



ORIGINAL INSTRUCTIONS



Refer to Declaration of Conformity for relevant Directives

Instruction Manual
Digital Flow Monitor
Series PFG300/PFG310



The intended use of this Digital Flow Monitor is to monitor and display flow. It can output a signal when the desired set flow is reached.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)⁽¹⁾, and other safety regulations.

- ⁽¹⁾ ISO 4414: Pneumatic fluid power - General rules relating to systems.
- ISO 4413: Hydraulic fluid power - General rules relating to systems.
- IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Manipulating industrial robots -Safety.etc.

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- To ensure safety of personnel and equipment the safety instructions in this manual must be observed, along with other relevant safety practices.

	Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

- The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
- Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

- Only personnel with appropriate training should operate machinery and equipment.**
- The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

- Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

- The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
- When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
- Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

1 Safety Instructions - continued

- Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

- Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
- Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustions and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specification described in the product catalogue.
- An application which could have negative effects on people, property or animals, requiring special safety analysis.
- Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

- Always ensure compliance with relevant safety laws and standards.**

All electrical work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

Caution

- The product is provided for use in manufacturing industries.** This product may cause interference if used in residential premises. The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

2 Specifications

Model		PFG3H0						
Applicable SMC	Model	PFMB7201	PFMB7501 PFMC7501	PFMB7102 PFMC7102	PFMB7202 PFMC7202	PF3A703H	PF3A706H	PF3A712H
Flow Switch	Rated flow range *1	2 to 200 L/min	5 to 500 L/min	10 to 1000 L/min	20 to 2000 L/min	30 to 3000 L/min	60 to 6000 L/min	120 to 12000 L/min
Flow	Set flow rate range	-10 to 210 L/min	-25 to 525 L/min	-50 to 1050 L/min	-100 to 2100 L/min	-150 to 3150 L/min	-300 to 6300 L/min	-600 to 12600 L/min

Flow	Set flow rate range	Accumulated flow	0 to 999,999,999 L				0 to 999,999,999,990 L				0 to 999,999,999,900 L						
			Minimum setting unit	Instantaneous flow	1 L/min				2 L/min				5 L/min				10 L/min
Electrical	Accumulated volume per pulse (Pulse width = 50 msec.)	Accumulated value hold *3	1 L/pulse				10 L/pulse				100 L/pulse						
			Every 2 or 5 minutes, The stored accumulated flow is held even when the power supply is OFF.														
Accuracy	Display accuracy	±0.5%F.S. Min. display unit (at ambient temperature 25 °C constant temperature)															
	Analogue output accuracy	±0.5%F.S. (at ambient temperature 25 °C constant temperature)															
	Repeatability	±0.1%F.S. Min. display unit															
Switch output	Temperature characteristics	±0.5%F.S. (at ambient temperature 0 to 50 °C, 25 °C standard)															
	Output type	Select from NPN or PNP open collector output.															
	Output mode	Hysteresis mode, Window comparator mode, Accumulated output mode or Accumulated pulse output mode, Error output mode or switch output OFF mode.															
	Switch operation	Normal output or Reversed output															
	Maximum load current	80 mA															
	Maximum applied voltage (Only NPN)	30 VDC															
Internal voltage drop (Residual voltage)	NPN output: 1.0 V or less (at 80 mA), PNP output: 1.5 V or less (at 80 mA)																
	Response time *2	3 ms or less															

2 Specifications - continued

Switch output	Delay time *2	Select from 0, 0.05 to 0.10 sec. (increment of 0.01 sec.), 0.1 to 1.0 sec. (increment of 0.1 sec.), 1 to 10 sec. (increment of 1 sec.), 20 sec., 30 sec., 40 sec., 50 sec. and 60 sec.														
	Hysteresis *4	Variable														
	Protection	Short circuit protection														
Analogue output *5	Output type	Voltage input: 1 to 5 VDC, 0 to 10 VDC (only when the power supply voltage is 24 VDC) Current input: 4 to 20 mA (0 L/min to maximum value of the rated flow)														
	Impedance	Voltage output	Output impedance approx.: 1 kΩ													
		Current output	Maximum load impedance: 300 Ω at 12 VDC, 600 Ω at 24 VDC													
	Response time *2	50 ms or less														
External input *6	External input specification	Input voltage: 0.4 V or less (reed or solid state type), Input time: 30 msec. or longer														
	Input mode	Accumulated flow external reset or peak/bottom hold value														
Sensor input	Input type	Voltage input: 1 to 5 VDC (Input impedance: 1 MΩ) Current input: 4 to 20 mA (Input impedance: 51 Ω) (0 L/min to maximum value of the rated flow)														
	Connection method	Connector (e-con)														
	Protection	Over voltage protection (up to 26.4 V)														
Display	Display mode	Select from Instantaneous flow or Accumulated flow.														
	Unit *7	Instantaneous flow	L/min, cm ³ /min													
		Accumulated flow	L, ft ³ , Lx10 ³ , ft ³ x10 ³													
	Displayable range	Instantaneous flow	-10 to 210 L/min	-25 to 525 L/min	-50 to 1050 L/min	-100 to 2100 L/min	-150 to 3150 L/min	-300 to 6300 L/min	-600 to 12600 L/min							
Accumulated flow *9		0 to 999,999,999 L	0 to 999,999,999,990 L				0 to 999,999,999,900 L									
Minimum setting unit		1 L/min				2 L/min				5 L/min				10 L/min		
Display type	Accumulated flow	1 L				10 L				100 L						
	Display type	LCD														

