

# 3-Colour Display Digital Flow Switch for Large Flow

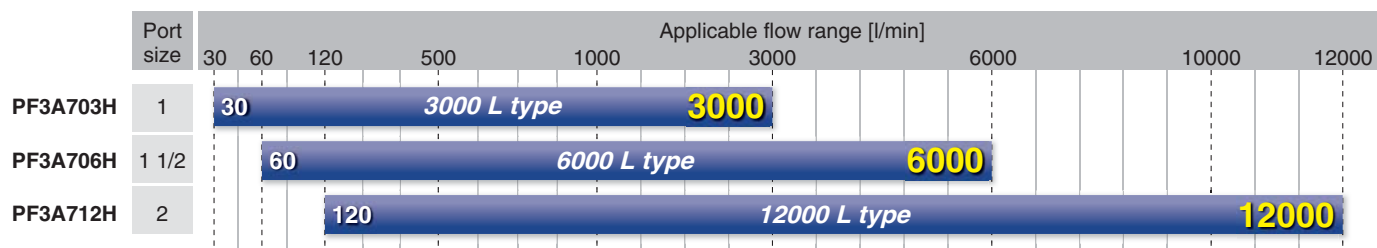
CE RoHS  
IP65

Applicable fluid Air, N<sub>2</sub>

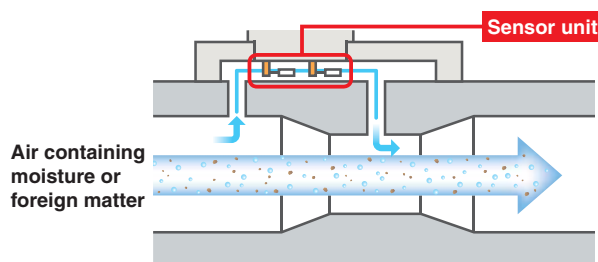
Flow range: Max. **12000 l/min**

Flow ratio<sup>\*1</sup> **100:1** Wide range of flow measurement with one product

<sup>\*1</sup> The flow ratio is 20 : 1 for the current model (PF2A7□H/Large flow type).



Improved drainage and resistance to foreign matter



Bypass construction reduces the moist air or foreign matter in contact with the sensor, reducing the accuracy deterioration and damage of the sensor.

Pressure loss: **75 % reduction**<sup>\*1</sup>  
(20 kPa → 5 kPa)

<sup>\*1</sup> Compared with the current model (PF2A7□H/Large flow type).

Through bore construction

Reduced pressure loss  
Maintenance-free fluid passage



New

3-Screen Display Digital Flow Monitor

Allows for the monitoring of remote lines



PFG300 Series p. 14

**PF3A7□H Series**

SVC

CAT.EUS100-117B-UK

## 3-Colour/ 2-screen display

\* 2-screen display: 2-row display of main screen and sub screen

Upper Main display: **Green** At set point

Set value **Orange** Instantaneous flow rate **Green** **Red**  
(Lower Sub display) (Upper Main display)



Upper Main display: **Red** At set point



The lower/sub display can be changed by pressing the up/down buttons.

■ Accumulated value



■ Peak/Bottom value



■ Line name



\* Either "Input of line name" or "Display OFF" can be added via the function settings.

## Smallest settable increment: **2 l/min**

Current model (PF2A7□H/Large flow type): 5 l/min

## Grease-free

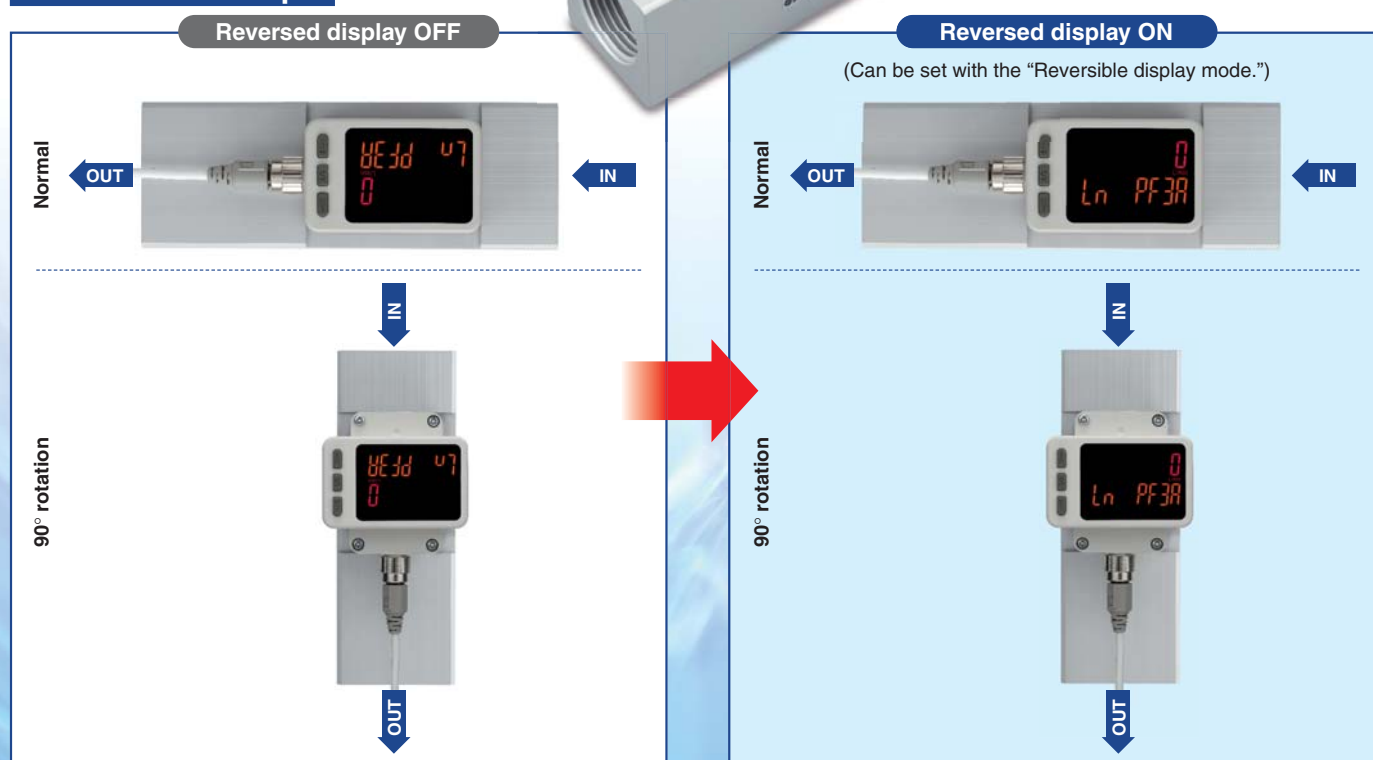
## Display rotates 90° and can be reversed.

The display can be rotated in increments of 90° according to the installation. The display can be reversed for easy operation.

**Clockwise 90°** Easy operation, improved visibility



### Installation Example

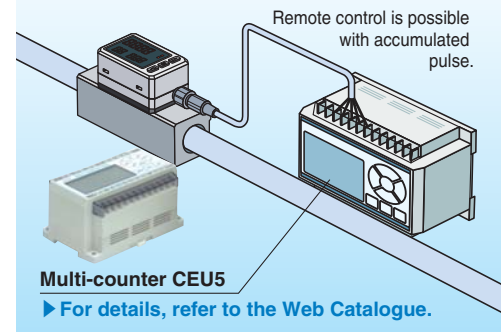


## Functions (Refer to pages 20 and 21 for details.)

- Output operation
- Simple setting mode
- Display colour
- Reference condition
- Response time
- FUNC output switching function (Analogue output ⇔ External input)
- Selectable Analogue output function
- External input function
- Forced output function
- Accumulated value hold
- Peak/Bottom value display
- Display OFF mode
- Setting of security code
- Keylock function
- Reset to the default settings
- Reversible display mode
- Zero cut function
- Selection of display on sub screen
- Analogue output free range function
- Error display function

## Application

### Flow control of equipment, main line, and branch line



## Digital flow switch to save energy!

Flow control is necessary for promoting energy saving in any application. Saving energy starts from numerical control of the flow consumption of equipment and lines and clarification of the purpose and effect.

- Digital display allows **visualisation**.
- **3-Colour/2-screen display**, Improved visibility
- **Remote control** is possible with accumulated pulse.



### Energy Saving Program

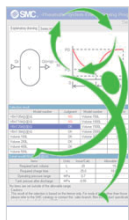
For details, refer to the SMC website.

<http://www.smcworld.com> SMC Model Selection Software Search

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Energy Saving Software

Are you ready to start reducing your costs?



Our Energy Saving Software aims to create awareness of the energy consumption of your pneumatic equipment and to encourage optimisation of its air consumption so you can begin cutting your costs while reducing CO2 emissions.

It's been specifically developed to provide a basic understanding of air parameters such as air consumption, flow rate, pressure and humidity.

This software includes:

- 20 mathematical ways to calculate both air and energy savings using six SMC model options.
- Develop pneumatic line (circuit piping) performance calculations including compressed air tank fill and discharge (pressure response).

[How to proceed](#) [System requirements](#)

Extract the downloaded file into the temporary folder of your choice and run "setup.exe". You may delete the temporary folder after the installation is completed.

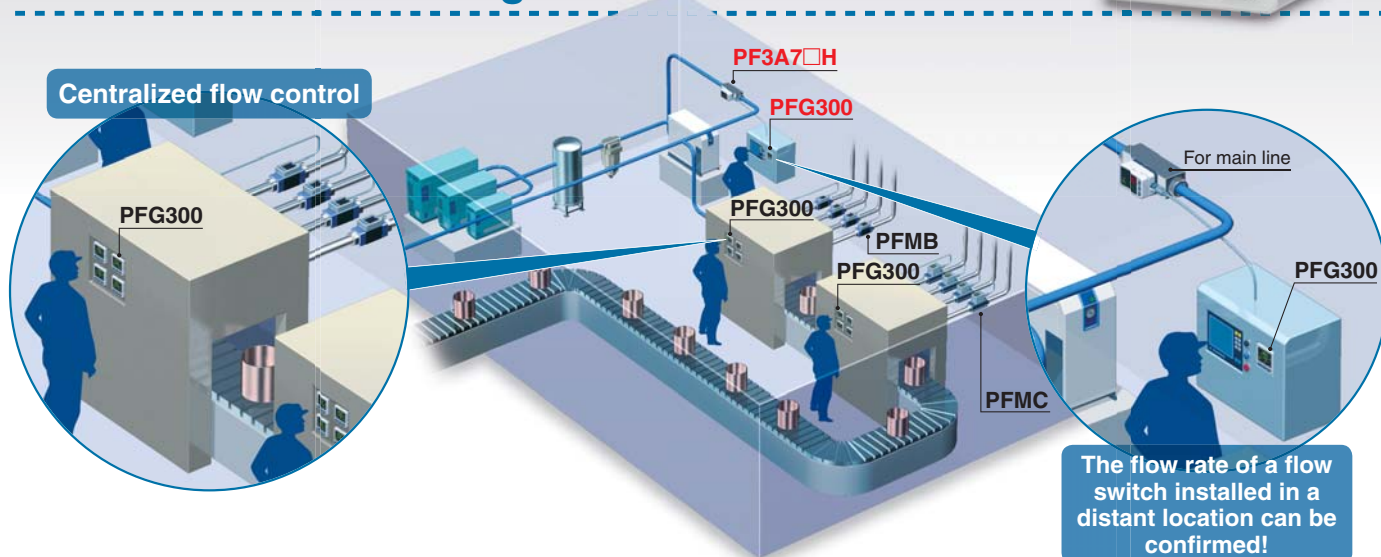


# 3-Screen Display Digital Flow Monitor

## PFG300 Series p. 14

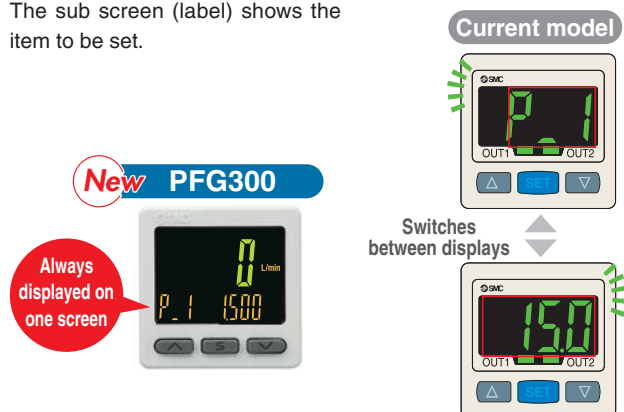


## Allows for the Monitoring of Remote Lines



## Visualisation of Settings

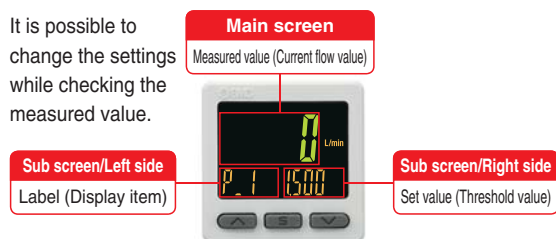
The sub screen (label) shows the item to be set.



