

For Air

Digital Flow Switch

Series PFA



How to Order

Integrated Display Type

PFA7 10 — [] 01 — 27 [] — []

Flow rate range

10	1 to 10 /min
50	5 to 50 /min
11	10 to 100 /min
21	20 to 200 /min
51	50 to 500 /min

Thread type

Nil	Rc
N	NPT
F	G

Port size

Symbol	Port size	Flow rate (/min)					Applicable models
		10	50	100	200	500	
01	1/8	●	●				PFA710, PFA750
02	1/4	●	●				PFA710, PFA750
03	3/8			●	●		PFA711, PFA721
04	1/2					●	PFA751

Wiring specification

Nil	3m lead wire with connector
N	Without lead wire

Unit specification

Nil	With unit switching function
M	Fixed SI unit (Note)

Note) Fixed units:
Real-time flow rate: /min
Accumulated flow: /

Output specification

Nil	Output specification	Applicable models
27	NPN open collector 2 outputs	PFA710, PFA750 PFA711, PFA721, PFA751
28	NPN open collector 1 output + Analog output (1 to 5V)	PFA711, PFA721, PFA751
67	PNP open collector 2 outputs	PFA710, PFA750 PFA711, PFA721, PFA751
68	PNP open collector 1 output + Analog output (1 to 5V)	PFA711, PFA721, PFA751

Specifications

Model	PFA710	PFA750	PFA711	PFA721	PFA751
Measured fluid	Dry air, N ₂				
Detection type	Heater type				
Flow rate measurement range	1 to 10 /min	5 to 50 /min	10 to 100 /min	20 to 200 /min	50 to 500 /min
Minimum setting unit	1% of maximum flow rate				
Note 1) Display units	Real-time flow rate	/min, CFM x 10 ⁻²		/min, CFM x 10 ⁻¹	
	Accumulated flow	/ ft ³ x 10 ⁻¹			
Operating pressure range	0 to 0.5MPa				
Proof pressure	1.0MPa				
Pressure loss	3kPa (at 50 /min)		3kPa (at 100 /min)	10kPa (at 200 /min)	30kPa (at 500 /min)
Accumulated flow range	0 to 999999 /				
Operating temperature range	0° to 50°C (with no condensation)				
Linearity	±5% F.S. or less				
Repeatability	±1% F.S. or less		±2% F.S. or less		
Temperature characteristics	±3% F.S. or less (15° to 35°C), ±5% F.S. or less (0° to 50°C)				
Note 2) Output specifications	Switch output	NPN open collector	Maximum load current: 80mA; Internal voltage drop: 1V or less (with load current of 80mA) Maximum applied voltage: 30V		
	Analog output	PNP open collector	Maximum load current: 80mA Internal voltage drop: 1.5V or less (with load current of 80mA)		
Indicator lights	27, 67: Lights up when output is ON OUT1: Green; OUT2: Red		27, 67: Lights up when output is ON 28, 68: Lights up when output is ON OUT1: Green; OUT2: None		
Response time	1 sec. or less				
Hysteresis	Hysteresis mode: Variable (can be set from 0), Window comparator mode: 3-digit fixed (Note 3)				
Power supply voltage	12 to 24VDC (ripple ±10% or less)				
Current consumption	150mA or less		160mA or less		170mA or less
Withstand voltage	1000VAC for 1 min. between external terminal and case				
Insulation resistance	50MΩ (500VDC) between external terminal and case				
Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns				
Vibration resistance	10 to 500Hz at whichever is smaller: 1.5mm amplitude or 98m/s ² acceleration, in X, Y, Z directions for 2 hrs. each				
Impact resistance	490m/s ² in X, Y, Z directions 3 times each				
Weight	250g (without lead wire)		290g (without lead wire)		
Enclosure	IP65				
Port size (Rc, NPT, G)	1/8, 1/4		3/8		1/2

Note 1) For digital flow switch with unit switching function. (Fixed SI unit /min or / will be set for switch types without the unit switching function.)

Note 2) The output functions operate only for the real-time flow rate display, and do not operate for the accumulated flow display.

