

# 2-Color Display



# Digital Flow Switch

Applicable fluid **Dry air, N<sub>2</sub>, Ar, CO<sub>2</sub>**

RoHS

**IO-Link**  
\* For the PF2M7-L

A wide range of flow measurement is possible with 1 product.

Flow ratio <sup>\*2</sup> **100:1**

<sup>\*2</sup> Excludes the PF2M725 <sup>\*3</sup> Made to order (Produced upon receipt of order)

Port size	Flow range [L/min]															Smallest settable increment	
	0.02	0.01	0.05	0.1	0.3	0.5	1	2	3	5	10	25	50	100	200		
PF2M701	0.01															0.001	
PF2M702	C4 <sup>*3</sup> , C6, □1/8	0.02															0.01
PF2M705		0.05															
PF2M710		0.1															
PF2M725	C6, N7, □1/8	0.3															0.1
PF2M750		0.5															
PF2M711	C8, N7, □1/4	1															1
PF2M721		2															

## IO-Link Compatible

The flow rate value and the device status can be figured out easily via the process data.

**PF2M7-L Series** p. 4

<b>Diagnosis items</b>	Over current error, Outside of rated flow range, Accumulated flow error, Internal product malfunction
<b>Made to order</b>	Compatible with argon (Ar) and carbon dioxide (CO <sub>2</sub> ) mixed gas <b>p. 28</b>

## Improved resistance to moisture and foreign matter **p. 1**

The bypass construction reduces sensor accuracy deterioration and damage.

\* There is no bypass construction for the 1 and 2 L ranges.

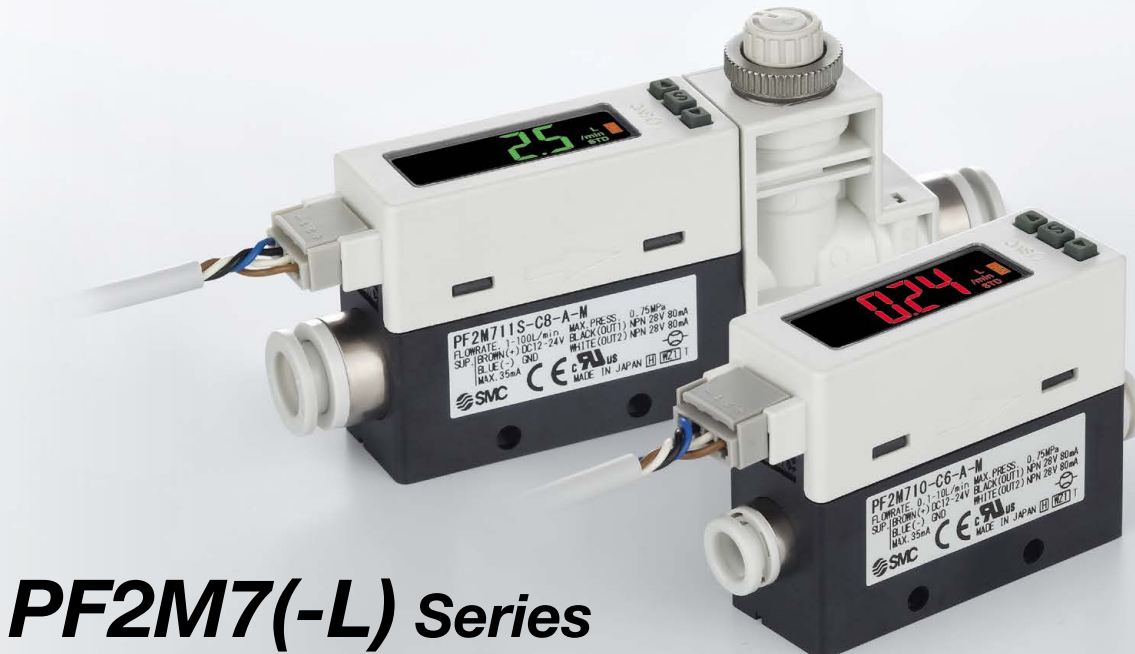
**New**

### 3-Screen Display

### Digital Flow Monitor (Dedicated for the PF2M7)

Allows for the monitoring of remote lines

**PFGM302 Series** p. 29



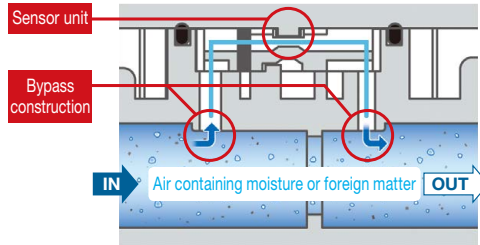
# PF2M7(-L) Series



CAT.ES100-127D

### Improved resistance to moisture and foreign matter

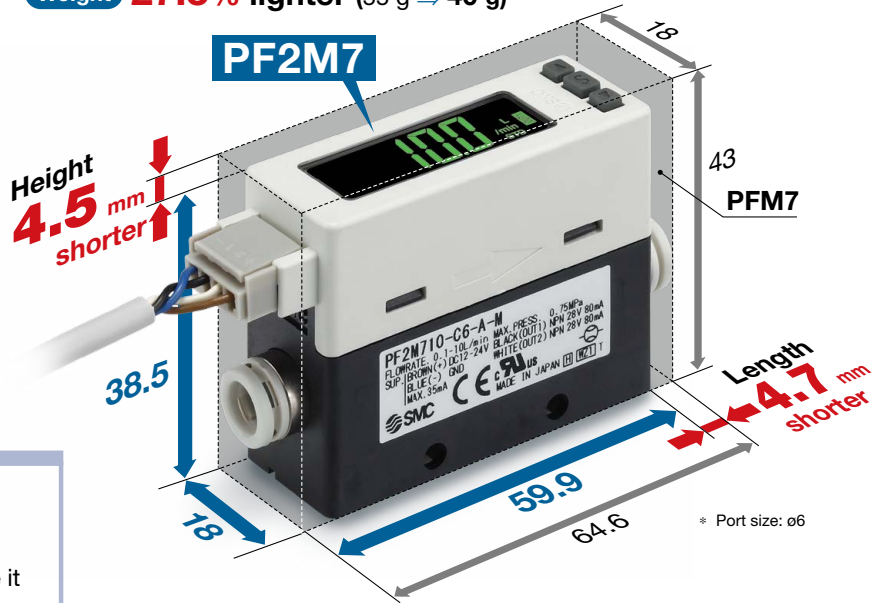
The bypass construction reduces the moist air or foreign matter in contact with the sensor, reducing sensor accuracy deterioration and damage.



\* There is no bypass construction for the 1 and 2 L ranges.

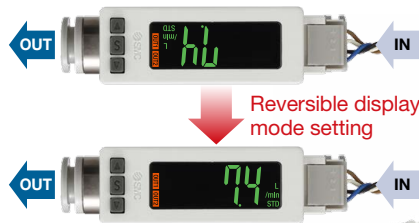
### Compact, Lightweight

**Weight 27.3% lighter** (55 g ⇒ 40 g)



### Reversible display mode

When the product is mounted upside down, the orientation of the display can be rotated to make it easier to read.



### A flow adjustment valve is integrated into the product.

- Space-saving design
- Reduced piping labor

Flow adjustment valve

### Piping variations

#### • One-touch fitting



Straight	ø4*, ø6,
Rear ported	ø8, ø1/4"

#### • Female thread



Straight	(Rc, NPT, G)
Rear ported	1/8, 1/4

\* Made to order  
(Produced upon receipt of order)

### Display OFF mode

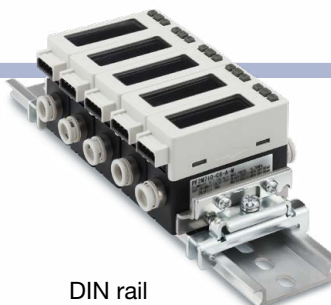


LEDs can be turned off and checked when necessary. The product can also be used as a remote sensor.

### Mounting variations



Bracket



DIN rail



Panel mounting

The digital display allows for the visualization of the flow rate.

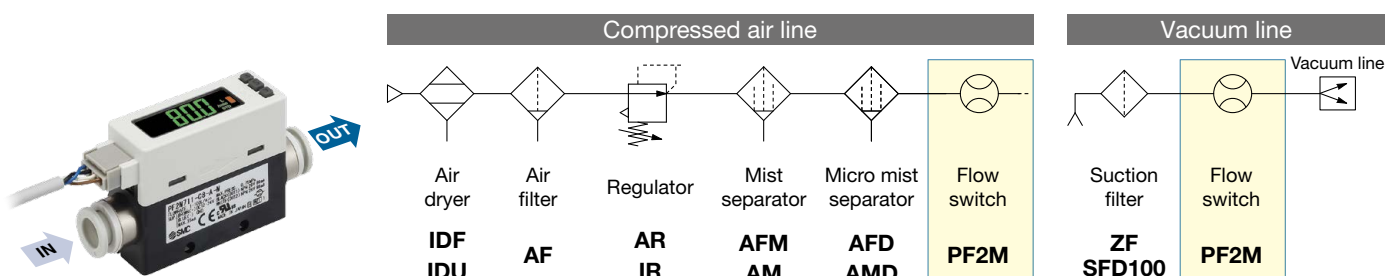
2-color display, Improved visibility



Select a model according to the fluid to be used.



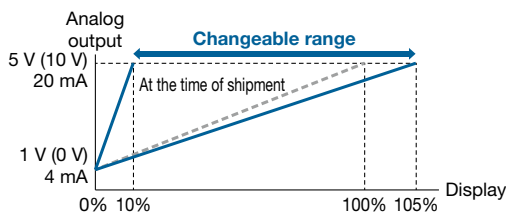
## Recommended pneumatic circuit examples



\* Recommended air quality class: JIS B 8392-1 1.1.2 to 1.6.2 (ISO 8753-1 1.1.2 to 1.6.2)

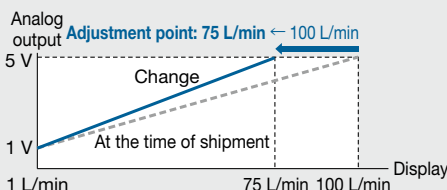
## Analog free span function

The analog span point (5 V (10 V), 20 mA) can be changed within 10 to 105% of the rated flow rate with respect to the displayed value.



### Application example

When 5 V output is required from the flow switch at 75 L/min, use a sensor that outputs 1 to 5 V at 1 to 100 L/min.



## Selectable analog output function

1 to 5 V or 0 to 10 V can be selected.

Low current consumption: 35 mA\*<sup>1</sup> or less

\*<sup>1</sup> PFM7: 55 mA or less

## Delay time setting

Can be set between 0 and 60 s

The delay time can be set according to the application.

## Grease-free

## Functions

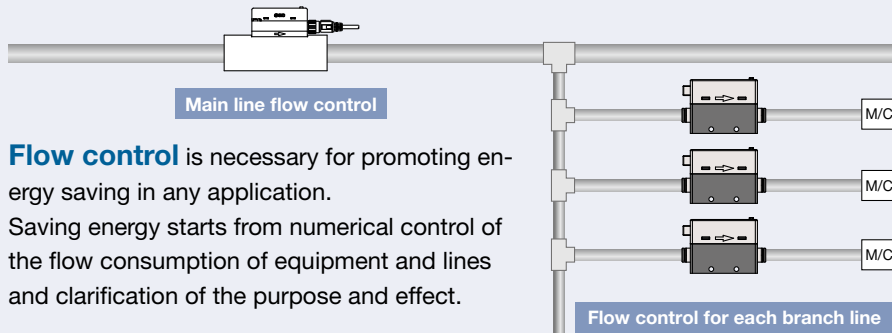
► For details, refer to the "Operation Manual" on the SMC website.)

Output operation	Key-lock function
Forced output function	Reset to the default settings
Analog free span function	Delay time setting
Display color	Error display function
Display OFF mode	Setting of a security code
Selectable analog output function	Display mode
Reference condition	Zero cut-off function
Peak/Bottom value display	Accumulated value hold
Reversible display mode	Simple setting mode
Digital filter setting	Zero-clear function

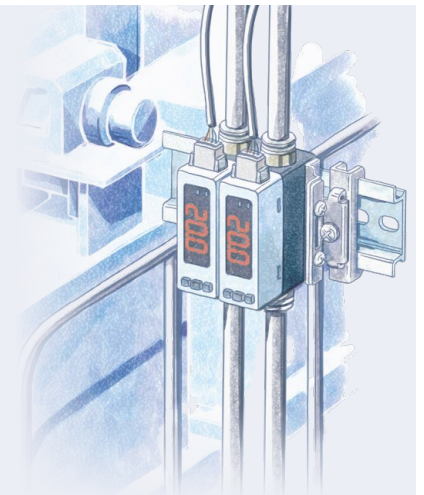
Power supply voltage: 12 to 24 V

\* For the IO-Link device: 18 to 30 V

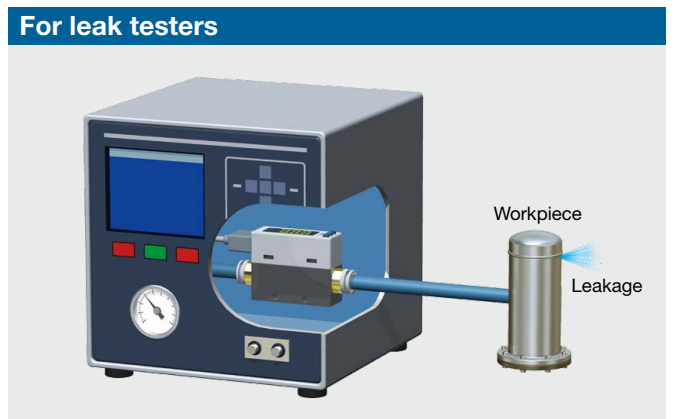
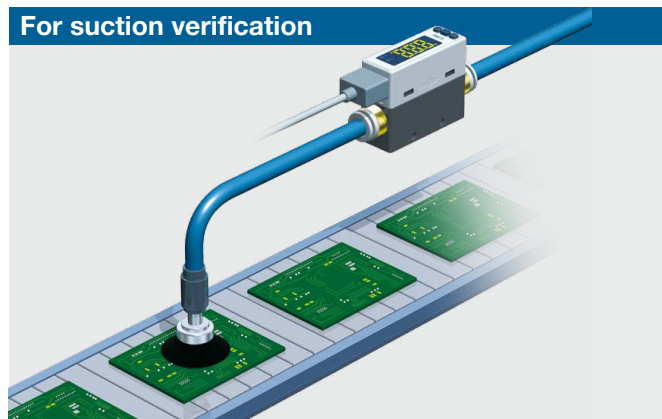
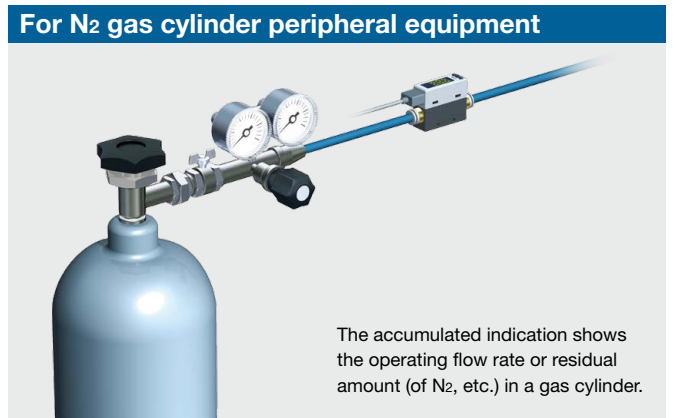
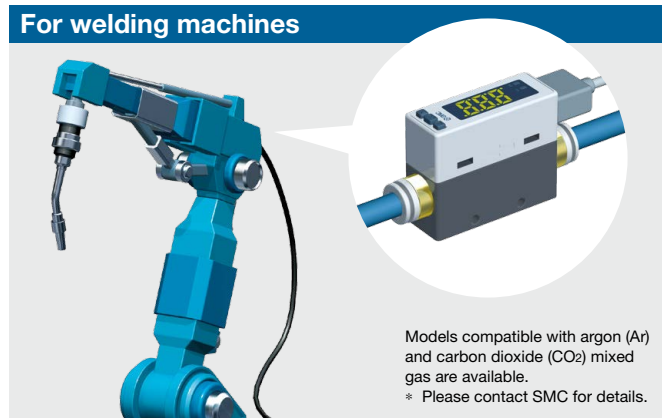
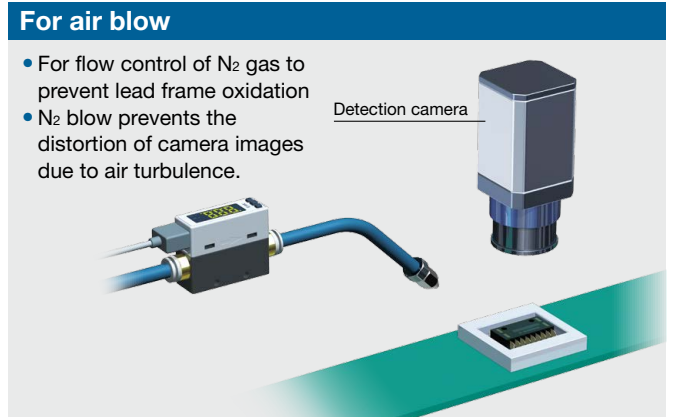
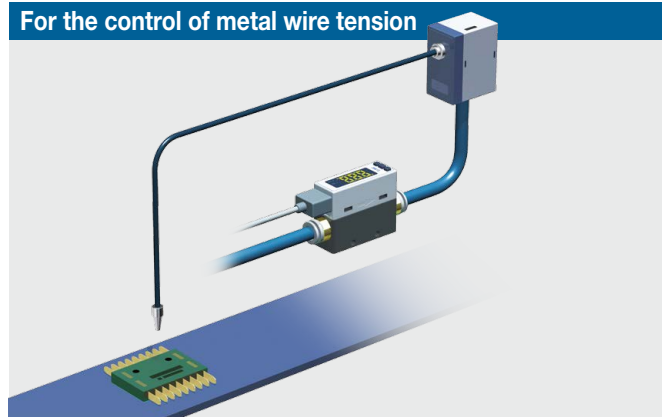
## Select a digital flow switch to increase energy savings!



**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.



## Applications

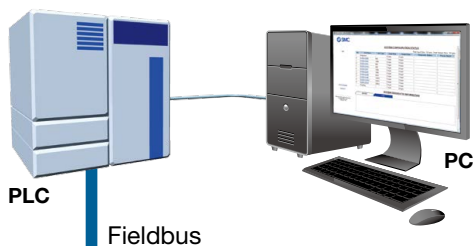


IO-Link Compatible PF2M7□□-□-L□-□□□

Supports the IO-Link communication protocol



IO-Link is an open communication interface technology between the sensor/ actuator and the I/O terminal that is an international standard: IEC 61131-9.



Configuration File (IODD File\*1)

- Manufacturer · Product part no.
- Set value

\*1 IODD File:  
IODD is an abbreviation of IO Device Description. This file is necessary for setting the device and connecting it to a master. Save the IODD file on the PC to be used to set the device prior to use.

Device settings can be set by the master.

- Threshold value
- Operation mode, etc.

Read the device data.