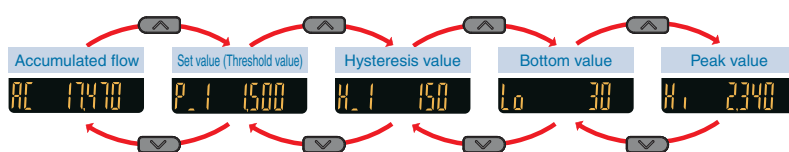
Mode Examples	Hysteresis mode					
	Normal output	Set value (Threshold value)	Reversed output	Set value (Threshold value)	Hysteresis	Set hysteresis value
	P.L	1500	n.L	1500	H.L	150
	Window comparator mode					
	Normal output Lo side	Set value (Threshold value)	Normal output Hi side	Set value (Threshold value)		
	P.L	900	P.H	1800		
	Reversed output Lo side	Set value (Threshold value)	Reversed output Hi side	Set value (Threshold value)		
	n.L	900	n.H	1800		

## Easy Screen Switching

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



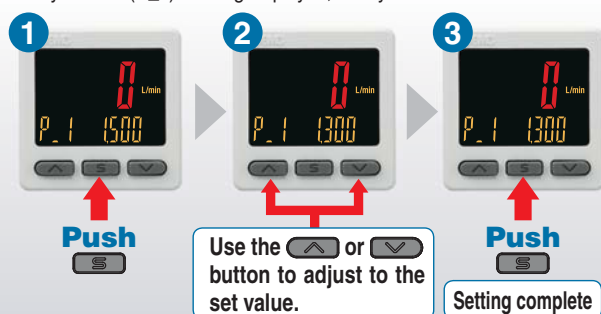
The sub screen can be switched by pressing the up/down buttons.



\* Either "Input of line name" or "Display OFF" can be added via the function settings.

## Simple 3-Step Setting

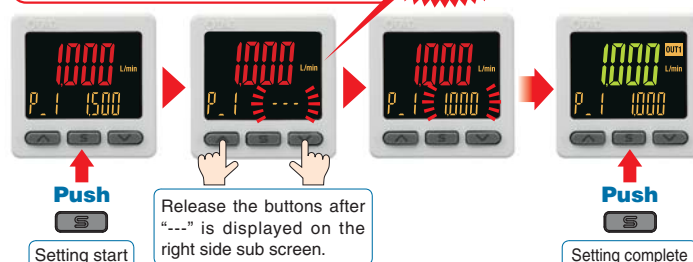
When the S button is pressed and the set value (P\_1) is being displayed, the set value (threshold value) can be set. When the S button is pressed and the hysteresis (H\_1) is being displayed, the hysteresis value can be set.



### With a snap shot function for set value reading

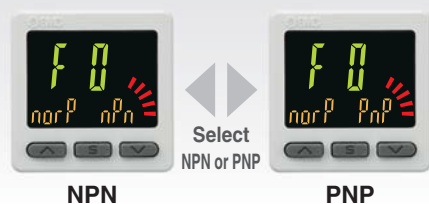
Pressing the and buttons simultaneously for a minimum of 1 second will make the set value (threshold value) the same as the current flow value.

**Snap shot function**



## NPN/PNP Switch Function

The number of stock items can be reduced.



## Analogue output of 0 to 10 V is also available.

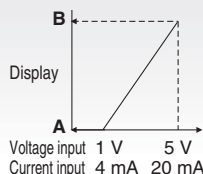
Voltage output	1 to 5 V	Switchable
	0 to 10 V	
Current output	4 to 20 mA	Fixed

## Input Range Selection (for Pressure/Flow rate)

The displayed value to the sensor input can be set as required.

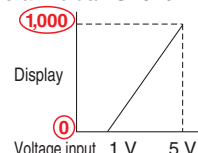
(Voltage input: 1 to 5 V/Current input: 4 to 20 mA)

Pressure switch/Flow switch can be displayed.



A is displayed for 1 V (or 4 mA).  
B is displayed for 5 V (or 20 mA).  
The range can be set as required.

■ Pressure Sensor for General Fluids/PSE570



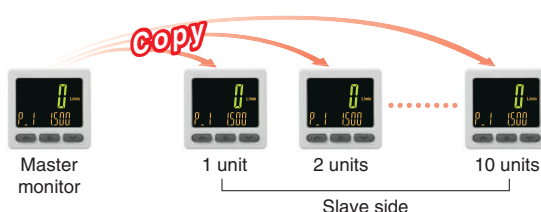
	A	B
PSE570	0	1,000
PSE573	-100	100
PSE574	0	500

Set A and B to the values shown in the table above.

## Convenient Functions

### ● Copy function

The settings of the master monitor can be copied to the slave monitors.



### ● Security code

The key locking function keeps unauthorized persons from tampering with the settings.

### ● Power saving mode

Power consumption is reduced by turning off the monitor.

Current consumption*1	Reduction rate*2
25 mA or less	Approx. 50 % reduction

\*1 During normal operation \*2 In power saving mode

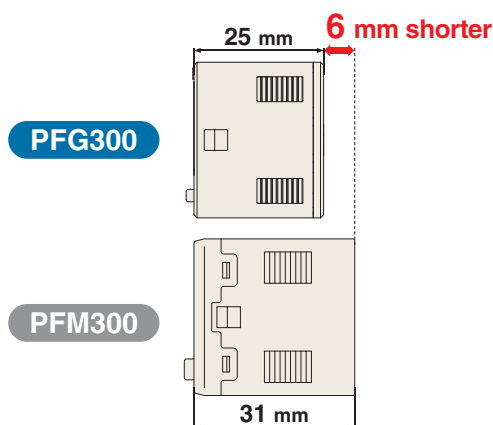
### ● External input function

The accumulated value, peak value, and bottom value can be reset remotely.

## Compact & Lightweight

### ● Compact: Max. 6 mm shorter

### ● Lightweight: Max. 5 g lighter (30 g → 25 g)



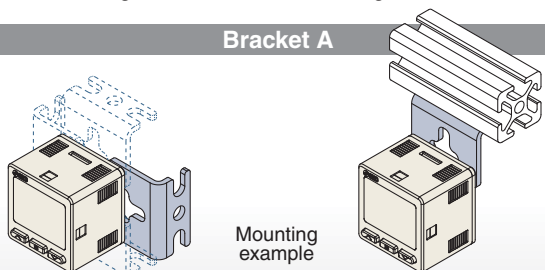
## Functions (▶ Refer to pages 22 to 24 for details.)

- Output operation
- Simple setting mode
- Display colour
- Delay time setting
- Digital filter setting
- FUNC output switching function
- Selectable analogue output function
- External input function
- Forced output function
- Accumulated value hold
- Peak/Bottom value display
- Setting of security code
- Keylock function
- Reset to the default settings
- Display with zero cut-off setting
- Selection of display on sub screen
- Analogue output free range function
- Error display function
- Copy function
- Selection of power saving mode

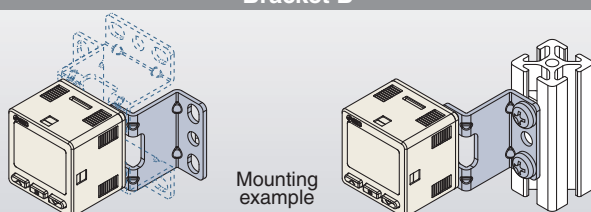
## Mounting

The bracket configuration allows for mounting in four orientations.

### Bracket A



### Bracket B

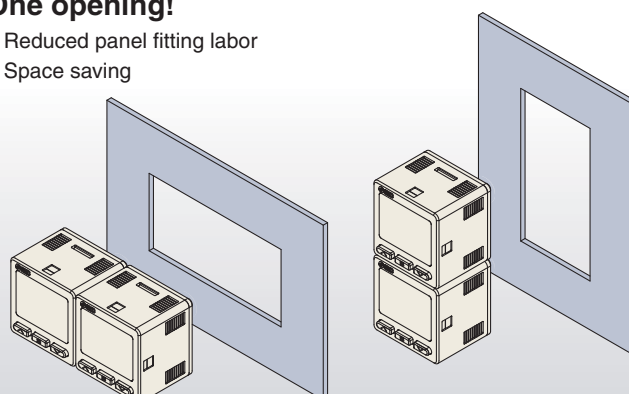


### Panel mount









Mountable side by side both vertically and horizontally


### One opening!

- Reduced panel fitting labor
- Space saving








# Flow Switch Flow Rate Variations

Series		Applicable fluid	Detection method	Smallest settable increment	Rated flow range [l/min]																	
Availability of the digital flow monitor PFG300					0.2	0.5	1	2	5	10	20	25	50	100	150	200	300	500	600	1000	2000	3000
	—	Air N <sub>2</sub>	Thermal type (Thermistor)	0.1 l/min	110																	
				0.5 l/min	550																	
				1 l/min	10100																	
				2 l/min	20200																	
				5 l/min	50500																	
		Air N <sub>2</sub>	Thermal type (Platinum sensor)	2 l/min	303000																	
				5 l/min	606000																	
				Bypass flow type	10 l/min	12012000																
	—	Dry air N <sub>2</sub> Ar CO <sub>2</sub>	Thermal type (MEMS)	0.01 l/min	10																	
				0.5	25																	
				0.1 l/min	150																	
				2	100																	
		Dry air N <sub>2</sub>	Thermal type (MEMS)	2	200																	
				5	500																	
				1 l/min	1000																	
				Bypass flow type	20	2000																
		Dry air N <sub>2</sub>	Thermal type (MEMS)	5	500																	
				1 l/min	1000																	
				Bypass flow type	20	2000																

Series	Applicable fluid	Detection method	Rated flow range [l/min]									
			-3	-2	-1	-0.5	0	0.5	1	2	3	
PFMV		Dry air N <sub>2</sub>	Thermal type (MEMS)						0.5			
									1			
											3	
							-0.5		0.5			
						-1			1			
												3

