

3-Screen Display

High-Precision Digital Pressure Switch



The **A** and **B** series have been added to the ZSE20(F)/ISE20 series!

Fluid	Series	Output type	Enclosure	Copy function, Auto-shift function	Piping		Note
					M5 female thread	1/8 (R, NPT)	
Air	ZSE20(F)/ISE20	1 output	IP40	—	●	●	—
	New ZSE20A(F)/ISE20A	2 outputs Analog output (Voltage/Current)	IP40	●	●	●	Newly released
	New ZSE20B(F)/ISE20B	2 outputs Analog output (Voltage/Current)	IP65	●	●	●	Newly released

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

Main screen	Measured value (Current pressure value)
Sub screen	Label (Display item), Set value (Threshold value)
Visualization of Settings	Set value (Threshold value) P_1
	Hysteresis value H_1
	Delay time dt1
	Peak value H_H1
	Bottom value H_Lo



Delay Time 1.5 ms^{*1} or less

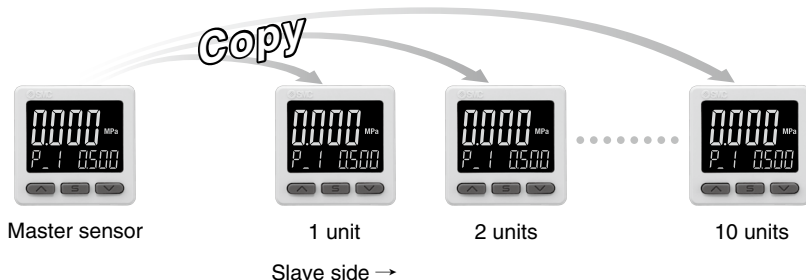
^{*1} Select from 1.5 ms or less, 20 ms, 100 ms, 500 ms, 1000 ms, 2000 ms, or 5000 ms.

Current Consumption 35 mA^{*2} or less

^{*2} Further reduced by approx. 40% in power-saving mode

● Copy function

The settings of the master sensor can be copied to the slave sensors.



● Auto-shift function

This measures the pressure at the time of external input and uses it as a reference to correct the on-off point of the switch.

ZSE20_B^A(F)/ISE20_B^A Series



17-E685

2 Outputs + Analog Output (Voltage/Current)

3-Screen Display High-Precision Digital Pressure Switch

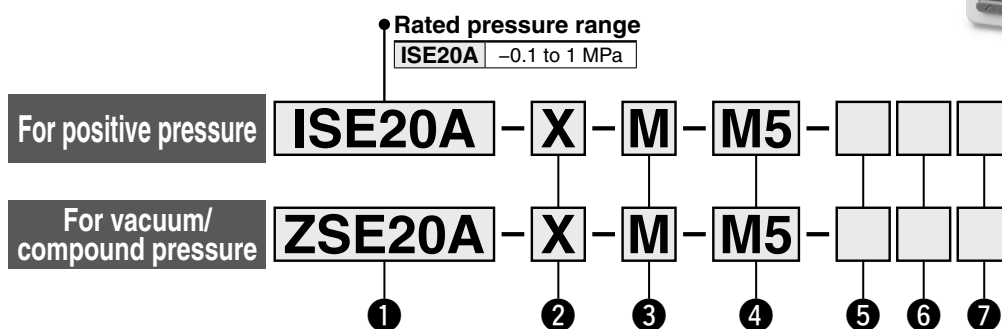
ZSE20A(F)/ISE20A Series



RoHS

IP40

How to Order



1 Rated pressure range

ZSE20A	0 to -101 kPa
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

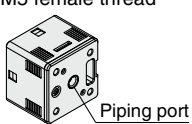
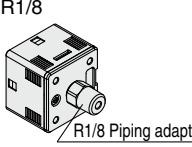
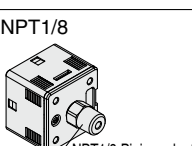
3 Unit specification

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

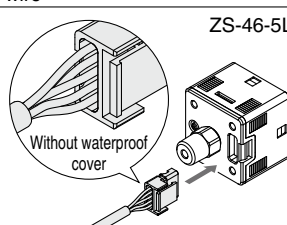
*1 Under the New Measurement Act, switches with the unit selection function are not permitted for use in Japan.