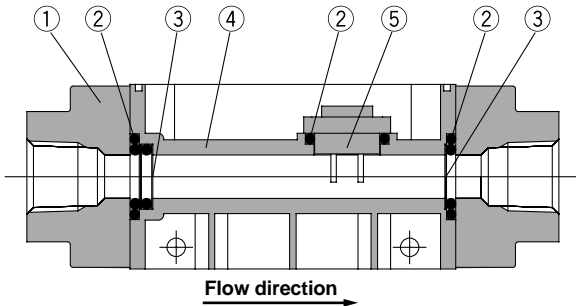
Note 3) Window comparator mode — Since hysteresis will reach 3 digits, keep P1 and P2 apart by 7 digits or more. The minimum setting unit is 1 digit. (Refer to the table above.)

* Flow rate units measured under the following conditions: 0°C and 101.3kPa.

Series PFA

Sensor Unit Construction

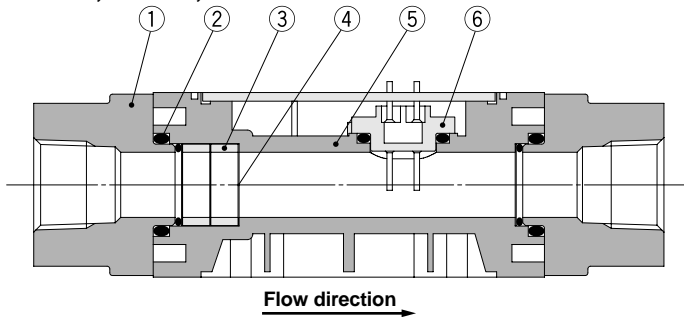
PFA710, PFA750
PFA510, PFA550



Parts list

No.	Description	Material
1	Attachment	ADC
2	Seal	NBR
3	Mesh	Stainless steel
4	Body	PBT
5	Sensor	PBT

PFA711, PFA721, PFA751
PFA511, PFA521, PFA551



Parts list

No.	Description	Material
1	Attachment	ADC
2	Seal	NBR
3	Spacer	PBT
4	Mesh	Stainless steel
5	Body	PBT
6	Sensor	PBT

Operating Unit Descriptions

RESET Buttons

Press the ▲ and ▼ buttons simultaneously to activate the RESET function.

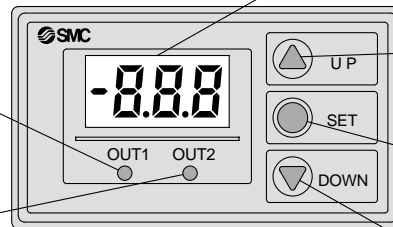
This clears the unit when an abnormality occurs and resets the accumulated flow display to "0".

Output (OUT1) Indicator: Green


Lights up when OUT1 is ON.
Blinks when an overcurrent error occurs on OUT1.

Output (OUT2) Indicator: Red

Lights up when OUT2 is ON.
Blinks when an overcurrent error occurs on OUT2.



LED Display

Displays the real-time flow rate, accumulated flow, and set value. The  mark blinks when the accumulated flow is being measured.

UP Button (▲ Button)

Use this button to increase a set value.

SET Button (● Button)

Use this button to change a set value or any of the modes.

DOWN Button (▼ Button)

Use this button to decrease a set value.

