2-Colour Display
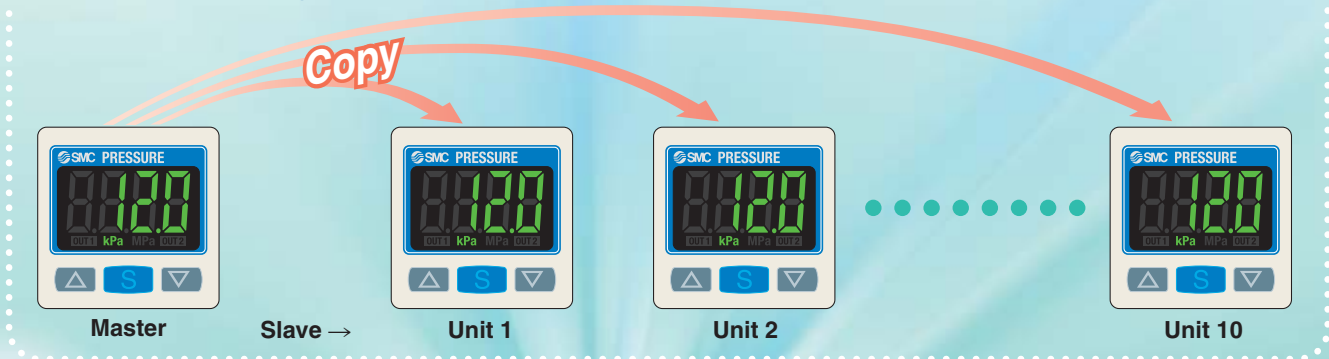# High-Precision Digital Pressure Switch

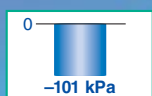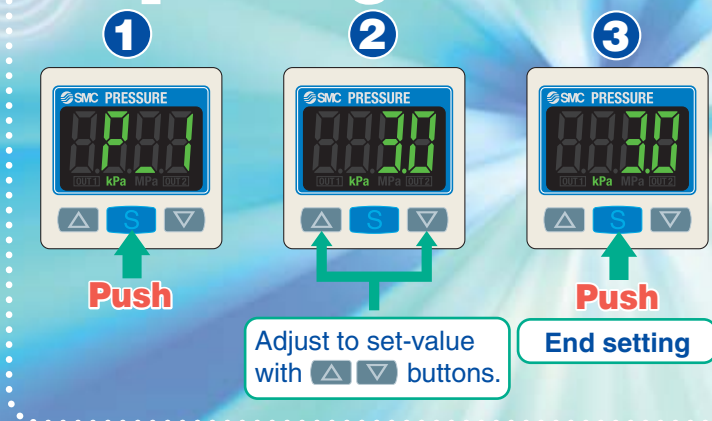CE c**UL**US
RoHS compliant

Settings can be copied to up to 10 slave sensors at once.

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

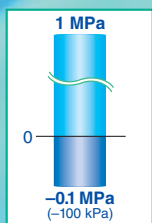● Reduced setting efforts   ● Reduced chance of set-value input error

Copy

SMC PRESSURE
12.0
OUT1 kPa MPa OUT2

SMC PRESSURE
12.0
OUT1 kPa MPa OUT2

SMC PRESSURE
12.0
OUT1 kPa MPa OUT2

SMC PRESSURE
12.0
OUT1 kPa MPa OUT2

Master   Slave →   Unit 1   Unit 2   Unit 10

3-step setting

① ② ③

SMC PRESSURE
P.1
OUT1 kPa MPa OUT2

SMC PRESSURE
3.0
OUT1 kPa MPa OUT2

SMC PRESSURE
3.0
OUT1 kPa MPa OUT2

Push   Push

Adjust to set-value with △ ▽ buttons.   End setting

SMC PRESSURE
-100
kPa   OUT2

Added vacuum range.
● Rated pressure range: 0.0 to –101.0 kPa

0
–101 kPa

Expanded pressure range for positive pressure type to the vacuum range:
● Rated pressure range: –0.1 to 1.0 MPa

1 MPa
0
–0.1 MPa
(–100 kPa)

SMC PRESSURE
1.000
OUT1   MPa

2 added outputs:
● NPN or PNP open collector 2 outputs
● NPN or PNP open collector 1 output + analogue output
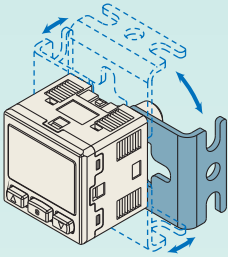   (1 to 5 V or 4 to 20 mA)

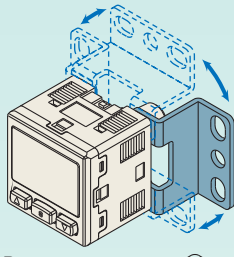## Series ZSE30A(F)/ISE30A

SMC

CAT.EUS100-70B-UK

Mounting

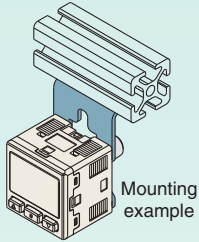**Bracket configuration allows mounting in four positions.**