- Switch ON/OFF signal and analog value
- Device information: Manufacturer, Product part number, Serial number, etc.
- Normal or abnormal device status
- Cable breakage



IO-Link Compatible Device: Digital Flow Switch

Implement diagnostic bits in the process data.

The diagnostic bit in the cyclic process data makes it easy to find problems with the equipment. It is possible to find problems with the equipment in real time using the cyclic (periodic) data and to monitor such problems in detail with the noncyclic (aperiodic) data.

Process Data

Bit offset	Item	Note
0	OUT1 output	0: OFF 1: ON
1	OUT2 output	0: OFF 1: ON
8	Diagnosis (flow rate)	0: OFF 1: ON
14	Fixed output	0: OFF 1: ON
15	Diagnosis (error)	0: OFF 1: ON
16 to 31	Measured flow rate value	Signed 16 bit

Diagnosis items
· Over current error
· Outside of rated flow range
· Accumulated flow error
· Internal product malfunction

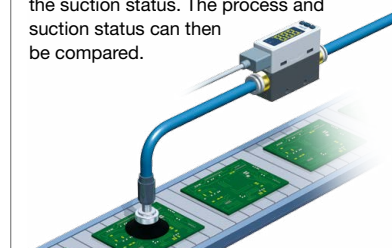
Bit offset	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Item	Measured flow rate value (PD)															

Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Item	Error	Fixed	Reservation				Flow rate	Reservation				OUT2	OUT1			
	Diagnosis	Output					Diagnosis					Switch output				

Application Example

For the predictive maintenance of suction verification

The flow rate “switch ON/OFF signals” and “analog values” are monitored to determine the suction status. The process and suction status can then be compared.



Operation and Display

Communication with master	IO-Link status indicator light	Status	Screen display*2	Description
Yes	*1	Normal	Operate	Normal communication status (readout of measured value)
			Start up	At the start of communication
			Preoperate	At the start of communication
No	*1 (Flashing)	Abnormal	Version does not match	The IO-Link version does not match that of the master. The master uses version 1.0.
			Communication disconnection	Normal communication was not received for 1 s or longer.
				Normal communication was not received for 1 s or longer.
				Normal communication was not received for 1 s or longer.
	OFF	SIO mode	General switch output	

\*1 In IO-Link mode, the IO-Link indicator is ON or flashing.  
\*2 “LoC” is displayed when the data storage lock is enabled. (Except for when the version does not match or when in SIO mode)  
The display color can be set to red or green.

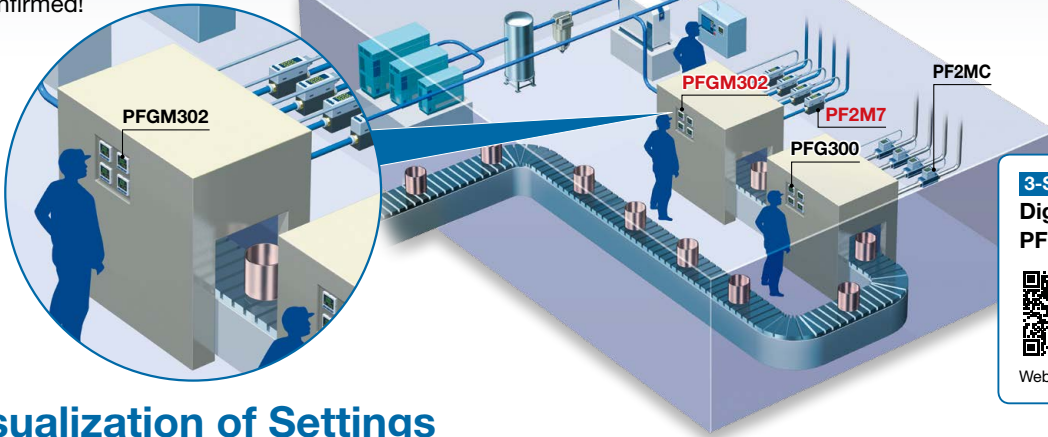
# 3-Screen Display Digital Flow Monitor

PFGM302 Series p. 29



## Allows for the Monitoring of Remote Lines

- Centralized flow control
- The flow rate of a flow switch installed in a distant location can be confirmed!



3-Screen Display  
Digital Flow Monitor  
PFG300 Series



Web Catalog



## Visualization of Settings

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

**New PFGM302**

Always displayed on one screen

Existing type

Switches between displays

**Mode Examples**

**Hysteresis mode**

Normal output	Set value (Threshold value)	Reversed output	Set value (Threshold value)	Hysteresis	Set hysteresis value
P.1	5.00	n.1	5.00	H.1	0.50

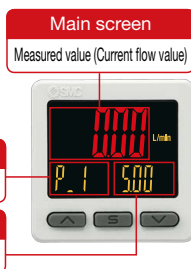
**Window comparator mode**

Normal output/Lo side	Set value (Threshold value)	Normal output/Hi side	Set value (Threshold value)
P.1L	3.00	P.1H	6.00
Reversed output/Lo side	Set value (Threshold value)	Reversed output/Hi side	Set value (Threshold value)
n.1L	3.00	n.1H	6.00

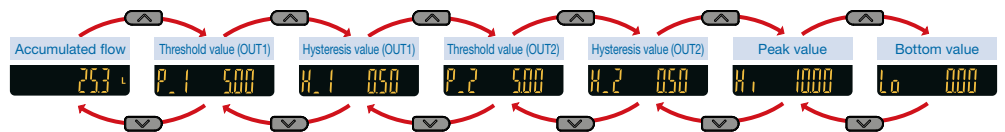
## Easy Screen Switching

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

- Sub screen/Left side: Label (Display item)
- Sub screen/Right side: Set value (Threshold value)



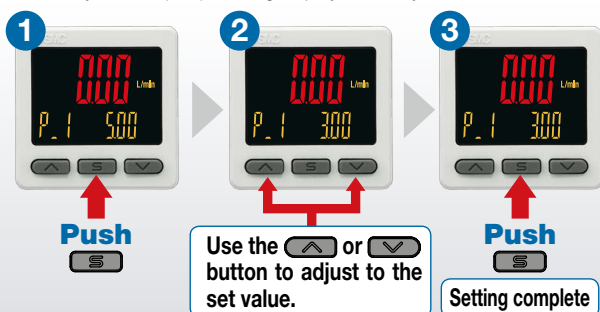
The sub screen can be switched by pressing the up/down buttons.



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

## Simple 3-Step Setting

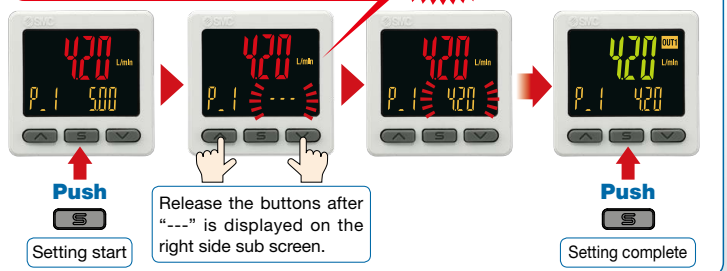
When the S button is pressed and the set value (P\_1) is being displayed, the set value (threshold value) can be set. When the S button is pressed and the hysteresis (H\_1) is being displayed, the hysteresis value can be set.



### 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.



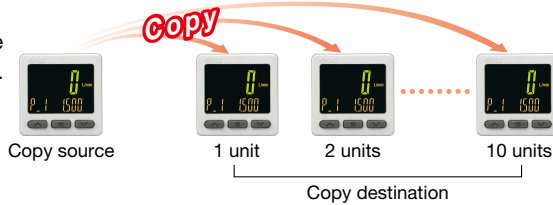
## Analog output of 0 to 10 V is also available.

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

## Convenient Functions

### ● Copy function

The set values of the monitor can be copied.



### ● 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.

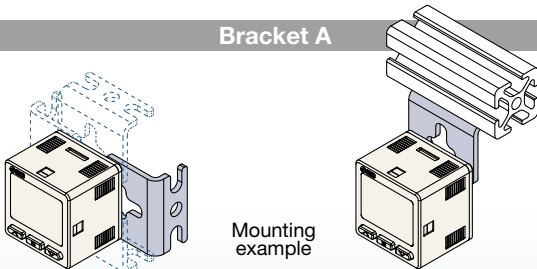
## Functions ▶ For details, refer to the "Operation Manual" on the SMC website.)

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

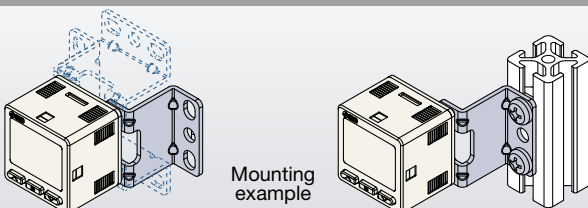
## Mounting

The bracket configuration allows for mounting in four orientations.

### Bracket A



### Bracket B

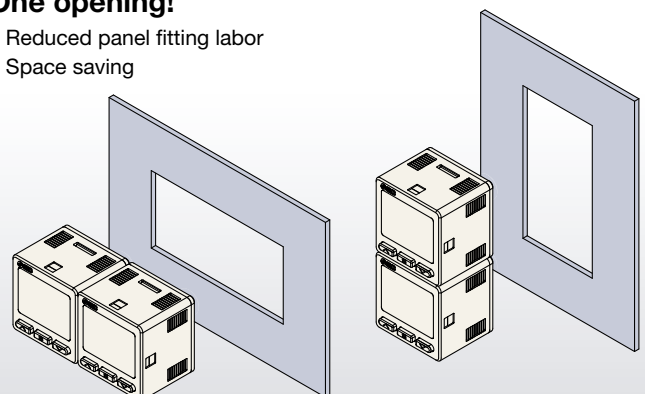


### Panel mount

Mountable side by side without clearance

### One opening!

- Reduced panel fitting labor
- Space saving

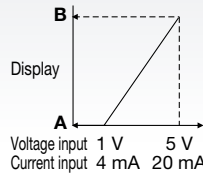


## Input Range Selection (for Pressure/Flow rate)

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

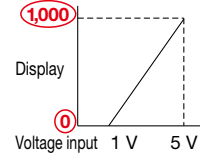
(Voltage input: 1 to 5 V/Current input: 4 to 20 mA)

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



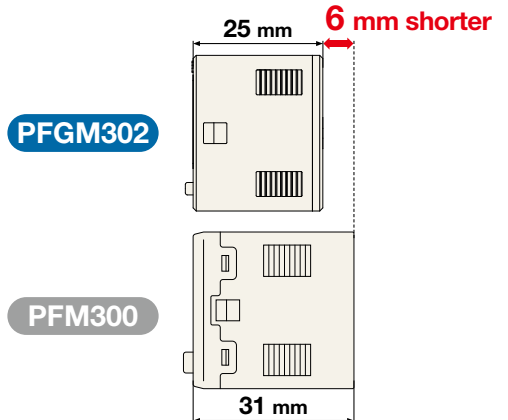
	A	B
PSE570	0	1,000
PSE573	-100	100
PSE574	0	500

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



## Compact & Lightweight











● Compact: Max. 6 mm shorter

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



# Flow Switch Flow Rate Variations

Series	Applicable fluid	Detection method	Rated flow range [L/min]									
			-3	-2	-1	-0.5	0	0.5	1	2	3	
<b>PFMV</b>  <b>PFGV301</b> 	Dry air N <sub>2</sub>	Thermal type (MEMS)	0	0.5								
			0	1								
			0	3								
			-0.5	0.5								
			-1	1								

Series	Applicable fluid	Detection method	Smallest settable increment	Rated flow range [L/min]																					
				0.02 0.01	0.1 0.05	0.3	0.5	1	2	5	10	25	50	100	150	200	300	500	600	1000	2000	3000	6000	12000	
<b>PF2M7(-L)</b>  <b>PFGM302</b> 	Dry air N <sub>2</sub> Ar CO <sub>2</sub>	Thermal type (MEMS)	0.001 L/min	0.01	1																				
			0.01 L/min	0.02	2																				
				0.05	5																				
			0.1 L/min	0.1	10																				
				0.3	25																				
			1 L/min	0.5	50																				
	1	100																							
	2	200																							
<b>PFMB</b>  <b>PFG300</b> 	Dry air N <sub>2</sub>	Thermal type (MEMS)	1 L/min			5	500																		
		Bypass flow type					10	1000																	
<b>PF2MC(-L)</b>  <b>PFG300</b> 	Dry air N <sub>2</sub>	Thermal type (MEMS)	1 L/min			5	500																		
		Bypass flow type					10	1000																	
<b>PF2A</b> 	Air N <sub>2</sub>	Thermal type (Thermistor)	0.1 L/min			1	10																		
			0.5 L/min			5	50																		
			1 L/min			10	100																		
			2 L/min			20	200																		
			5 L/min			50	500																		
<b>PF3A□H(-L)</b>  Body ported type  Modular type <b>PFG300</b> 	Air N <sub>2</sub>	Thermal type (Platinum sensor)	2 L/min			30	Body ported type	3000																	
			5 L/min			60	Body ported type	6000																	
			10 L/min			120	Body ported type	12000																	
		Bypass flow type	1 L/min			10	Modular type	1000																	
			2 L/min			20	Modular type	2000																	



# Flow Switch Variations / Basic Performance Table

Series	PFMV	PF2M7(-L)	PFMB	PF2MC(-L)	PF2A	PF3A7□H(-L)	
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 [L/min]	0 to 0.5    -0.5 to 0.5 0 to 1       -1 to 1 0 to 3       -3 to 3	0.01 to 1 0.02 to 2 0.05 to 5 0.1 to 10 0.3 to 25 0.5 to 50 1 to 100 2 to 200	5 to 500 10 to 1000 20 to 2000	5 to 500 10 to 1000 20 to 2000	1 to 10 5 to 50 10 to 100 20 to 200 50 to 500	30 to 3000 60 to 6000 120 to 12000	10 to 1000 20 to 2000
Power supply voltage	12 to 24 VDC ±10%	PF2M7    12 to 24 VDC ±10% PF2M7-L   18 to 30 VDC ±10%	12 to 24 VDC ±10%	PF2MC    12 to 24 VDC ±10% PF2MC-L   18 to 30 VDC ±10%	12 to 24 VDC ±10%	PF3A7□H    24 VDC ±10% PF3A7□H-L   18 to 30 VDC ±10% PF3A701H/ 702H-L       21.6 to 30 VDC PF3A8□H-L   21.6 to 30 VDC	
Temperature characteristics (25°C standard)	±2% F.S. (15 to 35°C)    [Monitor unit ±0.5% F.S. (0 to 50°C)] ±5% F.S. (0 to 50°C)	±3% F.S. ±1 digit (15 to 35°C) ±5% F.S. ±1 digit (0 to 50°C)	±2% F.S. (15 to 35°C)    [Monitor unit ±0.5% F.S. (0 to 50°C)] ±5% F.S. (0 to 50°C)	±2% F.S. (15 to 35°C)    [Monitor unit ±0.5% F.S. (0 to 50°C)] ±5% F.S. (0 to 50°C)	±3% F.S. (15 to 35°C) ±5% F.S. (0 to 50°C)	±5% F.S.    [Monitor unit ±0.5% F.S. (0 to 50°C)]	
Repeatability	±2% F.S. (Fluid: Dry air) Analog output: ±5% F.S.    [Monitor unit ±0.1% F.S. Analog output: ±0.3% F.S.]	±1% F.S. ±1 digit (Fluid: Dry air)	±1% F.S.    [Monitor unit ±0.1% F.S.] (Fluid: Dry air)	±1% F.S.    [Monitor unit ±0.1% F.S.] (Fluid: Dry air)	±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 Analog voltage output Analog current output	NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output IO-Link	NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output	NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output IO-Link	NPN/PNP open collector Accumulated pulse output	NPN/PNP open collector Accumulated pulse output Analog voltage output Analog current output IO-Link	
Display	[Monitor unit 2-color LCD display]	2-color LCD display [Monitor unit 3-color LCD display]	2-color LED display    2-color LCD display [Monitor unit 3-color LCD display]	3-color LCD display [Monitor unit 3-color LCD display]	LED display	3-color LCD display [Monitor unit 3-color LCD display]	

\* The monitor unit values are for the PFG300, PFGV301, and PFGM302.



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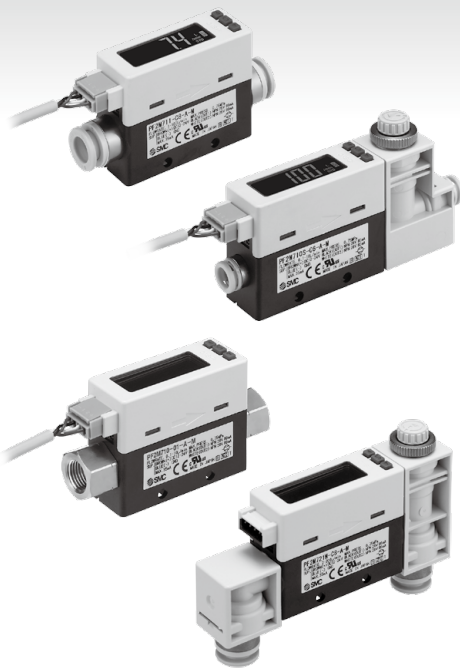
**3-Screen Display** Digital Flow Monitor *PFGM302 Series*

## **2-Color Display** Digital Flow Switch *PF2M7(-L) Series*

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## **3-Screen Display** Digital Flow Monitor *PFGM302 Series*

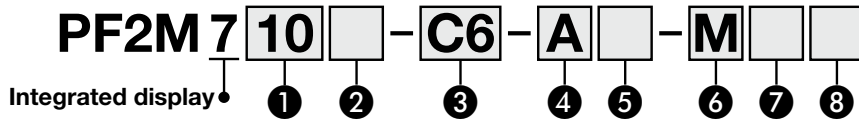
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2-Color Display Digital Flow Switch

# PF2M7 Series

## How to Order



### 1 Rated flow range

<b>01</b>	0.01 to 1 L/min	<b>25</b>	0.3 to 25 L/min
<b>02</b>	0.02 to 2 L/min	<b>50</b>	0.5 to 50 L/min
<b>05</b>	0.05 to 5 L/min	<b>11</b>	1 to 100 L/min
<b>10</b>	0.1 to 10 L/min	<b>21</b>	2 to 200 L/min

### 2 Flow adjustment valve/Piping entry direction

Symbol	Flow adjustment valve	Piping entry direction	Rated flow range							
			1	2	5	10	25	50	100	200
<b>Nil</b>	None	Straight	●	●	●	●	●	●	●	●
<b>S</b>	Yes	Straight	—	—	●	●	●	●	●	●
<b>L</b>	None	Rear ported	●	●	●	●	●	●	●	●
<b>W</b>	Yes	Rear ported	—	—	●	●	●	●	●	●

\* 1 and 2 L/min type products are not available with a flow adjustment valve.