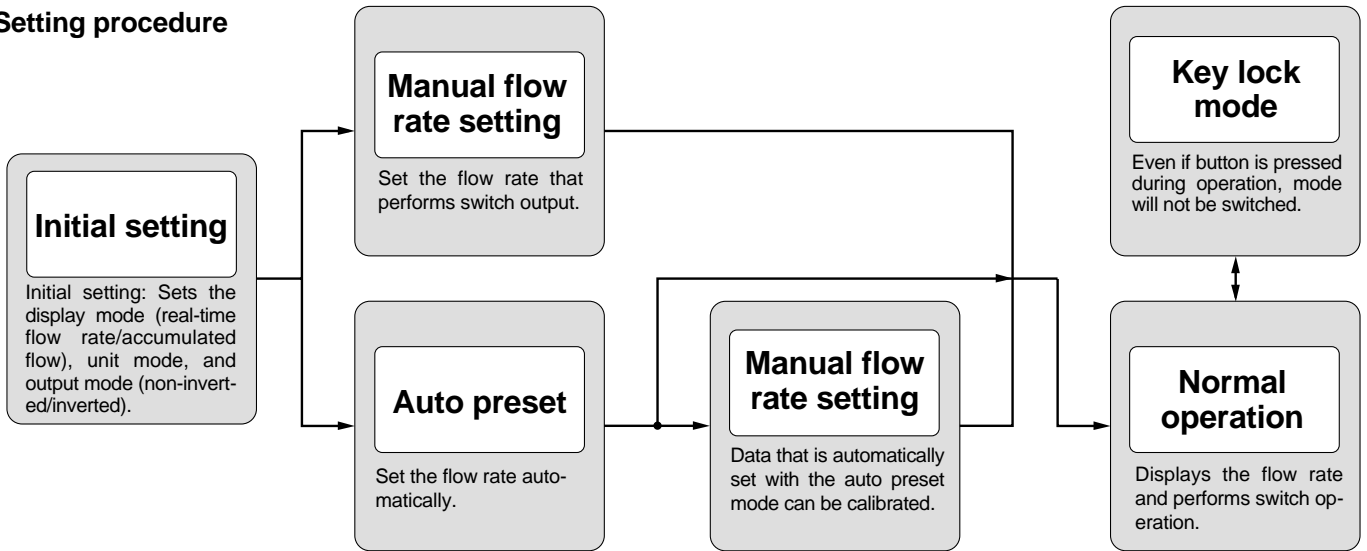
Error Correction

Take the following corrective solutions when errors occur.

LED display	Contents	Solution
E-1	A current of more than 80mA is flowing to OUT1.	Check the load and wiring for OUT1.
E-2	A current of more than 80mA is flowing to OUT2.	Check the load and wiring for OUT2.
E-4	The setting data has changed for whatever reasons.	Perform the RESET operation, and reset all data again.
- - -	The flow rate is over the flow rate measurement range (for air only).	Reduce the flow rate until it is within the flow rate measurement range, using an adjustment valve.

Flow Rate Setting

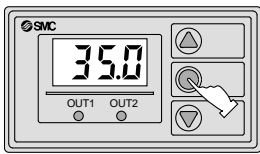
Setting procedure



Initial setting

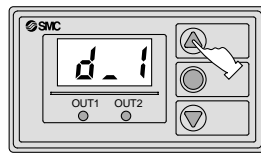
Note) Operation is the same for the integrated display type and the remote type (display unit).

1. Initial Setting Mode



Press the SET button and hold for 1 second or longer. Release the SET button once the display changes from F.1 to d.1 or d.2.

2. Selection of the Display Mode

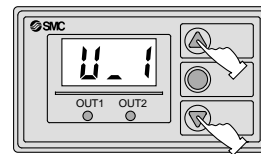


Set the display mode. Use the ▲ button to switch. d.1: Display for real-time flow rate d.2: Display for accumulated flow

Press the SET button.



3. Selection of Display Units

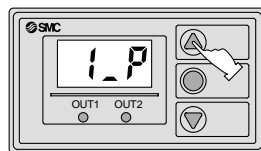


Set the display unit. Note 1) Use the ▲ and ▼ buttons to switch. U.□: Unit number (Refer to Table 1.)

Press the SET button.



4. Selection of OUT1 Output Mode

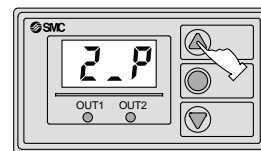


Set the output mode for OUT1. Use the ▲ button to switch the output mode for OUT1. 1.P: Non-inverted output 1.n: Inverted output (Refer to Table 2.)

Press the SET button.



5. Selection of OUT2 Output Mode



Set the output mode for OUT2. Use the ▲ button to switch the output mode for OUT2. 2.P: Non-inverted output 2.n: Inverted output

Press the SET button to complete the setting.



Table 1 Note 1)

For air

Display	Real-time flow rate	Accumulated flow
U.1	/min	/
U.2	CFM x 10 ⁻² , CFM x 10 ⁻¹	ft ³ x 10 ⁻¹

