

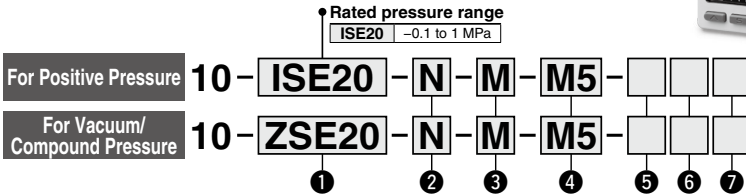
10-ZSE20(F)/10-ISE20 series



1 Output 3-Screen Display IP40
High-Precision Digital Pressure Switch



How to Order



1 Rated pressure range

10-ZSE20	0 to -101 kPa
10-ZSE20F	-100 to 100 kPa

2 Output specification

Symbol	Description
N	NPN open collector 1 output
P	PNP open collector 1 output










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.

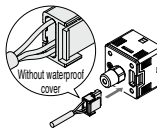
*2 Fixed units: kPa, MPa

4 Piping specification

Symbol	Description	Symbol	Description
M5	M5 female thread  Piping port	C4H	One-touch fitting ø4 mm Straight type 
		C6H	One-touch fitting ø6 mm 
		N7H	One-touch fitting ø1/4 inch 
01	R1/8 R1/8 Piping adapter 	C4L	One-touch fitting ø4 mm Elbow type 
		C6L	One-touch fitting ø6 mm 
		N7L	One-touch fitting ø1/4 inch 
N01	NPT 1/8 NPT 1/8 Piping adapter 		

* One-touch fitting is shipped together with the product.

5 Option 1



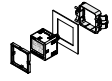
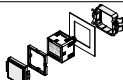
Symbol	Description
Nil	Without lead wire
L	Lead wire with connector (3-core, 2 m lead wire) 

7 Option 3

Symbol	Operation manual*1	Calibration certificate*1
Nil	○	—
Y	—	○
K	○	○
T	—	○

*1 All texts are in both English and Japanese.

6 Option 2

Symbol	Description
Nil	None
A1	Bracket A (Vertical mounting) 
A2	Bracket B (Horizontal mounting) 
B	Panel mount adapter 
D	Panel mount adapter + Front protection cover 

Caution

- This product is blown with air and double packed in a Class M3.5 (ISO Class 5) clean room.
- The clean specification part of the model number (10-) is not printed on the product body.

3-Screen Display High-Precision Digital Pressure Switch 10-ZSE20(F)/10-ISE20

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

Specifications

Model		10-ZSE20 (Vacuum pressure)	10-ZSE20F (Compound pressure)	10-ISE20 (Positive pressure)
Applicable fluid		Air, Non-corrosive gas, Non-flammable gas		
Pressure	Rated pressure range	0.0 to -101.0 kPa	-100.0 to 100.0 kPa	-0.100 to 1.000 MPa
	Display/Set pressure range	10.0 to -105.0 kPa	-105.0 to 105.0 kPa	-0.105 to 1.050 MPa
	Display/Smallest settable increment	0.1 kPa		0.001 MPa
	Withstand pressure	500 kPa		1.5 MPa
Power supply	Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p) 10% or less		
	Current consumption	25 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	±2% F.S. (25°C standard)		
Switch output	Output type	NPN or PNP open collector 1 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 V or less (at load current of 80 mA)		
	Delay time*1	1.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000, 5000 ms)		
	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: Orange		
Digital filter*4	0, 10, 50, 100, 500, 1000, 5000 ms			
Environmental resistance	Enclosure	IP40		
	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: -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)		
Length of lead wire with connector		2 m		
Cleanliness class (ISO class)		Class 4		

*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.

* 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		M5	01	N01	C4H	C6H	N7H	C4L	C6L	N7L
Port size	Model	M5 x 0.8	R1/8	NPT1/8	—	—	—	—	—	—
	One-touch fitting Straight type	—	—	—	ø4 mm ø5/32 inch	ø6 mm	ø1/4 inch	—	—	—
	One-touch fitting Elbow type	—	—	—	—	—	—	ø4 mm ø5/32 inch	ø6 mm	ø1/4 inch
Materials of parts in contact with fluid	Sensor pressure receiving area	Silicon								
	Piping port (Common)	PBT, CB156, Heat-resistant PPS, O-ring: HNBR								
Weight	Piping port	—	C3604 (Electroless nickel plating), Stainless steel 304, NBR	POM, Stainless steel 304, NBR (Fluoro coated), C3604						
	Body	22 g	32 g	34 g	25 g	26 g	26 g	28 g	29 g	35 g
Lead wire with connector		+35 g								

Cable Specifications

Conductor cross section	0.15 mm ² (AWG26)	
Insulator	O.D.	1.0 mm
	Color	Brown, Blue, Black (3-core)
Sheath	Finished O.D.	ø3.4

*Set Pressure Range and Rated Pressure Range, *Functions* ➔ p. 1311-6

Internal Circuits and Wiring Examples ➔ From p. 1311-7 "Dimensions" ➔ From p. 1311-9

10-ZSE20A(F)/10-ISE20A series



2 Outputs + Analog Output (Voltage/Current) **IP40**
3-Screen Display High-Precision Digital Pressure Switch

How to Order



Rated pressure range
ISE20A | -0.1 to 1 MPa

For Positive Pressure

10- **ISE20A** - **X** - **M** - **M5** - [] - [] - []

For Vacuum/
Compound Pressure

10- **ZSE20A** - **X** - **M** - **M5** - [] - [] - []

① ② ③ ④ ⑤ ⑥ ⑦

① Rated pressure range

10-ZSE20A	0 to -101 kPa
10-ZSE20AF	-100 to 100 kPa

② Output specification

Symbol	Description
R	NPN open collector 2 outputs + Analog voltage output *1
S	NPN open collector 2 outputs + Analog current output *1
T	PNP open collector 2 outputs + Analog voltage output *1
V	PNP open collector 2 outputs + Analog current output *1
X	NPN open collector 2 outputs + Copy function
Y	PNP open collector 2 outputs + Copy function

*1 Can be switched to auto-shift or copy function




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	Symbol	Description
M5	M5 female thread  Piping port	C4H	One-touch fitting ø4 mm Straight type
		C6H	One-touch fitting ø6 mm
		N7H	One-touch fitting ø1/4 inch
O1	R1/8  R1/8 Piping adapter	C4L	One-touch fitting ø4 mm Elbow type
		C6L	One-touch fitting ø6 mm
		N7L	One-touch fitting ø1/4 inch
N01	NPT1/8  NPT1/8 Piping adapter		

* One-touch fitting is shipped together with the product.

⑤ Option 1



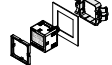

Symbol	Description
Nil	Without lead wire
J	Lead wire with connector (5-core, 2 m lead wire)  Without waterproof cover

⑦ Option 3

Symbol	Operation manual*1	Calibration certificate*1
Nil	○	—
Y	—	—
K	○	○
T	—	○

*1 All texts are in both English and Japanese.

⑥ Option 2

Symbol	Description
Nil	None
A1	Bracket A (Vertical mounting) 
A2	Bracket B (Horizontal mounting) 
B	Panel mount adapter 
D	Panel mount adapter + Front protection cover 

⚠ Caution

- This product is blown with air and double packed in a Class M3.5 (ISO Class 5) clean room.
- The clean specification part of the model number (10-) is not printed on the product body.