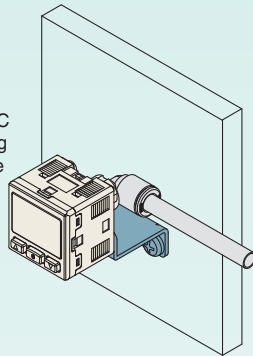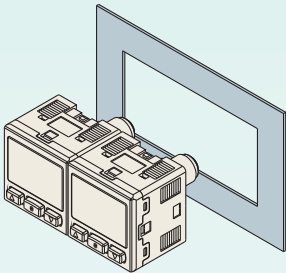| Bracket A	Bracket B/C

Bracket B Mounting example
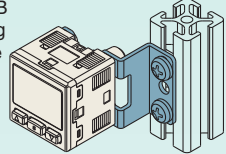
Bracket C Mounting example

Mounting example

Panel mount

Mountable side by side without clearance

One opening!
- Reduction of panel-cut job
- Space-saving

Series

| Series	ZSE30A (vacuum)	ZSE30AF (compound)	ISE30A (positive)
	SMC PRESSURE	SMC PRESSURE	SMC PRESSURE
Rated pressure range	0.0 to −101.0 kPa	−100.0 to 100.0 kPa	−0.100 to 1.000 MPa
	0 / −101 kPa	100 kPa / 0 / −100 kPa	1 MPa / 0 / −0.1 MPa (−100 kPa)
Set pressure range	10.0 to −105.0 kPa	−105.0 to 105.0 kPa	−0.105 to 1.050 MPa
Withstand pressure	500 kPa	500 kPa	1.5 MPa
Minimum unit setting	0.1 kPa	0.1 kPa	0.001 MPa
Output	NPN or PNP open collector 1 output / NPN or PNP open collector 2 outputs / NPN or PNP open collector 1 output + Analogue output (voltage or current)		
Piping	R1/8, NPT1/8 (M5 female threaded) / ø4, ø6, ø5/32, ø1/4 one-touch fittings		

Features 1

Replaceable one-touch fittings

The clip type allows easy removal of fittings. Fitting's type and size can be changed.

Clip

One-touch fitting
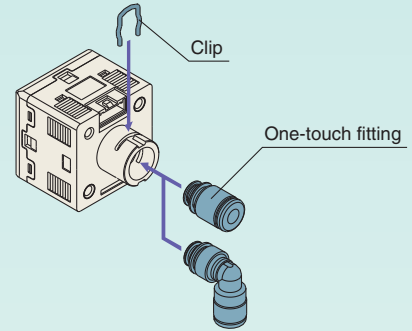
Lead wire

Connector cover added.

Connector cover

Lead wire with connector (2 m)
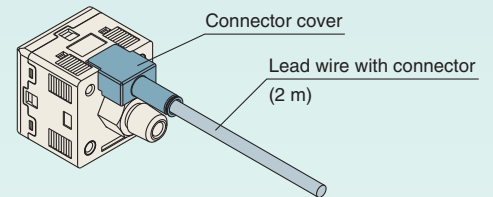
4-digit display

4-digit display allows easy reading of displayed values.
Example: 0.5 MPa

Series 30 (Conventional) → Series 30A (New)

Possible to check set-value during key locking

Additional functions

◆ **Secret code setting function**
The key locking function keeps unauthorized users from tampering with buttons.

◆ **Power-saving function**
Power consumption is reduced by turning off the monitor (power consumption reduced by up to 20%.)

◆ **Resolution-switch function**
It reduces the monitor to flicker.

1/1000 ↔ 1/100
(Accuracy does not changed, only displayed values.)

◆ **MPa/kPa switch function**
Vacuum, compound and/or positive pressure can be displayed both in MPa or kPa.

MPa ↔ kPa

SMC

2-Color Display High-Precision Digital Pressure Switch

Series *ZSE30A(F)/ISE30A*

CE c(UL)us RoHS

How to Order

Output

N	NPN open collector 1 output
P	PNP open collector 1 output
A	NPN open collector 2 outputs
B	PNP open collector 2 outputs
C Note)	NPN open collector 1 output + Analogue voltage output
D Note)	NPN open collector 1 output + Analogue current output
E Note)	PNP open collector 1 output + Analogue voltage output
F Note)	PNP open collector 1 output + Analogue current output

Note) Made to Order

Rated pressure range

ISE30A	−0.1 to 1 MPa

For positive pressure

ISE30A – **01** – **N** – **M** ☐ ☐ ☐ – ☐

For vacuum/ compound pressure

ZSE30A – **01** – **N** – **M** ☐ ☐ ☐ – ☐

Rated pressure range

ZSE30A	0 to −101 kPa
ZSE30AF	−100 to 100 kPa

Made to Order (P.12)

X510	For M12 4-pin pre-wired connector

Available only for output "A" or "B".