CFM = ft³/min

For water

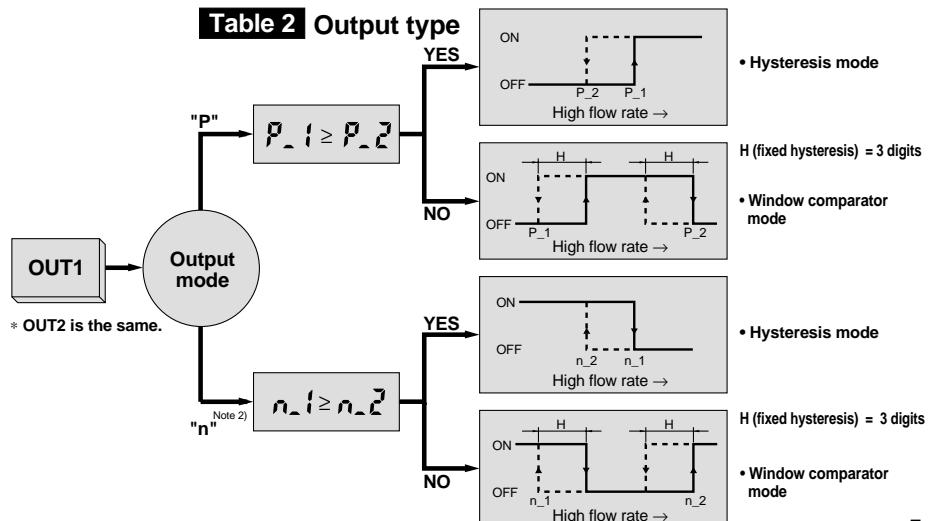
Display	Real-time flow rate	Accumulated flow
U.1	/min	/
U.2	GPM	gal (US)

GPM = gal (US)/min

Note 1) For digital flow switch with unit switching function (Fixed SI unit [L/min or L] will be set for the type without the unit switching function.)

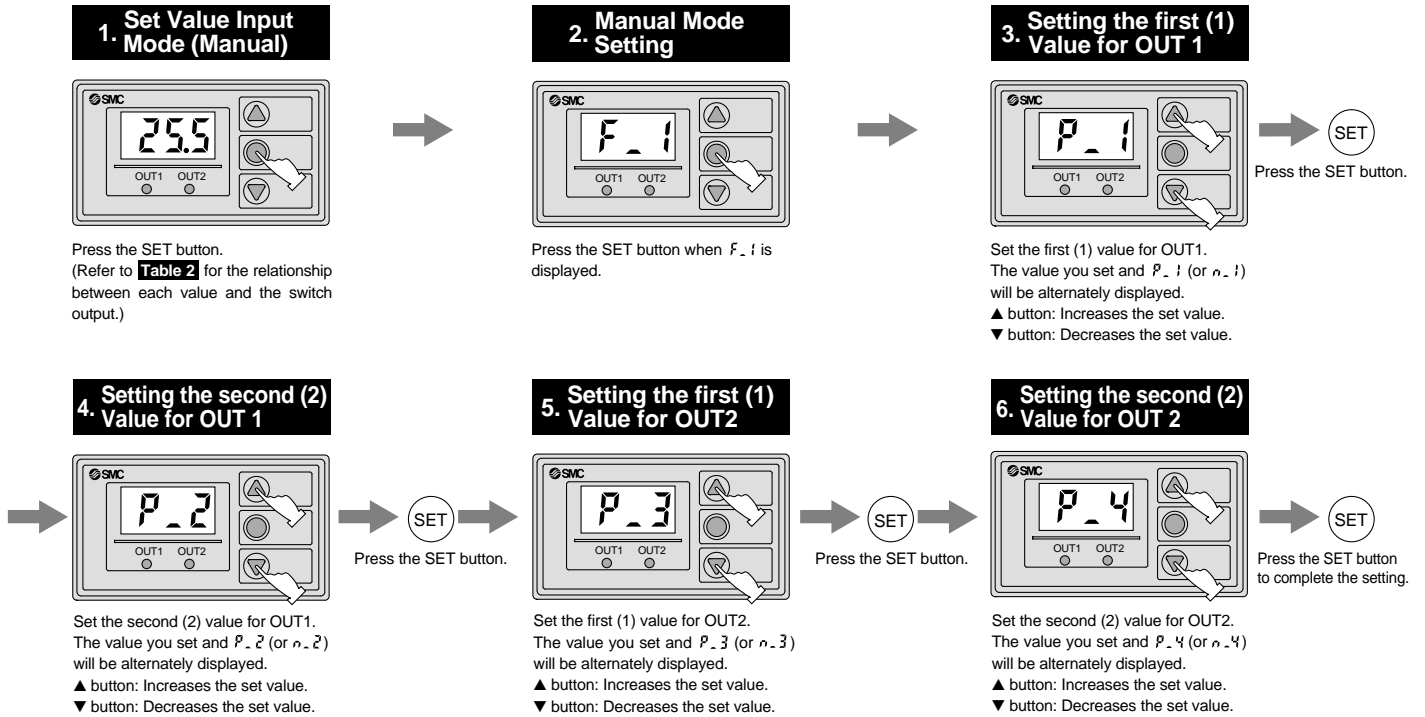
Note 2) Output mode is set to inverted output at the factory before shipment.