# Flow Switch Variations / Basic Performance Table

Series	 <b>PFMV3</b>		 <b>PFG300</b>	 <b>PFG300</b>		 <b>PFG300</b>
Enclosure	IP40	IP40	IP40	IP65 [Monitor unit: IP40]	IP65	IP65 [Monitor unit: IP40]
Fluid	Dry air, N <sub>2</sub>	Dry air, N <sub>2</sub> , Ar, CO <sub>2</sub>	Dry air, N <sub>2</sub>	Dry air, N <sub>2</sub>	Air, N <sub>2</sub>	Air, N <sub>2</sub>
Setting	Digital	Digital	Digital	Digital	Digital	Digital
Rated flow range	0 to 0.5 l/min 0 to 1 l/min 0 to 3 l/min -0.5 to 0.5 l/min -1 to 1 l/min -3 to 3 l/min	0.2 to 10 l/min 0.5 to 25 l/min 1 to 50 l/min 2 to 100	2 to 200 l/min 5 to 500 l/min 10 to 1000 l/min 20 to 2000 l/min	5 to 500 l/min 10 to 1000 l/min 20 to 2000 l/min	1 to 10 l/min 5 to 50 l/min 10 to 100 l/min 20 to 200 l/min 50 to 500 l/min	30 to 3000 l/min 60 to 6000 l/min 120 to 12000 l/min
Power supply voltage	12 to 24 VDC ±10 %	24 VDC ±10 %	12 to 24 VDC ±10 %	12 to 24 VDC ±10 %	12 to 24 VDC ±10 %	24 VDC ±10 %
Temperature characteristics (25 °C standard)	±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) [Monitor unit] ±0.5 % F.S. (0 to 50 °C)	±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C)	±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) [Monitor unit] ±0.5 % F.S. (0 to 50 °C)	±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) [Monitor unit] ±0.5 % F.S. (0 to 50 °C)	±3 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C)	±5 % F.S. (0 to 50 °C) [Monitor unit] ±0.5 % F.S. (0 to 50 °C)
Repeatability	±1 % F.S. (Fluid: Dry air) Analogue output: ±5 % F.S. [Monitor unit] ±0.1 % F.S. Analogue output: ±0.5 % F.S.	±1 % F.S. (Fluid: Dry air) Analogue output: ±3 % F.S.	±1 % F.S. (Fluid: Dry air) [Monitor unit] ±0.1 % F.S.	±1 % F.S. (Fluid: Dry air) [Monitor unit] ±0.1 % F.S.	±1 % F.S. (PF2A7□0) ±2 % F.S. (PF2A7□1)	±1 % F.S. [Monitor unit] ±0.1 % F.S.
Hysteresis	Hysteresis mode: Variable Window comparator mode: Variable	Hysteresis mode: Variable Window comparator mode: Variable	Hysteresis mode: Variable Window comparator mode: Variable	Hysteresis mode: Variable Window comparator mode: Variable	Hysteresis mode: Variable Window comparator mode: Fixed (3 digits)	Hysteresis mode: Variable Window comparator mode: Variable
Output	NPN/PNP open collector Analogue voltage output Analogue current output	NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output	NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output	NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output	NPN/PNP open collector Accumulated pulse output	NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output
Display	[Monitor unit] 2-colour LCD display	2-colour LED display	2-colour LED display 2-colour LCD display [Monitor unit 3-colour LCD display]	3-colour LCD display	LED display	3-colour LCD display

\* The monitor unit shows the PFG300 and PFMV3.





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**PF3A7□H**

**PFG300**

**Function  
Details**



**3-Colour Display**

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# 3-Colour Display

## Digital Flow Switch for Large Flow

# PF3A7□H Series



RoHS



### How to Order

**PF3A 7 03 H - 10 - ES -**

**Type**

7	Integrated display
---	--------------------

**Rated flow range**

03	30 to 3000 l/min
06	60 to 6000 l/min
12	120 to 12000 l/min

**Large flow type**

**Thread type**

—	Rc
N	NPT
F*1	G

\*1 ISO 1179-1 compliant

**Port size**

Symbol	Port size	Rated flow range		
		03	06	12
10	1	●	—	—
14	1 1/2	—	●	—
20	2	—	—	●

**Calibration certificate\*7**

—	None
A*8	Yes

\*7 Certificate in both English and Japanese  
\*8 Made to order

**Unit specification**

—	Units selection function
M	SI unit only*6

\*6 Fixed unit: Instantaneous flow: l/min  
Accumulated flow: L

**Options**

—	With lead wire and M12 connector (3 m)*5
N	Without lead wire and M12 connector

\*5 Option is shipped together, but not assembled.

**Output specification**

Symbol	OUT	FUNC*2	Applicable monitor unit model
CS	NPN	Analogue voltage output*3 ⇔ External input*4	PFG300 series
DS	NPN	Analogue current output ⇔ External input*4	PFG310 series
ES	PNP	Analogue voltage output*3 ⇔ External input*4	PFG300 series
FS	PNP	Analogue current output ⇔ External input*4	PFG310 series

\*2 Analogue output or external input can be selected by pressing the buttons. Analogue output is set as default setting.  
\*3 1 to 5 V or 0 to 1.0 V can be selected by pressing the button. The default setting is 1 to 5 V.  
\*4 The accumulated value, peak value, and bottom value can be reset.

### Option/Part No.

When only optional parts are required, order with the part number listed below.

Part no.	Option	Note
ZS-37-A	Lead wire and M12 connector	Length: 3 m

# 3-Colour Display

## Digital Flow Switch for Large Flow **PF3A7□H Series**

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

### Specifications

Model		PF3A703H	PF3A706H	PF3A712H	
Fluid	Applicable fluid*1		Air, Nitrogen		
	Fluid temperature		0 to 50 °C		
Flow	Detection method		Thermal type		
	Rated flow range		30 to 3000 l/min	60 to 6000 l/min 120 to 12000 l/min	
	Set point range*2	Instantaneous flow	30 to 3150 l/min	60 to 6300 l/min 120 to 12600 l/min	
		Accumulated flow	0 to 999,999,999,990 L	0 to 999,999,999,900 L	
	Smallest settable increment	Instantaneous flow	2 l/min	5 l/min	10 l/min
		Accumulated flow	10 L	100 L	
	Accumulated volume per pulse (Pulse width = 50 ms)		Select from 100 L/pulse or 1000 L/pulse.		
	Accumulated value hold function*3		Interval of 2 or 5 minutes can be selected.		
Pressure	Rated pressure range		0.1 to 1.5 MPa		
	Proof pressure		2.25 MPa		
	Pressure loss		Refer to "Pressure Loss" graph.		
	Pressure characteristics*4		±2.5 % F.S. (0.1 to 1.0 MPa, 0.5 MPa standard)		
Electrical	Power supply voltage		24 VDC ±10 %		
	Current consumption		150 mA or less		
	Protection		Polarity protection		
Accuracy	Display accuracy		±3.0 % F.S.		
	Analogue output accuracy		±3.0 % F.S.		
	Repeatability		Switch output/Display: ±1.0 % F.S. Analogue output: ±1.0 % F.S.		
	Temperature characteristics		±5.0 % F.S. (Ambient temperature of 0 to 50 °C, 25 °C standard)		
Switch output	Output type		NPN open collector PNP open collector		
	Output mode		Select from Instantaneous output (Hysteresis mode or Window comparator mode), Accumulated output, or Accumulated pulse output.		
	Switch operation		Select from Normal or Reversed output.		
	Max. load current		80 mA		
	Max. applied voltage (NPN only)		28 VDC		
	Internal voltage drop (Residual voltage)		NPN output type: 1 V or less (at load current of 80 mA) PNP output type: 2 V or less (at load current of 80 mA)		
	Response time*5		Select from 1 s, 2 s, or 5 s.		
	Hysteresis*6		Variable from 0		
Analogue output*7	Protection		Over current protection		
	Output type		Voltage output: 1 to 5 V (0 to 10 V can be selected*8), Current output: 4 to 20 mA		
	Impedance	Voltage output	Output impedance: Approx. 1 kΩ		
		Current output	Maximum load impedance: Approx. 600 Ω		
External input*10	Response time*9		Linked with the response time of the switch output.		
	Input type		No-voltage input: 0.4 V or less		
	Input mode		Select from Accumulated value external reset or Peak/Bottom value reset.		
	Input time		30 ms or longer		
Display	Reference condition*11		Select from Standard condition or Normal condition.		
	Unit*12	Instantaneous flow	l/min, CFM (ft³/min)		
		Accumulated flow	L, ft³		
	Display range*13	Instantaneous flow	0 to 3150 l/min (Flow under 30 l/min is displayed as "0")	0 to 6300 l/min (Flow under 60 l/min is displayed as "0")	0 to 12600 l/min (Flow under 120 l/min is displayed as "0")
		Accumulated flow*14	0 to 999,999,999,990 L 0 to 999,999,999,900 L		
	Minimum display unit	Instantaneous flow	2 l/min	5 l/min	10 l/min
		Accumulated flow	10 L	100 L	
	Display		LCD, 2-screen display (Main screen/Sub screen) Main screen: Red/Green, Sub screen: Orange Main screen: 5 digits, 7 segment, Sub screen: 6 digits, 7 segment		
Indicator LED		OUT indicator: Red LED is ON when output is ON			
Environment	Enclosure		IP65		
	Withstand voltage		1000 VAC for 1 minute between terminals and housing		
	Insulation resistance		50 MΩ (500 VDC measured via megohmmeter) between terminals and housing		
	Operating temperature range		Operating: 0 to 50 °C, Stored: -10 to 60 °C (No freezing or condensation)		
Operating humidity range		Operating/Stored: 35 to 85 % RH (No condensation)			
Standards		CE, RoHS			
Piping	Piping specification		Rc1, NPT1, G1	Rc1 1/2, NPT1 1/2, G1 1/2	Rc2, NPT2, G2
Main materials of parts in contact with fluid		Aluminum alloy, PPS, HNBR [Sensor: Pt, Au, Fe, Lead glass (exempted from the RoHS application), Al2O3]			
Length of lead wire with connector		3 m			
Weight	Piping specification	Rc	610 g	1190 g	1680 g
		NPT	610 g	1190 g	1680 g
		G	630 g	1220 g	1720 g
	Lead wire with connector		+90 g		

- <sup>\*1</sup> Air quality grade is JIS B 8392-1:2012 [3:6:-] and ISO 8573-1:2010 [3:6:-].
- <sup>\*2</sup> Set point range will change according to the setting of the zero cut function.
- <sup>\*3</sup> When using the accumulated value hold function, use the operating conditions to calculate the product life, and do not exceed it. The maximum update limit of the memory device is 1.5 million times. If the product is operated 24 hours per day, the product life will be as follows:  
 · 5 min interval: life is calculated as 5 min x 1.5 million = 7.5 million min = 14.3 years  
 · 2 min interval: life is calculated as 2 min x 1.5 million = 3 million min = 5.7 years  
 If the accumulated flow external reset is repeatedly used, the product life will be shorter than calculated life.
- <sup>\*4</sup> When the pressure range is 1.0 to 1.5 MPa, the pressure characteristics will be ±5 % F.S. (standard pressure is 0.5 MPa). Do not release the OUT side piping port of the product to the atmosphere without connecting piping. If the product is used with the piping port released to atmosphere, accuracy may vary.
- <sup>\*5</sup> The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum value of the rated flow range instantaneously) until the switch output turns ON (or OFF) when set to be 90 % of the rated flow rate.

- <sup>\*6</sup> If the flow fluctuates around the set value, the width for setting more than the fluctuating width needs to be set. Otherwise, chattering will occur.
- <sup>\*7</sup> Analogue output or external input can be selected by pressing the buttons. Refer to the graph for analogue output.
- <sup>\*8</sup> When selecting 0 to 10 V, refer to the analogue output graph for the allowable load current.
- <sup>\*9</sup> The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum value of the rated flow range instantaneously) until the analogue output reaches 90 % of the rated flow rate.
- <sup>\*10</sup> Analogue output or external input can be selected by pressing the buttons.
- <sup>\*11</sup> The flow rate given in the specification is the value under standard conditions.
- <sup>\*12</sup> Setting is only possible for models with the units selection function.
- <sup>\*13</sup> Display range will change according to the setting of the zero cut function.
- <sup>\*14</sup> The accumulated flow display is the upper 6-digit and lower 6-digit (total of 12 digits) display. When the upper digits are displayed, x 10<sup>6</sup> lights up.
- \* Products with tiny scratches, marks, or display colour or brightness variations which do not affect the performance of the product are verified as conforming products.