Option 3

Symbol	Operating manual Booklet	Calibration certificate
—	○	—
Y	—	—
K	○	○
T	—	○

Piping

01	R1/8 (M5 female threaded)	
N01 Note)	NPT1/8 (M5 female threaded)	
C4H	One-touch fitting ø4 mm, ø5/32 inch	Straight type
C6H	One-touch fitting ø6 mm	
N7H	One-touch fitting ø1/4 inch	
C4L	One-touch fitting ø4 mm, ø5/32 inch	Elbow type
C6L	One-touch fitting ø6 mm	
N7L	One-touch fitting ø1/4 inch	

Note) Made to Order

Display unit

—	With unit display Note 2) switching function
M	Fixed SI unit Note 3)
P Note 1)	With unit display Note 2) switching function (Initial value PSI)

Note 1) Made to Order
Note 2) Under the New Measurement Law, sales of switches with the unit switching function have not been allowed for use in Japan.
Note 3) Fixed unit kPa, MPa

Option 1

—	Without lead wire	
L	Lead wire with connector (Lead wire length 2 m) Note)	
G	Lead wire with connector (lead wire length 2 m) Note) and with connector cover	Connector cover

Note) For output types N and P, the number of core of lead wires will be 3, and for other types, it will be 4.

Option 2

—	None
A1	Bracket A
A2	Bracket B
A3	Bracket C
B	Panel mount adapter
D	Panel mount adapter + Front protection cover

SMC

1

Series *ZSE30A(F)/ISE30A*

Specifications

Model	ZSE30A (Vacuum pressure)	ZSE30AF (Compound pressure)	ISE30A (Positive pressure)
Rated pressure range	0.0 to −101.0 kPa	−100.0 to 100.0 kPa	−0.100 to 1.000 MPa
Regulating pressure range	10.0 to −105.0 kPa	−105.0 to 105.0 kPa	−0.105 to 1.050 MPa
Proof pressure	500 kPa	500 kPa	1.5 MPa
Setting/display resolution	0.1 kPa	0.1 kPa	0.001 MPa
Applicable fluid	Air, non-corrosive gas, non-flammable gas		
Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p) 10% or less (with power supply polarity protection)		
Current consumption	40 mA or less		
Switch output	NPN or PNP open collector 1 output, NPN or PNP open collector 2 outputs (selectable)		
Maximum load current	80 mA		
Maximum applied voltage	28 V (with NPN output)		
Residual voltage	1 V or less (with load current of 80 mA)		
Response time	2.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000 ms)		
Short circuit protection	Yes		
Repeatability	±0.2% F.S. ±1 digit		
Hysteresis — Hysteresis mode	Variable (0 or above) Note 1)		
Hysteresis — Window comparator mode			
Analogue output — Voltage output Note 2) — Output voltage	1 to 5V ±2.5% F.S.		0.6 to 5 V ±2.5% F.S.
Analogue output — Voltage output — Linearity	±1% F.S. or less		
Analogue output — Voltage output — Output impedance	Approx. 1 k		
Analogue output — Current output Note 3) — Output current	4 to 20 mA ±2.5% F.S.		2.4 to 20 mA ±2.5% F.S.
Analogue output — Current output — Linearity	±1% F.S. or less		
Analogue output — Current output — Load impedance	Maximum load impedance: 300 Ω with power supply voltage of 12 V; 600 Ω with power supply voltage of 24 V Minimum load impedance: 50 Ω		
Display	4-digit, 7-segment, 2-colour LCD (Red and Green)		
Display accuracy	±2% F.S. ±1 digit (ambient temperature of 25 ±30°C)		
Indicator light	Lights up when switch output is ON. OUT1: Green, OUT2: Red		
Environment resistance — Enclosure	IP40		
Environment resistance — Operating temperature range	Operating: 0 to 50°C, Stored: −10 to 60°C (no freezing or condensation)		
Environment resistance — Operating humidity range	Operating/Stored: 35 to 85% RH (no condensation)		
Environment resistance — Withstand voltage	1000 VAC for 1 minute between live parts and enclosure		
Environment resistance — Insulation resistance	50 MΩ or more between live parts and enclosure (at 500 VDC Megohmmeter)		
Environment resistance — Vibration resistance	10 to 150 Hz, 1.5 mm amplitude (or 20 m/s^2 acceleration), in X, Y, Z directions, for 2 hours each (Non-energised)		
Environment resistance — Impact resistance	100 m/s^2 in X, Y, Z directions, 3 times each (non-energised)		
Temperature characteristics	±2% F.S. (based on 25°C)		
Lead wire	Oilproof heavy-duty vinyl cable, 3 cores ø3.5, 2 m 4 cores Conductor area: 0.15 mm^2 (AWG26), Insulator O.D.: 1.0 mm		
Standards	CE Marking, UL/CSA, RoHS compliance		

Note 1) If applied pressure fluctuates near the set value, set the hysteresis above the fluctuation range to prevent chattering.
Note 2) When analogue the voltage output is selected, a simultaneous selection of switch output and current output is not available.
Note 3) When analogue the current output is selected, a simultaneous selection of switch output and voltage output is not available.