Table 2 Output type

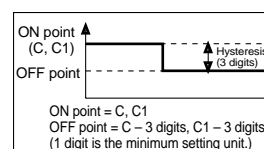
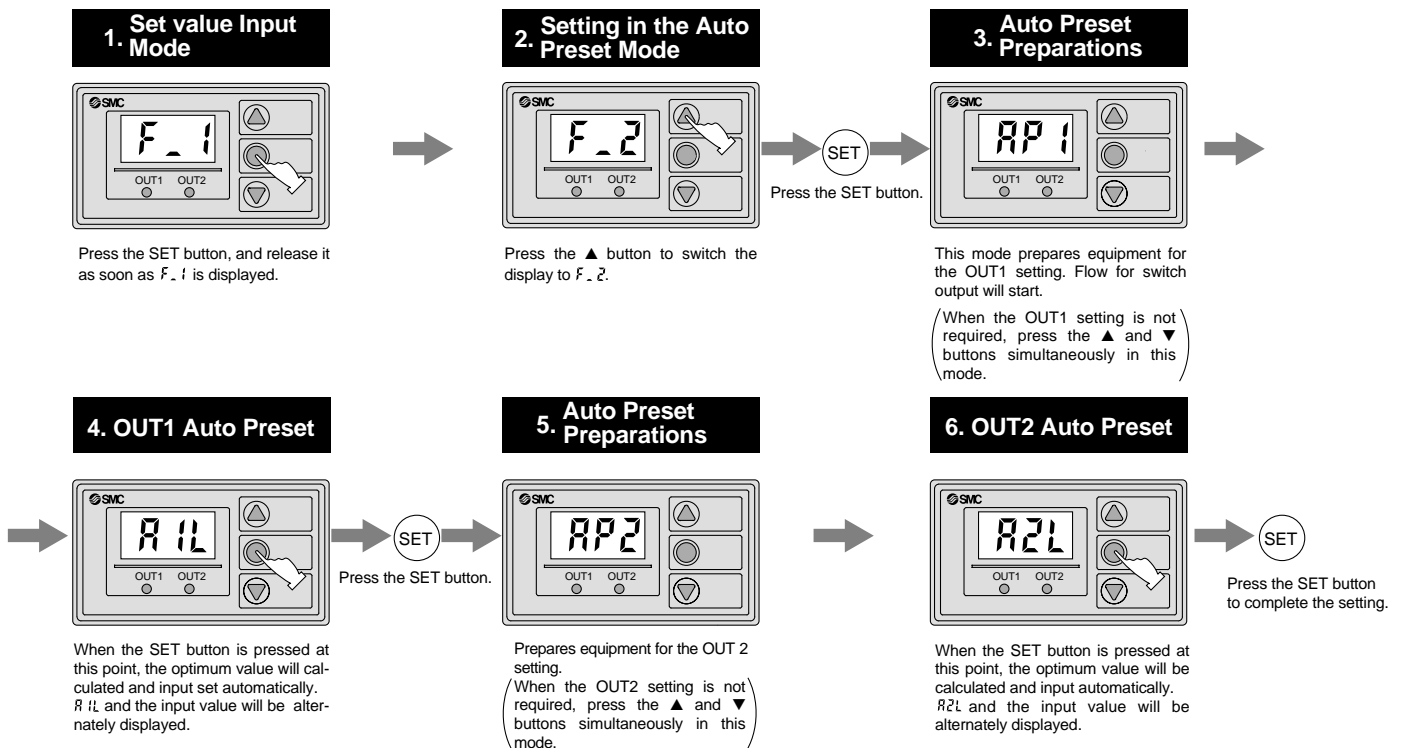


Flow Rate Setting

Flow rate setting mode (manual)



