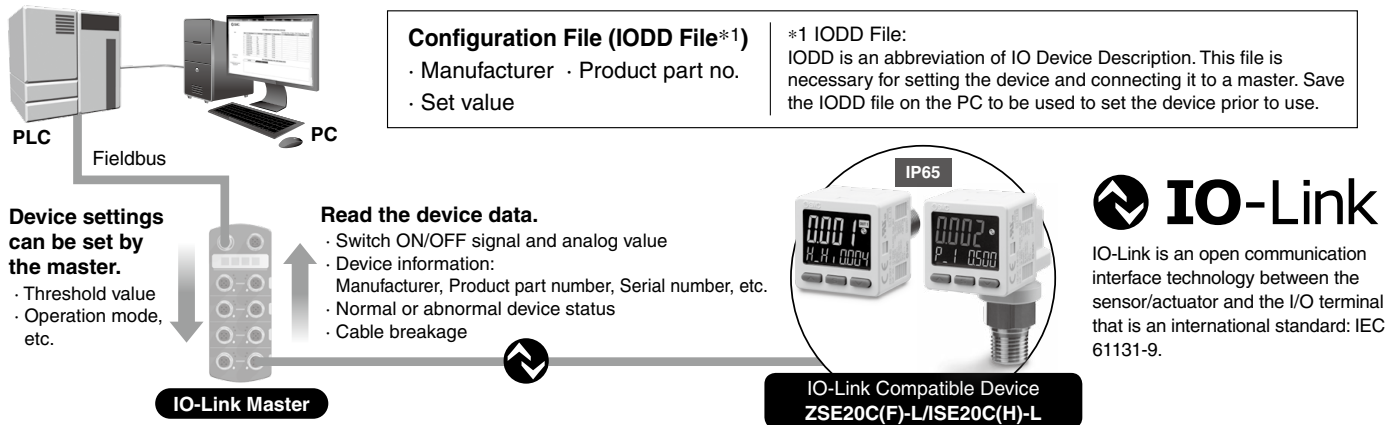


3-Screen Display High-Precision Digital Pressure Switch

■ **Stainless diaphragm** Oil-free (Single-layer diaphragm structure)

Sensor unit: **Stainless steel 630** Fitting parts: **Stainless steel 304**

■ **Visualization of operation/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

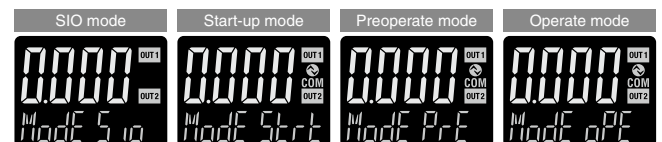
Diagnosis items

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


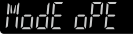
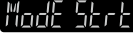
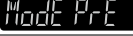

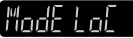
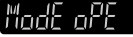


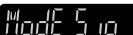
Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Item	Measured pressure value													Diagnosis	OUT2	OUT1

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	COM*1	 *2	IO-Link mode	Normal	Operate		Normal communication status (readout of measured value)
		Start up				At the start of communication	
		Preoperate					
		No	OFF	 *2 (Flashing)	IO-Link mode	Abnormal	Version does not match
Lock				Backup and restore required due to data storage lock			
Communication disconnection	  			Normal communication was not received for 1 s or longer.			
				OFF	SIO mode		

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

ZSE20C(F)-L/ISE20C(H)-L Series



22-E779

IO-Link Compatible (1 Output)



RoHS

For General Fluids

IP65

3-Screen Display High-Precision Digital Pressure Switch

ZSE20C(F)-L/ISE20C(H)-L Series

How to Order



For Positive Pressure

ISE20C - L - M - 02 - - - - -

For Vacuum/
Compound Pressure

ZSE20C - L - M - 02 - - - - -

Rated pressure range

ISE20C	-0.1 to 1 MPa
ISE20CH	-0.1 to 2 MPa

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Rated pressure range

ZSE20C	0 to -101 kPa
ZSE20CF	-100 to 100 kPa

② Output specification

Symbol	Description
L	IO-Link/Switch: 1 output ← (PNP or NPN switching type for switch output)

⑦ Option 2

* Note that the optional parts that can be used vary depending on the piping direction.

Symbol	Description
Nil	None

③ Unit specification

Symbol	Description
Nil	Units selection function*1
M	SI units only*2
P	Units selection function (Initial value psi)*1

*1 Under the New Measurement Act, switches with the units selection function are no longer allowed for use in Japan.