## Flow Range

Model	Flow range				
	0 l/min	1000 l/min	3000 l/min	6000 l/min	12000 l/min
PF3A703H	30 l/min	3000 l/min			
	30 l/min	3150 l/min			
	0 l/min	3150 l/min			
PF3A706H	60 l/min	6000 l/min			
	60 l/min	6300 l/min			
	0 l/min	6300 l/min			
PF3A712H	120 l/min	12000 l/min			
	120 l/min	12600 l/min			
	0 l/min	12600 l/min			

Rated flow range
  Set point range
  Display range

## Analogue Output

### Flow/Analogue Output

	0 l/min	A*2	B
Voltage output (1 to 5 V)*1	1 V	1.04 V	5 V
Current output*1	4 mA	4.16 mA	20 mA

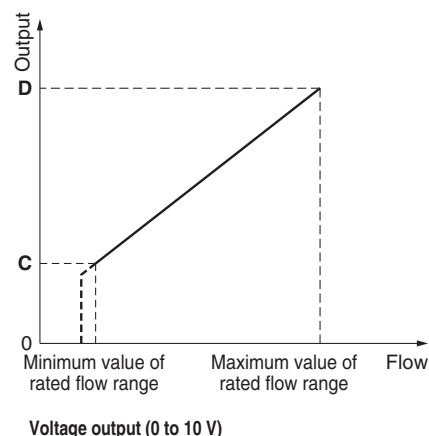
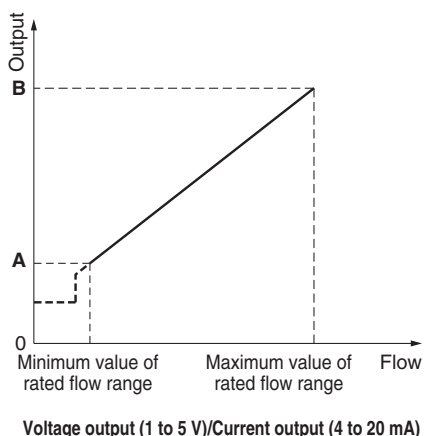
  

	0 l/min	C*2	D
Voltage output (0 to 10 V)*1*3	0 V	0.1 V	10 V

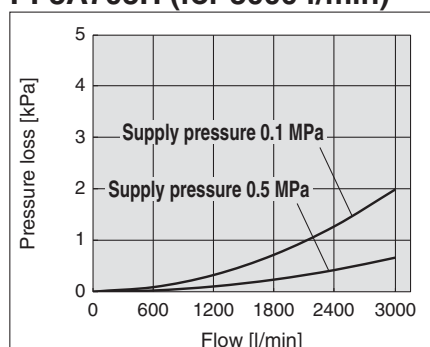
Model	Minimum value of rated flow range*4	Maximum value of rated flow range
PF3A703H	30 l/min	3000 l/min
PF3A706H	60 l/min	6000 l/min
PF3A712H	120 l/min	12000 l/min

- \*1 Analogue output accuracy is within  $\pm 3\%$  F.S.
- \*2 A and C will change according to the setting of the zero cut function.
- \*3 The analogue output current from the connected equipment should be 20  $\mu$ A or less when selecting 0 to 10 V. When more than 20  $\mu$ A current flows, it is possible that the accuracy is not satisfied below 0.5 V.
- \*4 The minimum value of the rated flow range will change according to the setting of the zero cut function.

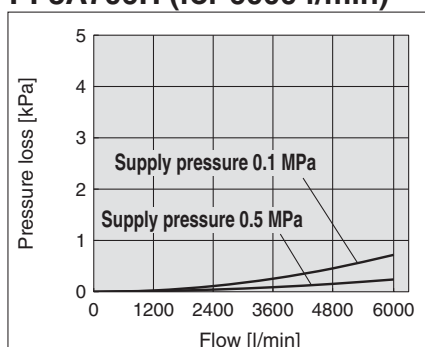


## Pressure Loss (Reference Data)

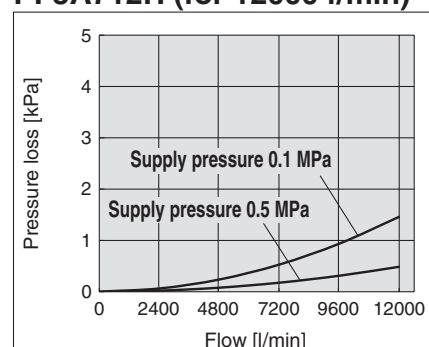
### PF3A703H (for 3000 l/min)



### PF3A706H (for 6000 l/min)

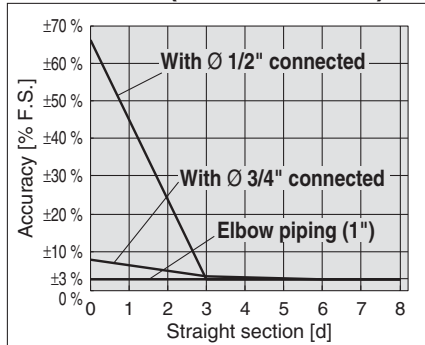


### PF3A712H (for 12000 l/min)

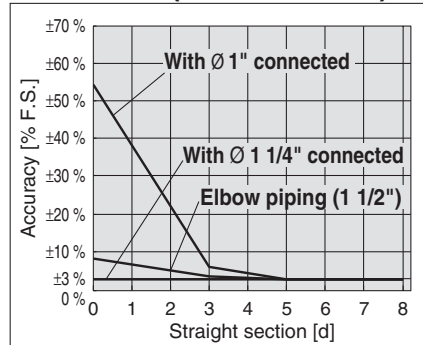


## IN Side Straight Section and Accuracy (Reference Data)

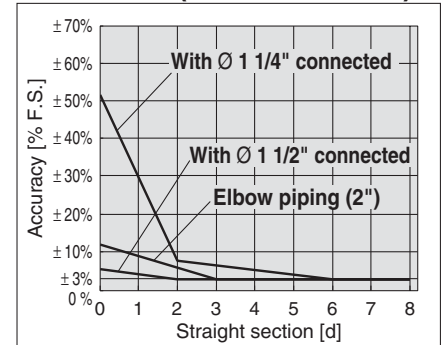
**PF3A703H (for 3000 l/min)**



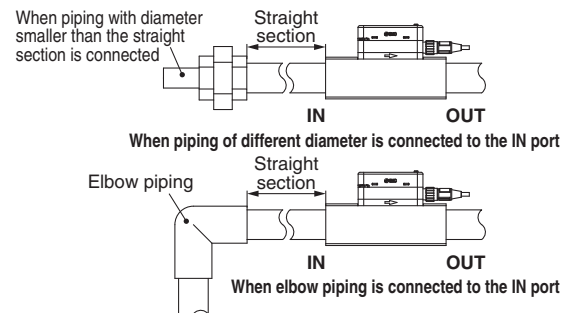
**PF3A706H (for 6000 l/min)**



**PF3A712H (for 12000 l/min)**



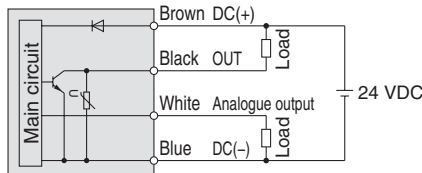
- Do not connect equipment or piping which may generate a fluctuation in the flow or drift at the IN side of the product. When installing a regulator at the IN side of the product, make sure that hunting is not generated.
  - The piping on the IN side must have a straight section of piping whose length is more than 8 times the piping I.D.
- If a straight section of piping is not installed, the accuracy may vary by  $\pm 3\%$  F.S. or more.
- \* "Straight section" means a section of piping without any bends or rapid changes in the cross sectional area.



## Internal Circuits and Wiring Examples

### NPN + Analogue output selected

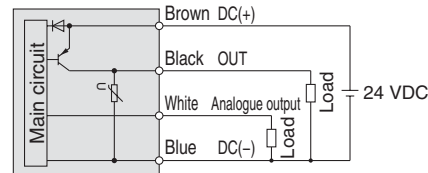
PF3A7□□H-□□-CS/DS-□□



Max. applied voltage: 28 V, Max. load current: 80 mA, Internal voltage drop: 1 V or less  
CS: Analogue output: 1 to 5 V or 0 to 10 V  
Output impedance: 1 k $\Omega$   
DS: Analogue output: 4 to 20 mA  
Max. load impedance: 600  $\Omega$   
Min. load impedance: 50  $\Omega$

### PNP + Analogue output selected

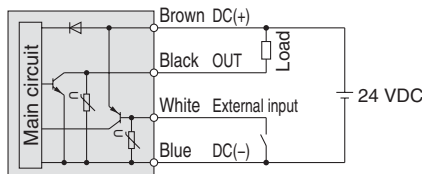
PF3A7□□H-□□-ES/FS-□□



Max. load current: 80 mA, Internal voltage drop: 2 V or less  
ES: Analogue output: 1 to 5 V or 0 to 10 V  
Output impedance: 1 k $\Omega$   
FS: Analogue output: 4 to 20 mA  
Max. load impedance: 600  $\Omega$   
Min. load impedance: 50  $\Omega$

### NPN + External input selected

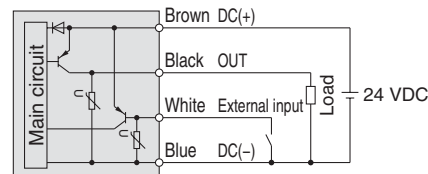
PF3A7□□H-□□-CS/DS-□□



Max. applied voltage: 28 V, Max. load current: 80 mA, Internal voltage drop: 1 V or less  
External input: Input voltage 0.4 V or less (Reed or Solid state input) for 30 ms or longer

### PNP + External input selected

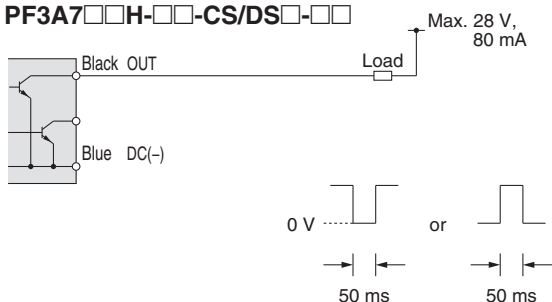
PF3A7□□H-□□-ES/FS-□□



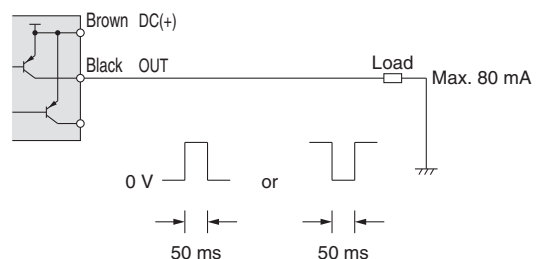
Max. load current: 80 mA, Internal voltage drop: 2 V or less  
External input: Input voltage 0.4 V or less (Reed or Solid state input) for 30 ms or longer