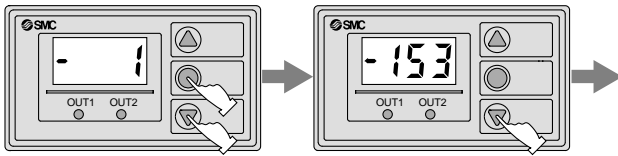
Flow rate setting mode (auto preset)



Other functions

• Accumulated flow function

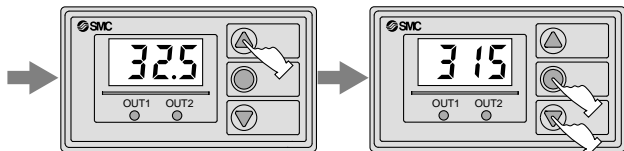
Start of Accumulation



Start accumulation. Press the SET button while pressing the ▼ button at the same time. The - mark blinks and accumulation begins.

Up to 999999 (L) of flow can be accumulated, but normally only the lower 3 digits are displayed. Press the ▼ button to verify the upper 3 digits.

Stopping Accumulation

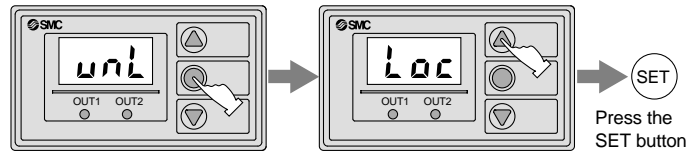


Press the ▲ button to verify the real-time flow rate during accumulation.

Press the SET button while pressing the ▼ button at the same time. The display fixes upon the current accumulated value and stops. To start further accumulation from this point, press the SET button while pressing the ▼ button at the same time. Press the ▲ and ▼ buttons simultaneously and hold for 2 seconds or longer to clear the display.

• Key lock mode --- Prevents incorrect operations of the button control.

Start of Key Lock Function

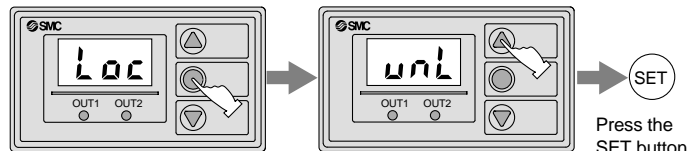


Press the SET button and hold it for 3 seconds or longer. Release the SET button when the display changes from F. L to d. L and displays uNL.

Use the ▲ button to display Loc.

Press the SET button to complete the setting.

Release of Key Lock Function



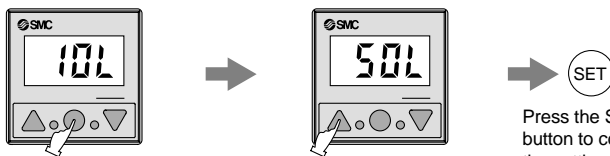
Press the SET button and hold it for 3 seconds or longer. Release the SET button when Loc is displayed.

Use the ▲ button to display uNL.

Press the SET button to complete the setting.

• Switching the flow rate range of the remote type (for air)

Switching Flow Rate Range



Press the SET button and hold it for 4 seconds or longer. the values shown in Table 3 will be displayed.

Use the ▲ button to select the desired flow rate range.

Press the SET button to complete the setting.

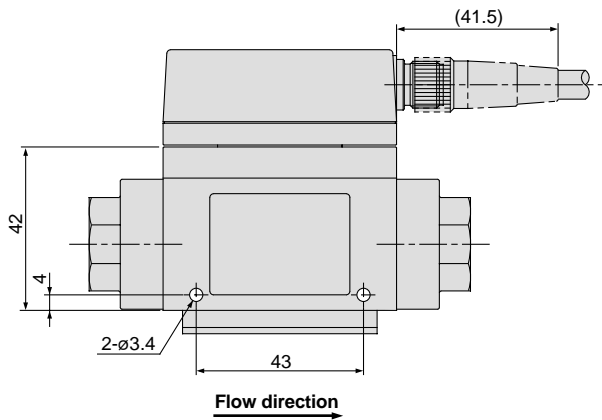
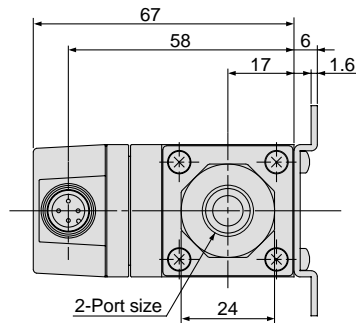
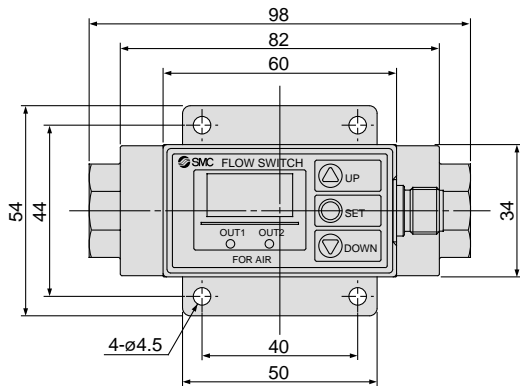
Table 3