*2 Fixed units: kPa, MPa

④ Piping specification

Symbol	Description
02	R1/4 (M5 female threaded)
N02	NPT1/4 (M5 female threaded)
F02	G1/4 (M5 female threaded)
C01	Rc1/8
A2	URJ1/4 (Face seal fitting)
B2	TSJ1/4 (Compression fitting)

Rear ported (⑤ Piping direction: Nil)

Symbol	Description	Symbol	Description
A1	Bracket A	B	Panel mount adapter
D	Panel mount adapter + Front protection cover		

⑤ Piping direction

Nil	Rear ported
L	Bottom ported

⑥ Option 1

Symbol	Description
Nil	Without lead wire
W	Lead wire with connector, 5-core (2 m lead wire, With waterproof cover)

* For the lead wire with M12 connector, refer to the Web Catalog.

Bottom ported (⑤ Piping direction: L)

Symbol	Description
A3	Bracket C
E	Panel mount adapter
F	Panel mount adapter + Front protection cover

Options/Part Nos.

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

Description	Part no.	Note
Bracket A	ZS-46-A1	For rear ported/Tapping screw: Nominal size 3 x 8 L (2 pcs.)
Bracket C	ZS-46-E	For bottom ported/Tapping screw: Nominal size 3 x 10 L (2 pcs.)
Panel mount adapter	ZS-46-B	Rear ported
Panel mount adapter + Front protection cover	ZS-35-B	Bottom ported
Panel mount adapter + Front protection cover	ZS-46-D	Rear ported
Panel mount adapter + Front protection cover	ZS-35-E	Bottom ported
Lead wire with connector	ZS-46-5F	5-core, 2 m, Waterproof (With waterproof cover)
Front protection cover	ZS-27-01	Rear ported
Front protection cover	ZS-35-01	Bottom ported

⑧ Option 3

Symbol	Operation manual*3	Calibration certificate*3
Nil	○	—
Y	—	—
K	○	○
T	—	○

*3 All texts are in both English and Japanese.

Specifications not listed are the same as those of the standard product.
More information can be viewed here.



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



Specifications

Model			ZSE20C-L (Vacuum pressure)	ZSE20CF-L (Compound pressure)	ISE20C-L (Positive pressure)	ISE20CH-L (Positive pressure)
Applicable fluid			Liquids and gases that do not corrode stainless steel 630 and 304			
Pressure	Rated pressure range		0.0 to −101.0 kPa	−100.0 to 100.0 kPa	−0.100 to 1.000 MPa	−0.100 to 2.000 MPa
	Display/Set pressure range		10.0 to −105.0 kPa	−105.0 to 105.0 kPa	−0.105 to 1.050 MPa	−0.105 to 2.100 MPa
	Display/Smallest settable increment		0.1 kPa		0.001 MPa	
	Withstand pressure		500 kPa		2 MPa	4 MPa
Power supply	Power supply voltage	When used as a switch output device (When not used as an IO-Link device)	12 to 24 VDC ±10% with 10% voltage ripple (p-p) or less			
		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		±0.2% F.S. ±1 digit			
	Temperature characteristics		±3% F.S. (25°C standard)			
Switch output (SIO mode)	Output type		Select from NPN or PNP open collector output.			
	Output mode		Hysteresis mode, Window comparator mode, Error output, Output OFF			
	Switch operation		Normal output, Reversed output			
	Max. load current		80 mA			
	Max. applied voltage (NPN only)		28 V			
	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			
		Window comparator mode				
Short circuit protection		Yes				
Display	Unit*3		MPa, kPa, kgf/cm ² , bar, psi, inHg, mmHg		MPa, kPa, kgf/cm ² , bar, psi	
	Display type		LCD			
	Number of screens		3-screen display (Main screen, Sub screen x 2)			
	Display color		1) Main screen: Red/Green 2) Sub screen: Orange			
	Number of display digits		1) Main screen: 4 digits (7 segments) 2) 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			
Environmental resistance	Enclosure		IP65			
	Withstand voltage		250 VAC for 1 minute between terminals and housing			
	Insulation resistance		2 MΩ or more (50 VDC measured via megohmmeter) between terminals and housing			
	Operating temperature range		Operating: −5 to 50°C, Stored: −10 to 60°C (No condensation)			
	Operating humidity range		Operating/Stored: 35 to 85% RH (No condensation)			
Standards			CE marking (EMC directive/RoHS directive)			
Length of lead wire with connector			2 m			
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 bytes			
	On request data communication		Yes			
	Data storage function		Yes			
	Event function		Yes			
Vendor ID			131 (0 x 000083)			

*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 greater 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.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.