## Accumulated pulse output wiring examples

PF3A7□□H-□□-CS/DS-□□



PF3A7□□H-□□-ES/FS-□□

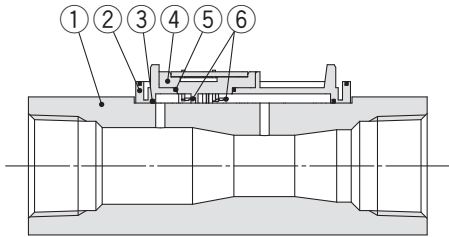




# PF3A7□H Series

## Construction: Parts in Contact with Fluid

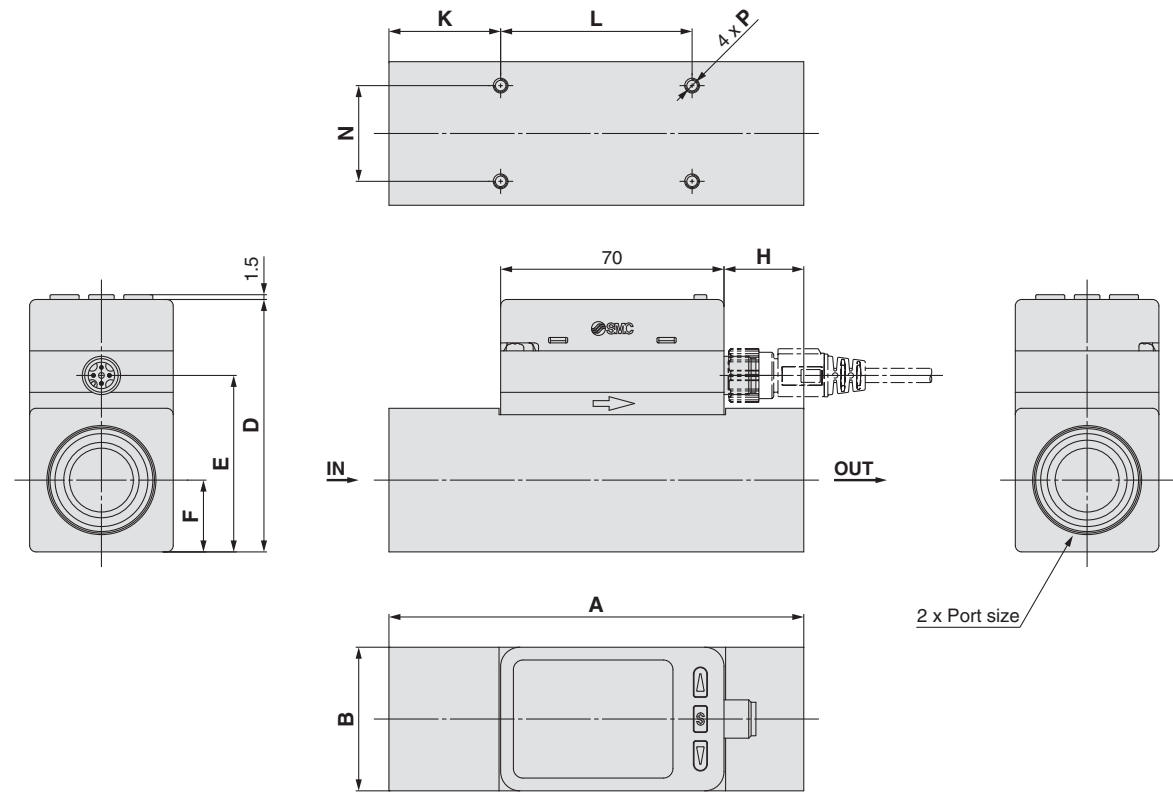
PF3A703H/706H/712H



### Component Parts

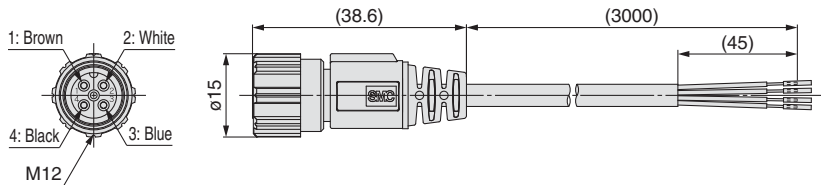
No.	Description	Material	Note
1	Body	Aluminium alloy	Anodised
2	Branch passage	PPS	—
3	Gasket	HNBR	—
4	Sensor base	PPS	—
5	Gasket	HNBR	—
6	Sensor	Au, Pt, Al <sub>2</sub> O <sub>3</sub>	—

## Dimensions



Model	Symbol	Port size	A	B	D	E	F	H	K	L	N	P
PF3A703H		Rc1, NPT1, G1	130	45	79.1	55.3	22.5	25	35	60	30	M4 x 0.7 depth 7
PF3A706H		Rc1 1/2, NPT1 1/2, G1 1/2	170	60	94.1	70.3	30	68	45	80	40	M5 x 0.8 depth 8
PF3A712H		Rc2, NPT2, G2	200	70	104.1	80.3	35	85	50	100	50	M6 x 1.0 depth 9

## Lead wire and M12 connector (Part no.: ZS-37-A)



Pin no.	Pin name	Wire colour
1	DC(+)	Brown
2	FUNC	White
3	DC(-)	Blue
4	OUT	Black

\* 4-wire type lead wire and M12 connector used for the PF3A series.

### Cable Specifications

Conductor	Nominal cross section	AWG23
Insulator	Outside diameter	Approx. 1.1 mm
	Colour	Brown, Blue, Black, White
Sheath	Finished outside diameter	Ø 4

# 3-Screen Display

# Digital Flow Monitor

# PFG300 Series



RoHS

PF3A7□H

PFG300

Function  
Details

## How to Order



**PFG 3 0 0 - RT - M - L**

### Type

**3** Remote type monitor unit

### Input specification

Symbol	Description	Applicable flow switch model
<b>0</b>	Voltage input	PF3A7□H-CS/ES series
<b>1</b>	Current input	PF3A7□H-DS/FS series

### Output specification

<b>RT</b>	2 outputs (NPN/PNP switching type) + Analogue voltage output*1, 2
<b>SV</b>	2 outputs (NPN/PNP switching type) + Analogue current output*2
<b>XY</b>	2 outputs (NPN/PNP switching type) + Copy function

\*1 Can switch between 1 to 5 V and 0 to 10 V

\*2 Can be switched to external input or copy function

### Unit specification

—	Units selection function
<b>M</b>	SI unit only*3

\*3 Fixed unit: Instantaneous flow: l/min  
Accumulated flow: L

### Option 4

	Operation manual	Calibration certificate
—	○	—
<b>Y</b>	—	—
<b>K</b>	○	○
<b>T</b>	—	○

### Option 3

—	None
<b>C</b>	ZS-28-CA-4  Sensor connector

### Option 1

Symbol	Description
—	Without lead wire
<b>L</b>	Power supply/output connection lead wire (Lead wire length: 2 m)  ZS-46-5L  Power supply/output connection lead wire

### Option 2

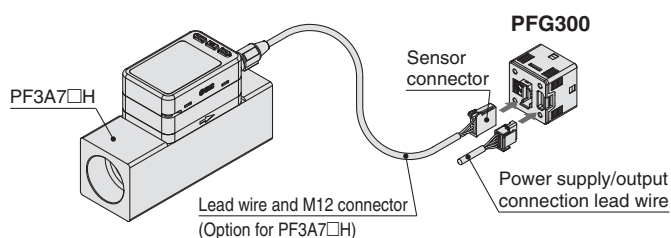
Symbol	Description
—	None
<b>A1</b>	Bracket A (Vertical mounting)  ZS-46-A1
<b>A2</b>	Bracket B (Horizontal mounting)  ZS-46-A2
<b>B</b>	Panel mount adapter  ZS-46-B
<b>D</b>	Panel mount adapter + Front protection cover  ZS-46-D

## Options/Part Nos.

When only optional parts are required, order with the part numbers listed below.

Part no.	Option	Note
<b>ZS-28-CA-4</b>	Sensor connector	For PF3A7□H
<b>ZS-46-A1</b>	Bracket A	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
<b>ZS-46-A2</b>	Bracket B	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
<b>ZS-46-B</b>	Panel mount adapter	
<b>ZS-46-D</b>	Panel mount adapter + Front protection cover	
<b>ZS-46-5L</b>	Power supply/output connection lead wire	5-core, 2 m
<b>ZS-27-01</b>	Front protection cover	

## Connection Example



# PFG300 Series

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

## Specifications

Model			PFG300 series		
Applicable SMC flow switch	Model		PF3A703H	PF3A706H	PF3A712H
	Rated flow range*1		30 to 3000 l/min	60 to 6000 l/min	120 to 12000 l/min
Flow	Set point range	Instantaneous flow	-150 to 3150 l/min	-300 to 6300 l/min	-600 to 12600 l/min
		Accumulated flow	0 to 999,999,999,990 L	0 to 999,999,999,900 L	
	Smallest settable increment	Instantaneous flow	2 l/min	5 l/min	10 l/min
		Accumulated flow	10 L	100 L	
	Accumulated volume per pulse (Pulse width = 50 ms)	10 L/pulse		100 L/pulse	
	Accumulated value hold function*3		Intervals of 2 or 5 minutes can be selected. The stored accumulated flow is held even when the power supply is OFF.		
Electrical	Power supply voltage		12 to 24 VDC ±10 % (24 VDC when the PF3A7□H is connected)		
	Current consumption		25 mA or less		
	Protection		Polarity protection		
Accuracy	Display accuracy		±0.5 % F.S. ± Minimum display unit (Ambient temperature of 25 °C)		
	Analogue output accuracy		±0.5 % F.S. (Ambient temperature of 25 °C)		
	Repeatability		±0.1 % F.S. ± Minimum display unit		
	Temperature characteristics		±0.5 % F.S. (Ambient temperature: 0 to 50 °C, 25 °C standard)		
Switch output	Output type		Select from NPN or PNP open collector output.		
	Output mode		Select from Hysteresis, Window comparator, Accumulated output, Accumulated pulse output, Error output, or Switch output OFF modes.		
	Switch operation		Select from Normal or Reversed output.		
	Max. load current		80 mA		
	Max. applied voltage (NPN only)		30 VDC		
	Internal voltage drop (Residual voltage)		NPN output: 1 V or less (at load current of 80 mA), PNP output: 1.5 V or less (at load current of 80 mA)		
	Response time*2		3 ms or less		
	Delay time*2		Select from 0.00, 0.05 to 0.1 s (increment of 0.01 s), 0.1 to 1.0 s (increment of 0.1 s), 1 to 10 s (increment of 1 s), 20 s, 30 s, 40 s, 50 s, or 60 s.		
	Hysteresis*4		Variable from 0		
	Protection		Short circuit protection		
Analogue output*5	Output type		Voltage output: 1 to 5 V, 0 to 10 V (only when the power supply voltage is 24 VDC) Current output: 4 to 20 mA (0 l/min to maximum value of the rated flow)		
	Impedance	Voltage output	Output impedance: 1 kΩ		
		Current output	Maximum load impedance: 300 Ω (at power supply voltage of 12 V), 600 Ω (at power supply voltage of 24 VDC)		
	Response time*2		50 ms or less		
External input*6	External input		Input voltage: 0.4 V or less (Reed or Solid state) for 30 ms or longer		
	Input mode		Select from Accumulated value external reset or Peak/Bottom value reset.		
Sensor input	Input type		Voltage input: 1 to 5 VDC (Input impedance: 1 MΩ), Current input: 4 to 20 mA DC (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 VDC)		
Display	Display mode		Select from Instantaneous flow or Accumulated flow.		
	Unit*7	Instantaneous flow	l/min, cfm (ft³/min)		
		Accumulated flow	L, ft³, L x 10⁶, ft³ x 10⁶		
	Display range	Instantaneous flow	-150 to 3150 l/min	-300 to 6300 l/min	-600 to 12600 l/min
		Accumulated flow*9	0 to 999,999,999,990 L	0 to 999,999,999,900 L	
	Minimum display unit	Instantaneous flow	2 l/min	5 l/min	10 l/min
		Accumulated flow	10 L	100 L	
	Display type		LCD		
	Number of displays		3-screen display (Main screen, Sub screen)		
	Display colour		1) Main screen: Red/Green, 2) Sub screen: Orange		
Number of display digits		1) Main screen: 5 digits (7 segments), 2) Sub screen: 9 digits (7 segments)			
Indicator LED		LED ON when switch output is ON. OUT1/2: Orange			
Digital filter*8			Select from 0.00, 0.05 to 0.1 s (increment of 0.01 s), 0.1 to 1.0 s (increment of 0.1 s), 1 to 10 s (increment of 1 s), 20 s, or 30 s.		
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: 0 to 50 °C, Stored: -10 to 60 °C (No condensation or freezing)		
	Operating humidity range		Operating/Stored: 35 to 85 % RH (No condensation or freezing)		
Standards			CE, RoHS		
Weight	Body		25 g (Excluding the power supply/output connection lead wire)		
	Lead wire with connector		+39 g		

\*1 Rated flow range of the applicable flow switch

\*2 Value without digital filter (at 0.00 s)

\*3 When using the accumulated value hold function, use the operating conditions to calculate the product life, and do not exceed it. The maximum access limit of the memory device is 1.5 million times. If the product is operated 24 hours per day, the product life will be as follows:  
 • 5 min interval: life is calculated as 5 min x 1.5 million = 7.5 million min = 14.3 years  
 • 2 min interval: life is calculated as 2 min x 1.5 million = 3 million min = 5.7 years  
 If the accumulated value external reset is repeatedly used, the product life will be shorter than the calculated life.

\*4 If the flow fluctuates around the set value, the width for setting more than the fluctuating width needs to be set. Otherwise, chattering will occur.

\*5 Setting is only possible for models with analogue output.

\*6 Setting is only possible for models with external input.

\*7 Setting is only possible for models with the units selection function.

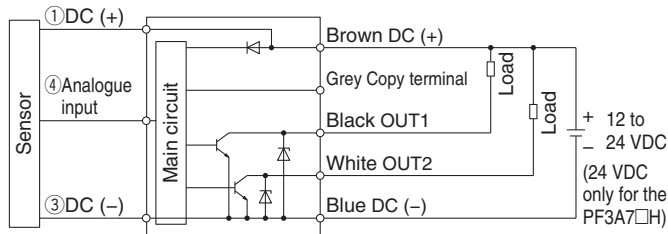
\*8 The response time indicates when the set value is 90 % in relation to the step input.

\*9 The accumulated flow display is the upper 6-digit and lower 6-digit (total of 12 digits) display. When the upper digits are displayed, x 10<sup>6</sup> lights up.