*2 Fixed unit: kPa, MPa

4 Piping specification

Symbol	Description
M5	M5 female thread 
01	R1/8 
N01	NPT1/8 

5 Option 1

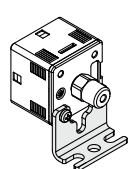
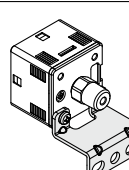
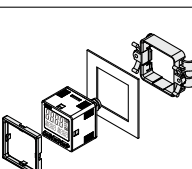
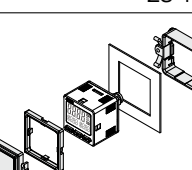
Symbol	Description
Nil	Without lead wire
J	Lead wire with connector (5-core, 2 m lead wire) 

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 

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	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
Bracket B	ZS-46-A2	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
Panel mount adapter	ZS-46-B	—
Panel mount adapter + Front protection cover	ZS-46-D	—
Lead wire with connector	ZS-46-5L	5-core, 2 m, Non-waterproof
Front protection cover	ZS-27-01	—
R1/8 piping adapter	ZS-46-N1	—
NPT1/8 piping adapter	ZS-46-N2	—

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

Specifications

Model		ZSE20A (Vacuum pressure)	ZSE20AF (Compound pressure)	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
	Minimum display unit/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	Output type	Voltage output: 1 to 5 V	Voltage output: 0.6 to 5 V
		Output impedance	Approx. 1 kΩ	
	Current output	Output type	Current output: 4 to 20 mA	Current output: 2.4 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	
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/cm², bar, psi, InHg, mmHg		MPa, kPa, kgf/cm², 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		
	Environment	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, RoHS		
Length of lead wire with connector		2 m		

*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.

* Products with tiny scratches, smears, 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
Port size		M5 x 0.8	R1/8	NPT1/8
Materials of parts in contact with fluid	Sensor pressure receiving area	Silicon		
	Piping port (Common)	PBT, CB156, Heat-resistant PPS, O-ring: HNBR		
	Piping port	— C3604 (Electroless nickel plating), Stainless steel 304, NBR		
Weight	Body	24 g	34 g	36 g
	Lead wire with connector	+39 g		

Cable Specifications

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

2 Outputs + Analog Output (Voltage/Current)

3-Screen Display High-Precision Digital Pressure Switch

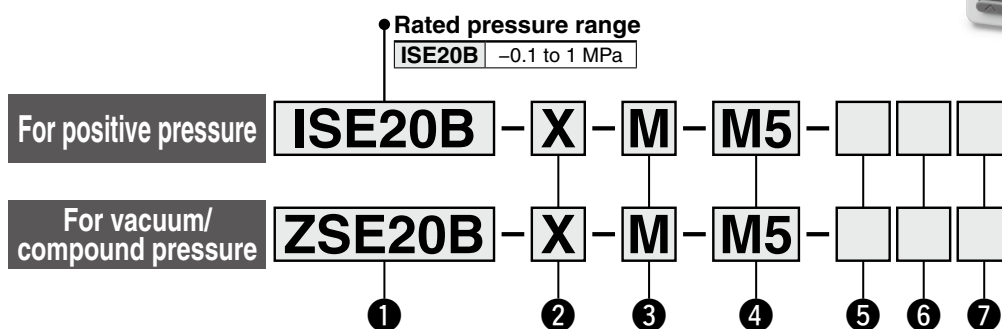
ZSE20B(F)/ISE20B Series



RoHS

IP65

How to Order



1 Rated pressure range

ZSE20B	0 to -101 kPa
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

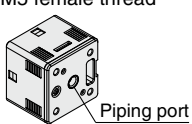
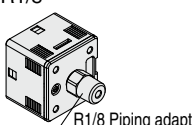
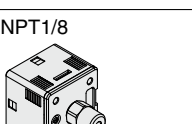
3 Unit specification

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

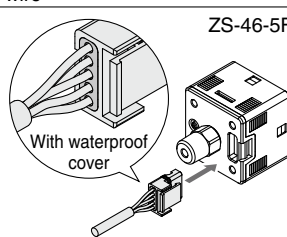
*1 Under the New Measurement Act, switches with the unit selection function are not permitted for use in Japan.