Piping Specifications

Model		01	N01	C4H	C6H	N7H	C4L	C6L	N7L
Port size		R1/8 M5 x 0.8	NPT1/8 M5 x 0.8	—	—	—	—	—	—
	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
Wetted parts material	Sensor pressure receiving area	Sensor pressure receiving area: Silicon							
	Piping port	C3602 (electroless nickel plated) O-ring: HNBR		PBT, POM, Stainless steel 304, C3604 (electroless nickel plated) O-ring: NBR					
Weight	Including lead wire with connector (3 cores, 2 m)	81 g		70 g	71 g	73 g	75 g	73 g	75 g
	Including lead wire with connector (4 cores, 2 m)	85 g		74 g	75 g	77 g	79 g	77 g	79 g
	Excluding lead wire with connector	43 g		32 g	33 g	35 g	37 g	35 g	37 g

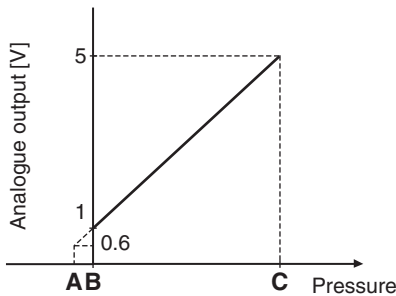## Optional Part No.

When optional parts are required separately, use the following part numbers to place an order.

Part no.	Option	Note
ZS-38-A1	Bracket A	Mounting screw (with 2 pcs. of M3 x 5L)
ZS-38-A2	Bracket B	Mounting screw (with 2 pcs. of M3 x 5L)
ZS-38-A3	Bracket C	Mounting screw (with 2 pcs. of M3 x 5L)
ZS-27-C	Panel mount adapter	Mounting screw (with 2 pcs. of M3 x 8L)
ZS-27-D	Panel mount adapter + front protection cover	Mounting screw (with 2 pcs. of M3 x 8L)
ZS-27-01	Front protection cover	
ZS-38-3L	Lead wire with connector	3 cores, for 1 output, 2 m
ZS-38-4L	Lead wire with connector	4 cores, for 2 outputs, 2 m
ZS-38-3G	Lead wire with connector (with connector cover)	3 cores, for 1 output, 2 m

Part no.	Option	Note
ZS-38-4G	Lead wire with connector (with connector cover)	4 cores, for 2 outputs, 2 m
ZS-38-5L	Lead wire with a connector for copying	3 cores, copy function, 1 m
ZS-38-U	Lead wire unit with a connector for copying	Copy function (up to 10 slaves)
ZS-38-C4H	One-touch fittings ø4 mm straight	O-ring, one-touch clip included
ZS-38-C6H	One-touch fittings ø6 mm straight	O-ring, one-touch clip included
ZS-38-N7H	One-touch fittings ø1/4 inch straight	O-ring, one-touch clip included
ZS-38-C4L	One-touch fittings ø4 mm elbow	O-ring, one-touch clip included
ZS-38-C6L	One-touch fittings ø6 mm elbow	O-ring, one-touch clip included
ZS-38-N7L	One-touch fittings ø1/4 inch elbow	O-ring, one-touch clip included

SMC

Analogue Output

Output voltage

Analogue output [V]

5

1

0.6

A B **C** Pressure

Output current

Analogue output [mA]

20

4

2.4
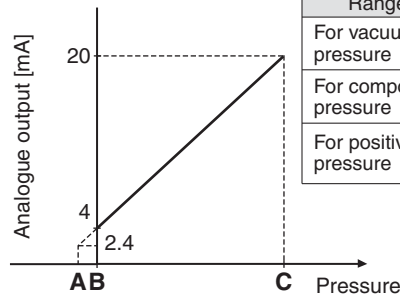
A B **C** Pressure

Range	Rated pressure range	A	B	C
For vacuum pressure	0.0 to −101.0 kPa	—	0	−101 kPa
For compound pressure	−100.0 to 100.0 kPa	—	−100 kPa	100 kPa
For positive pressure	−0.100 to 1.000 MPa	−0.1 MPa	0	1 MPa

Descriptions

Unit display

Displays unit being used (only kPa and MPa).

OUT1 Output display (Green)

Lights up when switch output (OUT1) is turned ON.

△ UP button

Use this button to select the mode or increase the ON/OFF set value.
It is also used for switching to the peak display mode.