### 3 Port size

Symbol	Port size	Rated flow range							
		1	2	5	10	25	50	100	200
<b>01</b>	Rc1/8	●	●	●	●	●	—	—	—
<b>N1</b>	NPT1/8	●	●	●	●	●	—	—	—
<b>F1</b>	G1/8	—	—	—	—	—	—	—	—
<b>02</b>	Rc1/4	—	—	—	—	—	—	—	—
<b>N2</b>	NPT1/4	—	—	—	—	—	—	—	—
<b>F2</b>	G1/4	—	—	—	—	—	—	—	—
<b>C4</b> <sup>*1</sup>	ø4	●	●	●	●	—	—	—	—
<b>C6</b>	ø6	●	●	●	●	●	—	—	—
<b>C8</b>	ø8	—	—	—	—	—	—	—	—
<b>N7</b>	ø1/4"	—	—	—	—	—	—	—	—

\*1 Made to order (Produced upon receipt of order)

### Piping variations

With One-touch fitting	Female thread
<b>C4</b> <sup>*2</sup> , <b>C6</b> , <b>C8</b> , <b>N7</b>	<b>01</b> , <b>02</b> , <b>N1</b> , <b>N2</b> , <b>F1</b> , <b>F2</b>
Straight	Straight
Rear ported	Rear ported

\*2 Made to order (Produced upon receipt of order)

### 4 Output specification

Symbol	OUT1	OUT2
<b>A</b>	NPN	NPN
<b>B</b>	PNP	PNP
<b>C</b>	NPN	Analog 1 to 5 V ⇔ Analog 0 to 10 V <sup>*3</sup>
<b>D</b>	NPN	Analog 4 to 20 mA
<b>E</b>	PNP	Analog 1 to 5 V ⇔ Analog 0 to 10 V <sup>*3</sup>
<b>F</b>	PNP	Analog 4 to 20 mA

\*3 1 to 5 V or 0 to 10 V can be selected by pressing the button. The default setting is 1 to 5 V.

### 7 Option 2

Nil	R	S
Without bracket	Bracket (For the type without a flow adjustment valve) <b>ZS-33-M</b> With 2 tapping screws	Bracket (For the type with a flow adjustment valve) <b>ZS-33-MS</b> With 3 tapping screws
	Panel mount adapter (For the type without a flow adjustment valve) <b>ZS-33-2J</b> Panel mount adapter Panel mount adapter B	Panel mount adapter (For the type with a flow adjustment valve) <b>ZS-33-2JS</b> Panel mount adapter S Panel mount adapter B
	Mounting bracket	Mounting bracket

\* Options are shipped together with the product but do not come assembled.

### 5 Option 1

Nil	W
Lead wire with connector (2 m) <b>ZS-33-D</b>	Lead wire with connector (2 m) + Connector cover (Silicone rubber) <b>ZS-33-F</b> <b>ZS-33-D</b> +
* Interchangeable with the existing PFM7 series	* Interchangeable with the existing PFM7 series
N	Without lead wire with connector

### 6 Unit specification

M	SI unit only <sup>*4</sup>
<b>Nil</b>	Unit selection function <sup>*5</sup>

\*4 Fixed unit: Instantaneous flow: L/min  
Accumulated flow: L

\*5 This product is for overseas use only. (The SI unit type is provided for use in Japan in accordance with the New Measurement Act.)  
The unit can be changed.  
Instantaneous flow: L/min ⇔ cfm  
Accumulated flow: L ⇔ ft<sup>3</sup>

### 8 Calibration certificate<sup>\*6</sup>

Nil	None
<b>A</b>	Yes

\*6 Made to order  
The certificate is in both English and Japanese.

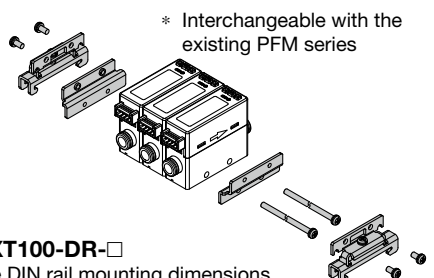
### DIN Rail Mounting Bracket (To Be Ordered Separately)

#### ZS-33-R **3**

Stations	
<b>1</b>	1 station
<b>2</b>	2 stations
<b>3</b>	3 stations
<b>4</b>	4 stations
<b>5</b>	5 stations

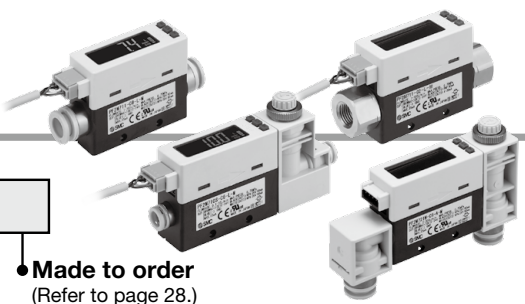
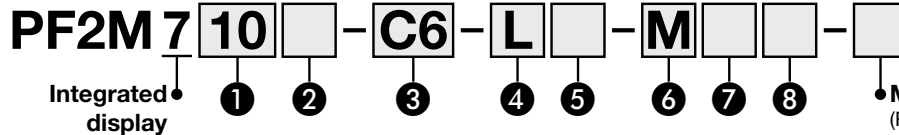
DIN rail part number: **AXT100-DR-□**

\* Refer to page 27 for the DIN rail mounting dimensions.



# PF2M7-L Series

## How to Order



### 1 Rated flow range

<b>01</b>	0.01 to 1 L/min	<b>25</b>	0.2 to 25 L/min
<b>02</b>	0.02 to 2 L/min	<b>50</b>	0.5 to 50 L/min
<b>05</b>	0.05 to 5 L/min	<b>11</b>	1 to 100 L/min
<b>10</b>	0.1 to 10 L/min	<b>21</b>	2 to 200 L/min

### 2 Flow adjustment valve/Piping entry direction

Symbol	Flow adjustment valve	Piping entry direction	Rated flow range										
			1	2	5	10	25	50	100	200			
<b>Nil</b>	None	Straight	●	●	●	●	●	●	●	●	●	●	●
<b>S</b>	Yes	Straight	—	—	●	●	●	●	●	●	●	●	●
<b>L</b>	None	Rear ported	●	●	●	●	●	●	●	●	●	●	●
<b>W</b>	Yes	Rear ported	—	—	●	●	●	●	●	●	●	●	●

\* 1 and 2 L/min type products are not available with a flow adjustment valve.

### 3 Port size

Symbol	Port size	Rated flow range							
		1	2	5	10	25	50	100	200
<b>01</b>	Rc1/8	●	●	●	●	●	●	—	—
<b>N1</b>	NPT1/8	●	●	●	●	●	●	—	—
<b>F1</b>	G1/8	●	●	●	●	●	●	—	—
<b>02</b>	Rc1/4	—	—	—	—	—	—	●	●
<b>N2</b>	NPT1/4	—	—	—	—	—	—	●	●
<b>F2</b>	G1/4	—	—	—	—	—	—	●	●
<b>C4</b> *1	ø4	●	●	●	●	—	—	—	—
<b>C6</b>	ø6	●	●	●	●	●	●	—	—
<b>C8</b>	ø8	—	—	—	—	—	—	●	●
<b>N7</b>	ø1/4"	—	—	—	—	—	—	●	●

\*1 Made to order (Produced upon receipt of order)

### Piping variations

With One-touch fitting	Female thread
<b>C4</b> *2, <b>C6</b> , <b>C8</b> , <b>N7</b>	<b>01</b> , <b>02</b> , <b>N1</b> , <b>N2</b> , <b>F1</b> , <b>F2</b>
Straight	Straight
Rear ported	Rear ported

\*2 Made to order (Produced upon receipt of order)

### 4 Output specification

Symbol	OUT1	OUT2
<b>L</b>	IO-Link/ NPN/PNP	—
<b>L2</b>	IO-Link/ NPN/PNP	NPN/PNP/External input
<b>L3</b>	IO-Link/ NPN/PNP	Analog 1 to 5 V ⇔ Analog 0 to 10 V*3
<b>L4</b>	IO-Link/ NPN/PNP	Analog 4 to 20 mA

\*3 1 to 5 V or 0 to 10 V can be selected by pressing the button. The default setting is 1 to 5 V.

### 6 Unit specification

Symbol	Specification
<b>M</b>	SI unit only*4
<b>Nil</b>	Unit selection function*5

\*4 Fixed unit: Instantaneous flow: L/min  
Accumulated flow: L

\*5 This product is for overseas use only. (The SI unit type is provided for use in Japan in accordance with the New Measurement Act.)  
The unit can be changed.  
Instantaneous flow: L/min ⇔ cfm  
Accumulated flow: L ⇔ ft<sup>3</sup>

### 5 Option 1

Nil	W
Lead wire with connector (2 m)	Lead wire with connector (2 m) + Connector cover (Silicone rubber)
<b>ZS-33-D</b>	<b>ZS-33-F</b> <b>ZS-33-D</b> +
* Interchangeable with the existing PFM7 series	* Interchangeable with the existing PFM7 series
N	Q
Without lead wire with connector	M12 conversion lead wire (0.1 m)

### 8 Calibration certificate\*6

Symbol	Specification
<b>Nil</b>	None
<b>A</b>	Yes

\*6 Made to order  
The certificate is in both English and Japanese.

### Made to Order

Symbol	Specification
<b>X731</b>	Compatible with argon (Ar) and carbon dioxide (CO <sub>2</sub> ) mixed gas

For details, refer to page 28.

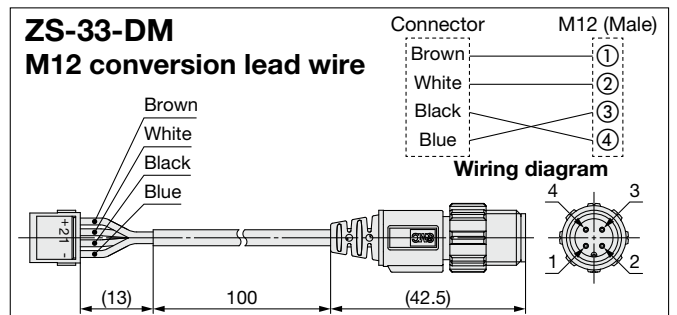
### 7 Option 2

Nil	R	S
Without bracket	Bracket (For the type without a flow adjustment valve) <b>ZS-33-M</b>	Bracket (For the type with a flow adjustment valve) <b>ZS-33-MS</b>
	With 2 tapping screws	With 3 tapping screws
	* Interchangeable with the existing PFM series	* Interchangeable with the existing PFM series
T	V	
Panel mount adapter (For the type without a flow adjustment valve) <b>ZS-33-2J</b>	Panel mount adapter (For the type with a flow adjustment valve) <b>ZS-33-2JS</b>	
Panel mount adapter B	Panel mount adapter S	
Mounting bracket	Mounting bracket	

\* Options are shipped together with the product but do not come assembled.

### DIN Rail Mounting Bracket (To Be Ordered Separately)

Refer to page 11.



# PF2M7(-L) Series

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



## Specifications

Model		PF2M701	PF2M702	PF2M705	PF2M710	PF2M725	PF2M750	PF2M711	PF2M721	
Fluid	Applicable fluid*1	Dry air, N <sub>2</sub> , Ar, CO <sub>2</sub> (JIS B 8392-1 1.1.2 to 1.6.2, ISO 8573-1 1.1.2 to 1.6.2)								
	Fluid temperature range	0 to 50°C								
Flow	Detection method	Thermal type (Main flow type)			Thermal type (Bypass flow type)					
	Rated flow range [L/min]	Dry air, N <sub>2</sub> , Ar	0.01 to 1	0.02 to 2	0.05 to 5	0.1 to 10	0.3 to 25	0.5 to 50	1 to 100	2 to 200
		CO <sub>2</sub>	0.01 to 0.5	0.02 to 1	0.05 to 2.5	0.1 to 5	0.3 to 12.5	0.5 to 25	1 to 50	2 to 100
	Set point range	Instantaneous flow [L/min]	-0.05 to 1.05	-0.1 to 2.1	-0.25 to 5.25	-0.5 to 10.5	-1.3 to 26.3	-2.5 to 52.5	-5 to 105	-10 to 210
		Accumulated flow [L]	0.00 to 9999999.99							
	Smallest settlable increment	Instantaneous flow [L/min]	0.001			0.01		0.1		1
		Accumulated flow [L]	0.01		0.1		1		1	
Accumulated volume per pulse [L/pulse]	0.01									
Accumulated value hold function*2	Intervals of 2 or 5 minutes can be selected.									
Pressure	Operating pressure range	-0.1 to 0.75 MPa								
	Rated pressure range*3	-0.07 to 0.75 MPa								
	Proof pressure	1.0 MPa								
	Pressure loss	Refer to the "Pressure Loss" graph.								
	Pressure characteristics	±5% F.S. ±1 digit (0.35 MPa standard)								
Electrical	Power supply voltage*4	For the switch output device	12 to 24 VDC ±10%							
		For the IO-Link device	18 to 30 VDC ±10%							
	Current consumption	35 mA or less								
Protection	Polarity protection									
Accuracy*5	Display accuracy	±3% F.S. ±1 digit								
	Analog output accuracy	±3% F.S.								
	Repeatability	±1% F.S. ±1 digit (±2% F.S. ±1 digit when the digital filter is set to 0.05 s)								
	Temperature characteristics	±3% F.S. ±1 digit (15 to 35°C: 25°C standard) ±5% F.S. ±1 digit (0 to 50°C: 25°C standard)								
Switch output	Output type	NPN/PNP open collector								
	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	Standard	28 VDC (NPN only)							
		IO-Link compatible	30 VDC (NPN only)							
	Internal voltage drop	Standard	NPN: 1 V or less (Load current: 80 mA)			PNP: 1.5 V or less (Load current: 80 mA)				
		IO-Link compatible	1.5 V or less (Load current: 80 mA)							
	Response time*6	50 ms or less								
	Delay time*7	Select from 0 to 0.10 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*8	Variable from 0									
Protection	Short circuit protection									
Analog output*9	Output type	Voltage output: 1 to 5 V, 0 to 10 V (only when the power supply voltage is 24 VDC)*10, Current output: 4 to 20 mA								
	Impedance	Voltage output	Output impedance: Approx. 1 kΩ							
		Current output	Maximum load impedance: 600 Ω at power supply voltage of 24 V, 300 Ω at power supply voltage of 12 V							
Response time*6	50 ms ±40%									
Display	Reference condition*11	Select from Standard condition (STD) or Normal condition (NOR).								
	Display mode	Select from Instantaneous flow or Accumulated flow.								
	Unit*12	Instantaneous flow	L/min, cfm							
		Accumulated flow	L, ft <sup>3</sup>							
	Display range	Instantaneous flow [L/min]	-0.05 to 1.05	-0.1 to 2.1	-0.25 to 5.25	-0.5 to 10.5	-1.3 to 26.3	-2.5 to 52.5	-5 to 105	-10 to 210
		Zero cut-off range	0 to ±10% F.S. (Select per 1% F.S. for the maximum rated flow rate.)							
Accumulated flow [L]*13	0.00 to 9999999.99		0.0 to 99999999.9		0 to 999999999					
Display	LCD, Color: Red/Green, 4 digits, 7 segments									
Indicator LED	LED ON when switch output is ON (OUT1/2: Orange)									
Digital filter*14	Select from 0.05 s, 0.1 s, 0.5 s, 1 s, 2 s, or 5 s.									
Environmental resistance	Enclosure	IP40								
	Withstand voltage	1000 VAC for 1 minute between terminals and housing								
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing								
	Operating temperature range	Operating: 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/UKCA marking, UL (CSA)									
Piping*15	Piping specification	One-touch fitting	C4 (ø4)/C6 (ø6)			C6 (ø6)/N7 (ø1/4")		C8 (ø8)/N7 (ø1/4")		
		Screw-in (Rc, NPT, G)	01 (Rc1/8)/N1 (NPT1/8)/F1 (G1/8)			02 (Rc1/4)/N2 (NPT1/4)/F2 (G1/4)				
	Piping entry direction	Straight, Rear								
Main materials of parts in contact with fluid	PPS, PBT, FKM, Stainless steel 304, Brass (Electroless nickel plating), Si, Au, GE4F									
Weight	Body	One-touch fitting	Straight: 40 g Rear: 55 g					Straight: 48 g Rear: 63 g		
		Screw-in	Straight: 60 g Rear: 75 g					Straight: 72 g (G1/4: 117 g) Rear: 87 g (G1/4: 132 g)		
	Flow adjustment valve	-		+34 g						
	Lead wire	+35 g								
	Bracket	+20 g								
	Panel mount adapter	+15 g								
	DIN rail mounting bracket	+65 g								

- \*1 Refer to the "Recommended pneumatic circuit examples" on page 2.
- \*2 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 3.7 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 3.7 million = 18.5 million min = 35 years
  - 2 min interval: life is calculated as 2 min x 3.7 million = 7.4 million min = 14 years
- \*3 Negative pressure indicates the pressure value on the IN side (inlet side).
- \*4 When multiple products are installed closely, the upper limit of the power supply voltage is 24 VDC.
- \*5 The accuracy value is based on dry air as a fluid. For other fluids, it is a reference value.
- \*6 Value when the digital filter is set at 0.05 s
- \*7 The time from when the instantaneous flow reaches the set value to when the switch output operates can be set.
- \*8 If the flow fluctuates around the set value, the hysteresis must be set to a value more than the fluctuating width. Otherwise, chattering will occur.
- \*9 When using a product with an analog output
- \*10 When selecting 0 to 10 V, refer to the analog output graph for the allowable load current.
- \*11 Standard condition (STD): 20 [°C], 101.3 [kPa] (Absolute pressure), 65 [% RH] (The flow rate given in the specifications is the value under standard conditions.)  
Normal condition (NOR): 0 [°C], 101.3 [kPa] (Absolute pressure), 0 [% RH]
- \*12 Setting is only possible for models with the unit selection function.
- \*13 Power value is displayed for accumulated flow. The first 4 digits of the measurement value are always displayed.
- \*14 The time for the digital filter can be set to the sensor input. The response time indicates when the set value is 90% in relation to the step input.
- \*15 Check the precautions for One-touch fitting before use. When the piping condition is changed, for example due to piping on the back of the product, use a general purpose fitting (KQ□L series). Some piping conditions may have negative effects on the flow accuracy.
- \* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

### Communication Specifications (IO-Link mode)

IO-Link type	Device	
IO-Link version	V1.1	
Communication speed	COM2 (38.4 kbps)	
Minimum cycle time	3.4 ms	
Process data length	Input data: 4 bytes, Output data: 0 byte	
On request data communication	Yes	
Data storage function	Yes	
Event function	Yes	
Vendor ID	131 (0 x 0083)	
Device ID	PF2M701-□-L□-□□□ : 0 x 00016D (365) PF2M701-□-L2□-□□□ : 0 x 00016E (366) PF2M701-□-L3□-□□□ : 0 x 00016F (367) PF2M701-□-L4□-□□□ : 0 x 000170 (368)	PF2M725-□-L□-□□□ : 0 x 00017D (381) PF2M725-□-L2□-□□□ : 0 x 00017E (382) PF2M725-□-L3□-□□□ : 0 x 00017F (383) PF2M725-□-L4□-□□□ : 0 x 000180 (384)
	PF2M702-□-L□-□□□ : 0 x 000171 (369) PF2M702-□-L2□-□□□ : 0 x 000172 (370) PF2M702-□-L3□-□□□ : 0 x 000173 (371) PF2M702-□-L4□-□□□ : 0 x 000174 (372)	PF2M750-□-L□-□□□ : 0 x 000181 (385) PF2M750-□-L2□-□□□ : 0 x 000182 (386) PF2M750-□-L3□-□□□ : 0 x 000183 (387) PF2M750-□-L4□-□□□ : 0 x 000184 (388)
	PF2M705-□-L□-□□□ : 0 x 000175 (373) PF2M705-□-L2□-□□□ : 0 x 000176 (374) PF2M705-□-L3□-□□□ : 0 x 000177 (375) PF2M705-□-L4□-□□□ : 0 x 000178 (376)	PF2M711-□-L□-□□□ : 0 x 000185 (389) PF2M711-□-L2□-□□□ : 0 x 000186 (390) PF2M711-□-L3□-□□□ : 0 x 000187 (391) PF2M711-□-L4□-□□□ : 0 x 000188 (392)
	PF2M710-□-L□-□□□ : 0 x 000179 (377) PF2M710-□-L2□-□□□ : 0 x 00017A (378) PF2M710-□-L3□-□□□ : 0 x 00017B (379) PF2M710-□-L4□-□□□ : 0 x 00017C (380)	PF2M721-□-L□-□□□ : 0 x 00023B (571) PF2M721-□-L2□-□□□ : 0 x 00023C (572) PF2M721-□-L3□-□□□ : 0 x 00023D (573) PF2M721-□-L4□-□□□ : 0 x 00023E (574)

# PF2M7(-L) Series

## Set Point Range and Rated Flow Range

### Set the flow rate within the rated flow range.

The set point range is the range of flow rate that can be set in the switch.