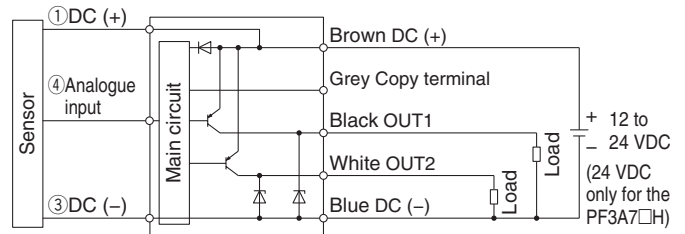
\* Products with tiny scratches, marks, or display colour or brightness variations which do not affect the performance of the product are verified as conforming products.

## Internal Circuits and Wiring Examples

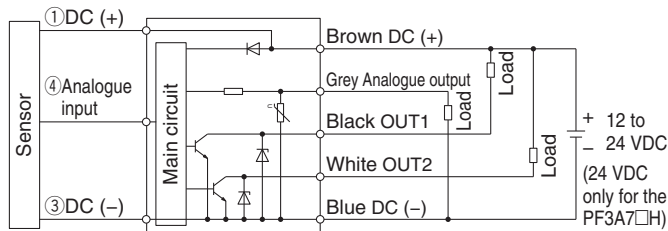
**-XY  
-RT  
-SV  
NPN (2 outputs) + Copy function**



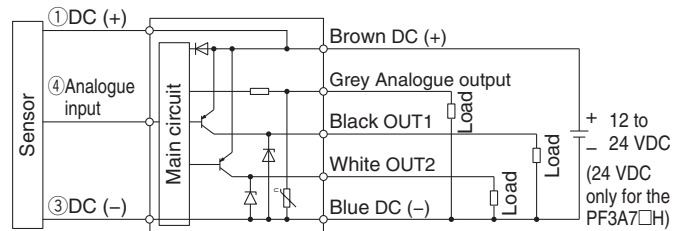
**-XY  
-RT  
-SV  
PNP (2 outputs) + Copy function**



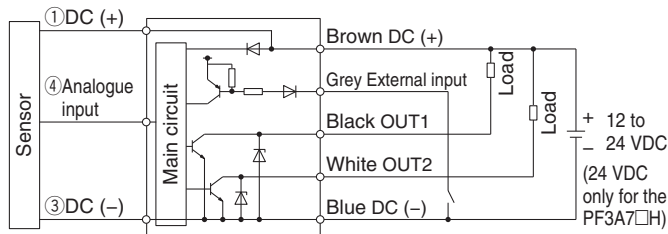
**-RT: NPN (2 outputs) + Analogue voltage output  
-SV: NPN (2 outputs) + Analogue current output**



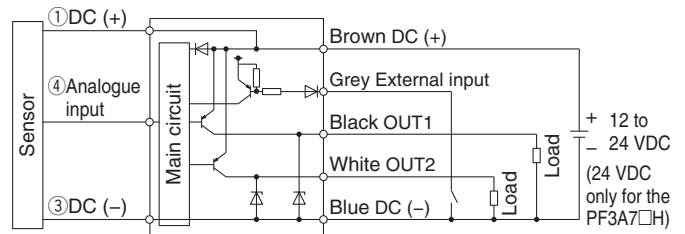
**-RT: PNP (2 outputs) + Analogue voltage output  
-SV: PNP (2 outputs) + Analogue current output**



**-RT: NPN (2 outputs) + External input  
-SV: NPN (2 outputs) + External input**

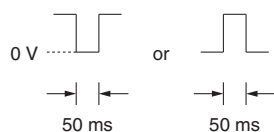
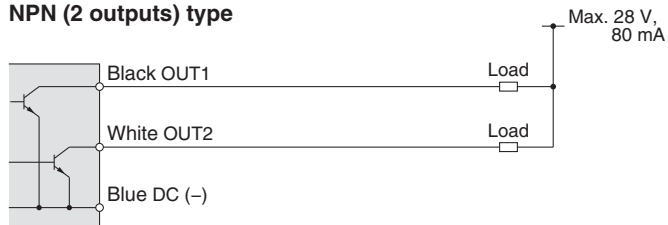


**-RT: PNP (2 outputs) + External input  
-SV: PNP (2 outputs) + External input**

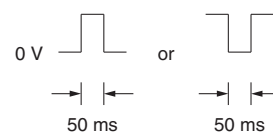
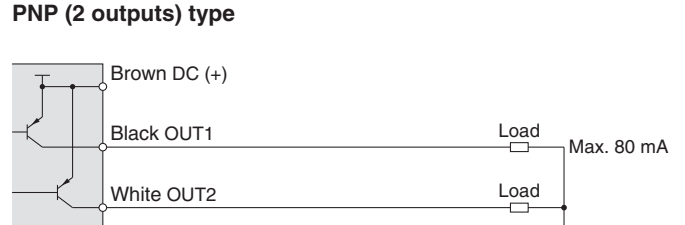


## Accumulated pulse output wiring examples

**NPN (2 outputs) type**



**PNP (2 outputs) type**



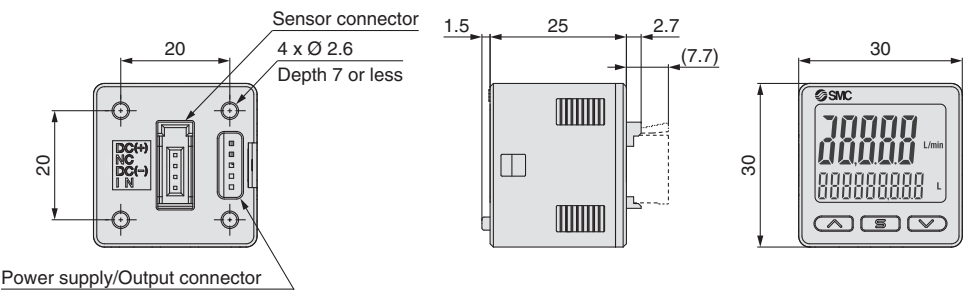
PF3A7□H

PFG300

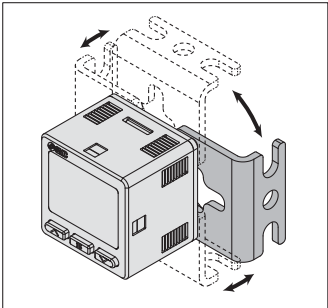
Function Details

# PFG300 Series

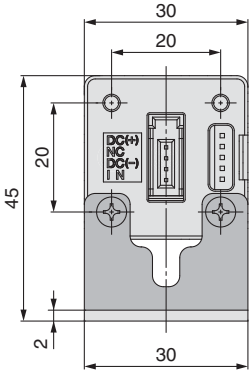
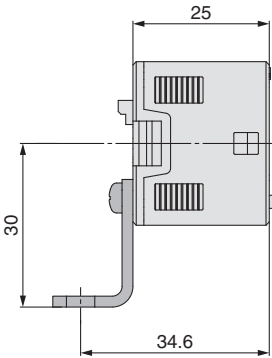
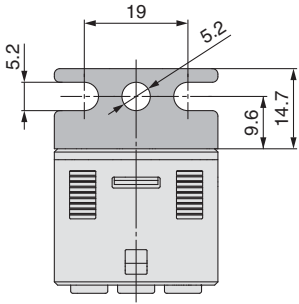
## Dimensions



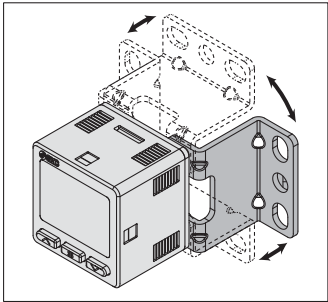
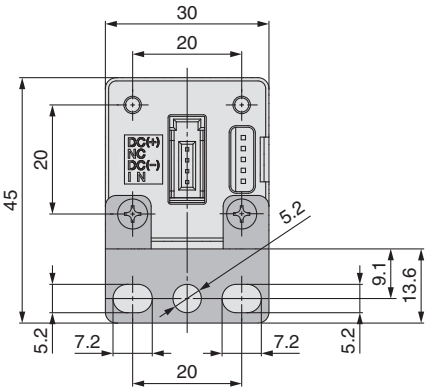
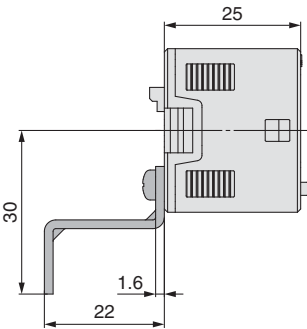
**Bracket A**  
(Part no.: ZS-46-A1)



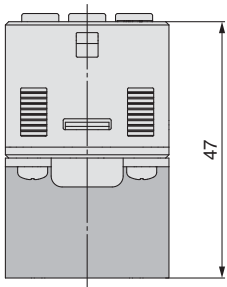
\* Bracket configuration allows for mounting in four orientations.



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



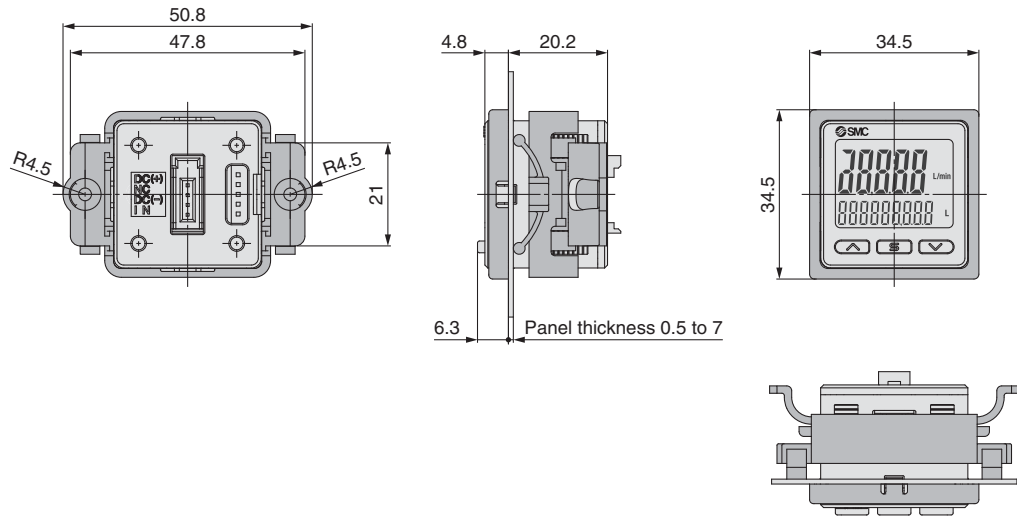
\* Bracket configuration allows for mounting in four orientations.