3-Screen Display High-Precision Digital Pressure Switch 10-ZSE20A(F)/10-ISE20A

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

Specifications

Model		10-ZSE20A (Vacuum pressure)	10-ZSE20AF (Compound pressure)	10-ISE20A (Positive pressure)
Applicable fluid		Air, Non-corrosive gas, Non-flammable gas		
Pressure	Rated pressure range	0.0 to -101.0 kPa	-100.0 to 100.0 kPa	-0.100 to 1.000 MPa
	Display/Set pressure range	10.0 to -105.0 kPa	-105.0 to 105.0 kPa	-0.105 to 1.050 MPa
	Display/Smallest settable increment	0.1 kPa		0.001 MPa
	Withstand pressure	500 kPa		1.5 MPa
Power supply	Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p) 10% or less		
	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		
	Analog output accuracy	±2.5% F.S. (Ambient temperature of 25 ±3°C)		
	Analog output linearity	±1% F.S.		
	Temperature characteristics	±2% F.S. (25°C standard)		
Switch output	Output type	NPN or PNP open collector 2 outputs		
	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 V or less (at load current of 80 mA)		
	Delay time*1	1.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000, 5000 ms)		
	Hysteresis	Hysteresis mode	Variable from 0*2	
		Window comparator mode		
		Short circuit protection	Yes	
Analog output	Voltage output	Voltage output: 1 to 5 V		Voltage output: 0.6 to 5 V
	Output type	Approx. 1 kΩ		
	Output impedance	Current output: 4 to 20 mA		
	Current output	Maximum load impedance at power supply voltage of 12 V: 300 Ω		Current output: 2.4 to 20 mA
	Load impedance	at power supply voltage of 24 V: 600 Ω		
		Minimum load impedance: 50 Ω		
Auto-shift input	Input type	Non-voltage input: 0.4 V or less		
	Input mode	Select from Auto-shift or Auto-shift zero.		
	Input time	5 ms or more		
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)		
Digital filter*4	Indicator light			
Environmental resistance	Enclosure	IP40		
	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: -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)			
Length of lead wire with connector	2 m			
Cleanliness class (ISO class)	Class 4			

*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.

* 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

Port size	Model	M5	01	N01	C4H	C6H	N7H	C4L	C6L	N7L
			M5 x 0.8	R1/8	NPT 1/8	—	—	—	—	—
One-touch fitting	Straight type	—	—	—	ø4 mm ø5/32 inch	ø6 mm	ø1/4 inch	—	—	—
	One-touch fitting	—	—	—	—	—	—	ø4 mm	ø6 mm	ø1/4 inch
	Elbow type	—	—	—	—	—	—	ø4 mm ø5/32 inch	ø6 mm	ø1/4 inch
Materials of parts in contact with fluid	Sensor pressure receiving area	Silicon								
	Piping port (Common)	PBT, CB156, Heat-resistant PPS, O-ring: HNBR								
Weight	Piping port	—	C3604 (Electroless nickel plating), Stainless steel 304, NBR	—	POM, Stainless steel 304, NBR (Fluoro coated), C3604					
	Body	24 g	34 g	36 g	27 g	28 g	28 g	30 g	31 g	37 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.	ø3.5

"Set Pressure Range and Rated Pressure Range," "Functions" → p. 1311-6

"Internal Circuits and Wiring Examples" → From p. 1311-6 "Dimensions" → From p. 1311-9

10-ZSE20B(F)/10-ISE20B series



2 Outputs + Analog Output (Voltage/Current)

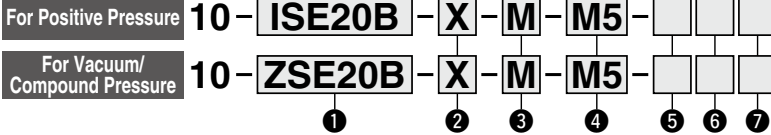
IP65

3-Screen Display High-Precision Digital Pressure Switch

How to Order



Rated pressure range
ISE20B | -0.1 to 1 MPa



1 Rated pressure range

10-ZSE20B	0 to -101 kPa
10-ZSE20BF	-100 to 100 kPa

2 Output specification

Symbol	Description
R	NPN open collector 2 outputs + Analog voltage output*1
S	NPN open collector 2 outputs + Analog current output*1
T	PNP open collector 2 outputs + Analog voltage output*1
V	PNP open collector 2 outputs + Analog current output*1
X	NPN open collector 2 outputs + Copy function
Y	PNP open collector 2 outputs + Copy function

*1 Can be switched to auto-shift or copy function

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.

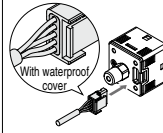
*2 Fixed units: kPa, MPa

4 Piping specification

Symbol	Description	Symbol	Description
M5	M5 female thread Piping port	C4L	One-touch fitting ø4 mm
		C6L	One-touch fitting ø6 mm
01	R1/8 R1/8 Piping adapter	* One-touch fitting is shipped together with the product.	
		N01	NPT1/8 NPT1/8 Piping adapter

5 Option 1

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



7 Option 3

Symbol	Operation manual*1	Calibration certificate*1
Nil	<input type="radio"/>	<input type="radio"/>
Y	<input type="radio"/>	<input type="radio"/>
K	<input type="radio"/>	<input type="radio"/>
T	<input type="radio"/>	<input type="radio"/>

*1 All texts are in both English and Japanese.

6 Option 2

Symbol	Description
Nil	None
A1	Bracket A (Vertical mounting)
A2	Bracket B (Horizontal mounting)
B	Panel mount adapter
D	Panel mount adapter + Front protection cover

Caution

- This product is blown with air and double packed in a Class M3.5 (ISO Class 5) clean room.
- The clean specification part of the model number (10-) is not printed on the product body.

3-Screen Display High-Precision Digital Pressure Switch 10-ZSE20B(F)/10-ISE20B

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

Specifications

Model		10-ZSE20B (Vacuum pressure)	10-ZSE20BF (Compound pressure)	10-ISE20B (Positive pressure)	
Applicable fluid		Air, Non-corrosive gas, Non-flammable gas			
Pressure	Rated pressure range	0.0 to -101.0 kPa	-100.0 to 100.0 kPa	-0.100 to 1.000 MPa	
	Display/Set pressure range	10.0 to -105.0 kPa	-105.0 to 105.0 kPa	-0.105 to 1.050 MPa	
	Display/Smallest settable increment	0.1 kPa		0.001 MPa	
	Withstand pressure	5.0 kPa		1.5 MPa	
Power supply	Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p) 10% or less			
	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			
	Analog output accuracy	±2.5% F.S. (Ambient temperature of 25 ±3°C)			
	Analog output linearity	±1% F.S.			
	Temperature characteristics	±2% F.S. (25°C standard)			
Switch output	Output type	NPN or PNP open collector 2 outputs			
	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 V or less (at load current of 80 mA)			
	Delay time *1	1.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000, 5000 ms)			
	Hysteresis	Hysteresis mode	Variable from 0% ²		
		Window comparator mode			
	Short circuit protection		Yes		
Analog output	Voltage output	Voltage output: 1 to 5 V		Voltage output: 0.6 to 5 V	
	Output type	Approx. 1 kΩ			
		Current output: 4 to 20 mA		Current output: 2.4 to 20 mA	
	Current output	Maximum load impedance at power supply voltage of 12 V: 300 Ω			
		at power supply voltage of 24 V: 600 Ω			
Load impedance		Minimum load impedance: 50 Ω			
Auto-shift input	Input type	Non-voltage input: 0.4 V or less			
	Input mode	Select from Auto-shift or Auto-shift zero.			
	Input time	5 ms or more			
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	0, 10, 50, 100, 500, 1000, 5000 ms				
Environmental resistance	Enclosure	IP65			
	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: -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)				
Length of lead wire with connector	2 m				
Cleanliness class (ISO class)	Class 4				

*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.