Digital filter *8	Number of displays	3-screen display (Main display, sub display)											
	Display colour	1) Main display: Red/Green 2) Sub display: Orange											
	Number of display digits	1) Main display: 5 digit (7-segments) 2) Sub display: 9 digit (7-segments)											
Environmental	Indicator LED	LED is ON when switch output is ON (OUT1/OUT2: Orange)											
	Enclosure rating	IP40											
	Withstand voltage	1000 VAC, for 1 minute between live parts and case											
	Insulation resistance	50 MΩ or more between live parts and case (with 500 VDC megger)											
Standards	Operating temperature range	Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing)											
	Operating humidity range	Operation, Storage: 35 to 85%RH (no condensation or freezing)											
Weight	Body	25 g (without lead wire)											
	Lead wire with connector	+39 g											

- *1: Rated flow range of the applicable flow switch.
- *2: Value without digital filter (at 0 ms).
- *3: When using the accumulated value hold function, calculate the product life from the operating conditions, and use the product within its life. The maximum access limit of the memory device is 1.5 million cycles. If the product is operated 24 hours per day, the product life will be as follows.
 - +5 min. cycle: 5min. x 1.5million times = 7.5 million min. = 14.3 years/2 min. cycle: 2min. x 1.5 million times = 3 million min. = 5.7 years
- If the Accumulated flow external reset is repeatedly used, the product life will be shorter than the calculated life.
- *4: If the applied voltage fluctuates around the set value, the hysteresis width must be greater than the fluctuation width. Otherwise, chattering will occur.
- *5: This function is available only for models with analogue output.
- *6: This function is available only for models with external input.
- *7: Setting is possible only for models with the units selection function.
- *8: Response time indicates when the set value is 90% in relation to the input.

2 Specifications - continued

- *9: The first and next 6 digits (12 digits in total) for accumulated flow rate are displayed. When the first 6 digits are displayed, [x 10³] is displayed.
- *10: Any products with tiny scratches, smears, or variations in the display colour or brightness, which does not affect the performance of the product, are verified as conforming products.

3 Installation

3.1 Installation

Warning

Do not install the product unless the safety instructions have been read and understood.

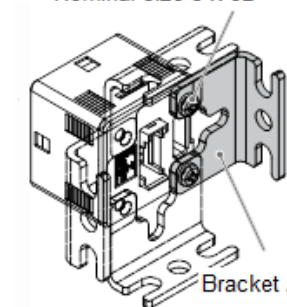
- Mounting with bracket**

- Mount the bracket to the body with mounting screws (Self tapping screws: Nominal size 3 x 8L (2 pcs)), then install the product in the specified position.

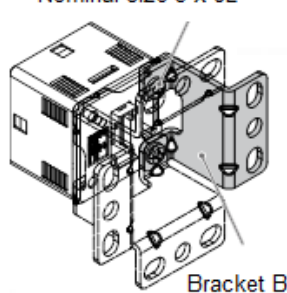
*: Tighten the bracket mounting screws to a torque of 0.5±0.05 Nm. Self-tapping screws are used, and should not be re-used several times.

- Bracket A (Part No.: ZS-46-A1)
- Bracket B (Part No.: ZS-46-A2)

Self tapping screws: Nominal size 3 x 8L

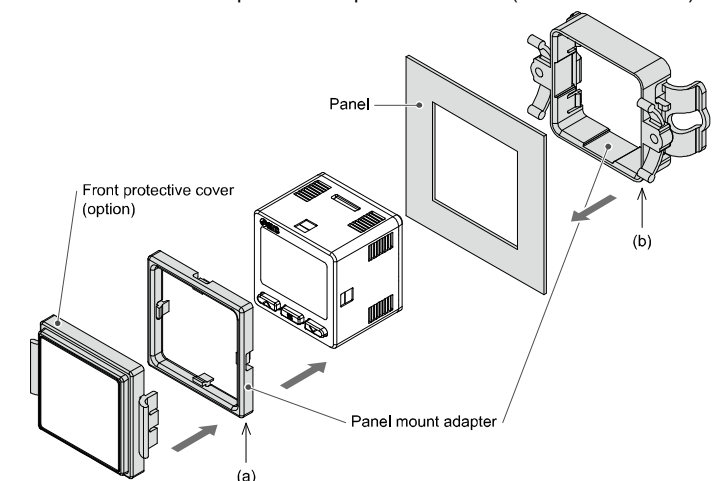


Self tapping screws: Nominal size 3 x 8L



- Mounting with panel mount adapter**

- Mount part (a) to the front of the body and fix it. Then insert the body with (a) into the panel until (a) comes into contact with the panel front surface. Next, mount part (b) to the body from the rear and insert it until (b) comes into contact with the panel for fixing.
- Panel mount adapter (Part No.: ZS-46-B)
- Panel mount adapter + Front protective cover (Part No.: ZS-46-D)



*: The panel mount adapter can be rotated through 90 degrees for mounting.

3.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not mount in a location exposed to radiant heat.

