2-Color Display Digital Flow Switch

Series PFM7

Integrated display

How to Order

Integrated display **PFM7 10 □ – C4 □ – A – M □ □ – □ □ – □**

Type

7	Integrated display

Rated flow range (Flow rate range)

10	0.2 to 10 (5) ℓ/min
25	0.5 to 25 (12.5) ℓ/min
50	1 to 50 (25) ℓ/min
11	2 to 100 (50) ℓ/min

∗ ( ): Fluid: CO_2

Flow adjustment valve

Nil	None
S	Yes

Port size

Symbol	Description	Flow rate range			
		10	25	50	11
01	Rc1/8	●	●	●	
02	Rc1/4				●
N01	NPT1/8	●	●	●	
N02	NPT1/4				●
F01	G1/8	●	●	●	
F02	G1/4				●
C4	ø4 (5/32") one-touch fitting	●			
C6	ø6 one-touch fitting	●	●	●	●
C8	ø8 (5/16") one-touch fitting		●	●	●
N7	ø1/4" one-touch fitting		●	●	●

Piping entry direction

Nil	Straight
L	Bottom

∗ Different combinations of piping entry directions for IN and OUT side are available as made-to-order. (Refer to page 940.)

Output specification

A	2 NPN outputs
B	2 PNP outputs
C	1 NPN output + Analog (1 to 5 V)
D	1 NPN output + Analog (4 to 20 mA)
E	1 PNP output + Analog (1 to 5 V)
F	1 PNP output + Analog (4 to 20 mA)
G	1 NPN output + External input Note 3)
H	1 PNP output + External input Note 3)

Note 3) User can select from accumulated value external reset, auto-shift and auto-shift zero.

Unit specification

M	Fixed SI unit Note)
Nil	With unit switching function

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

Instruction manual

Nil	With instruction manual (Leaflet: Japanese and English)
N	None

Calibration certificate

Nil	None
A	With calibration certificate

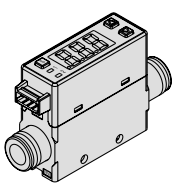
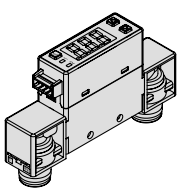
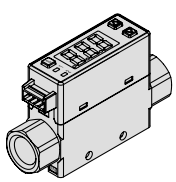
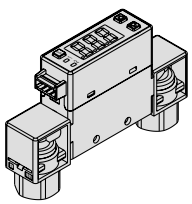
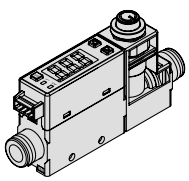
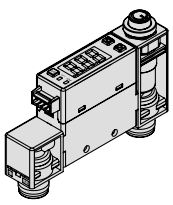
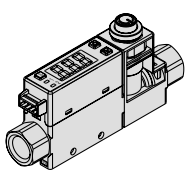
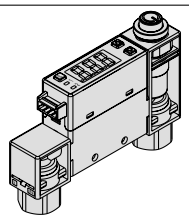
∗ The certificate is written in English and Japanese. Other languages are available as specials.

Option 1
(Refer to page 907.)

Option 2
(Refer to page 907.)

Made to Order
(Refer to page 907 and 940.)

Piping Variations

	With one-touch fittings (C4, C6, C8, N7)		Female thread (01, 02, N01, N02, F01, F02)	
	Straight (Nil)	Bottom (L)	Straight (Nil)	Bottom (L)
Without flow adjustment valve (Nil)				
With flow adjustment valve (S)				