* 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

Port size	Model					
	M5	O1	N01	C4L	C6L	
One-touch fitting Straight type	M5 x 0.8	R1/8	NPT 1/8	—	—	
	—	—	—	—	—	
One-touch fitting Elbow type	—	—	—	ø4 mm ø5/32 inch	ø6 mm	
Materials of parts in contact with fluid	Sensor pressure receiving area					
	Piping port (Common)					
Piping port	Silicon					
	PBT, CB156, Heat-resistant PPS, O-ring: HNBR					
Body	—		C3604 (Electroless nickel plating), Stainless steel 304, NBR	POM, Stainless steel 304, NBR (Fluoro coated), C3604		
	24 g	34 g	36 g	30 g	31 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.	ø3.5

"Set Pressure Range and Rated Pressure Range,"
"Functions" → p. 1311-6
"Internal Circuits and Wiring Examples" → From p. 1311-7 "Dimensions" → From p. 1311-9

Set Pressure Range and Rated Pressure Range

Set the pressure within the rated pressure range.

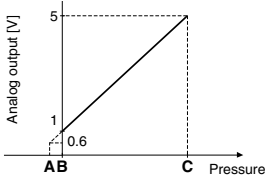
The set pressure range is the range of pressure within which setting is possible. The rated pressure range is the range of pressure that satisfies the specifications (accuracy, linearity, etc.) of the switch. Although it is possible to set a value outside the rated pressure range, the specifications 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
For vacuum pressure 10-ZSE20 10-ZSE20A 10-ZSE20B	-101 kPa -105 kPa	0	10 kPa		
For compound pressure 10-ZSE20F 10-ZSE20AF 10-ZSE20BF	-100 kPa -105 kPa	100 kPa	105 kPa		
For positive pressure 10-ISE20 10-ISE20A 10-ISE20B	-100 kPa -105 kPa (-0.105 MPa)				1 MPa 1.05 MPa

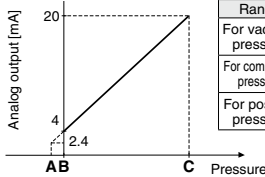
Rated pressure range of the switch
 Set pressure range of the switch

Analog Output*1

Voltage output



Current output



Range	Rated pressure range	A	B	C
For vacuum pressure	0.0 to -101.0 kPa	10.1 kPa	0	-101.0 kPa
For compound pressure	-100.0 to 100.0 kPa	—	-100.0 kPa	100.0 kPa
For positive pressure	-0.100 to 1.000 MPa	-0.100 MPa	0	1.000 MPa

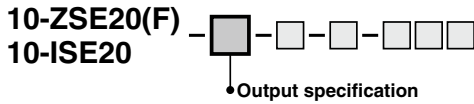
*1 Excluding the 20 type

Functions

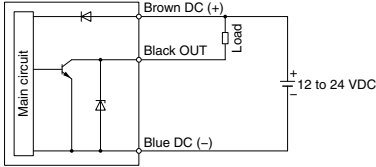
Sub screen setting function	The display of the sub screen can be selected.
Auto-preset function	This function calculates a rough set value automatically based on the on-going operation.
Display value fine adjustment function	Evens out deviations in the displayed value
Peak value indication function	Can retain the maximum pressure value displayed during measurement
Bottom value indication function	Can retain the minimum pressure value displayed during measurement
Key-lock function (Selectable security code)	The keyboard can be locked to prevent the accidental operation of the operation switch.
Zero-clear function	The pressure display can be set to zero when the pressure is open to the atmosphere.
Error indication function	This function displays the error location and content when a problem or error has occurred.
Anti-chattering function	Prevents possible malfunctions due to sudden fluctuations in the primary pressure by adjusting the delay time
Units selection function	Can convert the display value
Power saving mode	Reduces power consumption
Display resolution switch function	Converts the display resolution from the normal value of 1/1000 to 1/100 Can reduce flickering of the monitor
kPa ↔ MPa switch function	Converts the unit between kPa and MPa
Copy function*1	The settings of the copy source can be copied to the copy destination.
Auto-shift function*1	Measures the pressure at the time of external input and uses it as a reference to correct the set value of the switch

*1 Not available for the 20 type

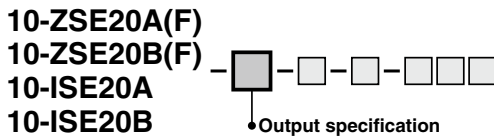
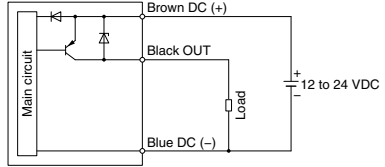
Internal Circuits and Wiring Examples



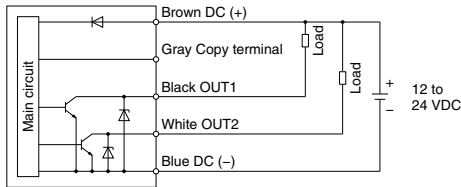
-N
NPN (1 output)



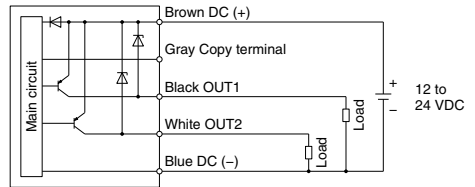
-P
PNP (1 output)



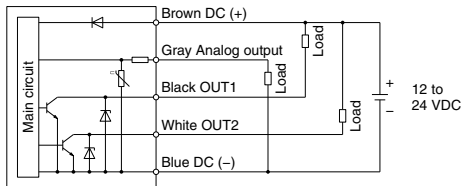
-X
NPN (2 outputs) + Copy function



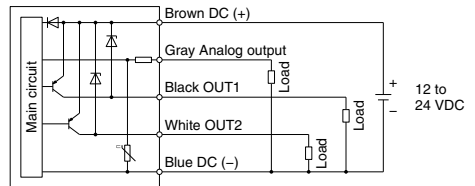
-Y
PNP (2 outputs) + Copy function



-R: NPN (2 outputs) + Analog voltage output
-S: NPN (2 outputs) + Analog current output



-T: PNP (2 outputs) + Analog voltage output
-V: PNP (2 outputs) + Analog current output



Directional Control Valves

Air Cylinders

Rotary Actuators

Air Grippers

Air Preparation Equipment

Modular F. R.