The rated flow range is the range that satisfies the switch specifications (accuracy, linearity, etc.).

It is possible to set a value outside of the rated flow range if it is within the set point range, however, the satisfaction of specifications can not be guaranteed. The flow range if using CO<sub>2</sub> is given in brackets.

Model	Flow range [L/min]										
	-10	-5	0	1	2	5	10	25	50	100	200
PF2M701(-L)			0.01 L/min	1.0 L/min (0.5 L/min)							
			-0.05 L/min	1.05 L/min (0.525 L/min)							
			-0.05 L/min	1.05 L/min (0.525 L/min)							
PF2M702(-L)			0.02 L/min	2.0 L/min (1 L/min)							
			-0.1 L/min	2.1 L/min (1.05 L/min)							
			-0.1 L/min	2.1 L/min (1.05 L/min)							
PF2M705(-L)			0.05 L/min	5.0 L/min (2.5 L/min)							
			-0.25 L/min	5.25 L/min (2.63 L/min)							
			-0.25 L/min	5.25 L/min (2.63 L/min)							
PF2M710(-L)			0.1 L/min	10.0 L/min (5 L/min)							
			-0.5 L/min	10.5 L/min (5.25 L/min)							
			-0.5 L/min	10.5 L/min (5.25 L/min)							
PF2M725(-L)			0.3 L/min	25.0 L/min (12.5 L/min)							
			-1.3 L/min	26.3 L/min (13.1 L/min)							
			-1.3 L/min	26.3 L/min (13.1 L/min)							
PF2M750(-L)			0.5 L/min	50.0 L/min (25 L/min)							
			-2.5 L/min	52.5 L/min (26.3 L/min)							
			-2.5 L/min	52.5 L/min (26.3 L/min)							
PF2M711(-L)			1.0 L/min	100.0 L/min (50 L/min)							
			-5.0 L/min	105.0 L/min (52.5 L/min)							
			-5.0 L/min	105.0 L/min (52.5 L/min)							
PF2M721(-L)			2 L/min	200 L/min (100 L/min)							
			-10 L/min	210 L/min (105 L/min)							
			-10 L/min	210 L/min (105 L/min)							

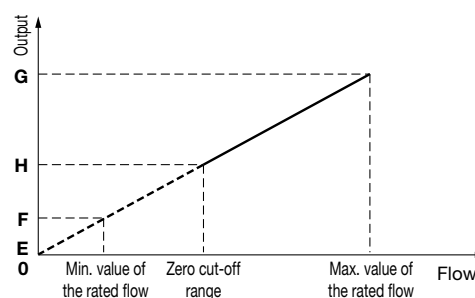
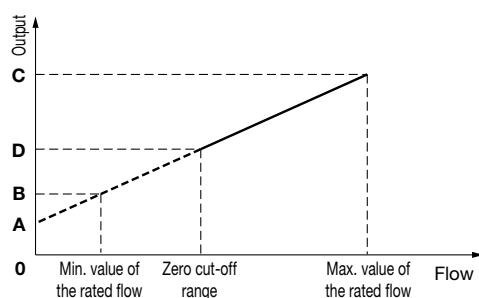
Rated flow range    Set point range    Display range

## Flow/Analog Output

	A	B		C
		PF2M701/02/05/10/50/11/21(-L)	PF2M725(-L)	
Voltage output (1 to 5 V)	1 V	1.04 V	1.05 V	5 V
Current output (4 to 20 mA)	4 mA	4.16 mA	4.19 mA	20 mA

	E	F		G
		PF2M701/02/05/10/50/11/21(-L)	PF2M725(-L)	
Voltage output (0 to 10 V)*1	0 V	0.10 V	0.12 V	10 V



\*1 The analog output current from the connected equipment should be 20 μA or less when selecting 0 to 10 V. When 20 μA or more current flows, it is possible that the accuracy is not satisfied at less than or equal to 0.5 V.

\* D or H fluctuates depending on the setting of the zero cut-off function.

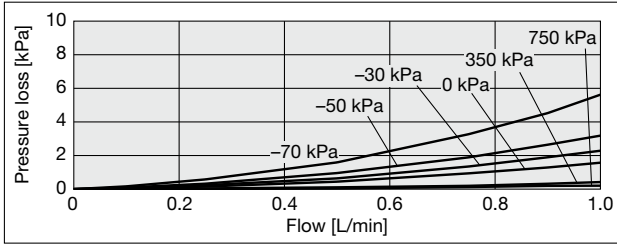
When the zero cut-off function is set to "0," the flow rate display value starts from 0 L/min., but in conditions other than horizontal installation and supply pressure of 0.35 MPa, the output may not be 0 L/min.



**Pressure Loss (Reference Data): Without Flow Adjustment Valve**

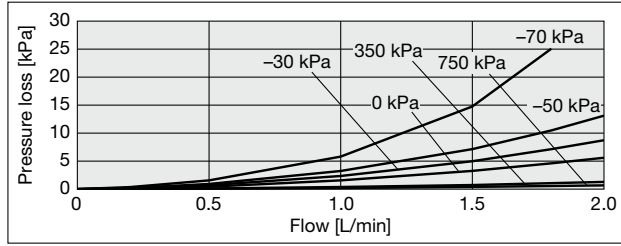
**PF2M701(-L)**

1 L/min



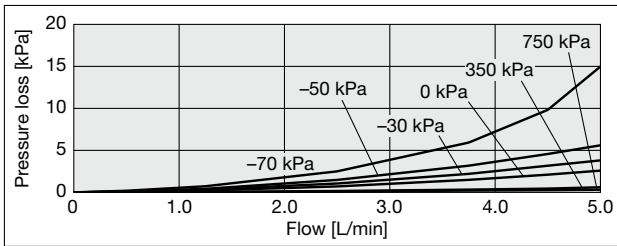
**PF2M702(-L)**

2 L/min



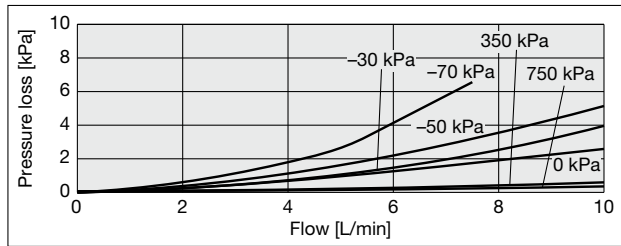
**PF2M705(-L)**

5 L/min



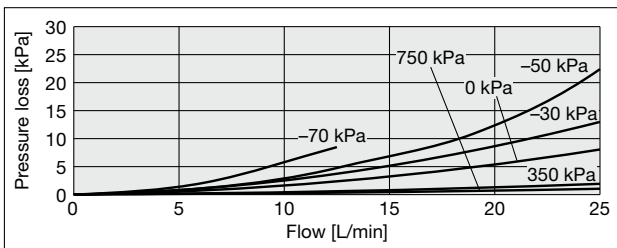
**PF2M710(-L)**

10 L/min



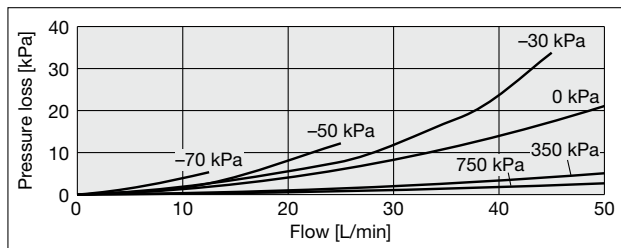
**PF2M725(-L)**

25 L/min



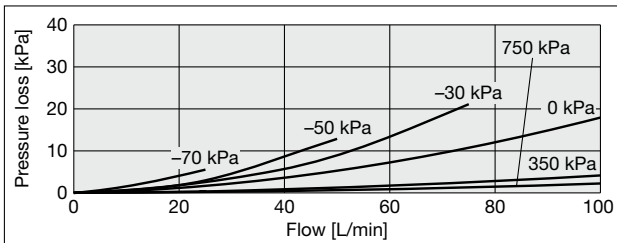
**PF2M750(-L)**

50 L/min



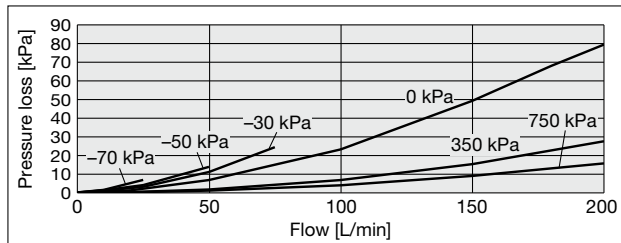
**PF2M711(-L)**

100 L/min



**PF2M721(-L)**

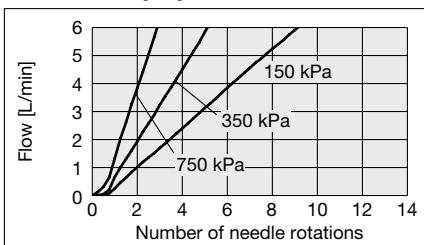
200 L/min



**Flow Rate Characteristics (Reference Data)**

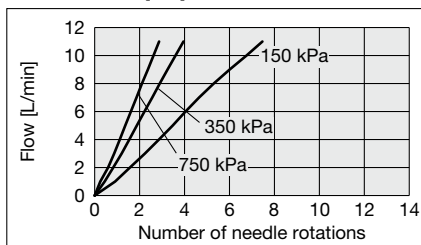
**PF2M705(-L)**

5 L/min



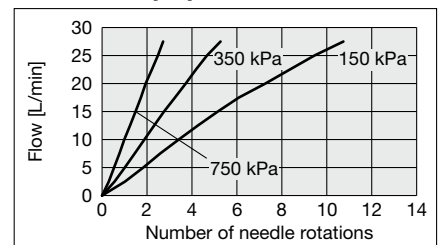
**PF2M710(-L)**

10 L/min



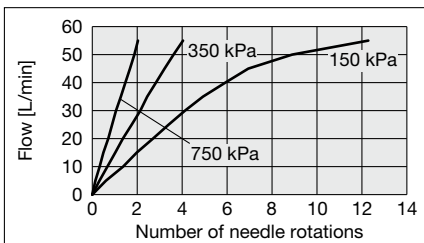
**PF2M725(-L)**

25 L/min



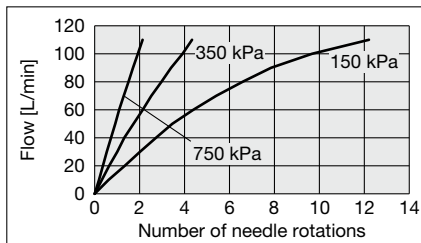
**PF2M750(-L)**

50 L/min



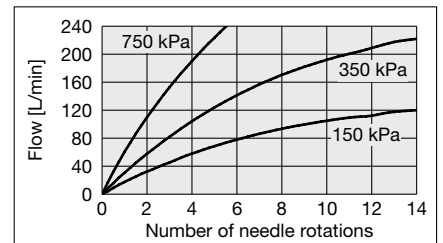
**PF2M711(-L)**

100 L/min



**PF2M721(-L)**

200 L/min



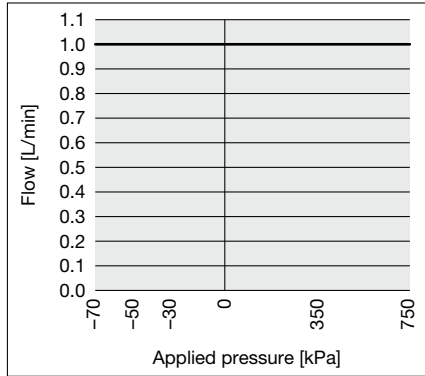
# PF2M7(-L) Series

## Flow Rate Characteristics at Negative Pressure (Reference Data)

When the PF2M series is used with negative pressure (-70 to 0 kPa), the measurable range (warranty range of the specifications including pressure characteristics) varies depending on the flow range. Select the flow range referring to the graph below.

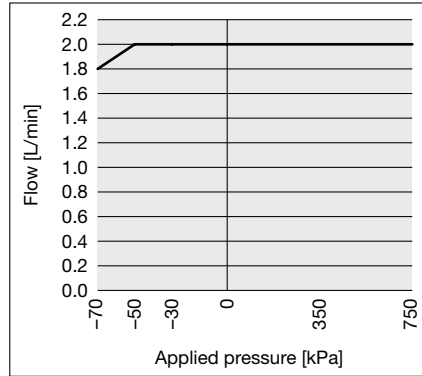
**PF2M701(-L)**

1 L/min



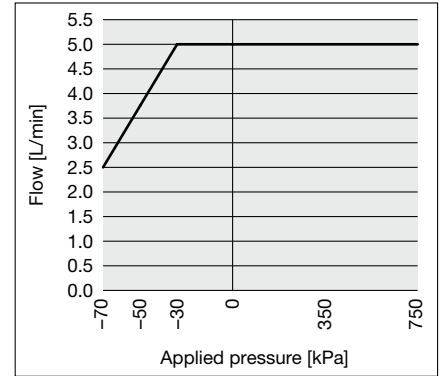
**PF2M702(-L)**

2 L/min



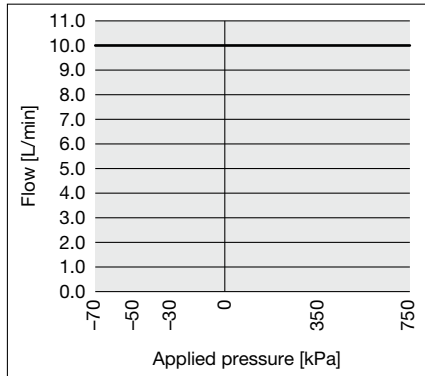
**PF2M705(-L)**

5 L/min



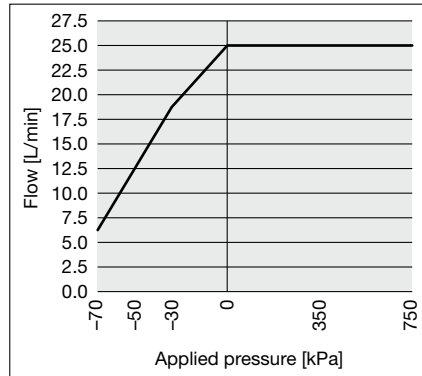
**PF2M710(-L)**

10 L/min



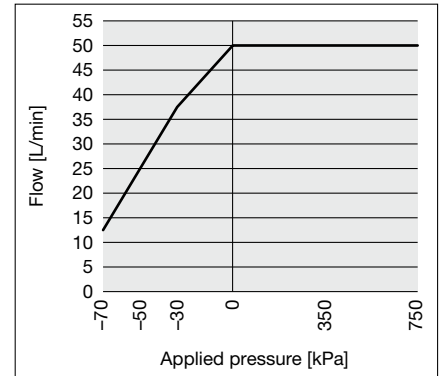
**PF2M725(-L)**

25 L/min



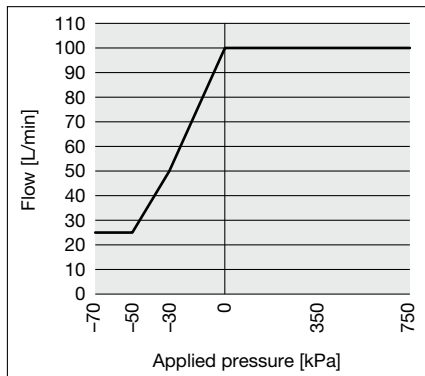
**PF2M750(-L)**

50 L/min



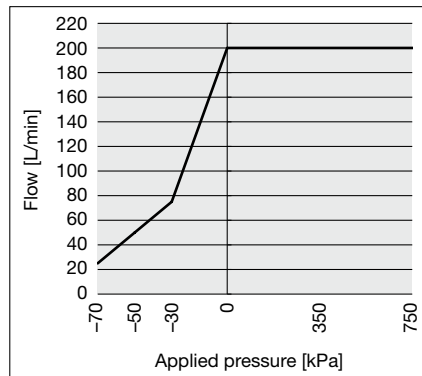
**PF2M711(-L)**

100 L/min



**PF2M721(-L)**

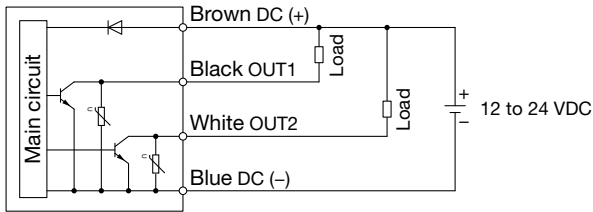
200 L/min



## Internal Circuits and Wiring Examples

### NPN + NPN output type

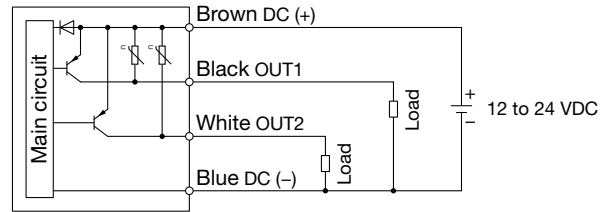
PF2M7□□-□-**A**□-□□□



Max. applied voltage: 28 V, Max. load current: 80 mA,  
Internal voltage drop: 1 V or less

### PNP + PNP output type

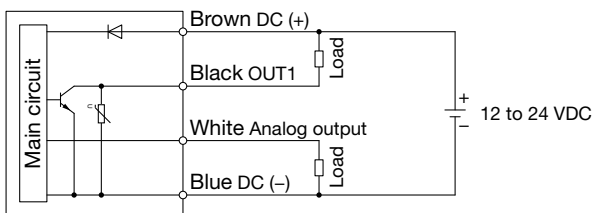
PF2M7□□-□-**B**□-□□□



Max. load current: 80 mA, Internal voltage drop: 1.5 V or less

### NPN + Analog output type

PF2M7□□-□-**C/D**□-□□□



Max. applied voltage: 28 V, Max. load current: 80 mA,  
Internal voltage drop: 1 V or less

