

IO-Link Compatible

For General Fluids

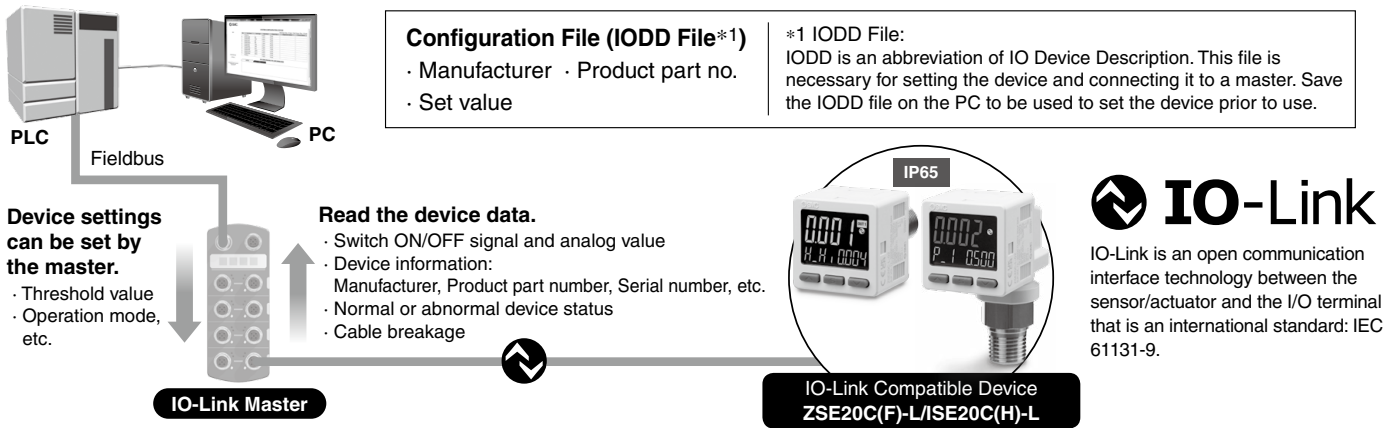


3-Screen Display High-Precision Digital Pressure Switch

■ **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	Normal	Operate	Mode oPE	Normal communication status (readout of measured value)
			Start up	Mode S trt	At the start of communication
			Preoperate	Mode Pr-E	
No	OFF	Abnormal	Version does not match	Er 15 V 1.0	The IO-Link version does not match that of the master. The master uses version 1.0. * The applicable IO-Link version is 1.1.
			Lock	Mode Loc	Backup and restore required due to data storage lock
			Communication disconnection	Mode oPE Mode S trt Mode Pr-E	Normal communication was not received for 1 s or longer.
	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 will be ON or flashing. *3 When the sub screen is set to Mode

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



IO-Link Compatible (1 Output)



RoHS

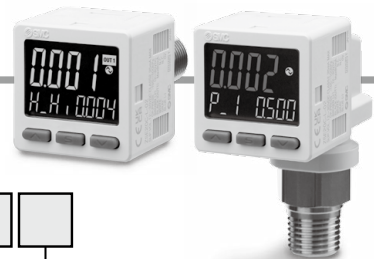
IP65

For General Fluids

3-Screen Display High-Precision Digital Pressure Switch

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

How to Order



Rated pressure range

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

For Positive Pressure

ISE20C - L - M - 02

For Vacuum/
Compound Pressure

ZSE20C - L - M - 02

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	T SJ1/4 (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)

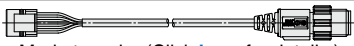
* For the lead wire with M12 connector, refer to the Web Catalog.

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
	ZS-35-B	Bottom ported
Panel mount adapter + Front protection cover	ZS-46-D	Rear ported
	ZS-35-E	Bottom ported
Lead wire with connector	ZS-46-5F	5-core, 2 m, Waterproof (With waterproof cover)
Lead wire with M12 connector	ZS-46-5FM12	 Made to order (Click here for details.)
Front protection cover	ZS-27-01	Rear ported
	ZS-35-01	Bottom ported
Adapter with restrictor Rc1/4	ZS-31-X175	To prevent the effects of water collision with inertia force Dimensions (Click here for details.)
Adapter with restrictor NPT1/4	ZS-31-X186	
Adapter with restrictor Rc1/8	ZS-31-X188	
Orifice M5	ZS-48-A	To prevent the effects of water collision with inertia force Dimensions (Click here for details.)