*2 Fixed unit: kPa, MPa

4 Piping specification

Symbol	Description
M5	M5 female thread 
R1/8	R1/8 
NPT1/8	NPT1/8 

5 Option 1

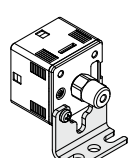
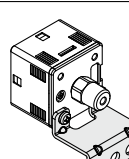
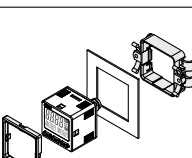
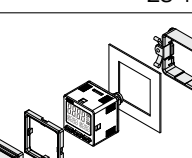
Symbol	Description
Nil	Without lead wire
W	Lead wire with connector (5-core, 2 m, waterproof lead wire) 

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 

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	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
Bracket B	ZS-46-A2	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
Panel mount adapter	ZS-46-B	—
Panel mount adapter + Front protection cover	ZS-46-D	—
Lead wire with connector	ZS-46-5F	5-core, 2 m, Waterproof
Front protection cover	ZS-27-01	—
R1/8 piping adapter	ZS-46-N1	—
NPT1/8 piping adapter	ZS-46-N2	—

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

Specifications

Model		ZSE20B (Vacuum pressure)	ZSE20BF (Compound pressure)	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
	Minimum display unit/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	Output type	Voltage output: 1 to 5 V	Voltage output: 0.6 to 5 V
		Output impedance	Approx. 1 kΩ	
	Current output	Output type	Current output: 4 to 20 mA	Current output: 2.4 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	
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		
	Unit*3	MPa, kPa, kgf/cm², bar, psi, InHg, mmHg		MPa, kPa, kgf/cm², bar, psi
Display	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		
Environment	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, RoHS		
Length of lead wire with connector		2 m		

*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.

* Products with tiny scratches, smears, 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
Port size		M5 x 0.8	R1/8	NPT1/8
Materials of parts in contact with fluid	Sensor pressure receiving area	Silicon		
	Piping port (Common)	PBT, CB156, Heat-resistant PPS, O-ring: HNBR		
	Piping port	— C3604 (Electroless nickel plating), Stainless steel 304, NBR		
Weight	Body	24 g	34 g	36 g
	Lead wire with connector	+39 g		

Cable Specifications

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

ZSE20□(F)/ISE20□ 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.

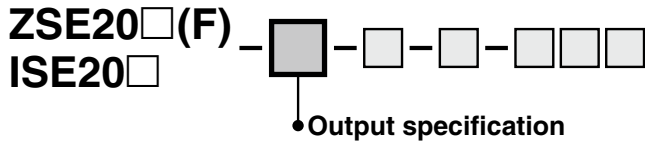
Switch		Pressure range				
		-100 kPa	0	100 kPa	500 kPa	1 MPa
For vacuum pressure	ZSE20A	-101 kPa	0			
	ZSE20B	-105 kPa	10 kPa			
For compound pressure	ZSE20AF	-100 kPa		100 kPa		
	ZSE20BF	-105 kPa		105 kPa		
For positive pressure	ISE20A	-100 kPa				1 MPa
	ISE20B	-105 kPa (-0.105 MPa)				1.05 MPa

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

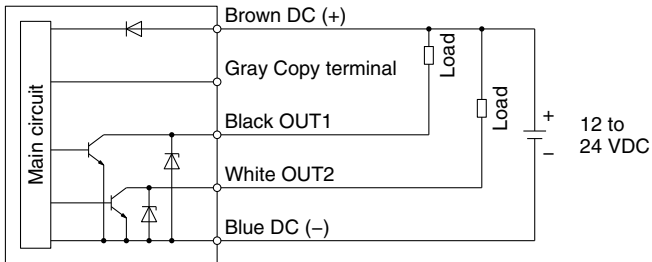
Functions

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
Keylock function (Selectable secret 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
Unit 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	The settings of the master sensor can be copied to the slave sensors.
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