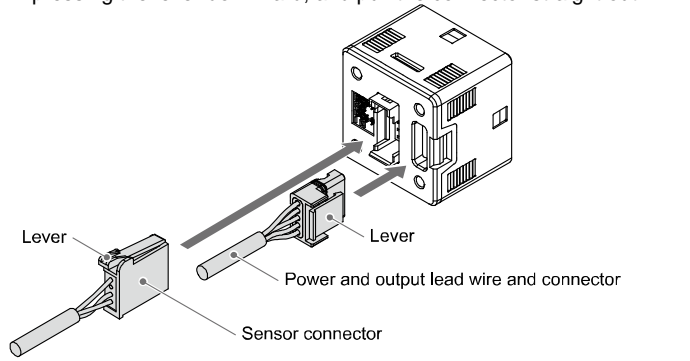
3 Installation - continued

3.3 Wiring connections

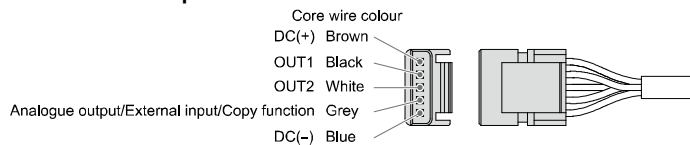
- Connections should be made with the power supply turned off.
- Use a separate route for the product wiring and any power or high voltage wiring. Otherwise, malfunction may result due to noise.
- If a commercially available switching power supply is used, be sure to ground the frame ground (FG) terminal. If a switching power supply is connected for use, switching noise will be superimposed and it will not be able to meet the product specifications. In that case, insert a noise filter such as a line noise filter/ferrite between the switching power supplies or change the switching power supply to the series power supply.

3.4 Connector attachment / detachment

- When connecting the connector, insert it straight onto the pins, holding the lever and connector body, and lock the connector by pushing the lever hook into the concave groove on the housing.
- To detach the connector, remove the hook from the groove by pressing the lever downward, and pull the connector straight out.

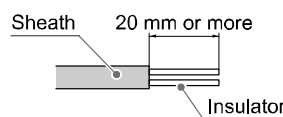


• Connector pin numbers



3.5 Attaching Connector to Sensor wire

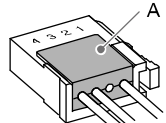
- Strip the sensor wire as shown.
- Do not cut the insulator.
- Insert the corresponding wire colour shown in the table into the pin number printed on the sensor connector, to the bottom.



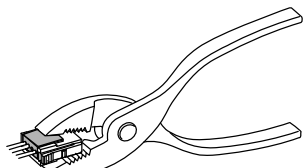
Pin no.	Wire colour *	Description
1	Brown	DC(+)
2	NC	-
3	Blue	DC(-)
4	White	IN

*: The wire colours shown are for the PFMB, PFMC, and PF3A7 series cables.

- Check that the above preparation has been performed correctly, then part A shown should be pressed in by hand to make temporary connection.



- Part A should then be pressed in using a suitable tool, such as pliers.



- The sensor connector cannot be re-used once it has been fully crimped.

In cases of connection failure such as incorrect order of wires or incomplete insertion, please use a new connector.

- If the sensor is not connected correctly "LLL" or "HHH" will be displayed.

3 Installation - continued

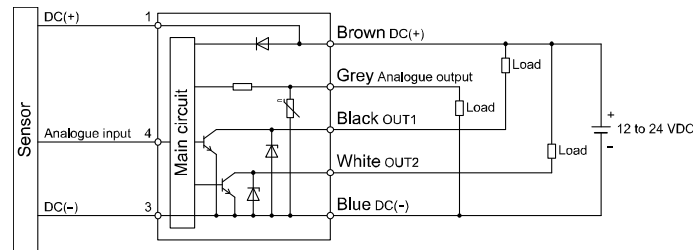
3.6 Internal circuit & wiring

PFG3□0-□-□□□□

Output specification

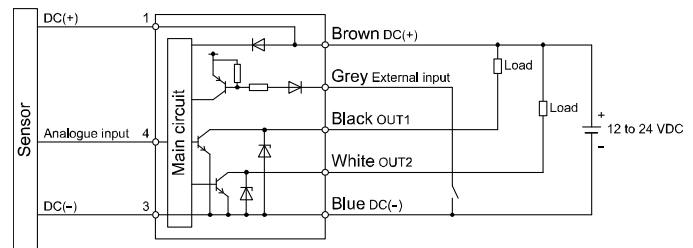
-RT/-SV

- NPN open collector 2 output + **Analogue output**
Max. 30 V, 80 mA, Residual voltage: 1 V or less
RT: Analogue output 1 to 5 V, 0 to 10 V, Output impedance 1 kΩ
SV: Analogue output 4 to 20 mA, Max. load impedance
Power supply voltage 12 V: 300 Ω
Power supply voltage 24 V: 600 Ω



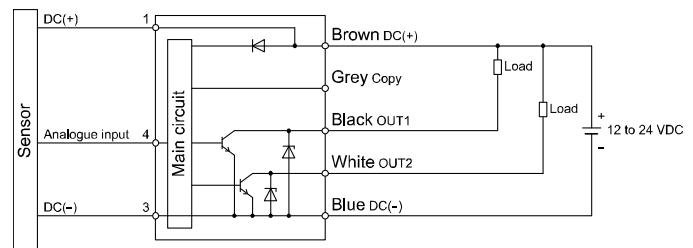
-RT/-SV

- NPN open collector 2 output + **External input**
Max. 30 V, 80 mA, Residual voltage: 1 V or less
External input: Input voltage 0.4 V or less (reed or solid state), 30 msec or more