Specifications

Model		PFM710	PFM725	PFM750	PFM711
Applicable fluid		Dry air, N_2, Ar, CO_2 (Air quality grade is JIS B8392.1-1, 1.2 to 1.6.2 and ISO8573.1-1, 1.2 to 1.6.2.)			
Rated flow range (Flow rate range)	Dry air, N_2, Ar	0.2 to 10 ℓ/min	0.5 to 25 ℓ/min	1 to 50 ℓ/min	2 to 100 ℓ/min
	CO_2	0.2 to 5 ℓ/min	0.5 to 12.5 ℓ/min	1 to 25 ℓ/min	2 to 50 ℓ/min
Displayable range Note 1)	Dry air, N_2, Ar	0.2 to 10.5 ℓ/min	0.5 to 26.3 ℓ/min	1 to 52.5 ℓ/min	2 to 105 ℓ/min
	CO_2	0.2 to 5.2 ℓ/min	0.5 to 13.1 ℓ/min	1 to 26.2 ℓ/min	2 to 52 ℓ/min
Settable range Note 1)	Dry air, N_2, Ar	0 to 10.5 ℓ/min	0 to 26.3 ℓ/min	0 to 52.5 ℓ/min	0 to 105 ℓ/min
	CO_2	0 to 5.2 ℓ/min	0 to 13.1 ℓ/min	0 to 26.2 ℓ/min	0 to 52 ℓ/min
Minimum unit setting Note 2)		0.01 ℓ/min	0.1 ℓ/min	0.1 ℓ/min	0.1 ℓ/min
Accumulated pulse flow rate exchange value		0.1 ℓ/pulse	0.1 ℓ/pulse	0.1 ℓ/pulse	1 ℓ/pulse
Indication unit Note 3)		Real-time flow rate ℓ/min, CFM x 10^{-2} Accumulated flow ℓ, ft^3 x 10^{-1}			
Linearity		Display accuracy: ±3%F.S. or less (Fluid: Dry air) Analog output accuracy: ±5%F.S. or less			
Repeatability		±1%F.S. or less (Fluid: Dry air) Analog output accuracy: ±3%F.S. or less			
Pressure characteristics		±5%F.S. or less (based on 0.35 MPa)			
Temperature characteristics		±2%F.S. (15 to 35°C) ±5%F.S. (0 to 50°C)			
Operating pressure range		–100 kPa to 750 kPa			
Rated pressure range		–70 kPa to 750 kPa			
Proof pressure		1 MPa			
Accumulated flow range		Max. 999999 ℓ Note 4)			
Switch output		NPN or PNP open collector output			
	Maximum load current	80 mA			
	Maximum applied voltage	28 VDC (at NPN output)			
	Internal voltage drop	NPN output: 1 V or less (at 80 mA) PNP output: 1.5 V or less (at 80 mA)			
	Response time	1 s (50 ms, 0.5 s, 2 s can be selected.)			
	Output protection	Short-circuit protection, Overcurrent protection			
Accumulated pulse output		NPN or PNP open collector output (Same as switch output)			
Analog output Note 5)	Response time	1.5 s or less (90% response)			
	Voltage output	Voltage output: 1 to 5 V Output impedance: 1 kΩ			
	Current output	Current output: 4 to 20 mA Max. load impedance: 600 Ω, Min. load impedance: 50 Ω			
Hysteresis Note 6)	Hysteresis mode	Variable			
	Window comparator mode	Variable			
External input		No-voltage input (Reed or Solid state) Input 30 ms or more			
Display method		3-digit, 7-segment LED 2-color display (Red/Green) Renewed cycle: 10 times/sec			
Status LED's		OUT1: Illuminates when output is turned ON (Green). OUT2: Illuminates when output is turned ON (Red).			
Power supply voltage		24 VDC ± 10%			
Current consumption		55 mA or less			
Environ-mental resistance	Enclosure	IP40			
	Operating fluid temperature	0 to 50°C (with no freezing and condensation)			
	Operating temperature range	Operating: 0 to 50°C Stored: –10 to 60°C (with no freezing and condensation)			
	Operating humidity range	Operating, Stored: 35 to 85%R.H. (with no condensation)			
	Withstand voltage	1000 VAC for 1 min. between external terminal and case			
	Insulation resistance	50 MΩ or more (500 VDC Mega) between external terminal and case			
	Vibration resistance	Without orifice: 10 to 500 Hz with a 1.5 mm amplitude or 98 m/s^2 acceleration, in each X, Y, Z direction for 2 hrs, whichever is smaller. With orifice: 10 to 150 Hz with a 1.5 mm amplitude or 19.6 m/s^2 acceleration, in each X, Y, Z direction for 2 hrs, whichever is smaller.			
	Impact resistance	490 m/s^2 in X, Y, Z directions 3 times each			

Note 1) When the minimum unit setting 0.01 ℓ/min is selected for 10 ℓ/min type, the indication upper limit will be [9.99 ℓ/min].
When the minimum unit setting 0.1 ℓ/min is selected for 100 ℓ/min type, the indication upper limit will be [99.9 ℓ/min].

Note 2) User can select between 0.01 ℓ/min and 0.1 ℓ/min for the PFM710, and between 0.1 ℓ/min and 1 ℓ/min for the PFM711 respectively.
If the indication unit is selected to "CFM", the minimum unit setting cannot be changed.
At the time of shipment from the factory, the minimum unit setting is set to 0.1 ℓ/min for the PFM710 and 1 ℓ/min for the PFM711 respectively.

Note 3) Set to "ANR" at the time of shipment from the factory.
"ANR" is used for standard conditions: 20°C, 1 atm and 65%R.H.
"Nℓ/min" is used for normal conditions: 0°C and 1 atm.
When equipped with a unit switching function. (The SI unit (ℓ/min or ℓ) is fixed for types with no unit switching function.)

Note 4) Cleared when the power supply is turned off. Hold function can be selected. (Interval of 2 min or 5 min can be selected).
If the 5 min interval is selected, the life of the memory element (electronic part) is limited to 1 million cycles. (If energized for 24 hours, life is calculated as 5 min x 1 million = 5 million min = 9.5 years). Therefore, if using the hold function, calculate the memory life for your operating conditions, and use within this life.

Note 5) Set to 1.5 s (90%), can be changed to 100 ms.

Note 6) Set to hystresis mode at the time of shipment from the factory. Can be changed to window comparator mode using push-buttons.