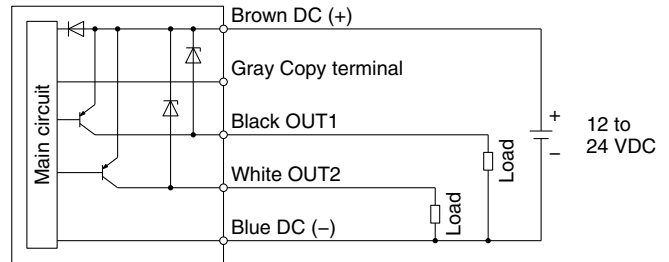
Internal Circuits and Wiring Examples



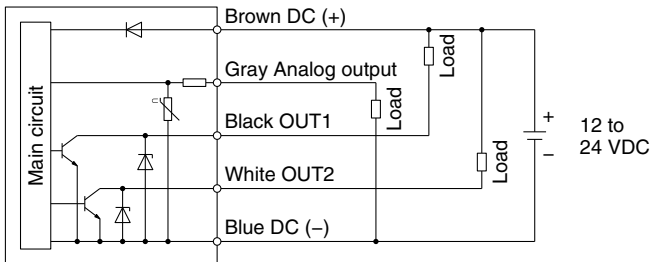
-X NPN (2 outputs) + Copy function



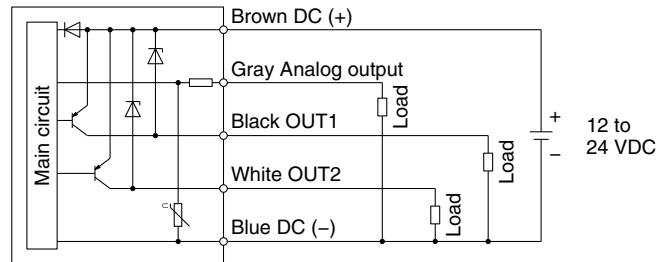
-Y PNP (2 outputs) + Copy function



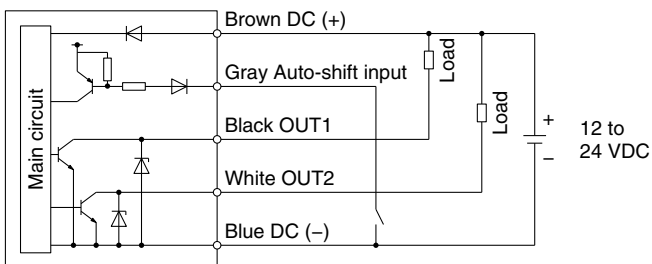
-R: NPN (2 outputs) + Analog voltage output -S: NPN (2 outputs) + Analog current output



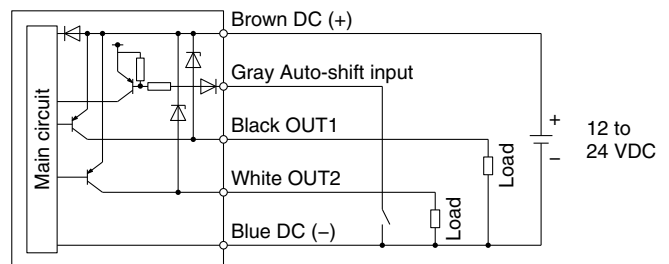
-T: PNP (2 outputs) + Analog voltage output -V: PNP (2 outputs) + Analog current output