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 $\pm 10\%$ 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	$\pm 2\%$ F.S. ± 1 digit (Ambient temperature of $25 \pm 3^\circ\text{C}$)				
	Repeatability	$\pm 0.2\%$ F.S. ± 1 digit				
	Temperature characteristics	$\pm 3\%$ 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 M Ω 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/UKCA marking					
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, Grease-free						
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.

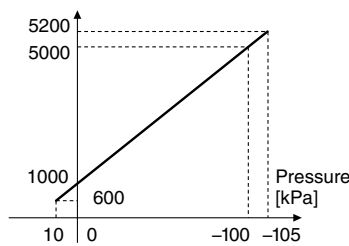
Switch	Pressure range						
	-100 kPa	0	100 kPa	500 kPa	1 MPa	2 MPa	
For vacuum pressure ZSE20C-L	-101 kPa -105 kPa	0 10 kPa					
For compound pressure ZSE20CF-L	-100 kPa -105 kPa		100 kPa 105 kPa				
For positive pressure	-100 kPa -105 kPa (-0.105 MPa)	ISE20C-L				1 MPa 1.05 MPa	
		ISE20CH-L				2 MPa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

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

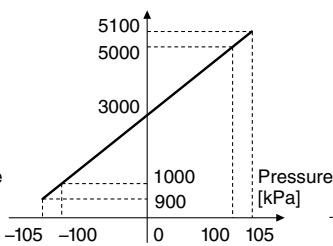
IO-Link: Process Data

Relationship between the process data and pressure value

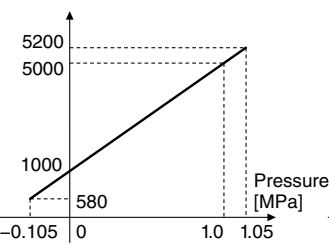
ZSE20C-L (For vacuum pressure)
Process data



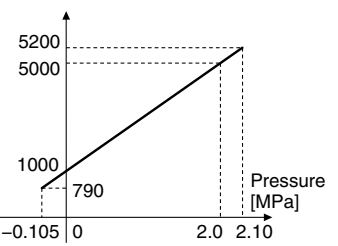
ZSE20CF-L (For compound pressure)
Process data



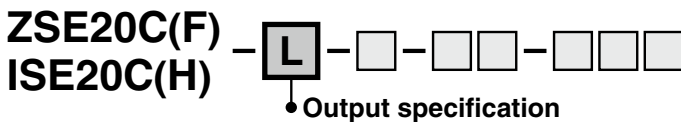
ISE20C-L (For positive pressure)
Process data



ISE20CH-L (For positive pressure)
Process data



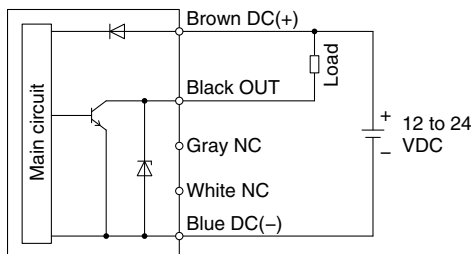
Internal Circuits and Wiring Examples



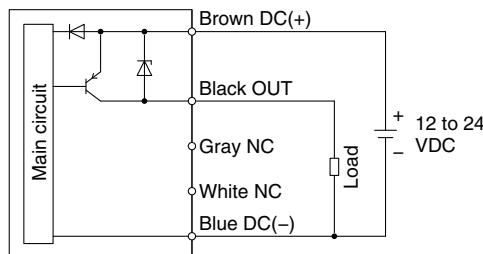
-L: (IO-Link/Switch: 1 output)

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

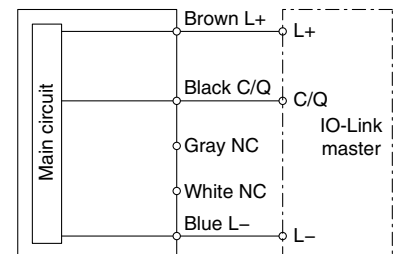
NPN open collector 1 output setting



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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