Pressure Control Equipment

Fittings & Tubing

Flow Control Equipment

Pressure Switches/ Pressure Sensors

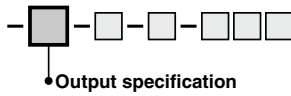
Internal Circuits and Wiring Examples

10-ZSE20A(F)

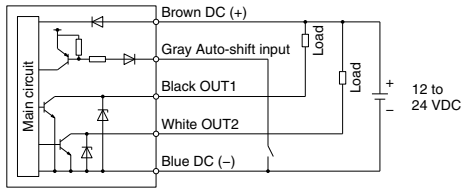
10-ZSE20B(F)

10-ISE20A

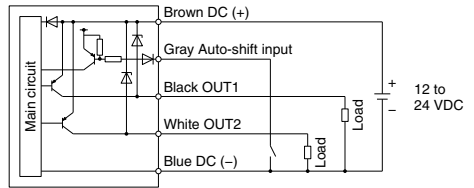
10-ISE20B



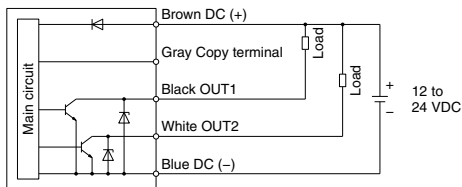
- R: NPN (2 outputs) + Auto-shift input
- S: NPN (2 outputs) + Auto-shift input



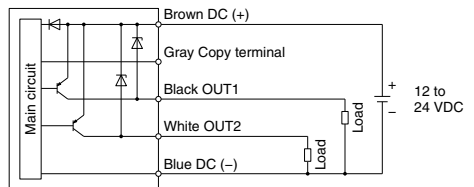
- T: PNP (2 outputs) + Auto-shift input
- V: PNP (2 outputs) + Auto-shift input



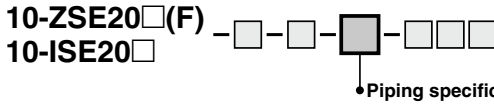
- R: NPN (2 outputs) + Copy function
- S: NPN (2 outputs) + Copy function



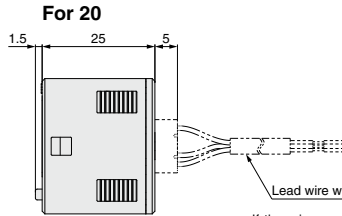
- T: PNP (2 outputs) + Copy function
- V: PNP (2 outputs) + Copy function



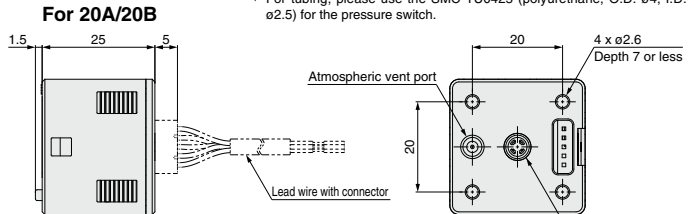
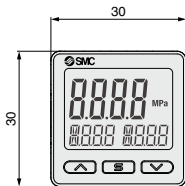
Dimensions



M5
M5 female thread



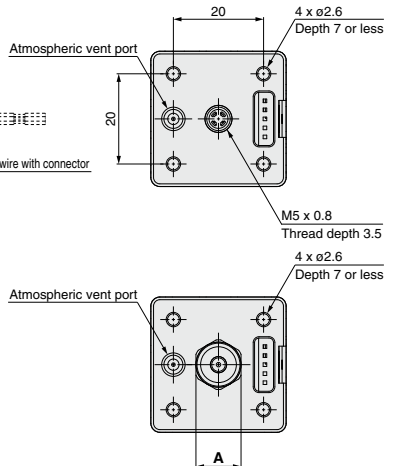
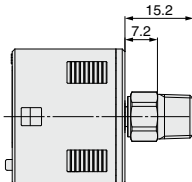
If there is a possibility that the atmospheric vent port of the switch will be exposed to water or dust, insert a tube into the atmospheric vent port and route the other end of the tube to a safe place away from water or dust. (10-Z/ISE20B)
* For tubing, please use the SMC TU0425 (polyurethane, O.D. ø4, I.D. ø2.5) for the pressure switch.



01
R1/8

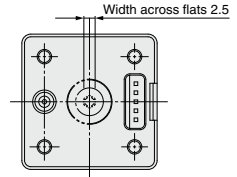
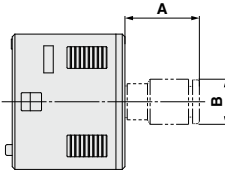
N01
NPT1/8

Piping specification	Port size	A
01	R1/8	Width across flats 10
N01	NPT1/8	Width across flats 12



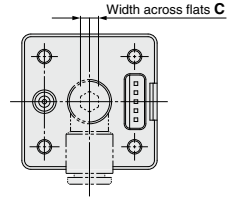
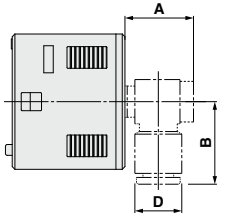
C4H, C6H, N7H
One-touch fitting Straight type
ø4 mm, ø6 mm, ø1/4 inch

Piping specification	A	B
C4H	15.6	ø8
C6H	16.5	ø10
N7H	16.5	ø10.3



C4L, C6L, N7L
One-touch fitting Elbow type
ø4 mm, ø6 mm, ø1/4 inch

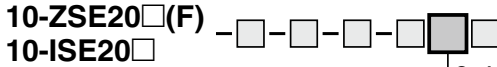
Piping specification	A	B	C	D
C4L	15.2	17.5	4	ø8.2
C6L	15.2	18.3	4	ø10.4
N7L	20.5	24.2	6	ø13.2



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Pressure Switches/ Pressure Sensors

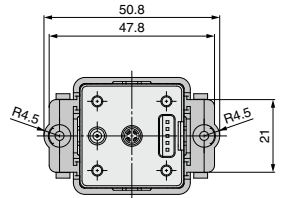
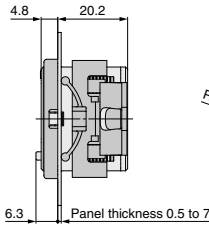
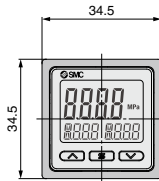
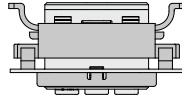
Dimensions

Panel mount adapter



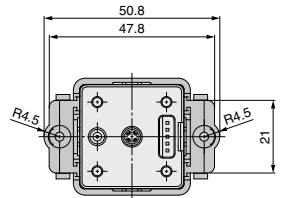
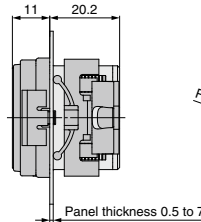
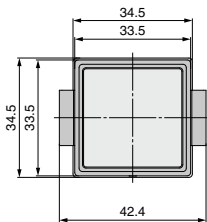
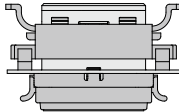
B

Panel mount adapter



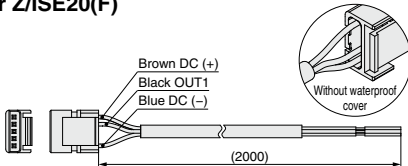
D

Panel mount adapter + Front protection cover

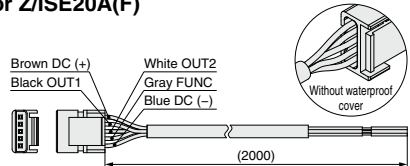


Lead wire with connector

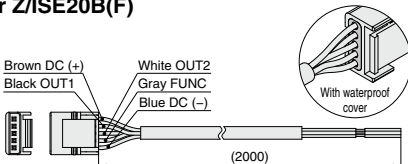
For Z/ISE20(F)



For Z/ISE20A(F)



For Z/ISE20B(F)



Directional Control Valves

Air Cylinders

Rotary Actuators

Air Grippers

Air Preparation Equipment

Modular F. R.