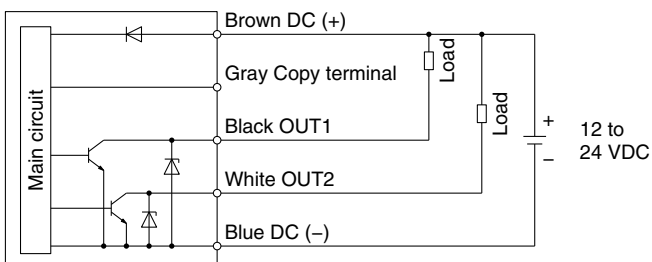
-R: NPN (2 outputs) + Auto-shift input -S: NPN (2 outputs) + Auto-shift input



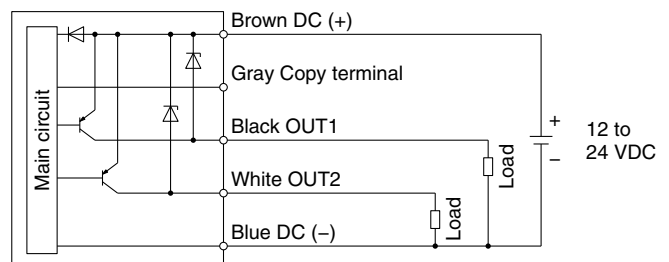
-T: PNP (2 outputs) + Auto-shift input -V: PNP (2 outputs) + Auto-shift input



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



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



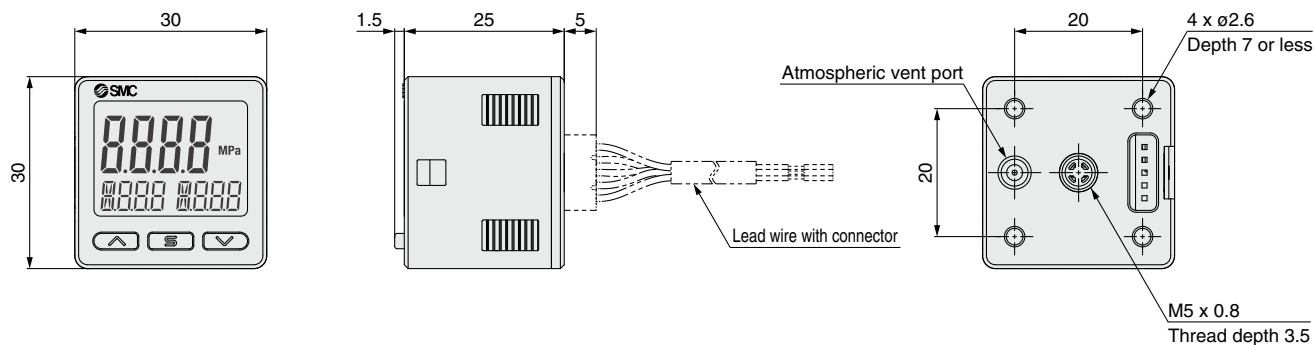
ZSE20□(F)/ISE20□ Series

Dimensions

ZSE20□(F) — □ — □ — **□** — □ □ □
 ISE20□
 • Piping specification

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. (Z/ISE20B)

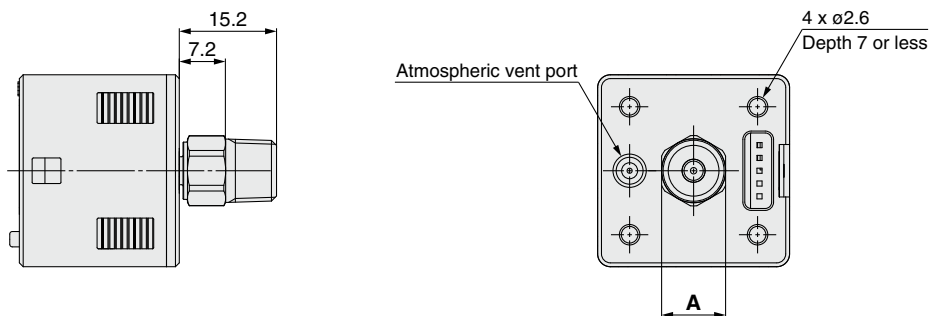
* For tubing, please use the SMC TU0425 (polyurethane, O.D. ø4, I.D. ø2.5) for the pressure switch.