Piping Specifications and Weights

Model		02	N02	F02	C01	A2	B2
Port size		R1/4	NPT1/4	G1/4	Rc1/8	URJ1/4	TSJ1/4
Materials of parts in contact with fluid		Pressure sensor: Stainless steel 630, Fitting: Stainless steel 304					
Weight	Body (Rear ported)	51 g	51 g	48 g	47 g	54 g	46 g
	Body (Bottom ported)	77 g	78 g	74 g	65 g	81 g	72 g
	Lead wire with connector	+39 g					

Cable Specifications

Conductor cross section		0.15 mm ² (AWG26)
Insulator	O.D.	1.0 mm
	Color	Brown, Blue, Black, White, Gray (5-core)
Sheath	Finished O.D.	$\phi 3.5$

ZSE20C(F)-L/ISE20C(H)-L 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 setting is possible. The rated pressure range is the range of pressure that satisfies the specifications (accuracy, linearity, etc.) of the switch. 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.

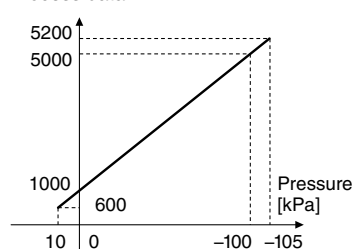
Switch		Pressure range					
		-100 kPa	0	100 kPa	500 kPa	1 MPa	2 MPa
For vacuum pressure	ZSE20C-L	-101 kPa	0				
		-105 kPa	10 kPa				
For compound pressure	ZSE20CF-L	-100 kPa	100 kPa				
		-105 kPa	105 kPa				
For positive pressure	ISE20C-L	-100 kPa	1 MPa				
		-105 kPa (-0.105 MPa)	1.05 MPa				
	ISE20CH-L	-100 kPa	2 MPa				
		-105 kPa (-0.105 MPa)	2.1 MPa				

Rated pressure range of the switchSet pressure range of the switch

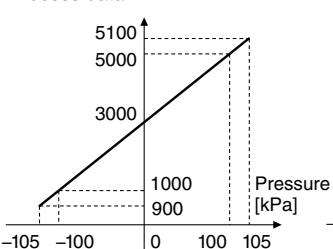
IO-Link: Process Data

Relationship between the process data and pressure value

ZSE20C-L (For vacuum pressure)
Process data

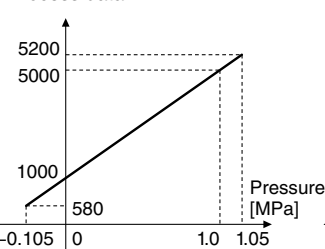


ZSE20CF-L (For compound pressure)
Process data

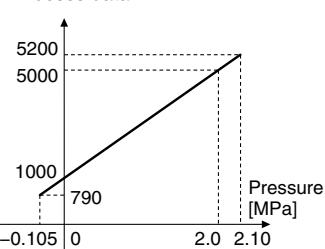


ISE20C-L (For positive pressure)







Process data



ISE20CH-L (For positive pressure)
Process data



Internal Circuits and Wiring Examples

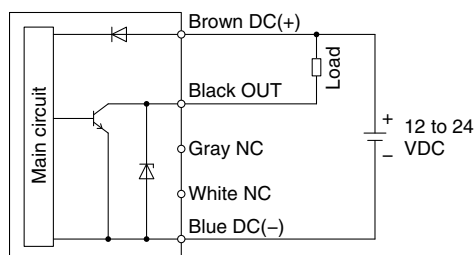
ZSE20C(F)
ISE20C(H) - **L** -  -   -   

• **Output specification**

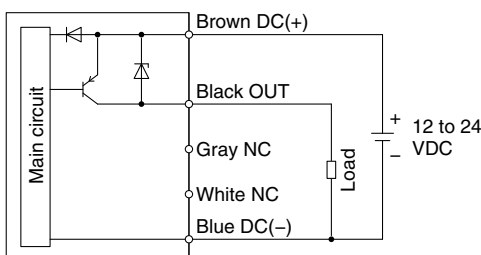
-L: (IO-Link/Switch: 1 output)

When used as a switch output device (When not used as an IO-Link device = When in SIO mode)

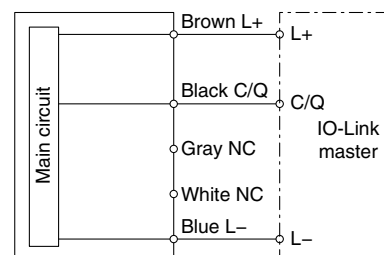
NPN open collector 1 output setting



PNP open collector 1 output setting



When used as an IO-Link device



⚠ Safety Instructions Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.

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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

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