**C:** Analog output: 1 to 5 V or 0 to 10 V can be selected.

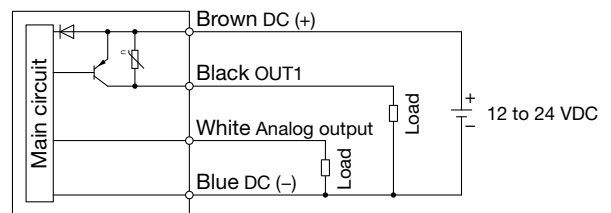
Output impedance: 1 kΩ

**D:** Analog output: 4 to 20 mA

Load impedance: 50 to 600 Ω

### PNP + Analog output type

PF2M7□□-□-**E/F**□-□□□



Max. load current: 80 mA, Internal voltage drop: 1.5 V or less

**E:** Analog output: 1 to 5 V or 0 to 10 V can be selected.

Output impedance: 1 kΩ

**F:** Analog output: 4 to 20 mA

Load impedance: 50 to 600 Ω

## Accumulated pulse output wiring examples

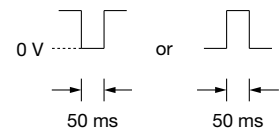
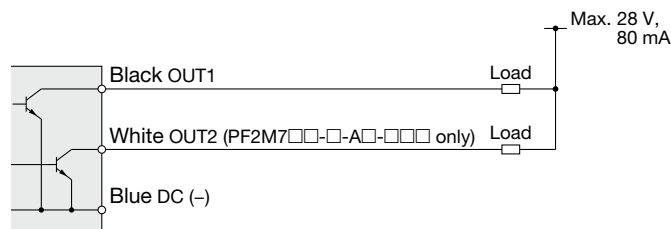
### NPN + NPN output type

PF2M7□□-□-**A**□-□□□

### NPN + Analog output type

PF2M7□□-□-**C**□-□□□

PF2M7□□-□-**D**□-□□□



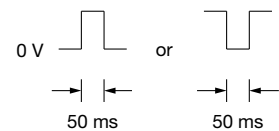
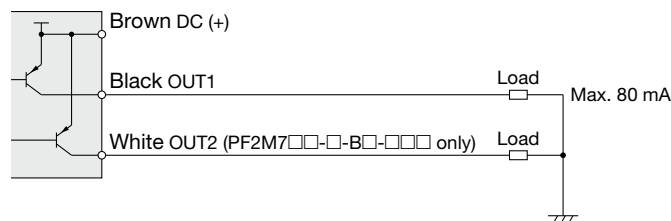
### PNP + PNP output type

PF2M7□□-□-**B**□-□□□

### PNP + Analog output type

PF2M7□□-□-**E**□-□□□

PF2M7□□-□-**F**□-□□□

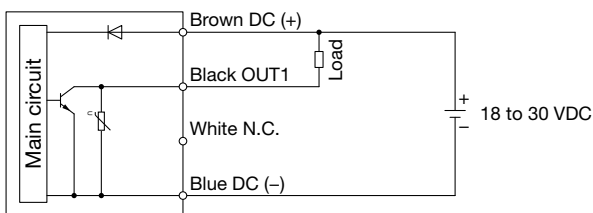


# PF2M7(-L) Series

## Internal Circuits and Wiring Examples

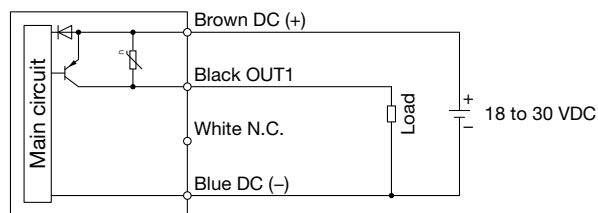
PF2M7□□-□-L□-□□□

### NPN output type



Max. applied voltage: 30 V, Max. load current: 80 mA,  
Internal voltage drop: 1.5 V or less

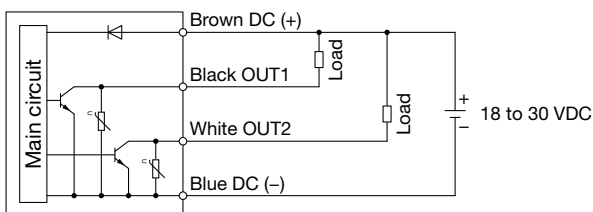
### PNP output type



Max. load current: 80 mA, Internal voltage drop: 1.5 V or less

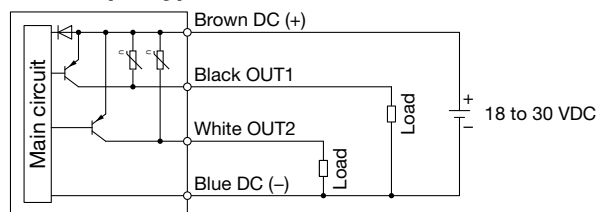
PF2M7□□-□-L2□-□□□

### NPN 2 output type



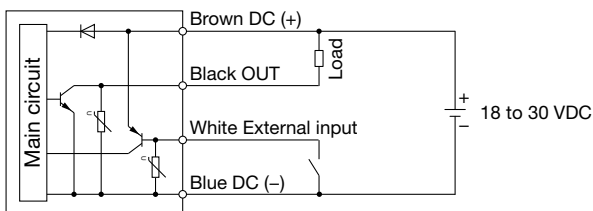
Max. applied voltage: 30 V, Max. load current: 80 mA,  
Internal voltage drop: 1.5 V or less

### PNP 2 output type



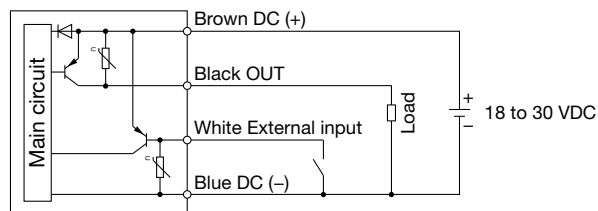
Max. load current: 80 mA, Internal voltage drop: 1.5 V or less

### NPN + External input type



Max. applied voltage: 30 V, Max. load current: 80 mA,  
Internal voltage drop: 1.5 V or less

### PNP + External input type

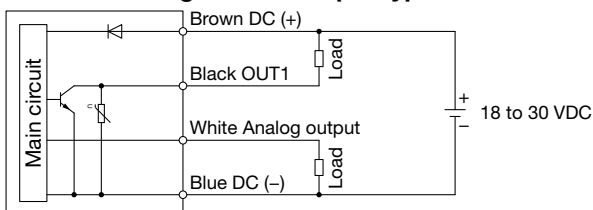


Max. load current: 80 mA, Internal voltage drop: 1.5 V or less

PF2M7□□-□-L3/4□-□□□

### L3: NPN + Analog voltage output type

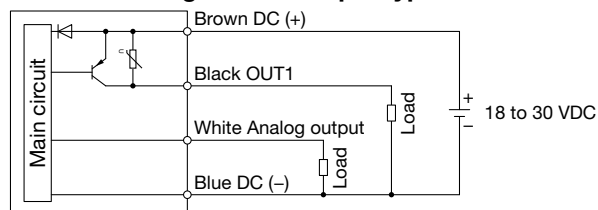
### L4: NPN + Analog current output type



Max. applied voltage: 30 V, Max. load current: 80 mA,  
Internal voltage drop: 1.5 V or less  
**L3:** Analog output: 1 to 5 V or 0 to 10 V can be selected.  
Output impedance: 1 kΩ  
**L4:** Analog output: 4 to 20 mA  
Load impedance: 50 to 600 Ω

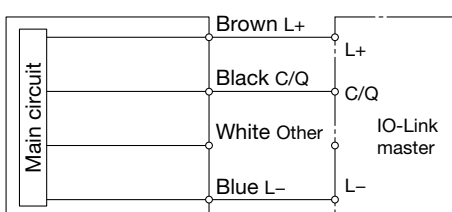
### L3: PNP + Analog voltage output type

### L4: PNP + Analog current output type



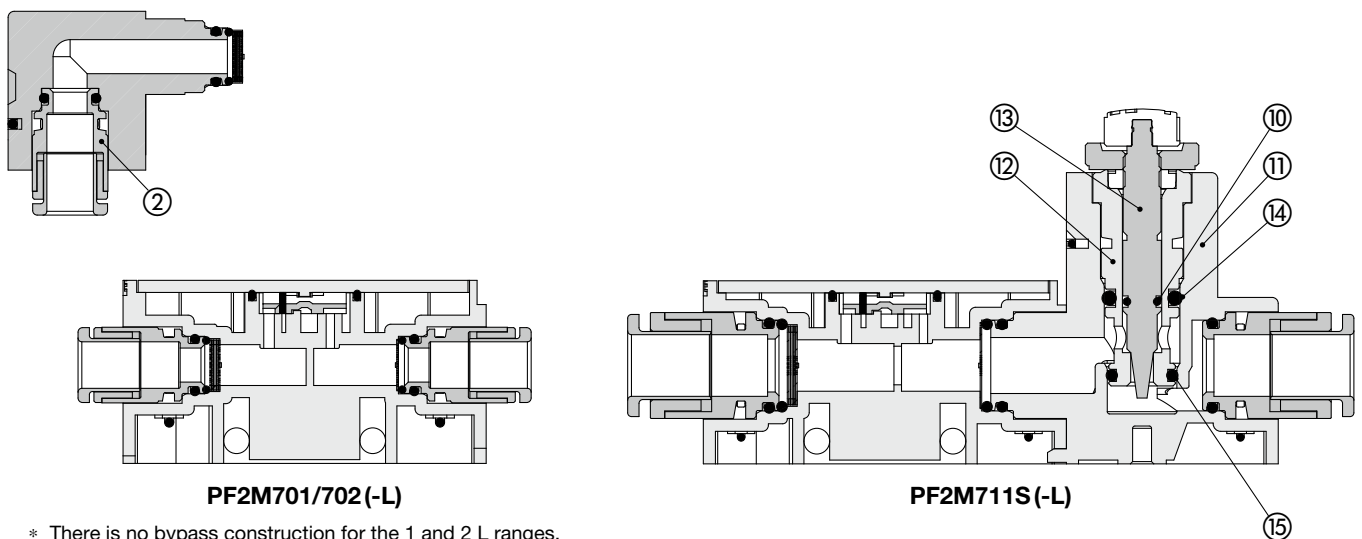
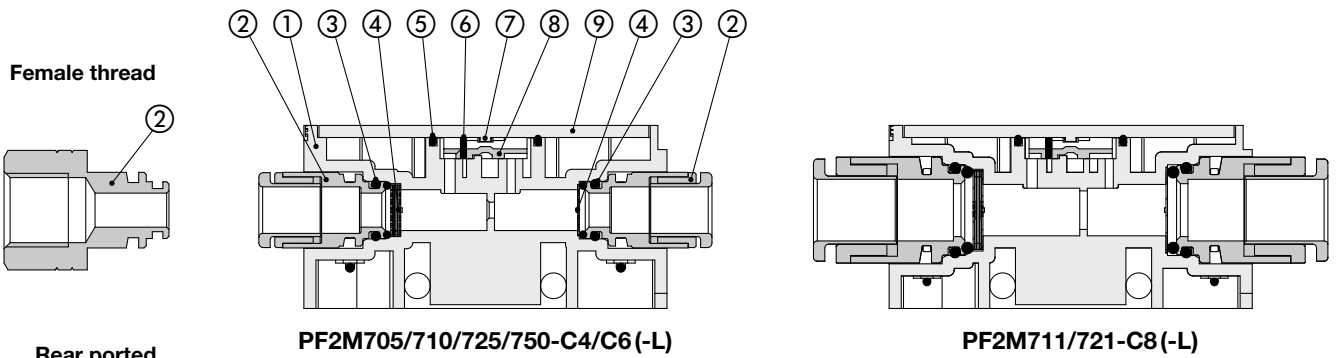
Max. load current: 80 mA, Internal voltage drop: 1.5 V or less  
**L3:** Analog output: 1 to 5 V or 0 to 10 V can be selected.  
Output impedance: 1 kΩ  
**L4:** Analog output: 4 to 20 mA  
Load impedance: 50 to 600 Ω

### When used as an IO-Link device



**Construction: Parts in Contact with Fluid**

**PF2M701/702/705/710/725/750/711(-L)**



\* There is no bypass construction for the 1 and 2 L ranges.

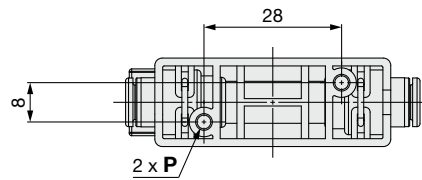
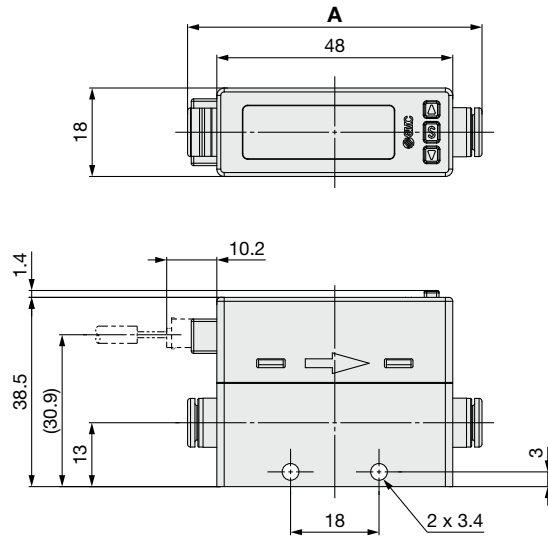
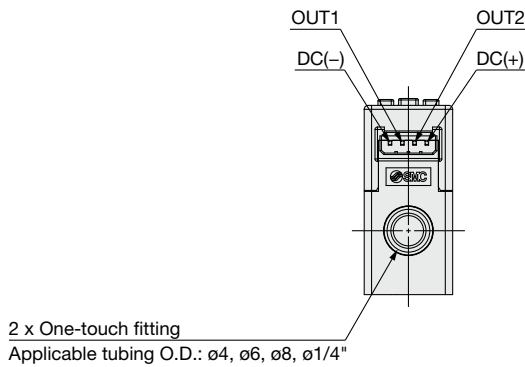
**Component Parts**

No.	Description	Material	Note
1	Body	PPS	
2	Fitting for piping	Brass	Electroless nickel plating
3	O-ring	FKM	
4	Flow rectifier	Stainless steel 304	
5	Seal	FKM	
6	Flow rectifier	Stainless steel 304	
7	Sensor chip	Silicon	
8	Body B	PPS	
9	Printed circuit board	GE4F	
10	O-ring	FKM	Fluoro coating
11	Flow adjustment valve body	PBT	
12	Body	Brass	Electroless nickel plating
13	Needle	Brass	Electroless nickel plating
14	O-ring	FKM	Fluoro coating
15	O-ring	FKM	Fluoro coating

# PF2M7(-L) Series

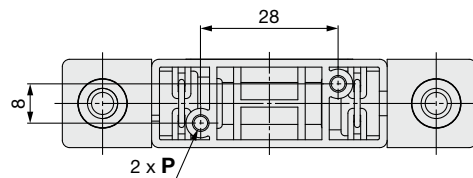
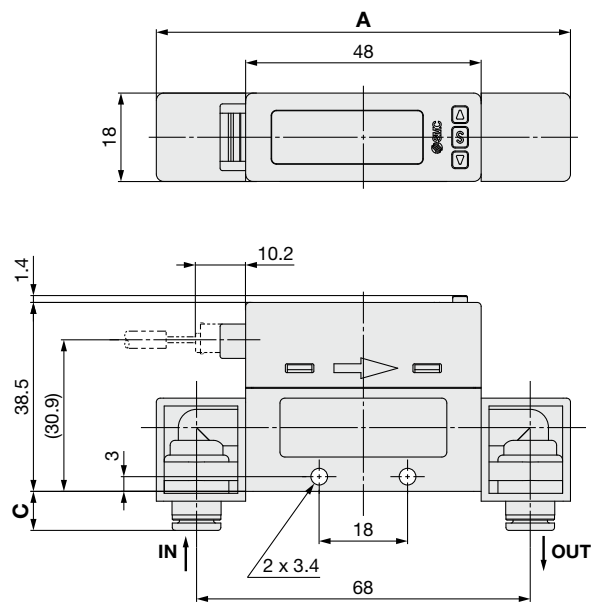
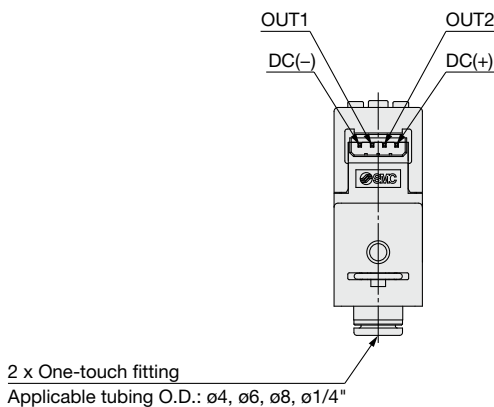
## Dimensions

### PF2M7□-C4/C6/C8/N7(-L)



Model	A	P
PF2M701/702/705/710-C4(-L)	59.1	ø2.8 depth 8.4
PF2M701/702/705/710/725/750-C6(-L)	59.9	ø2.8 depth 8.4
PF2M725/750-N7(-L)	67.5	ø2.8 depth 8.4
PF2M711/721-C8(-L)	68	ø2.8 depth 6.2
PF2M711/721-N7(-L)	64.6	ø2.8 depth 6.2

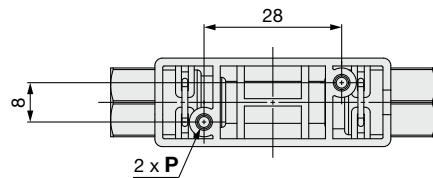
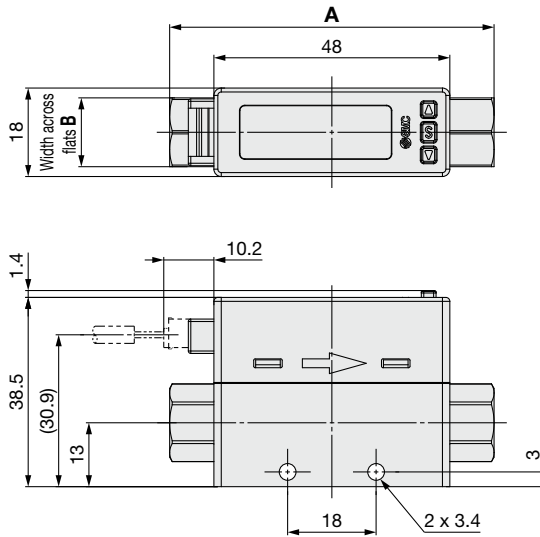
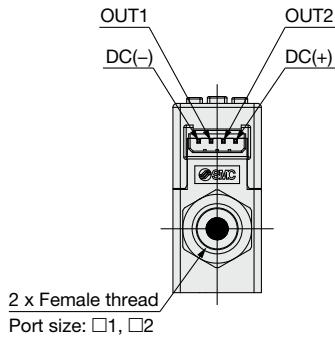
### PF2M7□L-C4/C6/C8/N7(-L)