Pressure Control Equipment

Fittings & Tubing

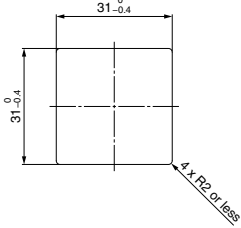
Flow Control Equipment

Pressure Switches/ Pressure Sensors

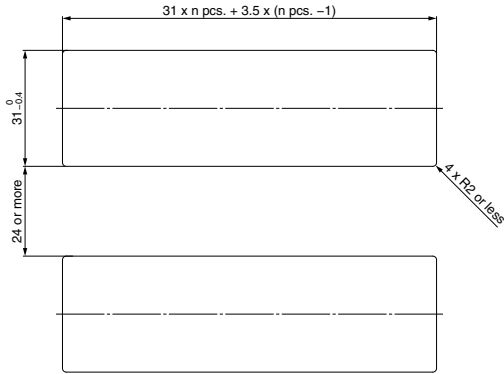
Dimensions

Panel fitting dimensions

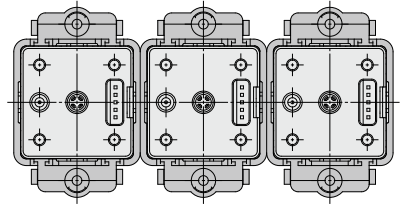
Individual mounting



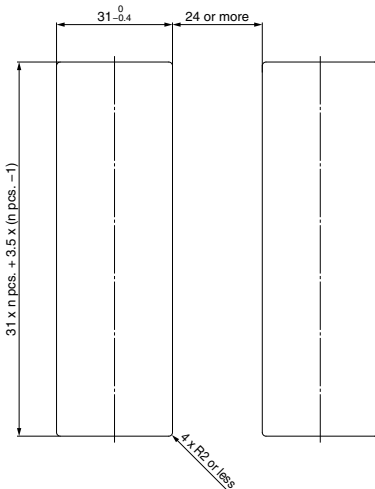
Multiple (2 pcs. or more) secure mounting <Horizontal>



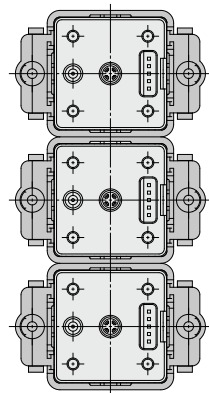
Panel mount example <Horizontal>



<Vertical>



Panel mount example <Vertical>



10-ZSE20C(F)/10-ISE20C(H) series



2 Outputs + Analog Output (Voltage/Current) 3-Screen Display
High-Precision Digital Pressure Switch for General Fluids



How to Order

For Positive Pressure

10-ISE20C-X-M-02- - - - -

For Vacuum/
Compound Pressure

10-ZSE20C-X-M-02- - - - -

Rated pressure range

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

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

1 Rated pressure range

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

2 Output specification

Symbol	Description
R	NPN open collector 2 outputs + Analog voltage output*1
S	NPN open collector 2 outputs + Analog current output*1
T	PNP open collector 2 outputs + Analog voltage output*1
V	PNP open collector 2 outputs + Analog current output*1
X	NPN open collector 2 outputs + Copy function
Y	PNP open collector 2 outputs + Copy function

*1 Can be switched to auto-shift or copy function

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*2
M	SI units only*3
P	Units selection function (Initial value psi)*3

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

*3 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)

5 Piping direction

Symbol	Description
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)

8 Option 3

Symbol	Operation manual*4	Calibration certificate*4
Nil	○	—
Y	—	—
K	○	○
T	—	○

*4 All texts are in both English and Japanese.

Rear ported (5 Piping direction: Nil)

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

Bottom ported (5 Piping direction: L)

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

⚠ Caution

- This product is blown with air and double packed in a Class M3.5 (ISO Class 5) clean room.
- The clean specification part of the model number (10-) is not printed on the product body.



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 Modular F. R.
 Pressure Control Equipment
 Fittings & Tubing
 Flow Control Equipment
 Pressure Switches/ Pressure Sensors

3-Screen Display High-Precision Digital Pressure Switch for General Fluid **10-ZSE20C(F)/10-ISE20C(H)**

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

Specifications

Model		10-ZSE20C (Vacuum pressure)	10-ZSE20CF (Compound pressure)	10-ISE20C (Positive pressure)	10-ISE20CH (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	12 to 24 VDC $\pm 10\%$ with 10% voltage ripple or less				
	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				
	Analog output accuracy	$\pm 2.5\%$ F.S. (Ambient temperature of 25 $\pm 3^\circ\text{C}$)				
	Analog output linearity	$\pm 1\%$ F.S.				
	Temperature characteristics	$\pm 3\%$ F.S. (25 $^\circ\text{C}$ standard)				
Switch output	Output type	NPN or PNP open collector 2 outputs				
	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 V or less (at load current of 80 mA)				
	Delay time*1	1.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000, 5000 ms)				
	Hysteresis	Hysteresis mode	Variable from 0*2			
		Window comparator mode				
	Short circuit protection	Yes				
Analog output	Voltage output	Output type	Voltage output: 1 to 5 V	Voltage output: 0.6 to 5 V	Voltage output: 0.8 to 5 V	
	Current output	Output impedance	Approx. 1 k Ω			
		Output type	Current output: 4 to 20 mA	Current output: 2.4 to 20 mA	Current output: 3.2 to 20 mA	
		Load impedance	Maximum load impedance at power supply voltage of 12 V: 300 Ω at power supply voltage of 24 V: 600 Ω Minimum load impedance: 50 Ω			
Auto-shift input		Input type	Non-voltage input: 0.4 V or less			
	Input mode	Select from Auto-shift or Auto-shift zero.				
	Input time	5 ms or more				
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	0, 10, 50, 100, 500, 1000, 5000 ms					
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 $^\circ\text{C}$, Stored: -10 to 60 $^\circ\text{C}$ (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)					
Length of lead wire with connector	2 m					
Cleanliness class (ISO class)	Class 4					

*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.