S SET button

Use this button to switch the mode and set the set value.
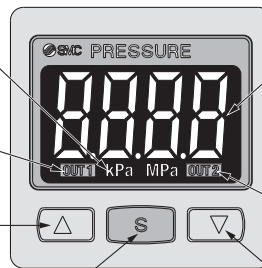
LCD display

Displays the current pressure condition, setting mode, and error codes. A display colour type can be selected from either a single colour display with red or green, or 2-colour display in which green and red are switched accordeing to the output. Four different display settings are available.

OUT2 Output display (Red)

Lights up when switch output (OUT2) is turned ON.

▽ DOWN button

Use this button to select the mode or decrease the ON/OFF set value.
It is also used for switching to the bottom value display mode.

Functions (Refer to pages 10 and 11 for details.)

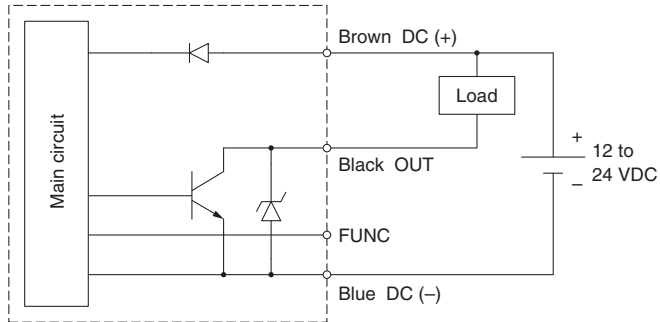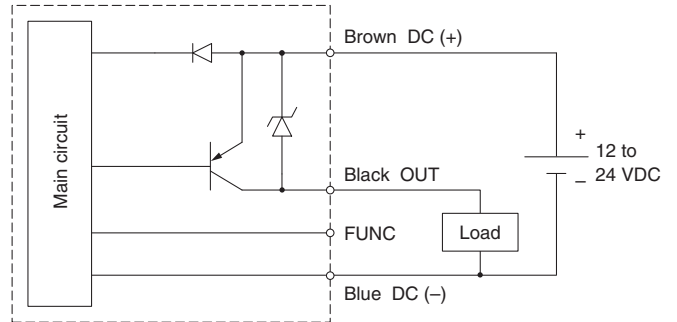|	
Copy function	Copies the settings of the master sensor to the slave sensors.
Auto-preset function	Calculates and enters rough set values automatically from the actual operating conditions.
Precision indicator setting function	Evens out deviations in the displayed value.
Peak display function	Can retain the maximum pressure value displayed during measurement.
Bottom display function	Can retain the minimum pressure value displayed during measurement.
Key lock function (Security code input can be selected)	The key board can be locked to prevent any incorrect function of the switch.
Zero-out function	The pressure display can be set at zero when the pressure is open to the atmosphere.
Anti-chattering function	Prevents possible malfunction due to sudden fluctuations in the primary pressure by adjusting the response time.
Unit display switching function	Can convert the display value.
Power-saving mode	Reduces power consumption.
Display resolution-switch function	Converts display resolution from the normal value of 1/1000 to 1/100. It reduces the monitor to flicker.
kPa⇔MPa switch function	Converts the unit between kPa and MPa.

Internal Circuits and Wiring Examples

Z/ISE30A(F) − ☐ − ■ − ☐☐☐☐

●**Output**

N

NPN (1 output)

Main circuit

Brown DC (+)

Load

Black OUT

FUNC

Blue DC (−)

+
− 12 to
24 VDC
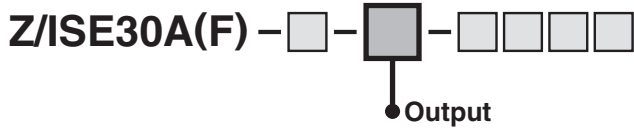
Max. 28 V, 80 mA
Residual voltage 1 V or less

P

PNP (1 output)

Main circuit

Brown DC (+)

Black OUT

FUNC   Load

Blue DC (−)

+
− 12 to
24 VDC

Max. 80 mA
Residual voltage 1 V or less

A

NPN (2 outputs)

Main circuit

Brown DC (+)

Load

Black OUT1

Load

White OUT2

FUNC

Blue DC (−)

+
− 12 to
24 VDC
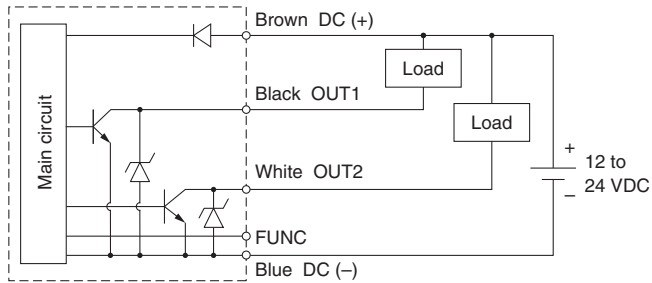
Max. 28 V, 80 mA
Residual voltage 1 V or less

B

PNP (2 outputs)

Main circuit

Brown DC (+)

Black OUT1

Load

White OUT2

FUNC   Load

Blue DC (−)