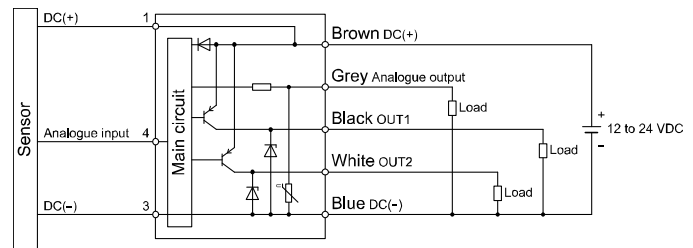
-RT/SV/XY

- NPN open collector 2 output + **Copy function**
Max. 30 V, 80 mA, Residual voltage: 1 V or less



-RT/-SV

- PNP open collector 2 output + **Analogue output**
Max. 80 mA, Residual voltage: 1.5 V or less
RT: Analogue output 1 to 5 V, 0 to 10 V
Output impedance 1 kΩ
SV: Analogue output 4 to 20 mA, Max. load impedance
Power supply voltage 12 V: 300 Ω
Power supply voltage 24 V: 600 Ω

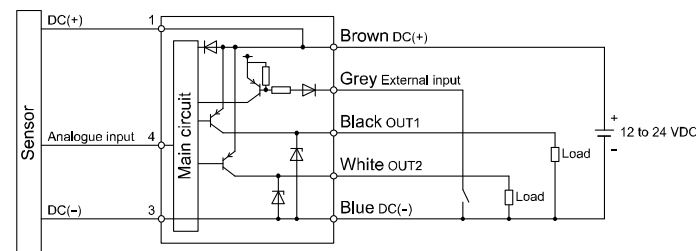


-RT/-SV

- PNP open collector 2 output + **External input**
Max. 80 mA, Residual voltage: 1.5 V or less

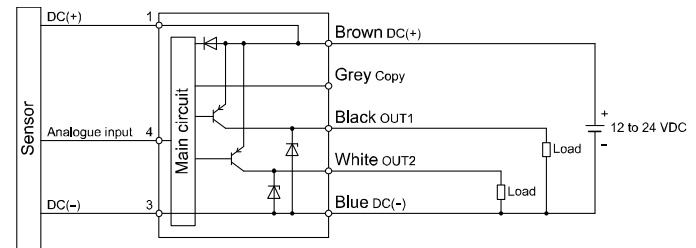
3 Installation - continued

External input: Input voltage 0.4 V or less (reed or solid state), 30 msec or more



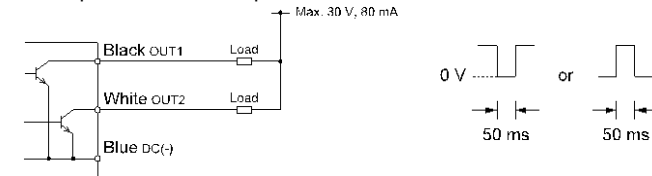
-RT/SV/XY

- PNP open collector 2 output + **Copy function**
Max. 30 V, 80 mA
Residual voltage: 1.5 V or less

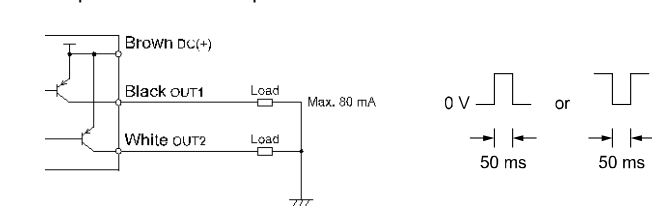


Example for wiring for accumulated pulse output

NPN open collector 2 output



PNP open collector 2 output



3.7 Lubrication

Caution

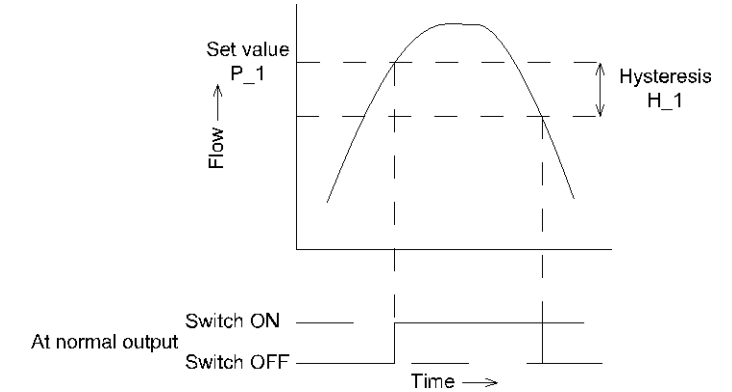
- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, use turbine oil Class 1 (no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

4 Settings

4.1 Default settings

When the flow exceeds the set value, the switch will be turned on. When the flow falls below the set value by the amount of hysteresis or more, the switch will be turned off. The default setting is that the output will be turned ON at 1500 L/min when the flow range of the connected sensor is 3000 L/min. Perform initial settings while referring to the "Outline of Settings" section.

4 Settings - continued



4.2 Outline of Settings

Power is supplied.