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

Dimensions

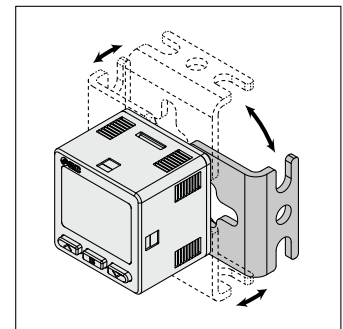
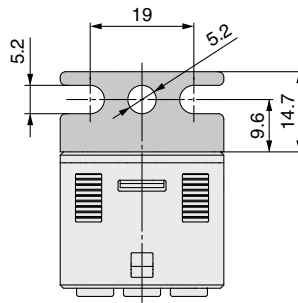
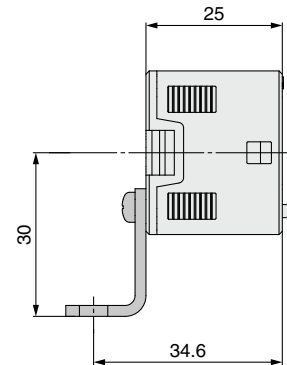
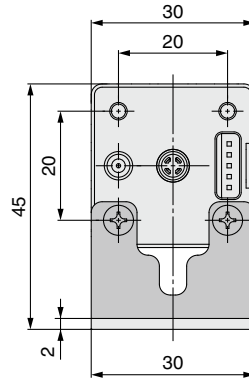
With Bracket

ZSE20□(F) — □ — □ — □ — □ — □
ISE20□

• Option 2

A1

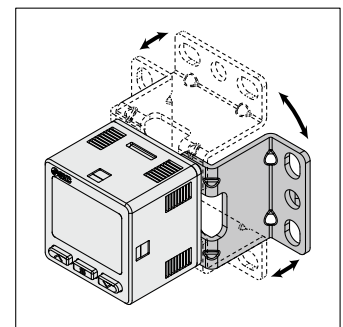
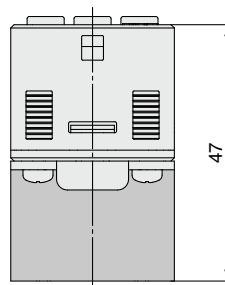
Bracket A
(Part no.: ZS-46-A1)



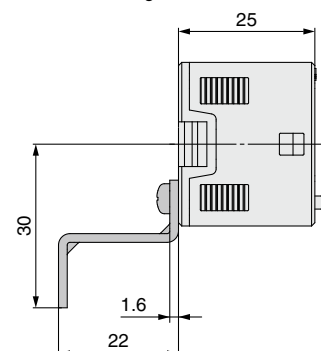
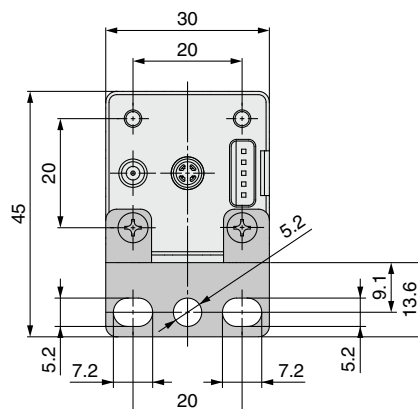
* Bracket configuration allows for mounting in four orientations.

A2

Bracket B
(Part no.: ZS-46-A2)



* Bracket configuration allows for mounting in four orientations.



* When using the bracket B, install it by taking the dimensions of the piping part into consideration.