Model	A	C	P
PF2M701/702/705/710L-C4(-L)	84.4	7.6	ø2.8 depth 8.4
PF2M701/702/705/710/725/750L-C6(-L)	84.4	8	ø2.8 depth 8.4
PF2M725/750L-N7(-L)	84.4	11.8	ø2.8 depth 8.4
PF2M711/721L-C8(-L)	88	12	ø2.8 depth 6.2
PF2M711/721L-N7(-L)	88	10.3	ø2.8 depth 6.2

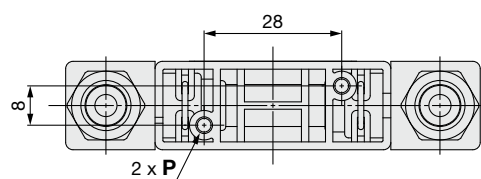
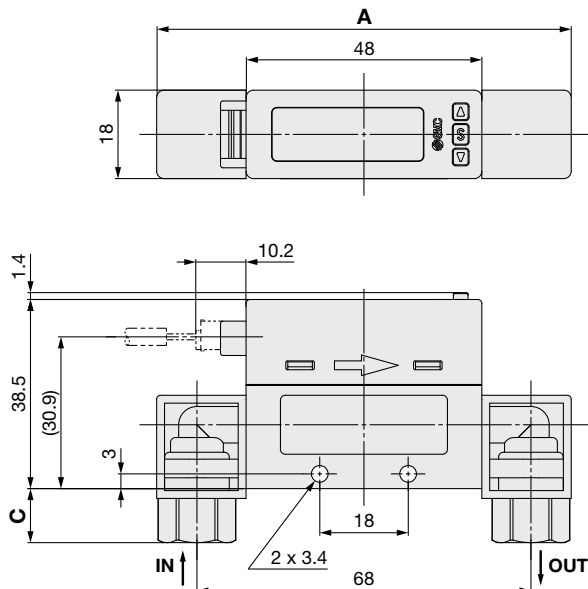
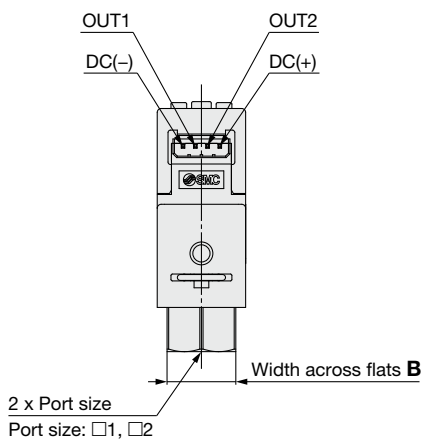
## Dimensions

### PF2M7□-□1/2(-L)



Model	A	B	P
PF2M701/702/705/710/725/750-01(-L)	66	14	ø2.8 depth 8.4
PF2M701/702/705/710/725/750-N1(-L)	68	14	ø2.8 depth 8.4
PF2M701/702/705/710/725/750-F1(-L)	70	14	ø2.8 depth 8.4
PF2M711/721-02(-L)	70	17	ø2.8 depth 6.2
PF2M711/721-N2(-L)	70	17	ø2.8 depth 6.2
PF2M711/721-F2(-L)	78	21	ø2.8 depth 6.2

### PF2M□L-□1/2(-L)

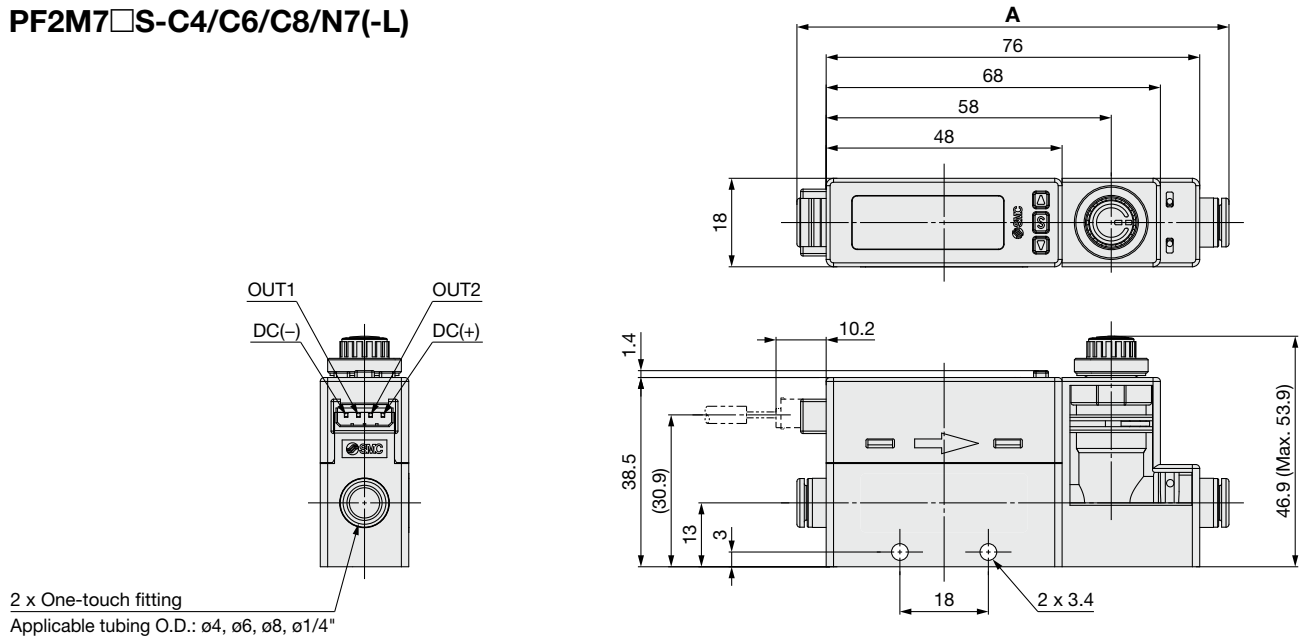


Model	A	C	B	P
PF2M701/702/705/710/725/750L-01(-L)	84.4	11	14	ø2.8 depth 8.4
PF2M701/702/705/710/725/750L-N1(-L)	84.4	12	14	ø2.8 depth 8.4
PF2M701/702/705/710/725/750L-F1(-L)	84.4	13	14	ø2.8 depth 8.4
PF2M711/721L-02(-L)	88	13	17	ø2.8 depth 6.2
PF2M711/721L-N2(-L)	88	13	17	ø2.8 depth 6.2
PF2M711/721L-F2(-L)	88	17	21	ø2.8 depth 6.2

# PF2M7(-L) Series

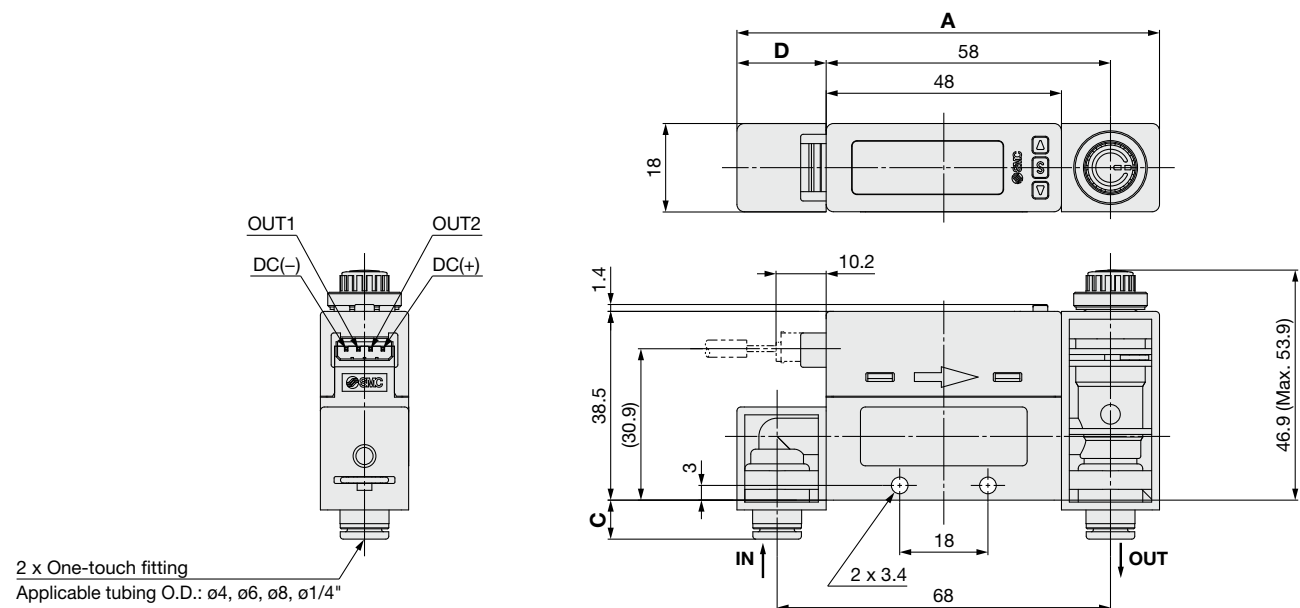
## Dimensions

### PF2M7□S-C4/C6/C8/N7(-L)



Model	A	P	Q
PF2M705/710S-C4(-L)	87.1	ø2.8 depth 8.4	ø2.5 depth 6
PF2M705/710/725/750S-C6(-L)	87.9	ø2.8 depth 8.4	ø2.5 depth 6
PF2M725/750S-N7(-L)	95.5	ø2.8 depth 8.4	ø2.5 depth 6
PF2M711/721S-C8(-L)	96	ø2.8 depth 6.2	ø2.5 depth 5
PF2M711/721S-N7(-L)	92.6	ø2.8 depth 6.2	ø2.5 depth 5

### PF2M7□W-C4/C6/C8/N7(-L)

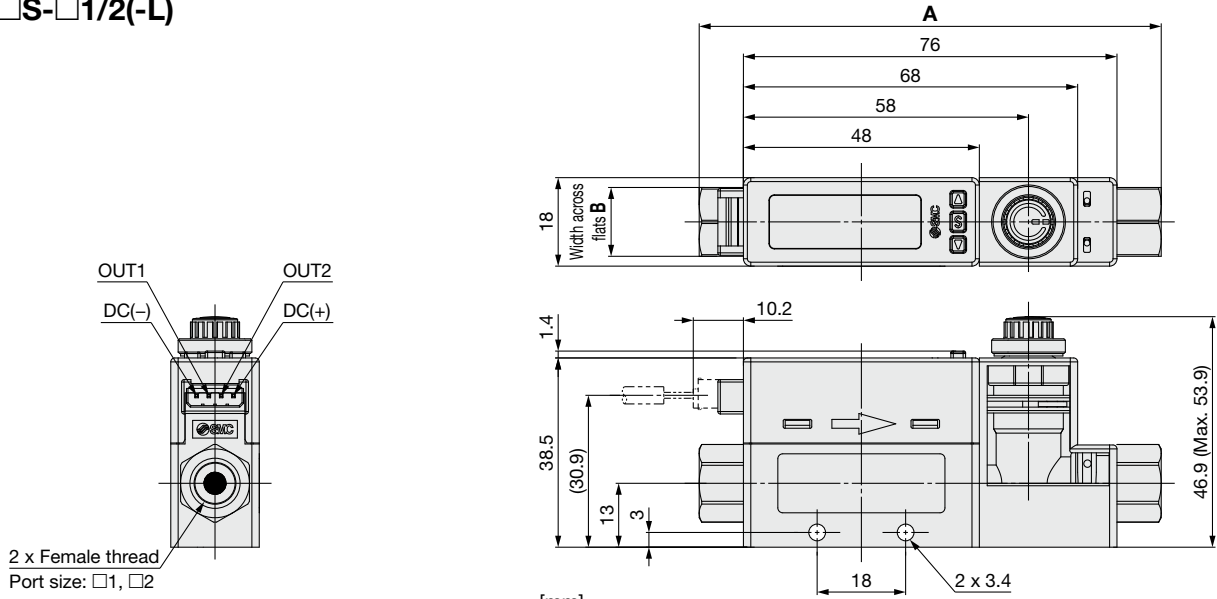


Model	A	C	D	P
PF2M705/710W-C4(-L)	86.2	7.6	18.2	ø2.8 depth 8.4
PF2M705/710/725/750W-C6(-L)	86.2	8	18.2	ø2.8 depth 8.4
PF2M725/750W-N7(-L)	86.2	11.8	18.2	ø2.8 depth 8.4
PF2M711/721W-C8(-L)	88	12	20	ø2.8 depth 6.2
PF2M711/721W-N7(-L)	88	10.3	20	ø2.8 depth 6.2



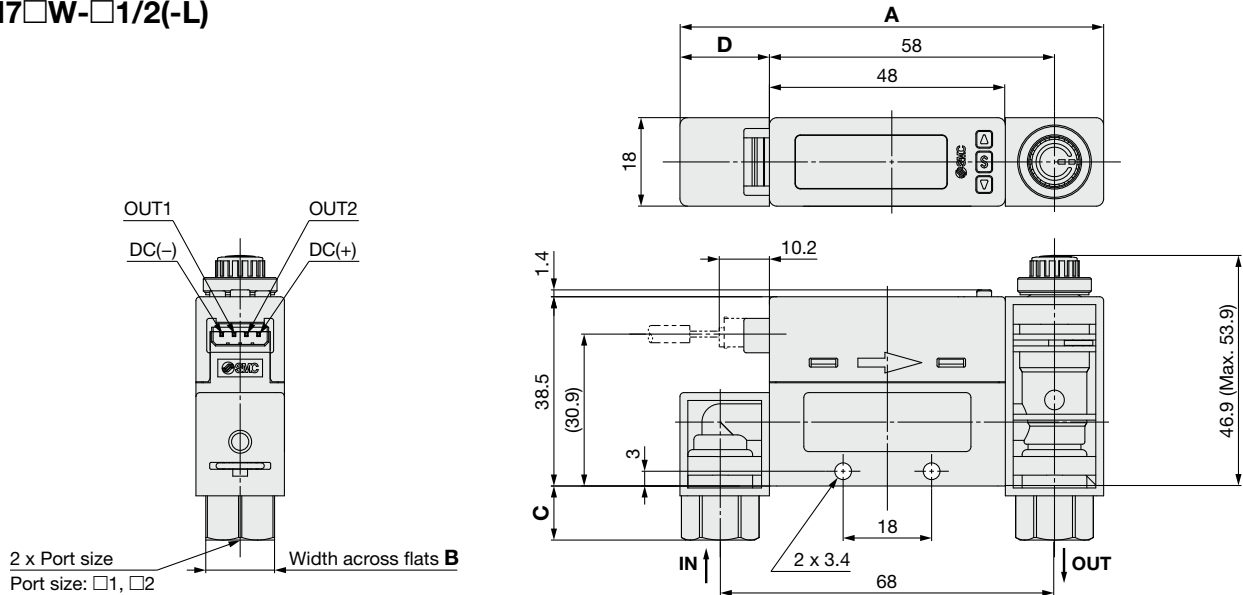
**Dimensions**

**PF2M7□S-□1/2(-L)**



Model	A	B	P	Q
PF2M705/710/725/750S-01(-L)	94	14	ø2.8 depth 8.4	ø2.5 depth 6
PF2M705/710/725/750S-N1(-L)	96	14	ø2.8 depth 8.4	ø2.5 depth 6
PF2M705/710/725/750S-F1(-L)	98	14	ø2.8 depth 8.4	ø2.5 depth 6
PF2M711/721S-02(-L)	98	17	ø2.8 depth 6.2	ø2.5 depth 5
PF2M711/721S-N2(-L)	98	17	ø2.8 depth 6.2	ø2.5 depth 5
PF2M711/721S-F2(-L)	106	21	ø2.8 depth 6.2	ø2.5 depth 5

**PF2M7□W-□1/2(-L)**



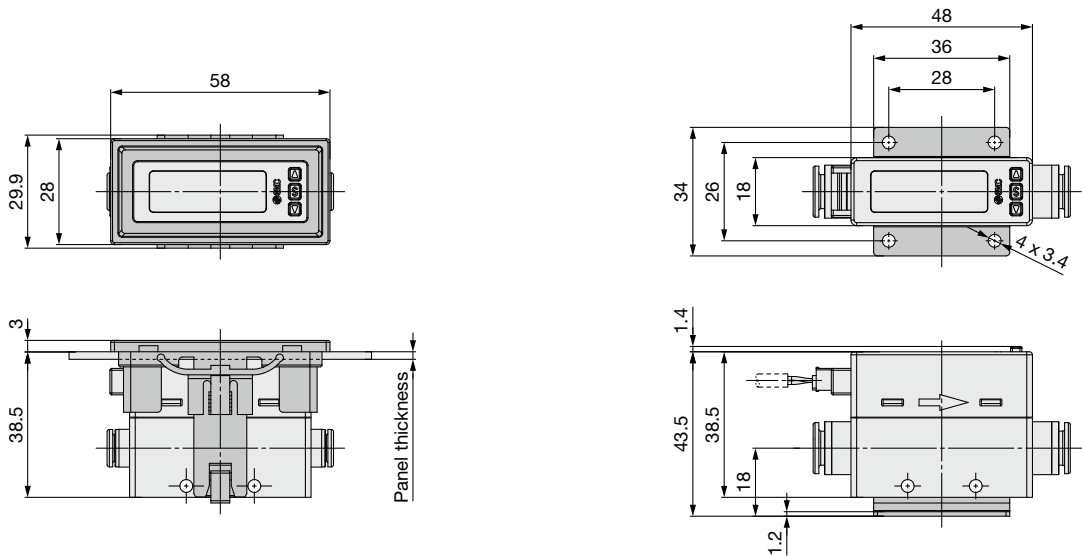
Model	A	C	B	D	P
PF2M705/710/725/750W-01(-L)	86.2	11	14	18.2	ø2.8 depth 8.4
PF2M705/710/725/750W-N1(-L)	86.2	12	14	18.2	ø2.8 depth 8.4
PF2M705/710/725/750W-F1(-L)	86.2	13	14	18.2	ø2.8 depth 8.4
PF2M711/721W-02(-L)	88	13	17	20	ø2.8 depth 6.2
PF2M711/721W-N2(-L)	88	13	17	20	ø2.8 depth 6.2
PF2M711/721W-F2(-L)	88	17	21	20	ø2.8 depth 6.2

# PF2M7(-L) Series

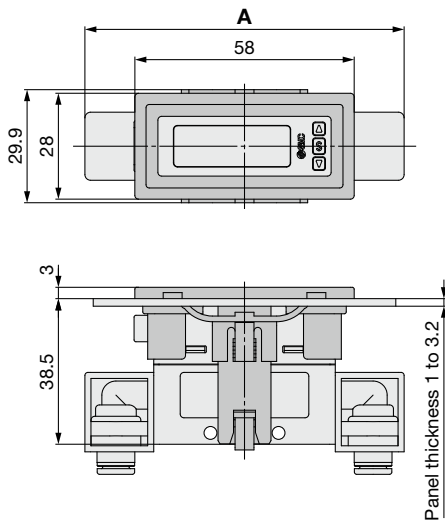
## Dimensions

### PF2M701/702/705/710/725/750/711/721(-L)

Panel mounting/Without flow adjustment valve/Straight      With bracket/Without flow adjustment valve

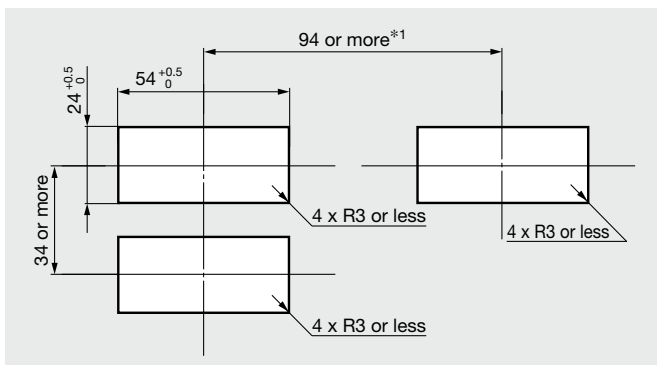


### Panel mount adapter/Without flow adjustment valve



Model	A [mm]
PF2M701/702/705/710/725/750L-□(-L)	84.4
PF2M711/721L-□(-L)	88

### Panel Fitting Dimensions



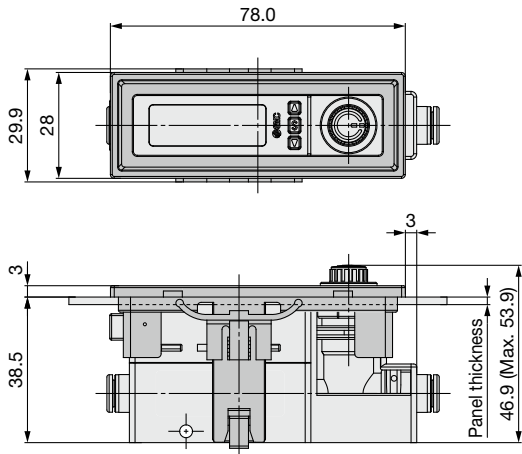
Panel thickness 1 to 3.2 mm

\*1 This is the minimum value when the rear ported type is selected for the piping entry direction. For the straight type, please design the layout with consideration to the piping material and tubing length. If a bend (R) is used, limit it to R3 or less.