+
− 12 to
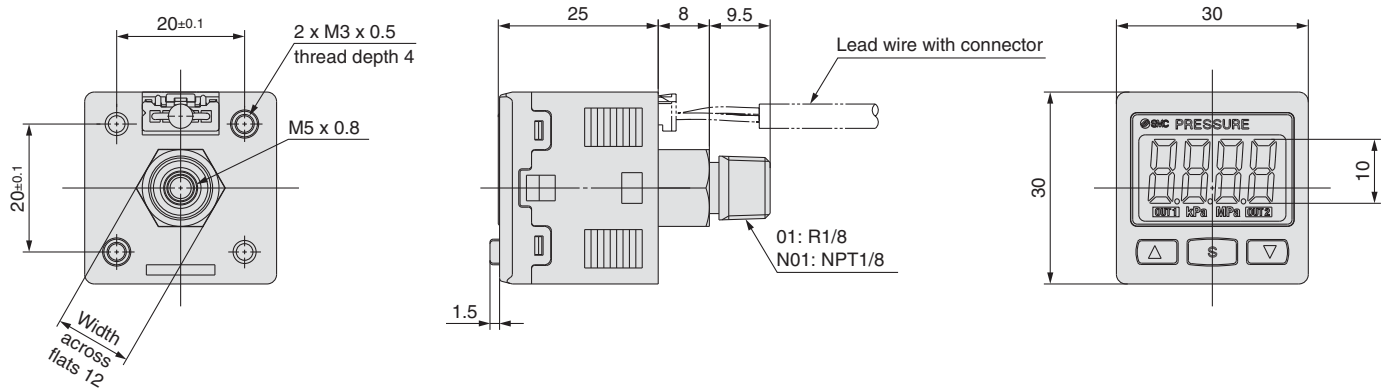24 VDC
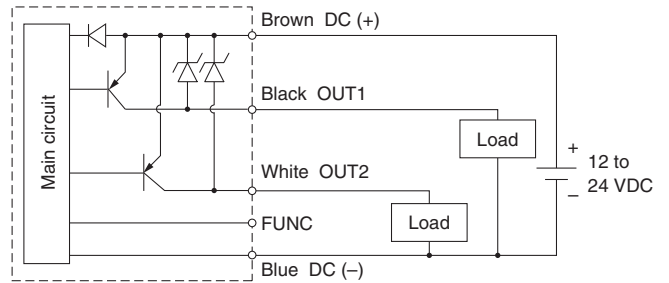
Max. 80 mA
Residual voltage 1 V or less

Note) The FUNC terminal is connected using a dedicated lead wire (ZS-38-5L or ZS-38-U) when the copy function is used. (Refer to "Copy function" on page 10.)
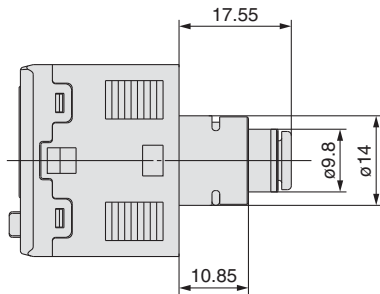
⊜SMC

C

NPN (1 output) + Analogue voltage output
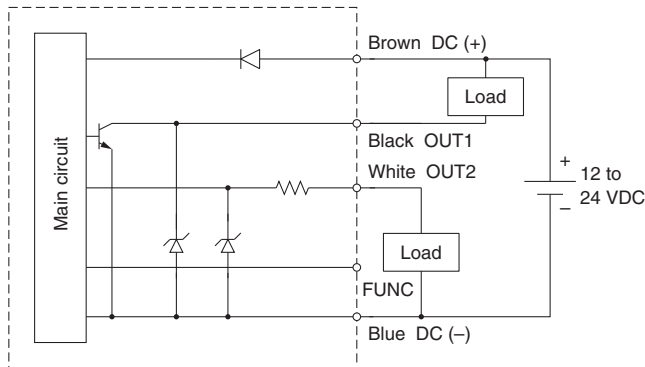
Max. 28 V, 80 mA
Residual voltage 1 V or less

Analogue voltage output
Output impedance: Approx. 1 kΩ

E

PNP (1 output) + Analogue voltage output
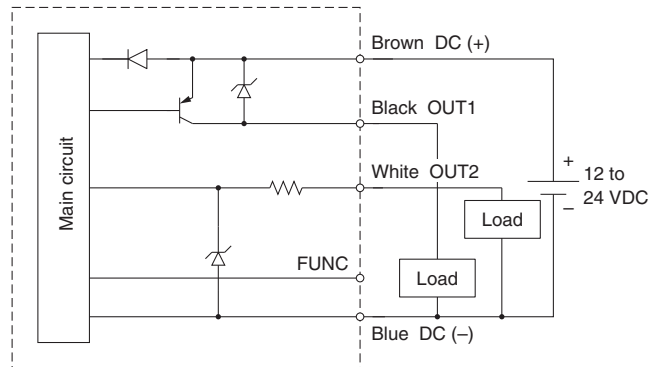
Max. 80 mA
Residual voltage 1 V or less