* 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	O2	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
	Body (Bottom ported)	77 g	78 g	74 g	65 g	81 g
	Lead wire with connector	+39 g				

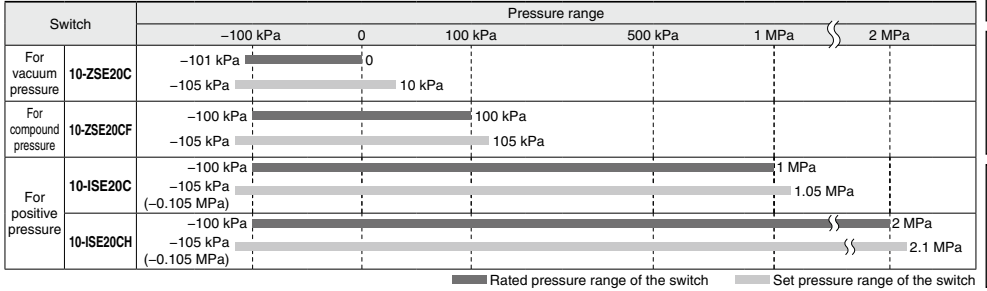
Cable Specifications

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.	$\phi 3.5$

Set Pressure Range and Rated Pressure Range

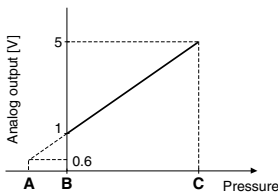
Set the pressure within the rated pressure range.

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.

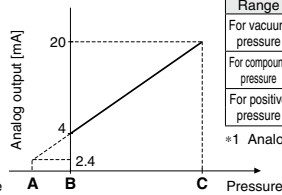


Analog Output

Voltage output



Current output



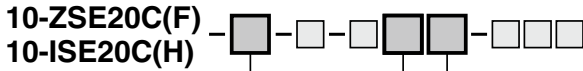
Range	Rated pressure range	A	B	C
For vacuum pressure	0.0 to -101.0 kPa	10.1 kPa	0	-101.0 kPa
For compound pressure	-100.0 to 100.0 kPa	—	-100.0 kPa	100.0 kPa
For positive pressure	-0.100 to 1.000 MPa	-0.100 MPa	0	1.000 MPa
	-0.100 to 2.00 MPa	-0.100 MPa ⁻¹	0	2.00 MPa

*1 Analog output is 0.8 [V] or 3.2 [mA] at the pressure A.

Functions

Sub screen setting function	The display of the sub screen can be selected.
Auto-preset function	This function calculates a rough set value automatically based on the on-going operation.
Display value fine adjustment function	Evens out deviations in the displayed value
Peak value indication function	Can retain the maximum pressure value displayed during measurement
Bottom value indication function	Can retain the minimum pressure value displayed during measurement
Key-lock function (Selectable security code)	The keyboard can be locked to prevent the accidental operation of the operation switch.
Zero-clear function	The pressure display can be set to zero when the pressure is open to the atmosphere.
Error indication function	This function displays the error location and content when a problem or error has occurred.
Anti-chattering function	Prevents possible malfunctions due to sudden fluctuations in the primary pressure by adjusting the delay time
Units selection function	Can convert the display value
Power saving mode	Reduces power consumption
Display resolution switch function	Converts the display resolution from the normal value of 1/1000 to 1/100
kPa ↔ MPa switch function	Can reduce flickering of the monitor
Copy function	Converts the unit between kPa and MPa
Copy function	The settings of the copy source can be copied to the copy destination.
Auto-shift function	Measures the pressure at the time of external input and uses it as a reference to correct the set value of the switch

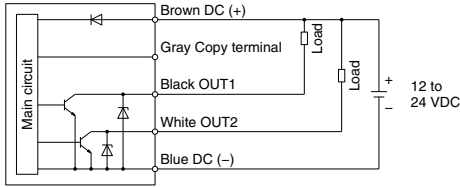
Internal Circuits and Wiring Examples



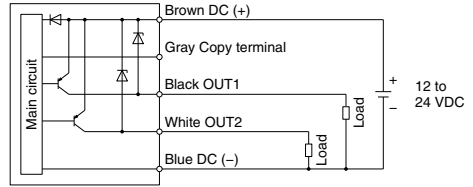
10-ZSE20C(F)
10-ISE20C(H)

Output specification Piping specification Piping direction

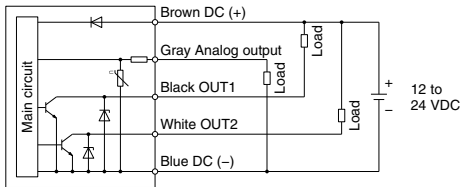
-X
NPN (2 outputs) + Copy function



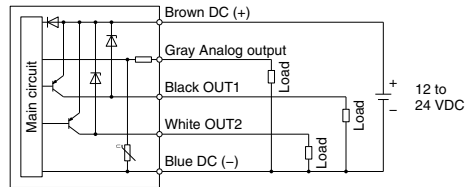
-Y
PNP (2 outputs) + Copy function



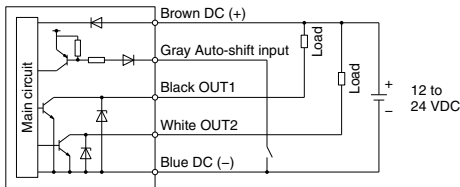
-R: NPN (2 outputs) + Analog voltage output
-S: NPN (2 outputs) + Analog current output



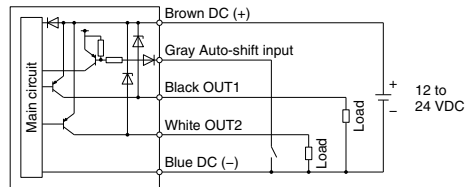
-T: PNP (2 outputs) + Analog voltage output
-V: PNP (2 outputs) + Analog current output



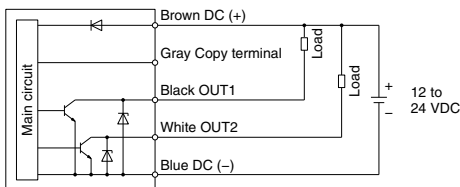
-R: NPN (2 outputs) + Auto-shift input
-S: NPN (2 outputs) + Auto-shift input



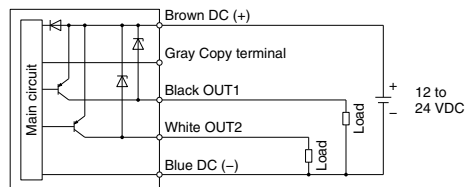
-T: PNP (2 outputs) + Auto-shift input
-V: PNP (2 outputs) + Auto-shift input



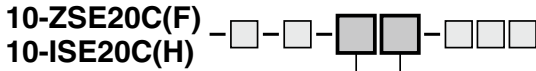
-R: NPN (2 outputs) + Copy function
-S: NPN (2 outputs) + Copy function



-T: PNP (2 outputs) + Copy function
-V: PNP (2 outputs) + Copy function



Dimensions

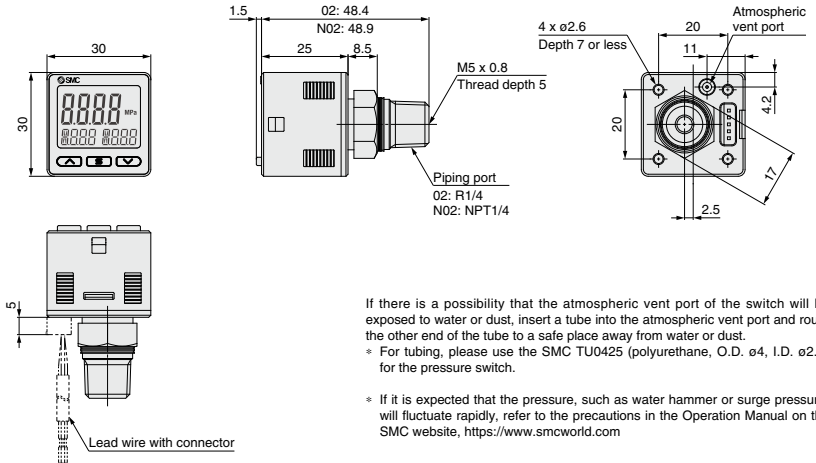


02

R1/4

N02

NPT1/4



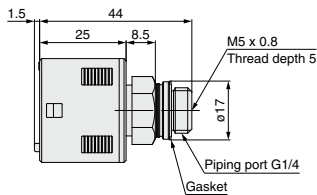
If there is a possibility that the atmospheric vent port of the switch will be exposed to water or dust, insert a tube into the atmospheric vent port and route the other end of the tube to a safe place away from water or dust.