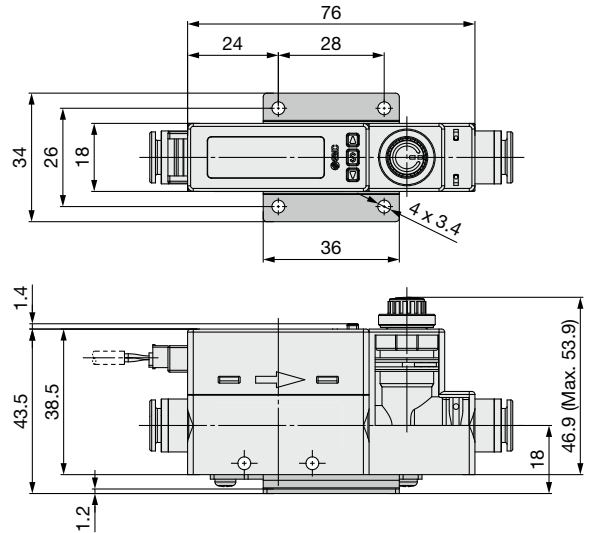
## Dimensions

### PF2M705/710/725/750/711/721(-L)

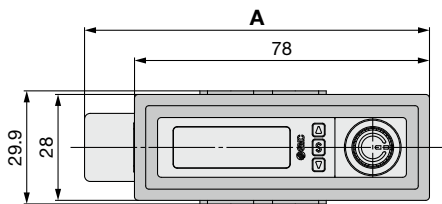
Panel mounting/With flow adjustment valve/Straight



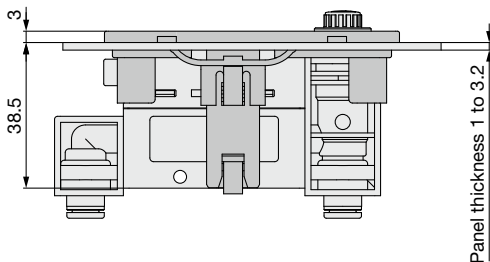
With bracket/With flow adjustment valve



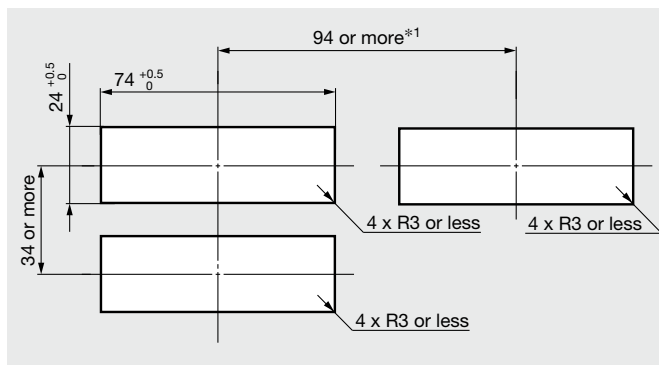
Panel mount adapter/With flow adjustment valve



Model	A [mm]
PF2M705/710/725/750W-□(-L)	91.2
PF2M711/721W-□(-L)	93



## Panel Fitting Dimensions



Panel thickness 1 to 3.2 mm

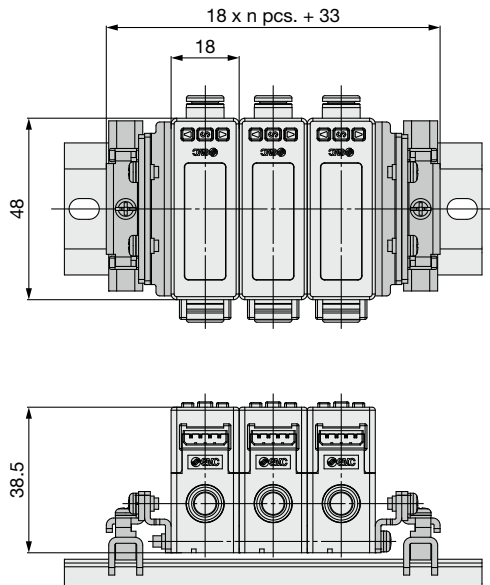
\*1 This is the minimum value when the rear ported type is selected for the piping entry direction. For the straight type, please design the layout with consideration to the piping material and tubing length. If a bend (R) is used, limit it to R3 or less.

# PF2M7(-L) Series

## Dimensions

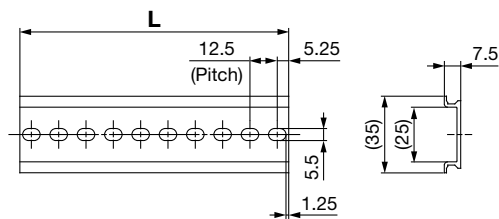
### PF2M701/702/705/710/725/750/711/721(-L)

#### DIN rail mounting bracket ZS-33-R□



#### DIN rail AXT100-DR-□

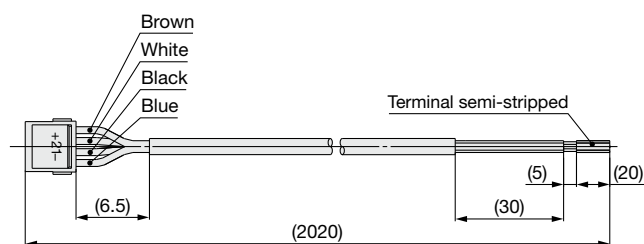
\* For □, enter a number from the No. line in the table below.



#### L Dimensions [mm]

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>L</b>	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5

#### Lead wire with connector ZS-33-D



#### Cable Specifications

<b>Conductor</b>	<b>Nominal cross section</b>	AWG 26
	<b>Outside diameter</b>	Approx. 0.50 mm
<b>Insulator</b>	<b>Outside diameter</b>	Approx. 1.00 mm
	<b>Color</b>	Brown, White, Black, Blue
<b>Sheath</b>	<b>Material</b>	Oil-resistant PVC
<b>Finished outside diameter</b>		ø3.5

\* For wiring, refer to the Operation Manual from the SMC website Documents/Download --> Instruction Manuals.

# PF2M7-L Series IO-Link Compatible Products

## Made to Order

Please contact SMC for detailed specifications, delivery times, and prices.



### Compatible with Argon (Ar) and Carbon Dioxide (CO<sub>2</sub>) Mixed Gas

Symbol  
**X731**

The argon-carbon dioxide gas ratio (Ar : CO<sub>2</sub>) can be selected using the push-buttons from among the following: 92 : 8, 90 : 10, 80 : 20, 70 : 30, 60 : 40, 40 : 60, and 30 : 70. The dimensions are the same as those of the standard model.

PF2M 7   -  - **L**  -   - X731

**7** Integrated display

#### Output specification

Symbol	OUT1	OUT2
<b>L</b>	IO-Link/NPN/PNP	—
<b>L2</b>	IO-Link/NPN/PNP	NPN/PNP/External input
<b>L3</b>	IO-Link/NPN/PNP	Analog 1 to 5 V ↔ Analog 0 to 10 V
<b>L4</b>	IO-Link/NPN/PNP	Analog 4 to 20 mA

For “How to Order,” refer to page 12.

\* Only applicable to the IO-Link output specification

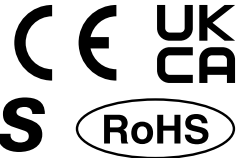
Model	Gas ratio		Rated flow range	Display/Set point range	Max. analog output	
	Ar	CO <sub>2</sub>			Voltage (Vmax)	Current (Imax)
PF2M701	92%	8%	0.01 to 1 L/min	-0.05 to 1.05 L/min	5 V	20 mA
	90%	10%				
	80%	20%				
	70%	30%				
	60%	40%				
	40%	60%				
PF2M702	30%	70%	0.01 to 0.6 L/min	-0.03 to 0.63 L/min	5 V	20 mA
	92%	8%	0.02 to 2 L/min	-0.1 to 2.1 L/min	5 V	20 mA
	90%	10%				
	80%	20%				
	70%	30%				
	60%	40%				
40%	60%					
PF2M705	30%	70%	0.02 to 1.2 L/min	-0.06 to 1.26 L/min	5 V	20 mA
	92%	8%	0.05 to 5 L/min	-0.25 to 5.25 L/min	5 V	20 mA
	90%	10%				
	80%	20%				
	70%	30%				
	60%	40%				
40%	60%					
PF2M710	30%	70%	0.05 to 3 L/min	-0.15 to 3.15 L/min	5 V	20 mA
	92%	8%	0.1 to 10 L/min	-0.5 to 10.5 L/min	5 V	20 mA
	90%	10%				
	80%	20%				
	70%	30%				
	60%	40%				
40%	60%					
PF2M710	30%	70%	0.1 to 6 L/min	-0.3 to 6.3 L/min	5 V	20 mA
	92%	8%	0.3 to 25 L/min	-1.3 to 26.3 L/min	5 V	20 mA
	90%	10%				
	80%	20%				
	70%	30%				
	60%	40%				
40%	60%					
PF2M725	30%	70%	0.3 to 15 L/min	-0.8 to 15.8 L/min	5 V	20 mA
	92%	8%	0.5 to 50 L/min	-2.5 to 52.5 L/min	5 V	20 mA
	90%	10%				
	80%	20%				
	70%	30%				
	60%	40%				
40%	60%					
PF2M750	30%	70%	0.5 to 30 L/min	-1.5 to 31.5 L/min	5 V	20 mA
	92%	8%	1 to 100 L/min	-5 to 105 L/min	5 V	20 mA
	90%	10%				
	80%	20%				
	70%	30%				
	60%	40%				
40%	60%					
PF2M711	30%	70%	1 to 60 L/min	-3 to 63 L/min	5 V	20 mA

\* When changing the max. analog output, use the analog free span function in the operation manual on the SMC website.

# 3-Screen Display

# Digital Flow Monitor

# PFGM302 Series



## How to Order

PFGM 3 0 2 - RT - M - L [ ] [ ] [ ]

### Type

3 Remote type monitor unit

### Input specification

Symbol	Description	Applicable flow switch model
0	Voltage input	PF2M7□-C/E series
1	Current input	PF2M7□-D/F series

### Output specification

RT	2 outputs (NPN/PNP switching type) + Analog voltage output*1,2
SV	2 outputs (NPN/PNP switching type) + Analog current output*2
XY	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

Nil	Units selection function*3
M	SI unit only*4

\*3 This product is for overseas use only according to the New Measurement Act. (The SI unit type is provided for use in Japan.)

\*4 Fixed unit: Instantaneous flow: L/min  
Accumulated flow: L

### Option 4

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

### Option 3

Nil	None
C	ZS-28-C-1  Sensor connector 

### Option 1

Symbol	Description
Nil	Without lead wire
L	Power supply/output connection lead wire (Lead wire length: 2 m) 

### Option 2

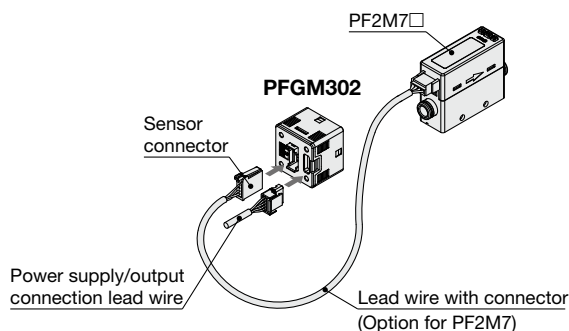
Symbol	Description
Nil	None
A1	Bracket A (Vertical mounting) 
A2	Bracket B (Horizontal mounting) 
B	Panel mount adapter 
D	Panel mount adapter + Front protection cover 

### Options/Part Nos.

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

Part no.	Option	Note
ZS-28-C-1	Sensor connector	For PF2M7
ZS-46-A1	Bracket A	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
ZS-46-A2	Bracket B	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
ZS-46-B	Panel mount adapter	
ZS-46-D	Panel mount adapter + Front protection cover	
ZS-46-5L	Power supply/output connection lead wire	5-core, 2 m
ZS-27-01	Front protection cover	

### Connection Example



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



## Specifications

Model		PFGM302 series									
Applicable SMC flow sensor	Model	PF2M701	PF2M702	PF2M705	PF2M710	PF2M725	PF2M750	PF2M711	PF2M721		
		Rated flow range*1 [L/min]	Dry air, N <sub>2</sub> , Ar CO <sub>2</sub>	0.01 to 1	0.02 to 2	0.05 to 5	0.1 to 10	0.3 to 25	0.5 to 50	1 to 100	2 to 200
Flow	Set point range	Instantaneous flow [L/min]	-0.05 to 1.05	-0.1 to 2.1	-0.25 to 5.25	-0.5 to 10.5	-1.3 to 26.3	-2.5 to 52.5	-5 to 105	-10 to 210	
		Accumulated flow [L]	0.00 to 9999999.99								
	Smallest settable increment	Instantaneous flow [L/min]	0.001	0.01			0.1			1	
		Accumulated flow [L]	0.01		0.1		1			1	
		Accumulated volume per pulse [L/pulse]	0.01			0.1			1		
	Accumulated value hold function*2	Intervals of 2 or 5 minutes can be selected.									
Electrical	Power supply voltage	12 to 24 VDC ±10% or less									
	Current consumption	25 mA or less									
	Protection	Polarity protection									
Accuracy	Display accuracy	±0.5% F.S. ± Minimum display unit (Ambient temperature of 25°C)									
	Analog output accuracy	±0.5% F.S. (Ambient temperature of 25°C)									
	Repeatability	±0.1% F.S. ±1 digit									
	Temperature characteristics	±0.5% F.S. (Ambient temperature: 0 to 50°C, 25°C standard)									
Switch output	Output type	Select from PNP or NPN open collector output.									
	Output mode	Select from Hysteresis, Window comparator, Error output, Accumulated output, Accumulated pulse output, or Switch output OFF modes.									
	Switch operation	Select from Normal or Reversed output.									
	Max. load current	80 mA									
	Max. applied voltage	30 V (NPN output)									
	Internal voltage drop	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*3	3 ms or less									
	Delay time*3	Select from 0.00, 0.05 to 0.10 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									
Analog output*5	Protection	Short circuit protection									
	Output type	Voltage output: 1 to 5 V (0 to 10 V can be selected only when the power supply voltage is 24 VDC.) Current output: 4 to 20 mA									
	Impedance	Voltage output	Output impedance: Approx. 1 kΩ								
		Current output	Maximum load impedance: 300 Ω (at power supply voltage of 12 VDC), 600 Ω (at power supply voltage of 24 VDC)								
External input*6	Response time*2	50 ms or less									
	External input type	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 (ft <sup>3</sup> /min)								
		Accumulated flow	L, ft <sup>3</sup>								
	Display range	Instantaneous flow [L/min]	-0.05 to 1.05	-0.1 to 2.1	-0.25 to 5.25	-0.5 to 10.5	-1.3 to 26.3	-2.5 to 52.5	-5 to 105	-10 to 210	
		Accumulated flow [L]	0.00 to 9999999.99			0.0 to 99999999.9			0 to 999999999		
	Minimum display unit	Instantaneous flow [L/min]	0.001	0.01			0.1			1	
		Accumulated flow [L]	0.01		0.1		1				
	Display type	LCD									
	Number of displays	3-screen display (Main screen, Sub screen)									
	Display color	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, 0.05 to 0.10 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										
Environmental resistance	Enclosure	IP40									
	Withstand voltage	1000 VAC for 1 minute between terminals and housing									
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing									
	Operating temperature range	Operating: 0 to 50°C, Stored: -10 to 60°C (No condensation or freezing)									
Standards	Operating/Stored: 35 to 85% RH (No condensation or freezing)										
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 sensor

\*2 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.

\*3 Value without digital filter (at 0 ms)

\*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 analog output.

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

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

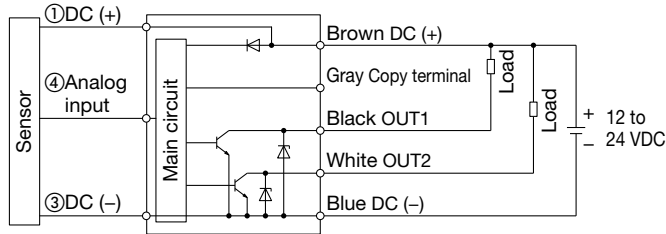
\*8 The response time indicates when the set value is 90% in relation to the step input.