The product code is displayed for approximately 3 seconds after power is supplied. Then, measurement mode will be displayed.
*: When moving on to measurement mode, the switch operation will start.

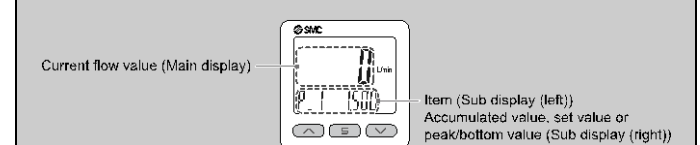
[Initial setting]

Set the flow range, display units and NPN/PNP output specifications of the connected sensor.

[Measurement mode]

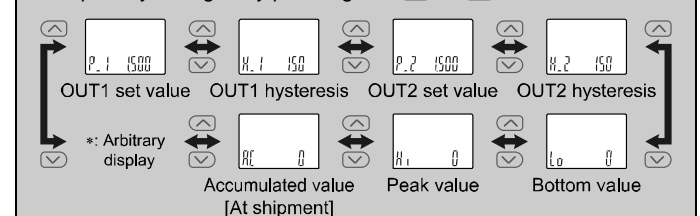
Detects the flow after power is supplied, and indicates the display and switch operating status. This is the basic mode; other modes should be selected for set-point changes and other function settings.

Measurement mode screen

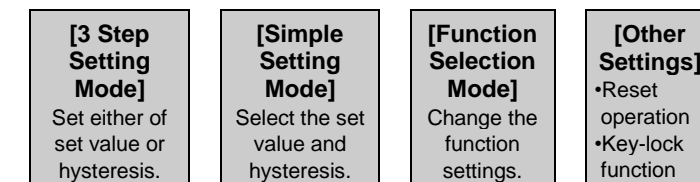
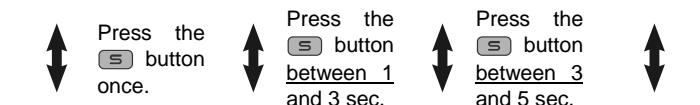


Sub display (Hysteresis mode)

In measurement mode, the display of the sub display can be temporarily changed by pressing the \wedge or \vee buttons.



*: One arbitrary display mode can be added to the sub display by setting the [F10] sub display setting. (The default setting does not include arbitrary display.)



*: The outputs will continue to operate during setting.

*: 3 step setting mode, simple setting mode and function selection mode settings are reflected each other.

4 Settings - continued

4.3 Initial setting

Set the flow range, display units and NPN/PNP output specifications of the connected sensor.

Measurement mode

Press the **[S]** button between 3 and 5 sec.

[F 0] Display the switching function of the flow range, display unit and switch output specifications.



Press the **[S]** button. Move on to flow range setting.

Flow range setting
Press the **[▲]** or **[▼]** button to select the flow range.

When the product includes units selection

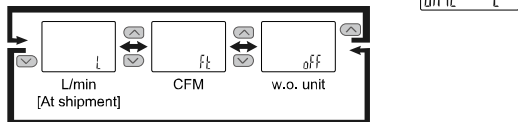
When other than [USER] is selected, Press the **[S]** button to move on to the display unit setting.

When fixed to SI units

When other than [USER] is selected, Press the **[S]** button to move on to the switching setting of switch output NPN/PNP specifications.

Press the **[S]** button to set.

Display unit setting
Press the **[▲]** or **[▼]** button to change the display units.

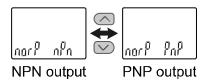


*: [CFM] cannot be selected if the additional range is set to SI units.

*: [w/o unit] cannot be selected if set items other than additional range are set with the units selection function

Press the **[S]** button to set. Move on to the switching setting of switch output NPN/PNP specifications.

Switching setting of switch output NPN/PNP specifications
The switch output of this product can be switched to NPN or PNP output in accordance with the user device construction.
The switch output specification can be selected by pressing **[▲]** or **[▼]** button.



Press the **[S]** button to set. Return to function selection mode.

[F 0] Setting of the switching function of the flow range, display unit and switch output specifications is completed.

Press the **[S]** button 2 sec. or longer.

Measurement mode
(Initial setting completed)

Perform the setting using the 3 step setting mode, simple setting mode and function selection mode.

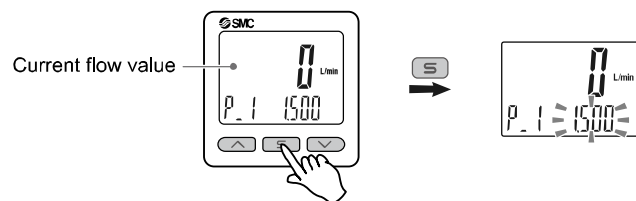
4 Settings - continued

4.4 3 step setting mode

[3 step setting mode (hysteresis mode)]

In the 3 step setting mode, the set value (P_1 or n_1, P_2 or n_2) and hysteresis (H_1, H_2) can be changed.

(1) Press the **[S]** button once when the item to be changed is displayed on the sub display.
The set value on the sub display (right) will start flashing.



(2) Press the **[▲]** or **[▼]** button to change the set value.

The set value can be increased with **[▲]** button and can be reduced with **[▼]** button. When the **[▲]** and **[▼]** buttons are pressed and held simultaneously for 1 second or longer, the set value is displayed as [- -], and the set value will be the same as the current flow value automatically (snap shot function). Afterwards, it is possible to adjust the value by pressing the **[▲]** or **[▼]** button.