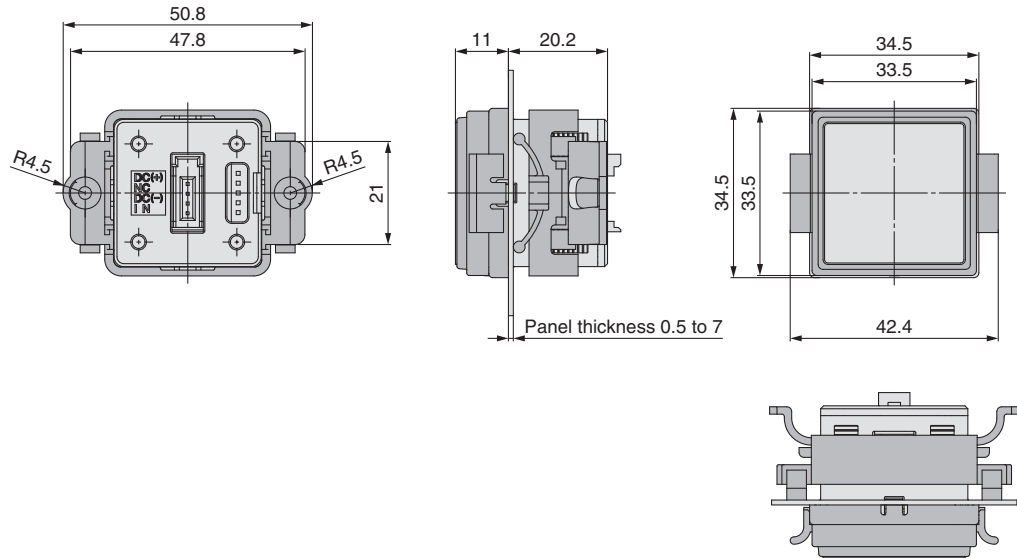


## Dimensions

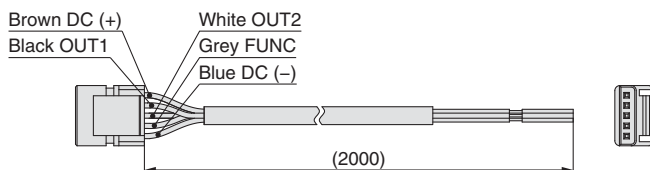
### Panel mount adapter (Part no.: ZS-46-B)



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



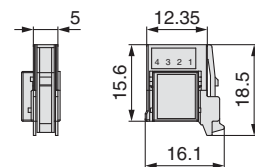
### Power supply/output connection lead wire (Part no.: ZS-46-5L)



### Sensor connector (Part no.: ZS-28-CA-4)

Pin no.	Terminal
1	DC (+)
2	N.C.
3	DC (-)
4	IN*1

\*1 1 to 5 V or 4 to 20 mA



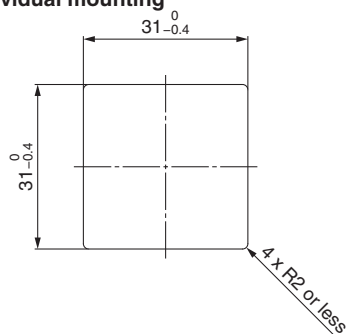
### Cable Specifications

Conductor cross section	0.15 mm <sup>2</sup> (AWG26)	
Insulator	Outside diameter	1.0 mm
	Colour	Brown, Blue, Black, White, Grey (5-core)
Sheath	Finished outside diameter	Ø 3.5

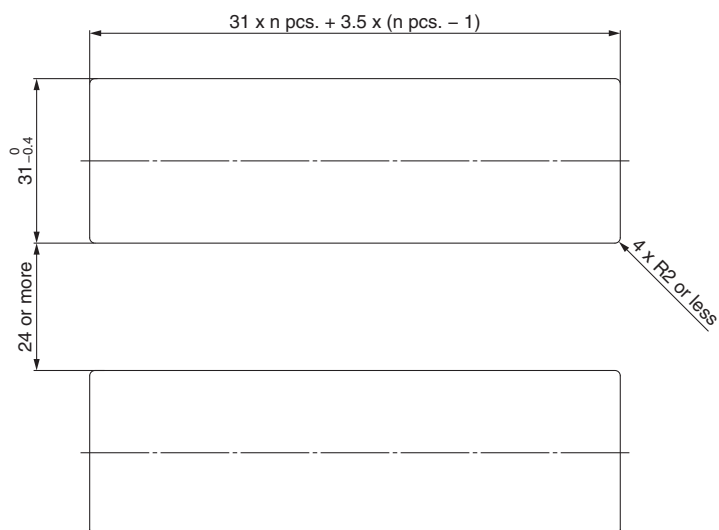
## Dimensions

### Panel fitting dimensions

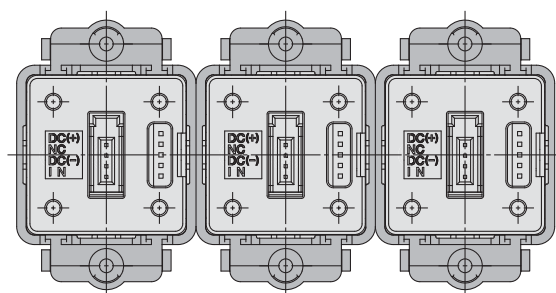
#### Individual mounting



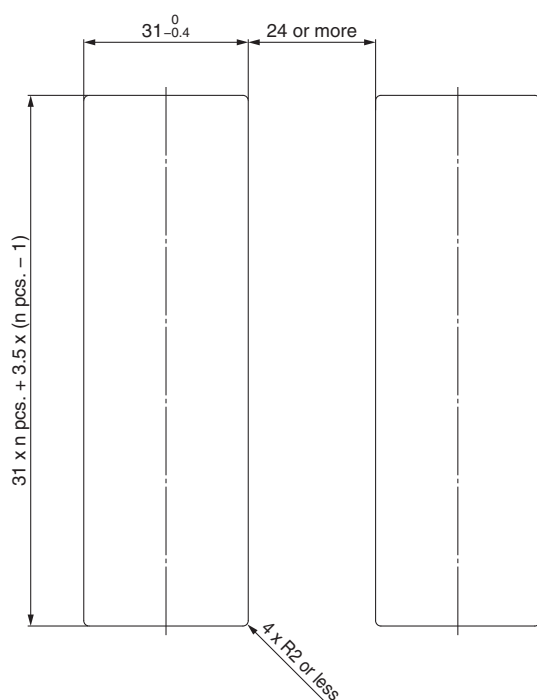
#### Multiple (2 pcs. or more) secure mounting <Horizontal>



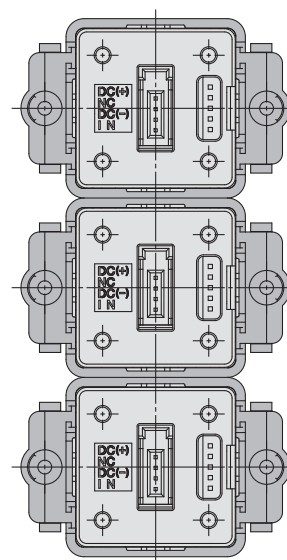
#### Panel mount example <Horizontal>



#### <Vertical>



#### Panel mount example <Vertical>



# PF3A7□H Series

## Function Details

For setting of functions and operation method, refer to the Operation Manual from the SMC website Documents/Download --> Instruction Manuals.

### Output operation

The output operation can be selected from the following:  
Output (hysteresis mode and window comparator mode) corresponding to instantaneous flow, or output (accumulated output and pulse output) corresponding to accumulated flow.

(Default setting: Hysteresis mode, Normal output)

### Simple setting mode

Only the set values for instantaneous flow and accumulated flow can be changed. Output mode, output type, display colour, and accumulate pulse output cannot be changed.

### Display colour

The display colour can be selected for each output condition. The selection of the display colour provides visual identification of abnormal values.

Green for ON, Red for OFF
Red for ON, Green for OFF
Red all the time
Green all the time

### Reference condition

The display unit can be selected from standard condition or normal condition.

Standard condition: Flow rate converted to a volume at 20 °C and 101.3 kPa (absolute pressure)
Normal condition: Flow rate converted to a volume at 0 °C and 101.3 kPa (absolute pressure)

### Response time

The response time can be selected to suit the application. (Default setting: 1 s) The effect of fluctuation and flickering of the display can be reduced by setting the response time to 2 seconds or 5 seconds.

1 s
2 s
5 s

### FUNC output switching function

Analogue output or external input can be selected.  
(Default setting: Analogue output)

### Selectable analogue output function

1 to 5 V or 0 to 10 V can be selected for the analogue voltage output type. (Default setting: 1 to 5 V)

### External input function

The accumulated flow, peak value and bottom value can be reset remotely.  
**Accumulated value external reset:** A function to reset the accumulated flow value when an external input signal is applied.

In accumulated increment mode, the accumulated value will reset to, and increase from zero.

In accumulated decrement mode, the accumulated value will reset to, and decrease from the set value.

\* When the accumulated value is stored to memory, every time the accumulated value external reset is activated, the memory will be accessed. Take into consideration that the maximum number of times the memory can be accessed is 1 . 5 million times. The total number of external inputs and the accumulated value memorizing time interval should not exceed 1.5 million times.

**Peak/Bottom value reset:** Peak and bottom value are reset.

### Forced output function

The output is turned on/off in a fixed state when starting the system or during maintenance. This enables confirmation of the wiring and prevents system errors due to unexpected output.

For the analogue output type: When ON, the output will be 5 V (or 10 V when 0 to 10 V is selected) or 20 mA, and when OFF, 1 V (or 0 V when 0 to 10 V is selected) or 4 mA.

\* Also, the increase or decrease of the flow will not change the on/off status of the output while the forced output function is activated.

### Accumulated value hold

Accumulated value is not cleared even when the power supply is turned off. The accumulated value is memorised every 2 or 5 minutes during measurement, and continues from the last memorised value

when the power supply is turned on again.

The maximum writable limit of the memory device is 1.5 million times, which should be taken into consideration.

### Peak/Bottom value display

The maximum (minimum) flow rate is detected and updated from when the power supply is turned on. In peak (bottom) value display mode, this maximum (minimum) flow rate is displayed.

### Display OFF mode

This function will turn the display OFF.

In the display OFF mode, three digits " \_ \_ \_ " on the right of the sub display will flash.

If any button is pressed during this mode, the display reverts to normal for 30 seconds to allow checking of the flow, etc.

When the flow monitor (PFG300 series) is connected, the displayed values might be different due to an error. When the flow monitor display is used, it is recommended to set this product to the display OFF mode.

### Setting of security code

The user can select whether a security code must be entered to release the key lock. At a time of shipment from the factory, it is set such that the security code is not required.

### Key-lock function

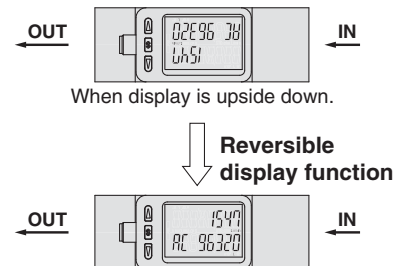
Prevents operation errors such as accidentally changing setting values

### Reset to the default settings

The product can be returned to its factory default settings.

### Reversible display mode

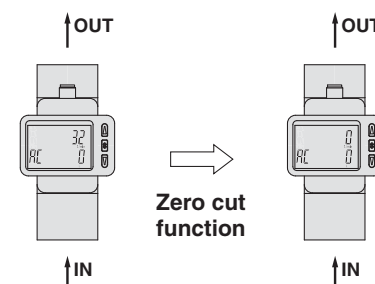
When the switch is used upside down, the orientation of the display can be rotated to make it easier to read by using the reversible display function.



### Zero cut function

When the flow is close to 0 l/min., the product will round the value down and zero will be displayed. A flow value may be displayed even when the flow rate is 0 l/min. due to high pressure or depending on the installation. The zero cut function will force the display to zero. The range to display zero can be changed.

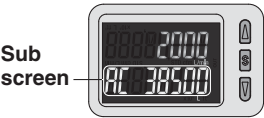
Example) Vertical mounting, with fluid direction: Bottom to top



# PF3A7□H Series

## ■ Selection of display on sub screen

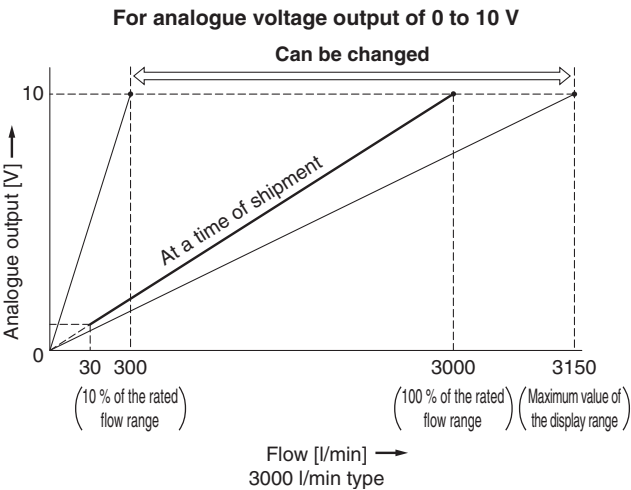
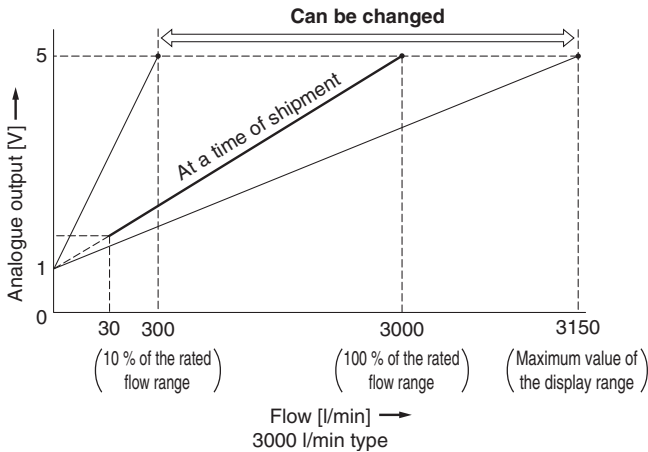
The display on the sub screen in measuring mode can be set.