* For tubing, please use the SMC TU0425 (polyurethane, O.D. ø4, I.D. ø2.5) for the pressure switch.

* If it is expected that the pressure, such as water hammer or surge pressure, will fluctuate rapidly, refer to the precautions in the Operation Manual on the SMC website, <https://www.smcworld.com>

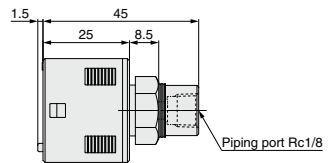
F02

G1/4



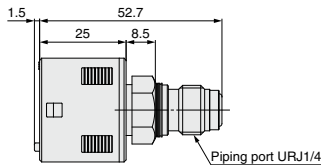
C01

Rc1/8



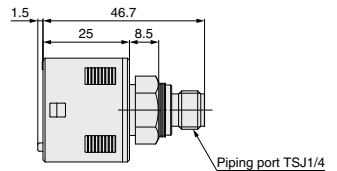
A2

URJ1/4



B2

TSJ1/4



Directional Control Valves

Air Cylinders

Rotary Actuators

Air Grippers

Air Preparation Equipment

Modular F. R.

Pressure Control Equipment

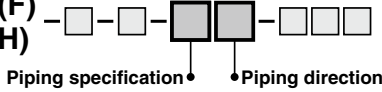
Fittings & Tubing

Flow Control Equipment

Pressure Switches/ Pressure Sensors

Dimensions

10-ZSE20C(F)
10-ISE20C(H)

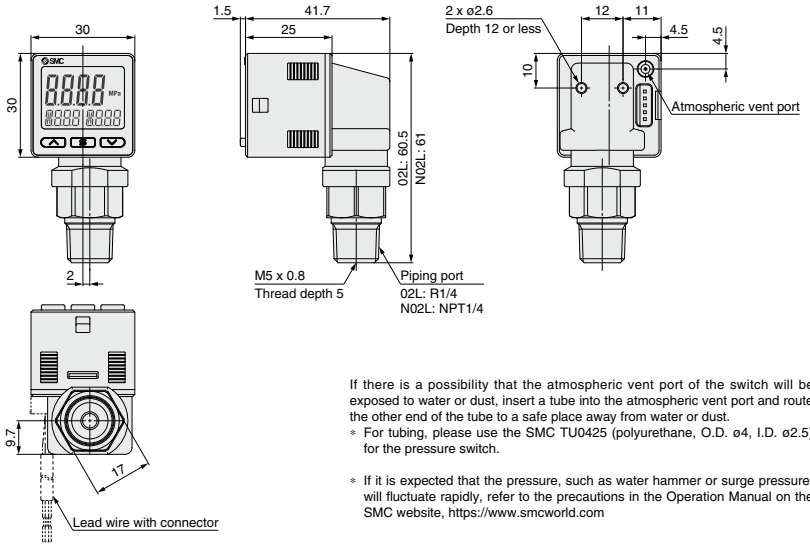


O2L

R1/4

N02L

NPT1/4



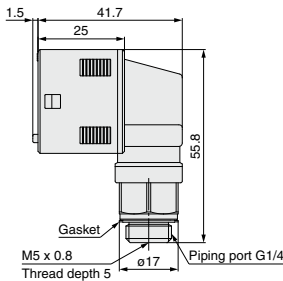
If there is a possibility that the atmospheric vent port of the switch will be exposed to water or dust, insert a tube into the atmospheric vent port and route the other end of the tube to a safe place away from water or dust.

* For tubing, please use the SMC TU0425 (polyurethane, O.D. ø4, I.D. ø2.5) for the pressure switch.

* If it is expected that the pressure, such as water hammer or surge pressure, will fluctuate rapidly, refer to the precautions in the Operation Manual on the SMC website, <https://www.smcworld.com>

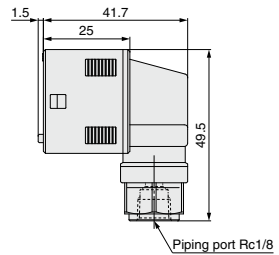
F02L

G1/4



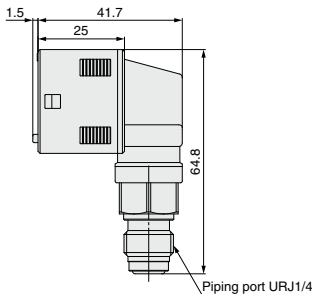
C01L

Rc1/8



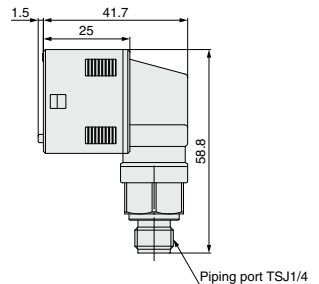
A2L

URJ1/4



B2L

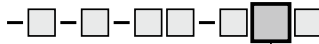
TSJ1/4



Dimensions

With bracket

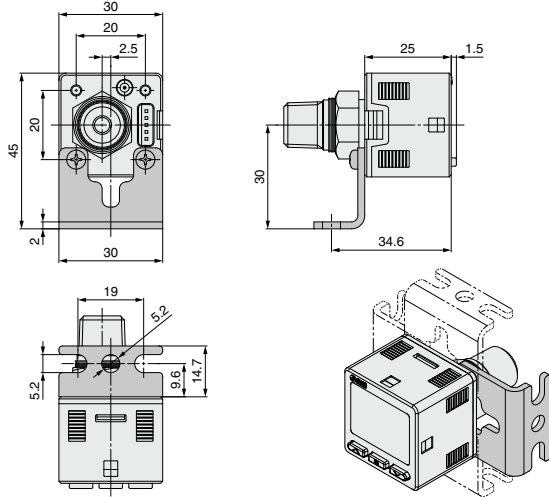
10-ZSE20C(F)
10-ISE20C(H)