(3) Press the **[S]** button to complete the setting.

The Flow switch turns on within a set flow range (OUT1: from P1L to P1H, OUT2: from P2L to P2H) during window comparator mode. Set P1L/P2L, the lower limit of the switch operation, and P1H/P2H, the upper limit of the switch operation and WH1/WH2 (hysteresis) following the instructions given on above.
(When reversed output is selected, the sub display (left) shows [n1L/n2L] and [n1H/n2H].)

In accumulated output mode, the switch will start at the set accumulated flow rate.
Set each P1/P2 (set value), referring to the Setting method on above.
(When reversed output is selected, the sub display (left) shows [n1/n2].)

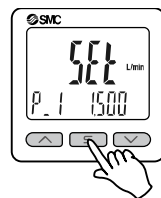
*: Set OUT2 in the same way.

*: Setting of the normal/reverse output switching and hysteresis/window comparator mode switching are performed with the function selection mode [F 1] Setting of OUT1 and [F 2] Setting of OUT2.

4.5 Simple setting mode

[Simple setting mode (hysteresis mode)]

(1) Press and hold the **[S]** button between 1 and 3 seconds in measurement mode. [SEt] is displayed on the main display. When the button is released while in the [SEt] display, the current flow value is displayed on the main display, [P_1] or [n_1] is displayed on the sub display (left), and the set value is displayed on the sub display (right) (Flashing).



(2) Change the set value with **[▲]** or **[▼]** button, and press the **[S]** button to set the value. Then, the setting moves to hysteresis setting. (The snap shot function can be used.)

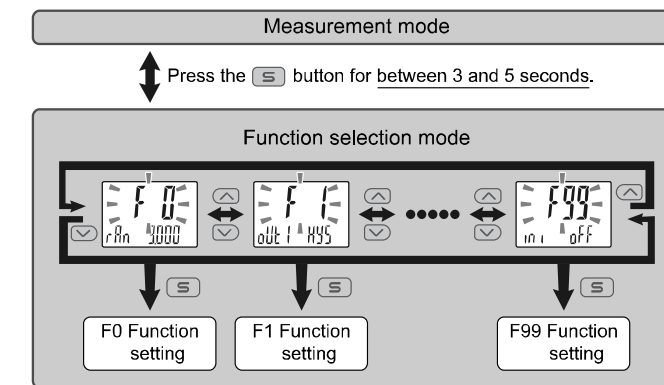
(3) Change the set value with **[▲]** or **[▼]** button, and press the **[S]** button to set the value. Then, the setting moves to setting of OUT2. (The snap shot function can be used.)
Press and hold the **[S]** button for 2 seconds or longer to complete the setting. The product will return to measurement mode.

In window comparator mode, set P1L/P2L, the lower limit of the switch operation, and P1H/P2H, the upper limit of the switch operation and WH1/WH2 (hysteresis) following the instructions given on above.
(When reversed output is selected, the sub display (left) shows [n1L/n2L] and [n1H/n2H].)

4 Settings - continued

4.6 Function selection mode

In measurement mode, press the **[S]** button between 3 and 5 seconds, to display [F 0]. Select to display the function to be changed [F□□]. Press and hold the **[S]** button for 2 seconds or longer in function selection mode to return to measurement mode.



*: Some products do not have all the functions. If no function is available or selected due to configuration of other functions, [- -] is displayed on the sub display (right).

4.6.1 Default Function settings

The default setting is as follows.
If no problem is caused by this setting, keep these settings.

- Switching function of [F 0] Flow range, display unit and switch output specifications

Item	Default setting
Flow range	3000 L/min
Display units *1	L
Switch output specifications	NPN

*1: This setting is only available for models with the units selection function.

[F 1] Setting of OUT1

Item	Default setting
Output mode	Hysteresis mode
Reversed output	Normal output
Flow setting	1500 L/min
Hysteresis	150 L/min
Delay time	0.00 s
Display colour	Output ON: Green Output OFF: Red (Linked to OUT1)

- [F 2] Setting of OUT2
Same setting as [F 1] OUT1.

4.6.2 Other parameter settings

Item	Default setting
[F 3] Digital filter setting	0.00 s
[F 5] FUNC terminal function setting *2	Analogue output: 1 to 5 V /4 to 20 mA External input: Accumulated value reset
[F10] Sub display setting	dEF
[F14] Display with zero cut-off setting	1.0%F.S.
[F30] Accumulated value hold setting	OFF
[F80] Power saving mode	OFF
[F81] Security code	OFF
[F90] Setting of all functions	OFF
[F96] Sensor input/External input signal status display	No configurable items
[F97] Copy master setting	No configurable items
[F98] Output check	Normal output
[F99] Reset to default settings	OFF

*2: This function is available for models with analogue output.

4 Settings - continued

4.7 Other settings

4.7.1 Snap shot function

The current flow value can be stored to the switch output ON/OFF set point.

When the set value and hysteresis are set, press the **[▲]** and **[▼]** buttons for 1 second or longer simultaneously. Then, the set value of the sub display (right) shows [- -], and the values corresponding to the current flow values are automatically displayed.

4.7.2 Peak/bottom value indication

The maximum (minimum) flow when the power is supplied is detected and updated.