Analogue voltage output
Output impedance: Approx. 1 kΩ

D

NPN (1 output) + Analogue current output
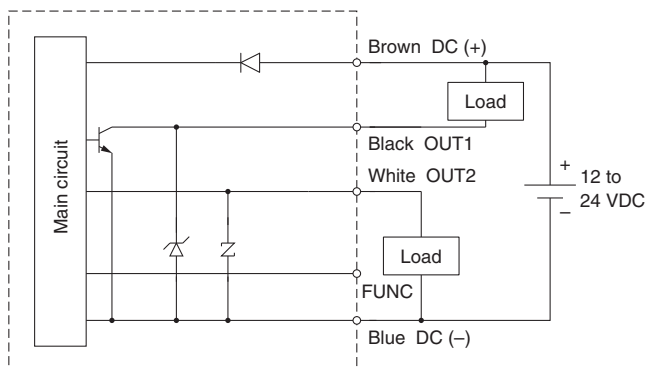
Max. 28 V, 80 mA
Residual voltage 1 V or less

Analogue current output
Max. load impedance:
  Power supply voltage 12 V: 300 Ω
  Power supply voltage 24 V: 600 Ω
Min. load impedance: 50 Ω

F

PNP (1 output) + Analogue current output

Max. 80 mA
Residual voltage 1 V or less

Analogue current output
Max. load impedance:
  Power supply voltage 12 V: 300 Ω
  Power supply voltage 24 V: 600 Ω
Min. load impedance: 50 Ω

Note) The FUNC terminal is connected using a dedicated lead wire (ZS-38-5L or ZS-38-U) when the copy function is used. (Refer to "Copy function" on page 10.)

Dimensions

Z/ISE30A(F) – ☐ – ☐ – ☐☐☐☐

● **Piping**

01 / **N01**

2 x M3 x 0.5
thread depth 4

20±0.1

20±0.1

M5 x 0.8

Width
across
flats 12

25   8   9.5

Lead wire with connector

01: R1/8
N01: NPT1/8

1.5

30

30

10

⊙SMC PRESSURE

OUT1 kPa MPa OUT2

△ S ▽

C4H

**One-touch fitting ø4 mm
ø5/32 inch straight**

17.55

ø9.8   ø14

10.85

C6H

**One-touch fitting ø6 mm
straight**

17.95

ø10   ø14

10.85

N7H

**One-touch fitting ø1/4 inch
straight**

21.75

ø10.3   ø14

10.85

C4L

**One-touch fitting ø4 mm
ø5/32 inch elbow**

20.7

15.6

ø9.3

10.85

C6L

**One-touch fitting ø6 mm
elbow**

22.85

16.1

ø11.6

10.85

N7L

**One-touch fitting ø1/4 inch
elbow**

23.45

16.1

ø12

10.85

⊗SMC
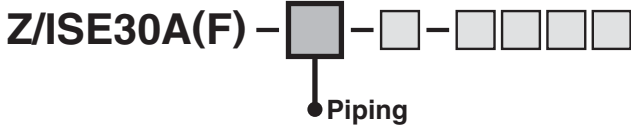
With bracket

Z/ISE30A(F) − ☐ − ☐ − ☐ ☐ ☐ ☐

● **Option 2**

A1

Bracket A
(Option unit part no.: ZS-38-A1)

42.5
25
30
34.6

30
20
45
20
2
30

19
5.2
5.2
9.6
14.7
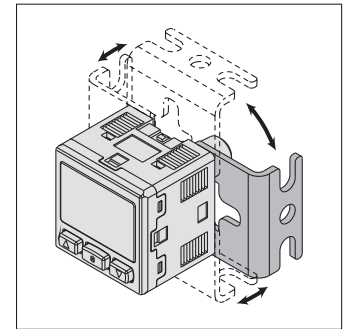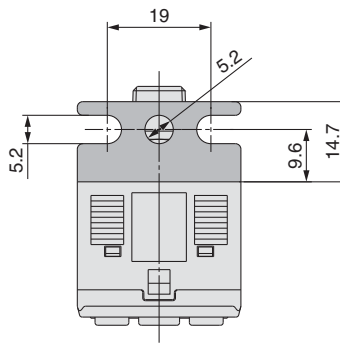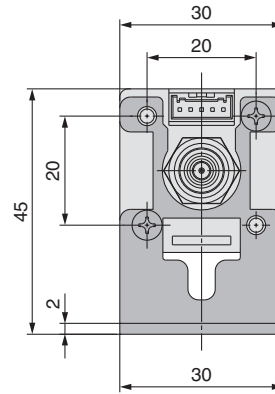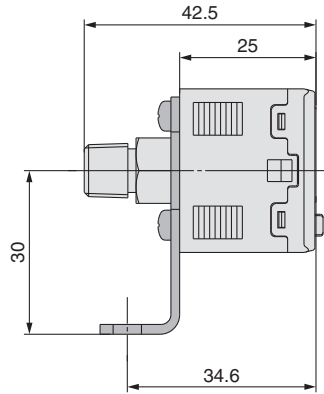
Note) Bracket configuration allows mounting in four directions.