ZSE20□(F)/ISE20□ Series

Dimensions

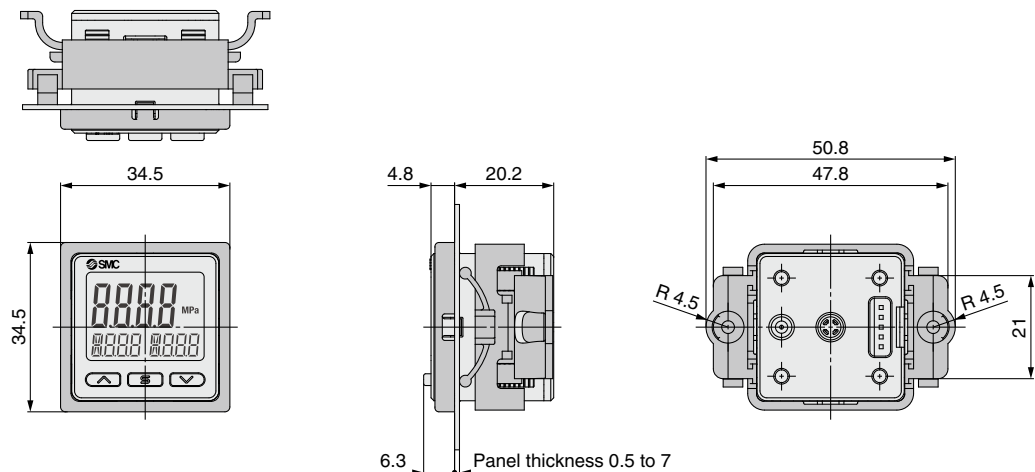
Panel mount adapter

ZSE20□(F) – □ – □ – □ – □ – □ – □
 ISE20□

• Option 2

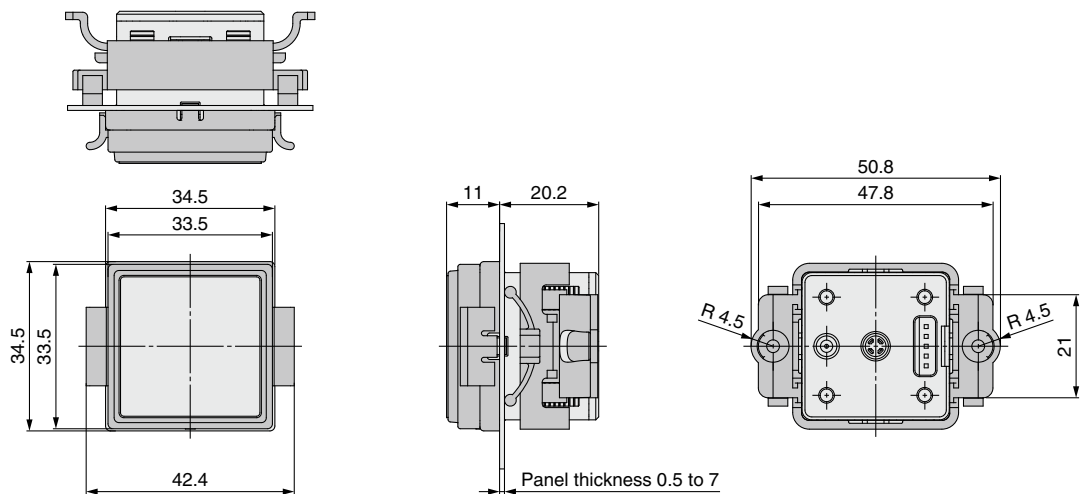
B

Panel mount adapter (Part no.: ZS-46-B)



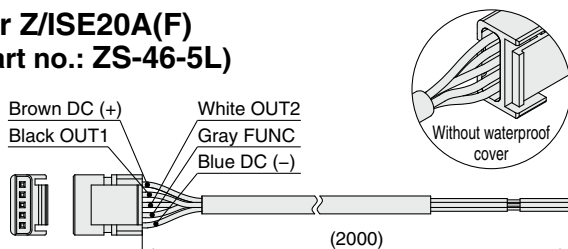
D

Panel mount adapter + Front protection cover (Part no.: ZS-46-D)

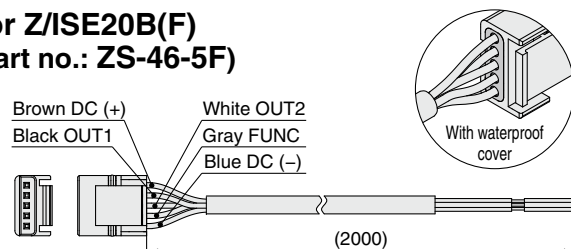


Lead wire with connector

For Z/ISE20A(F) (Part no.: ZS-46-5L)