The value can be displayed on the sub display by pressing **[▲]** or **[▼]** button in measurement mode.

4.7.3 Key-lock function

The key-lock function is used to prevent errors occurring due to unintentional changes of the set values. If the **[S]** button is pressed while the keys are locked, [LoC] is displayed on the sub display (right) for approximately 1 second.
(Each setting and peak/bottom values are displayed with **[▲]** and **[▼]** buttons.)

4.7.4 Reset operation

When the **[S]** and **[▼]** buttons are pressed for 1 second or longer simultaneously while the accumulated flow/peak/bottom values are displayed, the sub display (right) displays [---] and the display values are cleared.

5 How to Order

PFG3 00-RT-M-LA1CY

Type	Content
3	Remote type monitor

Input specification	Content
0	Voltage input
1	Current input

Output specification	Content
RT	2 output (NPN or PNP selectable) + Analogue voltage output *1 *2
SV	2 output (NPN or PNP selectable) + Analogue current output *2
XY	2 output (NPN or PNP selectable) + Copy function

Unit specification	Content
Nil	With units selection function *3
M	Fixed SI unit *4

Option 1	Content
L	Power and output lead wire and connector
Nil	None

Option 2	Content
Nil	None
A1	Bracket A (vertical mounting)
A2	Bracket B (horizontal mounting)
B	Panel mount adapter
D	Panel mount adapter + Front protective cover

Option 3	Content
Nil	None
C	Sensor connector (For PFMC and PF3A7)
F	Sensor connector (For PFMB)

Option 4	Content	
Symbol	Operation manual	Calibration certificate
Nil	○	-
Y	-	-
K	○	○
T	-	○

*1: Select from 1 to 5 V or 0 to 10 V
*2: Select from external input or copy function
*3: This product will not be sold for use in Japan.
*4: Fixed units: Instantaneous flow: L/min
Accumulated flow: L

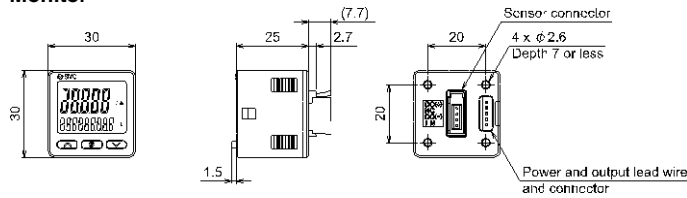
Accessories/Part numbers

Accessories can be ordered separately. Place the order using the following part numbers.

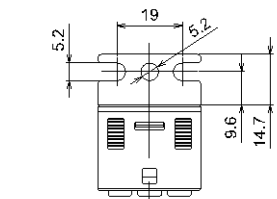
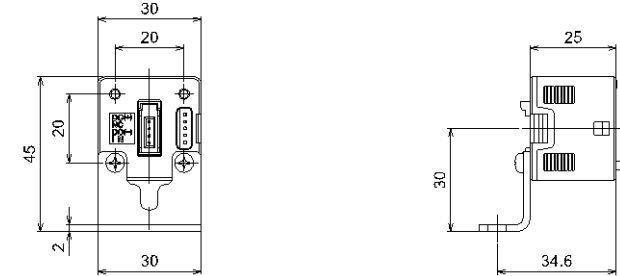
Items	Part No.	Remarks
Sensor connector (For PFMB)	ZS-28-C-1	
Sensor connector (For PFMC and PF3A7)	ZS-28-CA-4	
Bracket A	ZS-46-A1	With self-tapping screws: Nominal size 3 x 8L (2 pcs)
Bracket B	ZS-46-A2	With self-tapping screws: Nominal size 3 x 8L (2 pcs)
Panel mount adapter	ZS-46-B	
Panel mount adapter + Front protective cover	ZS-46-D	
Lead wire with connector	ZS-46-5L	5 cores, 2 m
Front protective cover	ZS-27-01	

6 Outline Dimensions (mm)

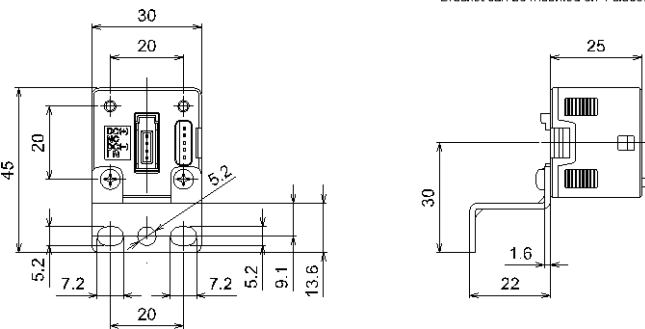
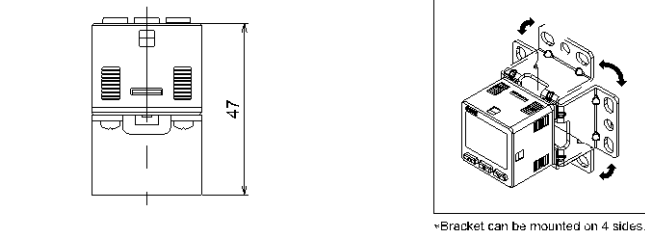
• **Digital Flow Monitor**