• Option 2

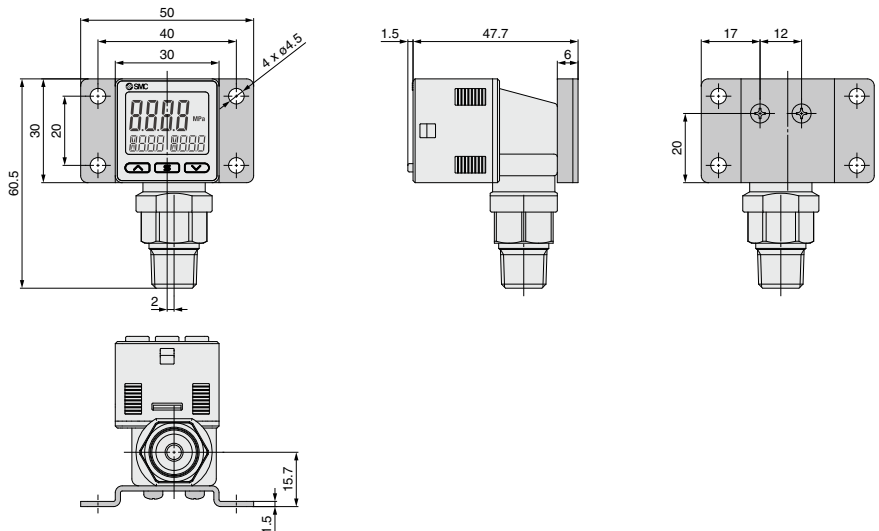
A1

Bracket A (Rear ported)



A3

Bracket C (Bottom ported)



Directional Control Valves

Air Cylinders

Rotary Actuators

Air Grippers

Air Preparation Equipment

Modular F. R.

Pressure Control Equipment

Fittings & Tubing

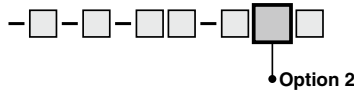
Flow Control Equipment

Pressure Switches/ Pressure Sensors

Dimensions

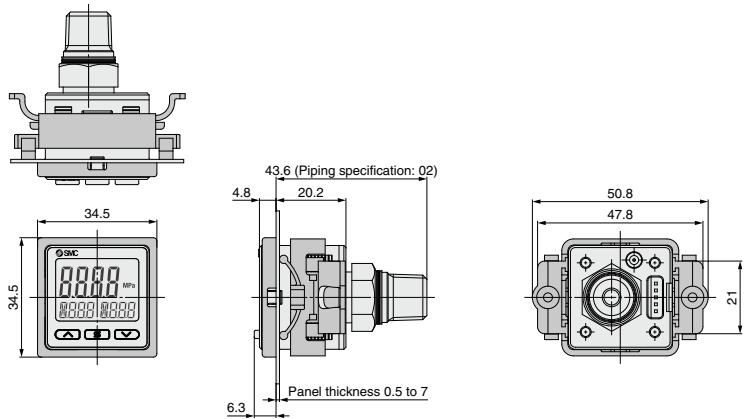
Panel mount adapter

10-ZSE20C(F)
10-ISE20C(H)



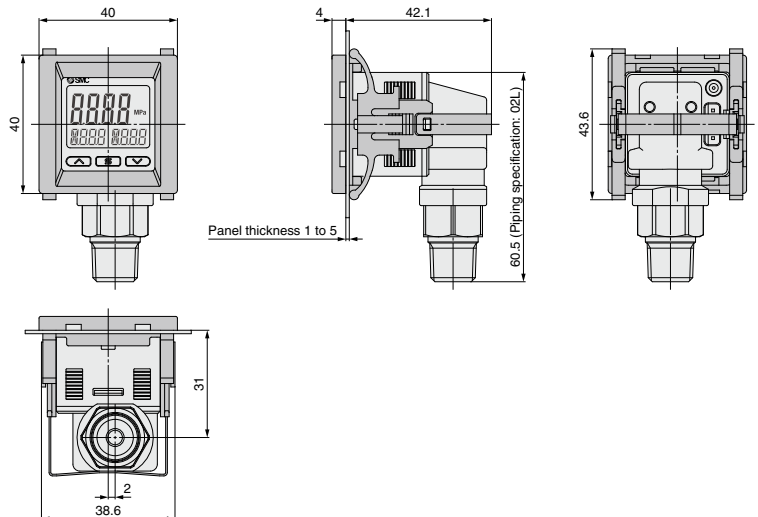
B

Panel mount adapter (Rear ported)



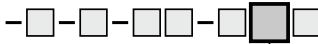
E

Panel mount adapter (Bottom ported)



Dimensions

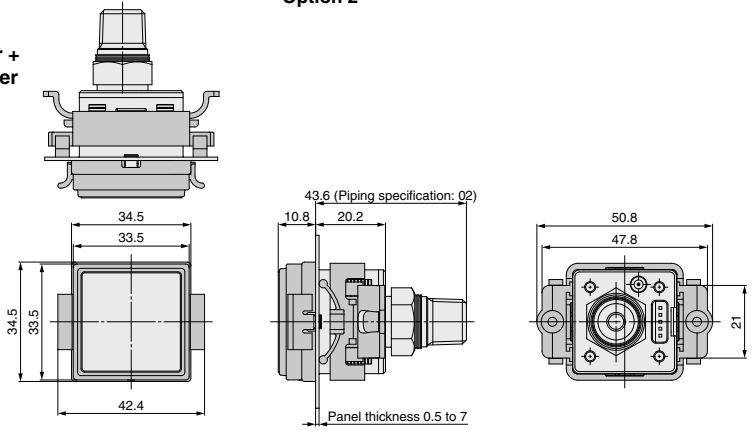
Panel mount adapter
10-ZSE20C(F)
10-ISE20C(H)



Option 2

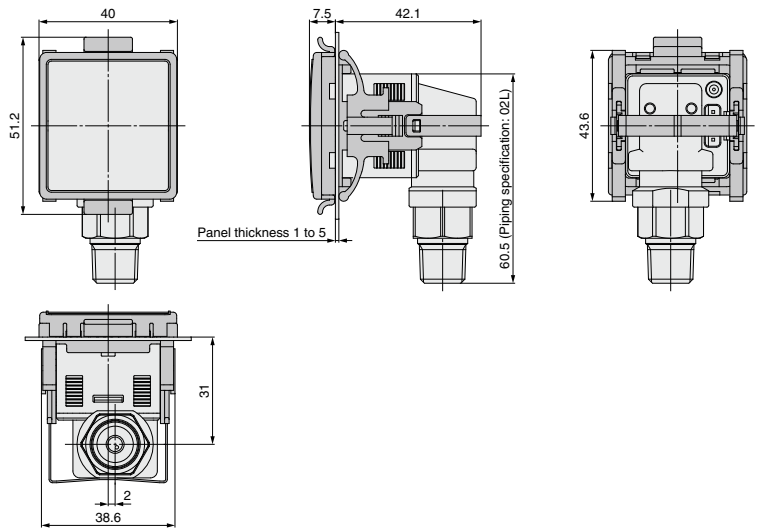
D

**Panel mount adapter +
 Front protection cover
 (Rear ported)**

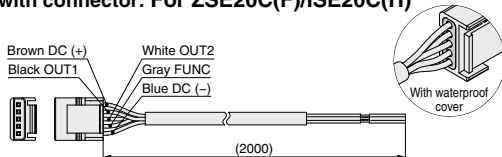


F

**Panel mount adapter +
 Front protection cover
 (Bottom ported)**



Lead wire with connector: For ZSE20C(F)/ISE20C(H)



Directional Control Valves
 Air Cylinders
 Rotary Actuators
 Air Grippers
 Air Preparation Equipment
 Modular F. R.
 Pressure Control Equipment
 Fittings & Tubing
 Flow Control Equipment
 Pressure Switches/
 Pressure Sensors