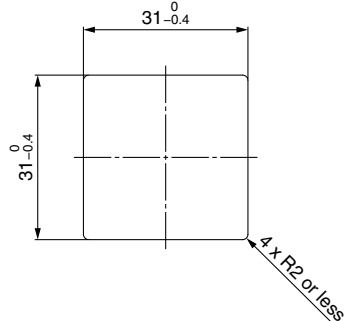
For Z/ISE20B(F) (Part no.: ZS-46-5F)



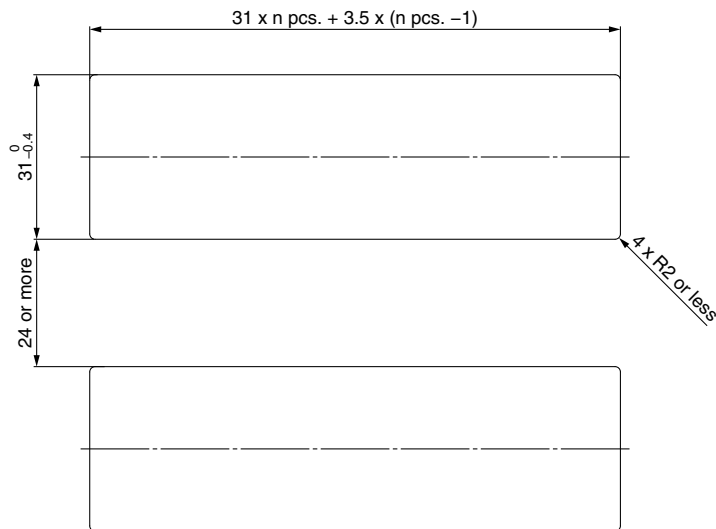
Dimensions

Panel fitting dimensions

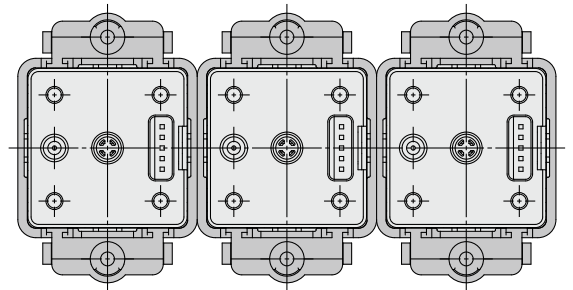
Individual mounting



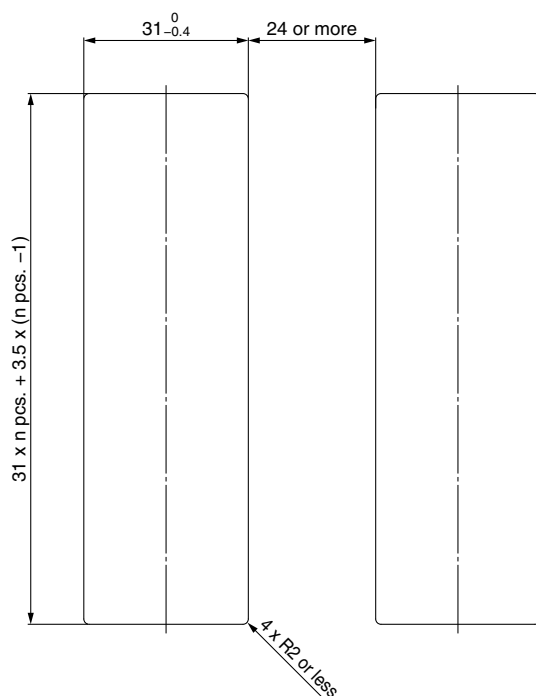
Multiple (2 pcs. or more) secure mounting <Horizontal>



Panel mount example <Horizontal>



<Vertical>



Panel mount example <Vertical>