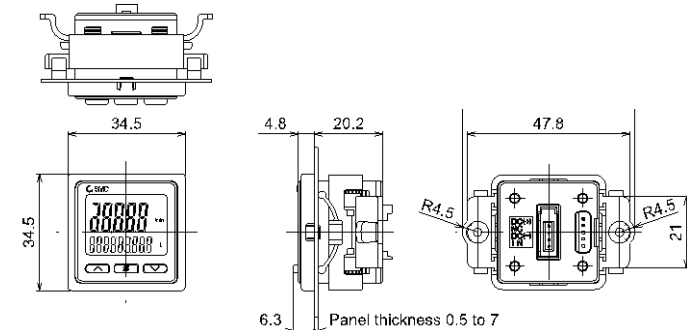
• **Bracket A (Part No: ZS-46-A1)**



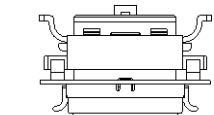
• **Bracket B (Part No: ZS-46-A2)**



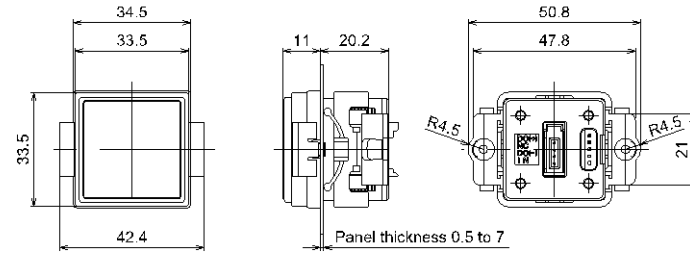
• **Panel mount adapter (Part No: ZS-46-B)**



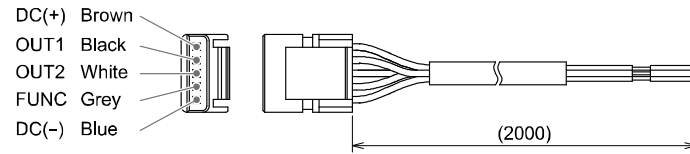
• **Panel mount adapter + Front protective cover (Part No: ZS-46-D)**



6 Outline Dimensions (mm) - continued



• **Lead wire with connector (Part No: ZS-46-5L)**



Conductor area	0.15 mm ² (AWG26)	
Insulator	Outside diameter	1.0 mm
	Colour	Brown, Blue, Black, White, Grey (5 core)
Sheath	Finished outside diameter	φ3.5

• **Sensor connector (Part No: ZS-28-C-1)**

Pin No.	Description
1	DC(+)
2	N.C.
3	DC(-)
4	IN *

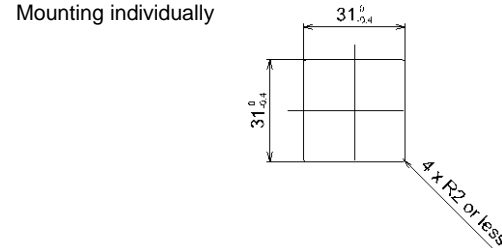
*: 1 to 5 V or 4 to 20 mA

• **Sensor connector (Part No: ZS-28-CA-4)**

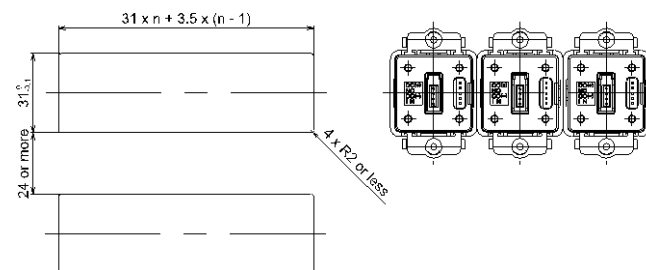
Pin No.	Description
1	DC(+)
2	N.C.
3	DC(-)
4	IN *

*: 1 to 5 V or 4 to 20 mA

• **Panel cut-out dimensions**
Mounting individually

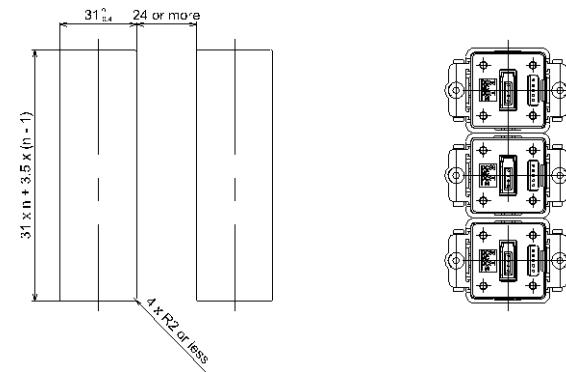


More than 2 pcs. (n pcs.) Close mounting
<Horizontal>



6 Outline Dimensions (mm) - continued

<Vertical>



7 Maintenance

7.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous. Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.

- Do not disassemble the product, unless required by installation or maintenance instructions.

8 Limitations of Use

8.1 Limited warranty and Disclaimer/Compliance Requirements

• **The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.**

• **Limited warranty and Disclaimer**

- 1) The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first ⁽¹⁾. Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
- 2) For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
- 3) Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

⁽¹⁾ Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

• **Compliance Requirements**

- 1) The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- 2) The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a

8 Limitations of Use - continued

SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

- **SMC products are not intended for use as instruments for legal metrology.** Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

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