Accumulated value display	Set value display	Peak value display
Displays the accumulated value 	Displays the set value 	Displays the peak value 
Bottom value display	Line name display	OFF
Displays the bottom value 	Displays the line name (Up to 5 alphanumeric characters can be input.) 	Displays nothing 

## ■ Analogue output free range function

This function allows a flow that generates an output of 5 V (or 10 V when 0 to 10 V is selected) or 20 mA to be changed. The value can be changed between 10 % of the maximum value of the rated flow and the maximum value of the display range.



## ■ Error display function

When an error or abnormality arises, the location and contents are displayed.

Display	Error name	Description	Action
Er 1	OUT over current error	A load current of 80 mA or more is applied to the switch output (OUT).	Eliminate the cause of the over current by turning off the power supply and then turn it on again.
HHH	Instantaneous flow error	The flow rate exceeds the maximum value of the display range.	Decrease the flow rate.
999999 flashes x 10 <sup>6</sup>	Accumulated flow error	The flow rate exceeds the accumulated flow rate range.	Clear the accumulated flow rate.
Er 0	System error	Internal data error	Turn the power off and then on again.
Er 4			
Er 6			
Er 7			
Er 8			
Er 10			
Er 12			
Er 13			
Er 14			

If the error cannot be solved after the instructions above are performed, please contact SMC for investigation.

# PFG300 Series

## Function Details

### ■ Output operation

The output operation can be selected from the following:  
Output (hysteresis mode and window comparator mode) corresponding to instantaneous flow or output (accumulated output and pulse output) corresponding to accumulated flow.

(Default setting: Hysteresis mode, Normal output)

### ■ Simple setting mode

Only the set values for instantaneous flow and accumulated flow can be changed. Output mode, output type, display colour, and accumulate pulse output cannot be changed.

### ■ Display Colour

The display colour can be selected for each output condition. The selection of the display colour provides visual identification of abnormal values.

Green for ON, Red for OFF
Red for ON, Green for OFF
Red all the time
Green all the time

### ■ Delay time setting

The time from when the instantaneous flow reaches the set value to when the switch output operates can be set. Setting the delay time can prevent the switch output from chattering.

(Default setting: 0 s)

0.00 s
0.05 to 0.1 s (increment of 0.01 s)
0.1 to 1.0 s (increment of 0.1 s)
1 to 10 s (increment of 1 s)
20 s
30 s
40 s
50 s
60 s

### ■ Digital filter setting

The time for the digital filter can be set to the sensor input. Setting the digital filter can reduce chattering of the switch output and flickering of the analogue output and the display.

The response time indicates when the set value is 90 % in relation to the step input.

(Default setting: 0 s)

0.00 s
0.05 to 0.1 s (increment of 0.01 s)
0.1 to 1.0 s (increment of 0.1 s)
1 to 10 s (increment of 1 s)
20 s
30 s

### ■ FUNC output switching function

Analogue output, external input, or copy function can be selected.  
(Default setting: Analogue output)

### ■ Selectable analogue output function

1 to 5 V or 0 to 10 V can be selected for the analogue voltage output type. (Default setting: 1 to 5 V)

### ■ External input function

The accumulated flow, peak value, and bottom value can be reset remotely.

**Accumulated value external reset:** A function to reset the accumulated flow value when an external input signal is applied.

In accumulated increment mode, the accumulated value will reset to and increase from zero.

In accumulated decrement mode, the accumulated value will reset to and decrease from the set value.

\* When the accumulated value is stored to memory, every time the accumulated value external reset is activated, the memory will be accessed. Take into consideration that the maximum number of times the memory can be accessed is 1.5 million times. The total number of external inputs and the accumulated value memorizing time interval should not exceed 1.5 million times.

**Peak/Bottom value reset:** Peak and bottom value are reset.

### ■ Forced output function

The output is turned on/off in a fixed state when starting the system or during maintenance. This enables the confirmation of wiring and prevents system errors due to unexpected output.

For the analogue output type: When ON, the output will be 5 V (or 10 V when 0 to 10 V is selected) or 20 mA, and when OFF, 1 V (or 0 V when 0 to 10 V is selected) or 4 mA.

\* Also, an increase or decrease of the flow will not change the on/off status of the output while the forced output function is activated.

### ■ Accumulated value hold

The accumulated value is not cleared even when the power supply is turned off. The accumulated value is memorised every 2 or 5 minutes during measurement and continues from the last memorised value when the power supply is turned on again.

The maximum writable limit of the memory device is 1.5 million times, which should be taken into consideration.

### ■ Peak/Bottom value display

The maximum (minimum) flow rate is detected and updated from when the power supply is turned on. In peak (bottom) value display mode, this maximum (minimum) flow rate is displayed.

### ■ Setting of security code

The user can select whether a security code must be entered to release the key lock. At a time of shipment from the factory, it is set such that a security code is not required.

### ■ Key-lock function

Prevents operation errors such as accidentally changing setting values

### ■ Reset to the default settings

The product can be returned to its factory default settings.

### ■ Display with zero cut-off setting

When the flow is close to 0 l/min, the product will round the value down and zero will be displayed. A flow value may be displayed even when the flow rate is 0 l/min due to high pressure or depending on the installation. The zero cut function will force the display to zero. The range to display zero can be changed.

PF3A7□H

PFG300

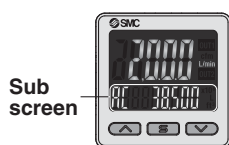
Function  
Details



# PFG300 Series

## ■ Selection of display on sub screen

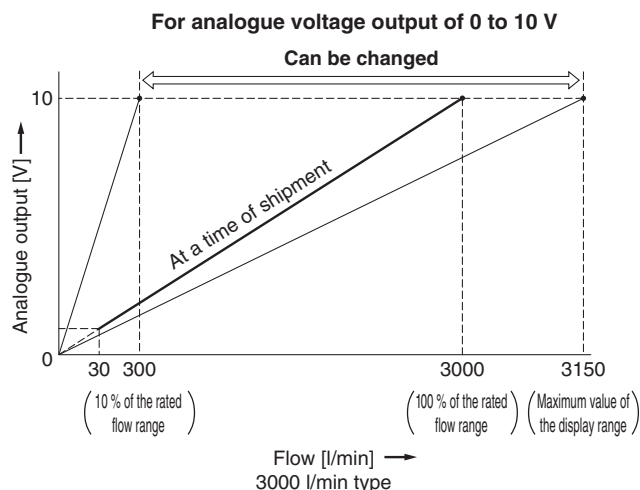
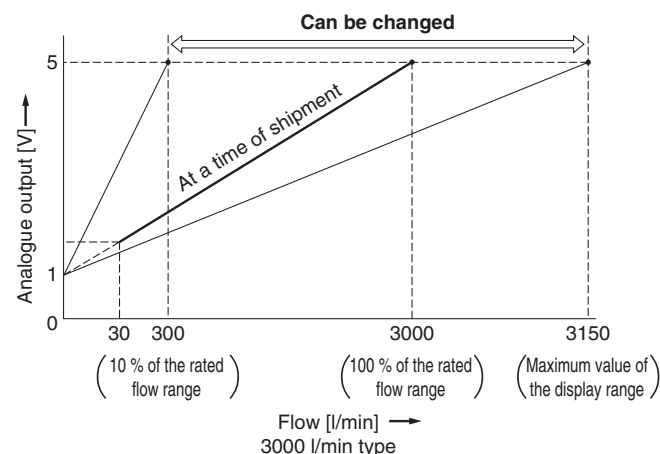
The display on the sub screen in measuring mode can be set.



Set value display	Accumulated value display	Peak value display
Displays the set value 	Displays the accumulated value 	Displays the peak value 
Bottom value display	Line name display	OFF
Displays the bottom value 	Displays the line name (Up to 5 alphanumeric characters can be input.) 	Displays nothing 

## ■ Analogue output free range function

This function allows a flow that generates an output of 5 V (or 10 V when 0 to 10 V is selected) or 20 mA to be changed. The value can be changed between 10 % of the maximum value of the rated flow and the maximum value of the display range.



## ■ Error display function

When an error or abnormality arises, the location and contents are displayed.

Display	Error name	Description	Action
Er1 Er2	OUT over current error	A load current of 80 mA or more is applied to the switch output (OUT).	Eliminate the cause of the over current by turning off the power supply and then turning it on again.
HHH	Instantaneous flow error	The flow rate exceeds the maximum value of the display range.	Decrease the flow rate.
LLL	Reverse flow error	There is a reverse flow equivalent to -5 % or more. (Except PF3A7□H series)	Change the flow to the correct direction.
999999 flashes x 10 <sup>6</sup>	Accumulated flow error	The flow rate exceeds the accumulated flow rate range.	Clear the accumulated flow rate.
Er0 Er4 Er6 Er7 Er8 Er14 Er40	System error	Internal data error	Turn the power off and then on again.
Er13	Copy error	The copy function does not operate properly.	After clearing the error by pressing the  and  buttons simultaneously for a minimum of 1 second, check the wiring and the model, and then attempt to copy again.

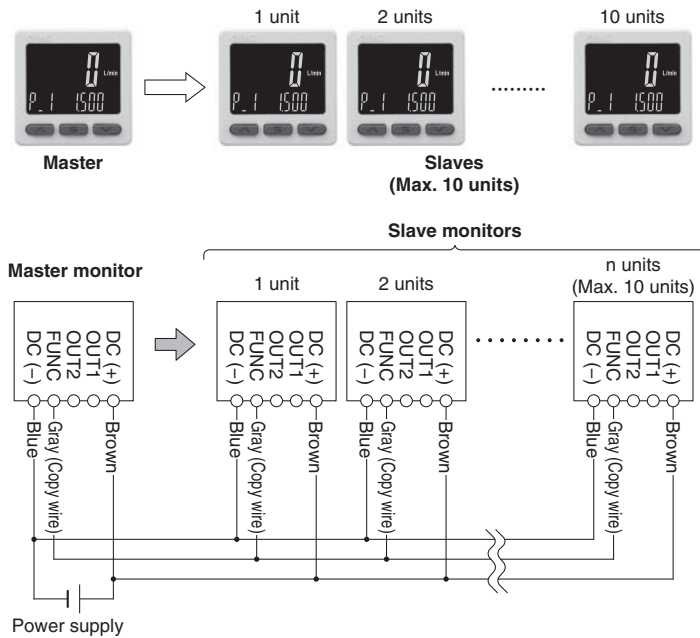
If the error cannot be solved after the instructions above are performed, please contact SMC for investigation.

## ■ Copy function

The settings of the master monitor can be copied to the slave monitors, reducing setting labor and minimizing the risk of setting mistakes.

**The set value can be copied to up to 10 flow monitors simultaneously.**

**(Maximum transmission distance: 4 m)**



## ■ Selection of power saving mode

Power saving mode can be selected.

It shifts to the power saving mode without button operation for 30 seconds.

It is set to the normal mode (Power saving mode is OFF.) at a time of shipment from the factory.

(During power saving mode, [ECo] will flash in the sub screen and the operation light is ON (only when the switch is ON).)

\* There may be a difference in the displayed value on the connected flow switch and the flow monitor. When the flow monitor display is being used, it is recommended to set the flow switch display to OFF mode.





## 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.

- 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.
- 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, combustion 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 specifications 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.

### Caution

- The product is provided for use in manufacturing industries.**  
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.

### 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.

## Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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Slovakia	☎ +421 (0)413213212	www.smc.sk	office@smc.sk
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Switzerland	☎ +41 (0)523963131	www.smc.ch	info@smc.ch
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- \*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.

## 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

- The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)  
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
- 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.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

\*2) 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

- The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- 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 SMC product to another country, assure that all local rules governing that export are known and followed.