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

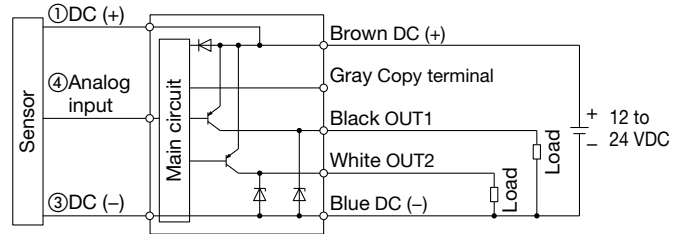
# PFGM302 Series

## Internal Circuits and Wiring Examples

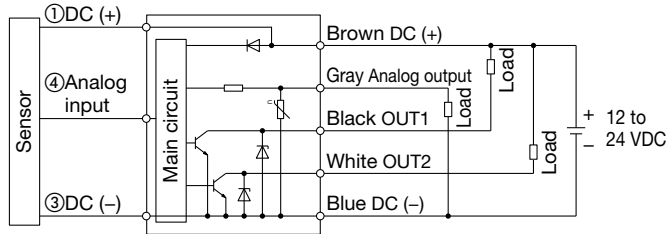
-XY  
-RT  
-SV  
**NPN (2 outputs) + Copy function**



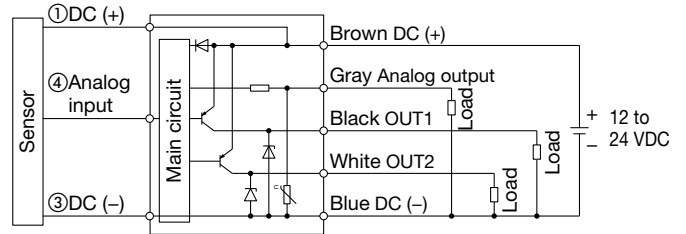
-XY  
-RT  
-SV  
**PNP (2 outputs) + Copy function**



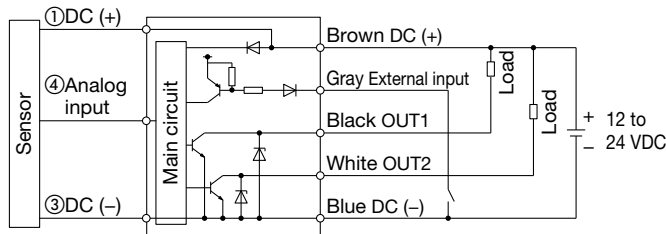
-RT: NPN (2 outputs) + Analog voltage output  
-SV: NPN (2 outputs) + Analog current output



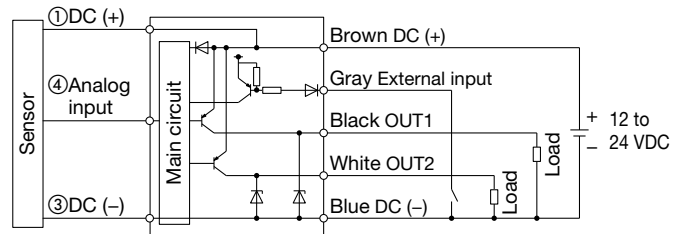
-RT: PNP (2 outputs) + Analog voltage output  
-SV: PNP (2 outputs) + Analog current output



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

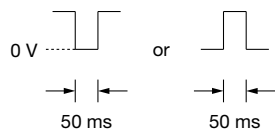
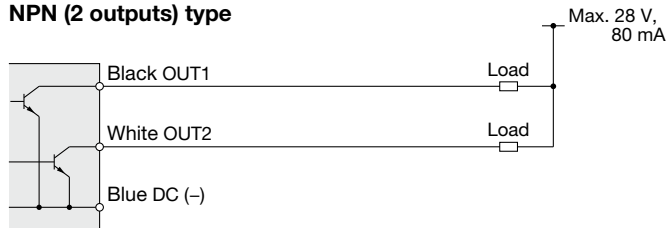


-RT: PNP (2 outputs) + External input  
-SV: PNP (2 outputs) + External input

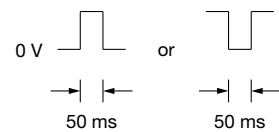
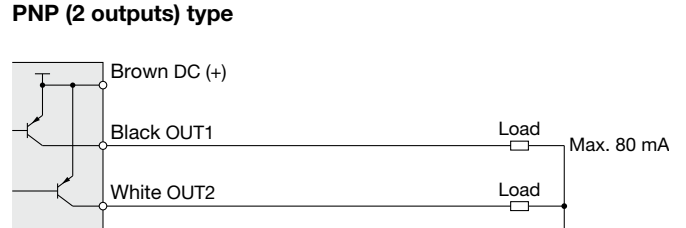


### Accumulated pulse output wiring examples

**NPN (2 outputs) type**

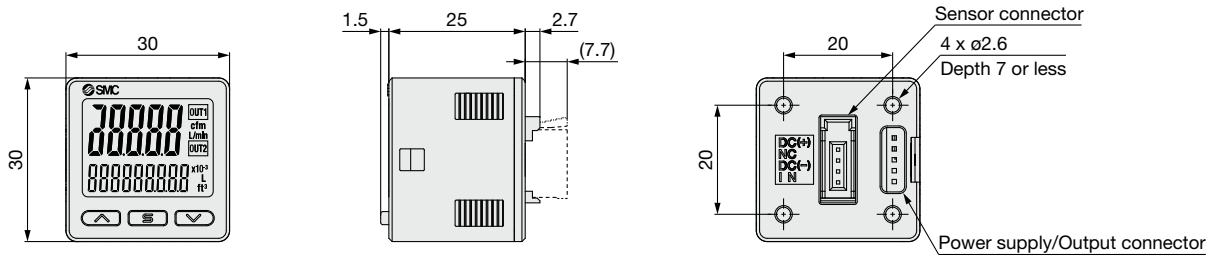


**PNP (2 outputs) type**

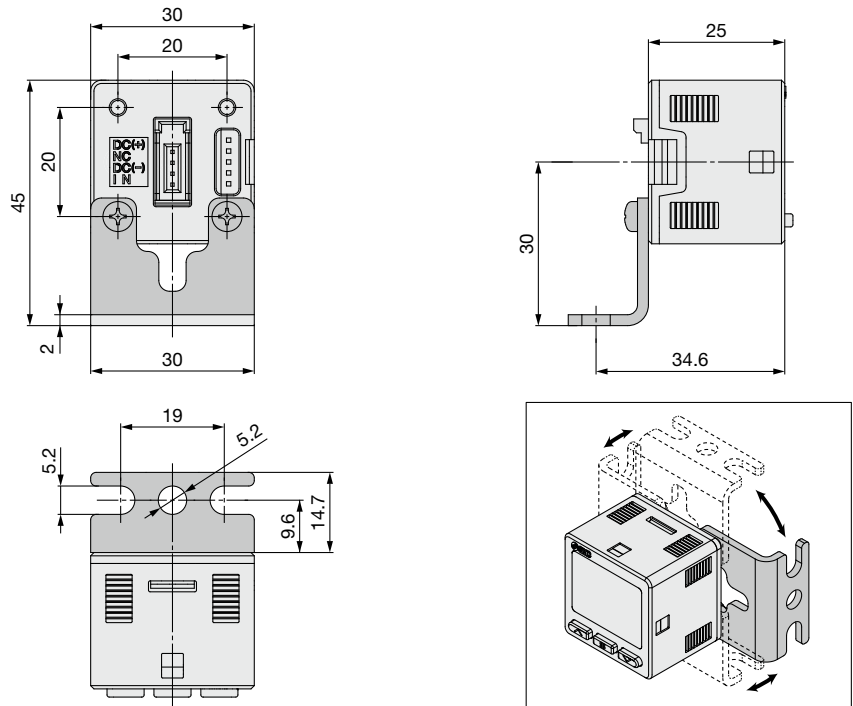




**Dimensions**

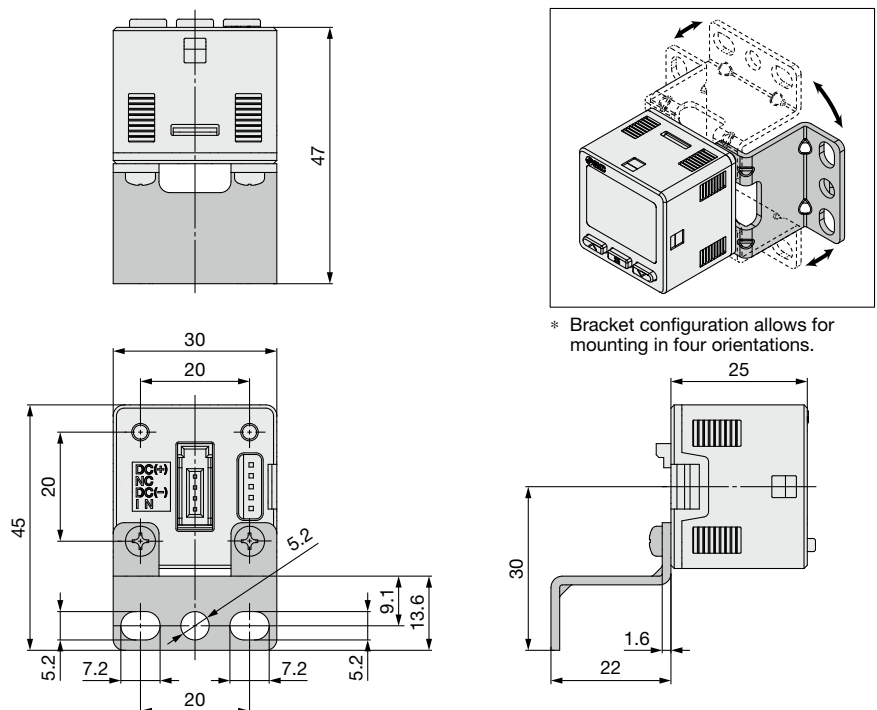


**Bracket A  
(Part no.: ZS-46-A1)**



\* Bracket configuration allows for mounting in four orientations.

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

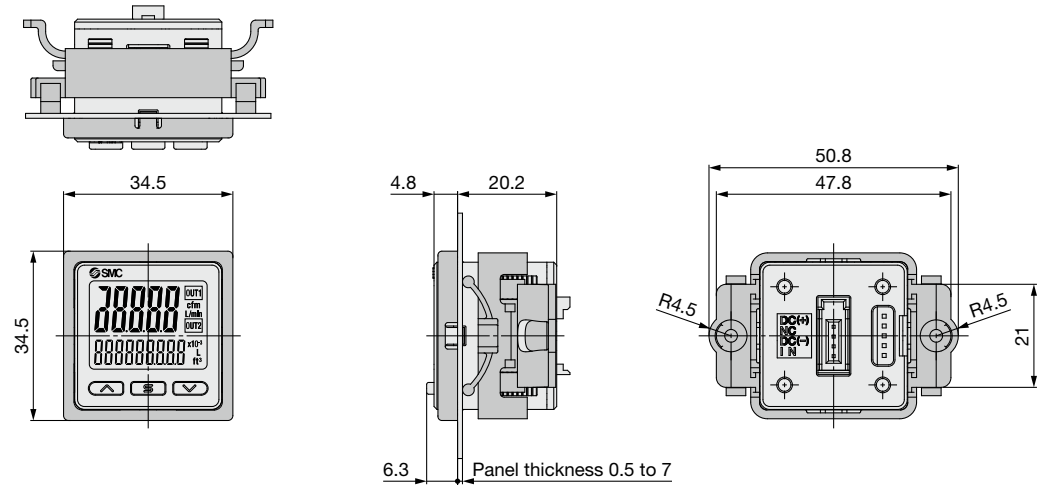


\* Bracket configuration allows for mounting in four orientations.

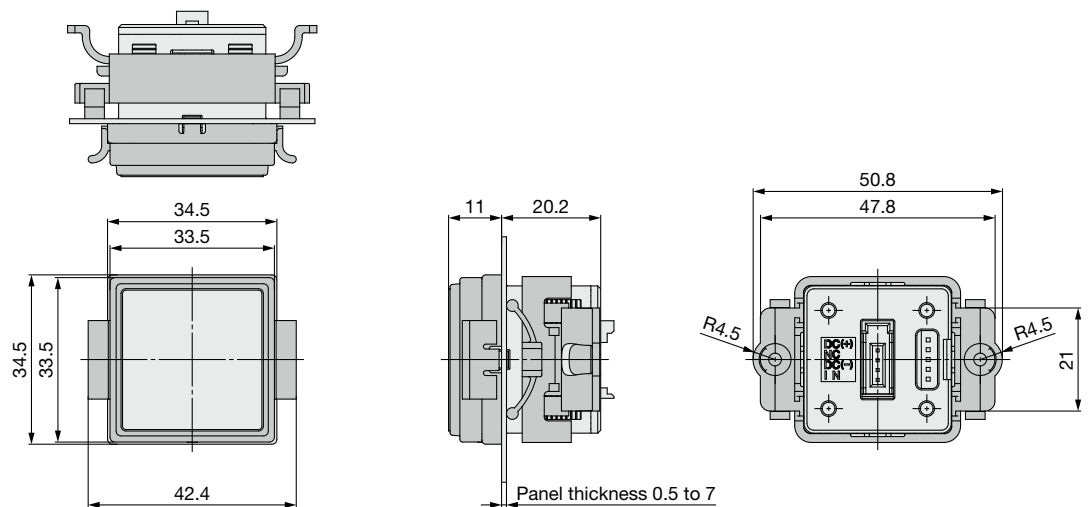
# PFGM302 Series

## Dimensions

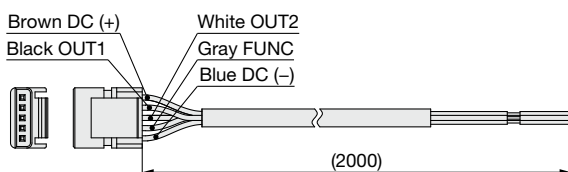
### Panel mount adapter (Part no.: ZS-46-B)



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



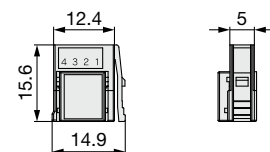
### Power supply/output connection lead wire (Part no.: ZS-46-5L)



### Sensor connector (Part no.: ZS-28-C-1)

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

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



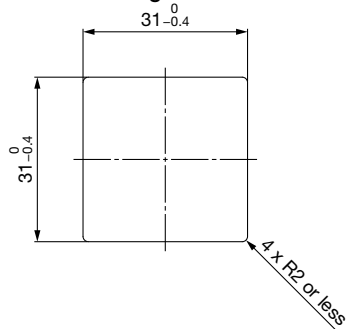
### Cable Specifications

Conductor cross section		0.15 mm <sup>2</sup> (AWG26)
Insulator	Outside diameter	1.0 mm
	Color	Brown, Blue, Black, White, Gray (5-core)
Sheath	Finished outside diameter	ø3.5

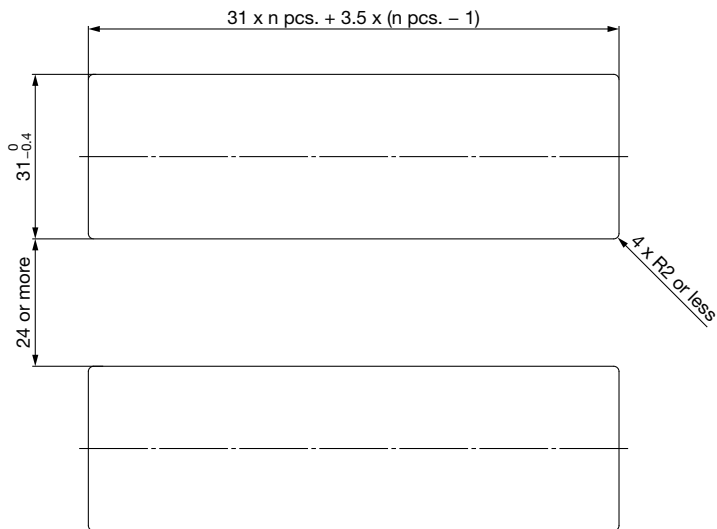
## Dimensions

### Panel fitting dimensions

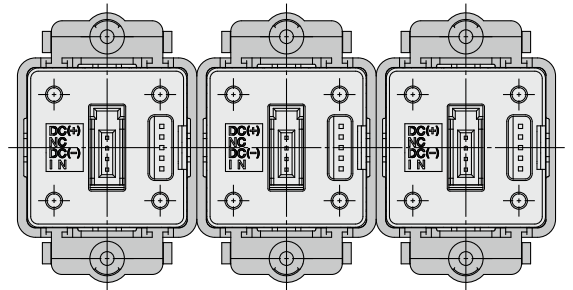
#### Individual mounting



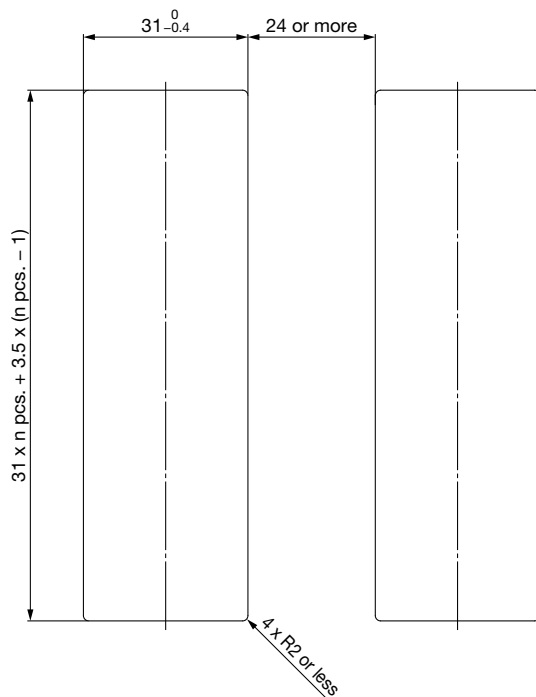
#### Multiple (2 pcs. or more) secure mounting <Horizontal>



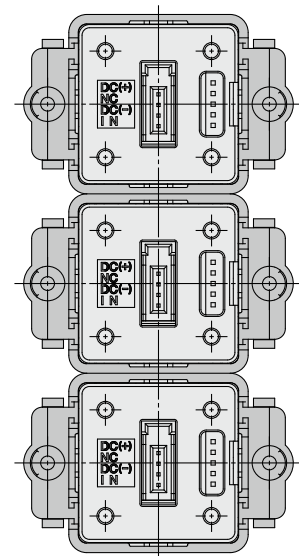
#### Panel mount example <Horizontal>



#### <Vertical>



#### Panel mount example <Vertical>



## 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.

**⚠ Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

**⚠ Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

**⚠ Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

\*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components  
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components  
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements  
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots etc.

### Warning

#### 1. 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 catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

#### 2. 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.

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

1. 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.
2. 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.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

#### 4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

### Caution

**We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.**

**Use in non-manufacturing industries is not covered.**

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

## 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.\*2)  
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 catalog 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

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

### Revision History

**Edition B** \* The PF2M701, 702, and 705 have been added.  
\* A female thread type has been added.  
\* The IO-Link compatible PF2M7-L series has been added.  
\* Internal circuits and wiring examples have been revised.  
\* A made-to-order option (Compatible with argon (Ar) and carbon dioxide (CO<sub>2</sub>) mixed gas) has been added.  
\* The number of pages has been increased from 20 to 28. YU

**Edition C** \* A flow adjustment valve (0.05 to 5 L/min) has been added.  
\* A 2 to 200 L/min flow range option has been added.  
\* A rear ported type has been added.  
\* The number of pages has been increased from 28 to 32. ZV

**Edition D** \* The PFGM302 digital flow monitor (dedicated for the PF2M7) has been added.  
\* The number of pages has been increased from 32 to 36.

**⚠ Safety Instructions** Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.

## SMC Corporation

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D-G