Display	Flow rate range	Applicable model
10L	1 to 10 /min	For PFA30□
50L	5 to 50 /min	
10L	10 to 100 /min	For PFA31□
20L	20 to 200 /min	
50L	50 to 500 /min	

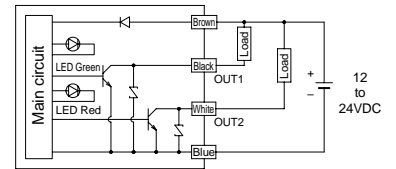
Series PFA

Dimensions: Integrated Display Type for Air

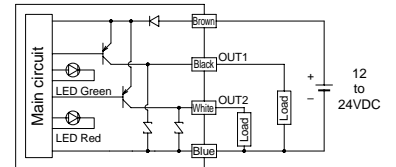
PFA710, PFA750



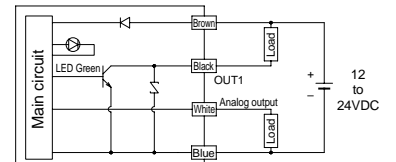
Internal circuits and wiring examples



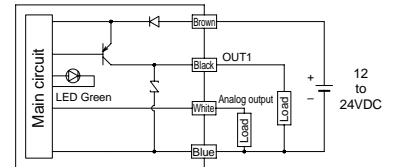
PFA7□□-□□-27□(-M)



PFA7□□-□□-67□(-M)

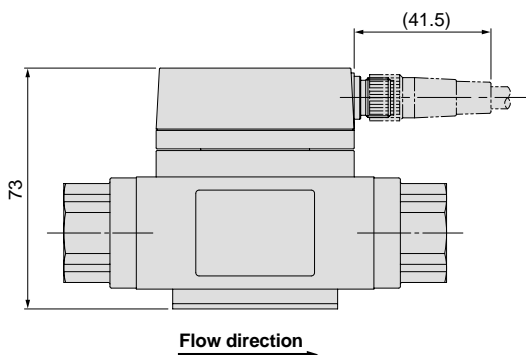
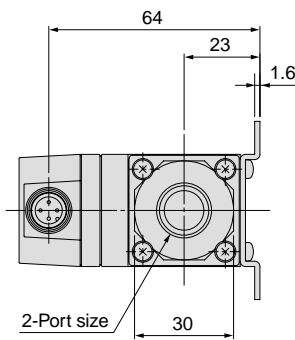
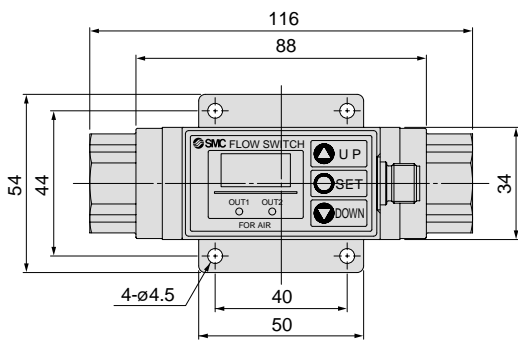


PFA7□1-□□-28□(-M)

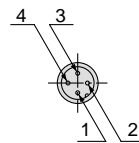


PFA7□1-□□-68□(-M)

PFA711, PFA721, PFA751



Connector pin numbers



Pin no.	Pin description
1	DC(+)
2	OUT2/Analog output
3	DC(-)
4	OUT1