A2

Bracket B
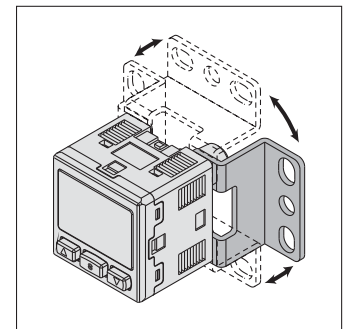**(Option unit part no.: ZS-38-A2)**
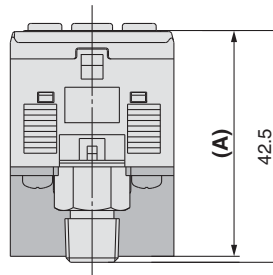
A3

Bracket C
(Option unit part no.: ZS-38-A3)

(A)
42.5

Note) Bracket configuration allows mounting in four directions.

1.6   25
30
16.4

30
20
45
20
5.5
5.2
9.1
13.6
7.5   7.2
20
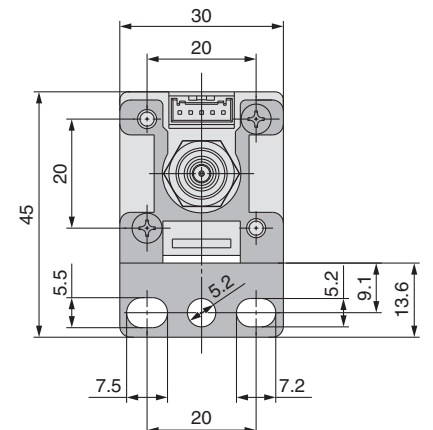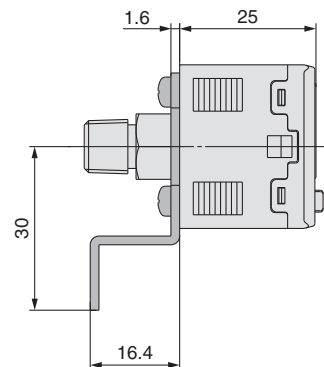
	A	B
Bracket B	41.4	16.4
Bracket C	53	28

SMC

Dimensions

Panel mount

Z/ISE30A(F) – ☐ – ☐ – ☐ ☐ ■ ☐

●**Option 2**

B

Panel mount adapter
(Option unit part no.: ZS-27-C)

47.8

R4.5   R4.5

21

7.2   17.8   8   9.5

8.5

Panel thickness 0.5 to 6

34.5

34.5

PRESSURE

OUT1 kPa MPa OUT2

D
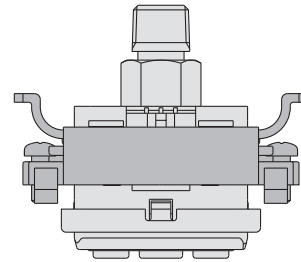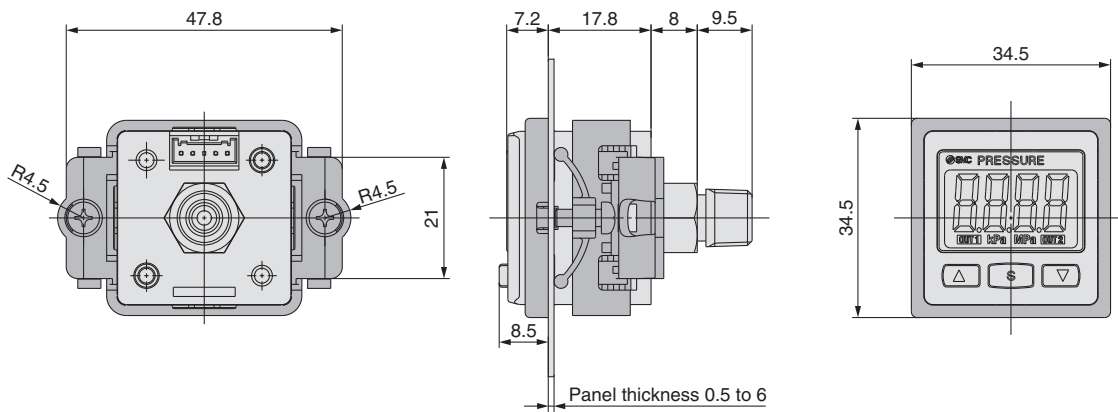
Panel mount adapter + Front protection cover
(Option unit part no.: ZS-27-D)

42.4

33.5

33.5

11   17.8   8   9.5

Panel thickness 0.5 to 6

⊘SMC