New

Digital Flow Switches

Remote Type

For Air Series PF2A

1. *Flow rate setting and monitoring are possible with the digital display.*
2. *Two types for different applications Integrated and remote type displays*
3. *Three types of output: Switch, accumulated pulse, and analog outputs.*
4. *Switching from real-time flow rate to accumulated flow is possible.*
5. *Two independent flow rate settings are possible.*
6. *Water resistant construction conforming to IP65*

Integrated Type

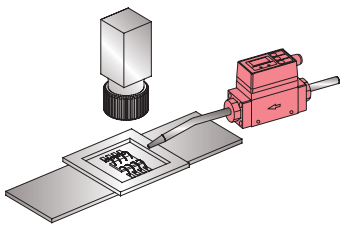
For Water Series PF2W

Flow rate measurement range (ℓ/min)

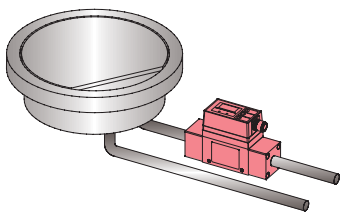
For Air	For Water	For High Temperature Fluid (Water 90°C)
1 to 10	0.5 to 4	0.5 to 4
5 to 50	2 to 16	2 to 16
10 to 100	5 to 40	5 to 40
20 to 200	10 to 100	
50 to 500		
150 to 3000		
300 to 6000		
600 to 12000		

Application examples

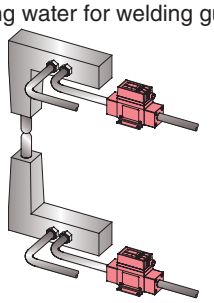
Flow control of N_2 gas to prevent detection camera shimmering and lead frame oxidation

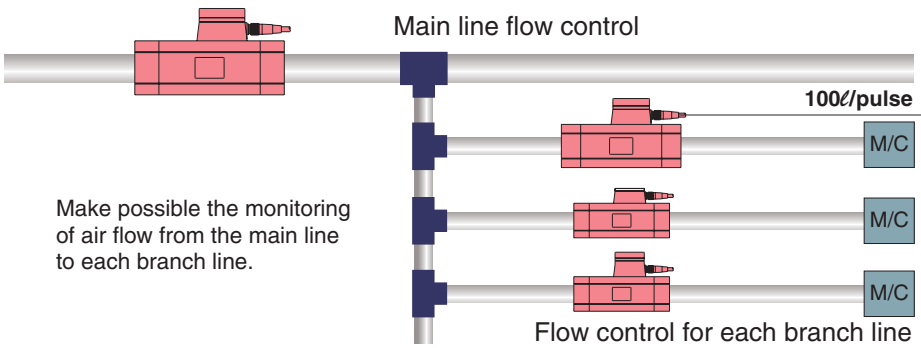


Flow control of cooling water for wafer temperature regulation and high frequency electric power supply



Flow control of pressurized cooling water for welding gun





Make possible the monitoring of air flow from the main line to each branch line.

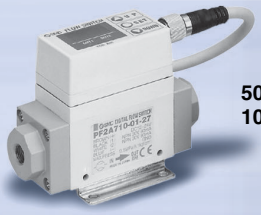
■ **The accumulated pulse output function (100ℓ/pulse) enables remote monitoring of accumulated flow.**

Series Variation

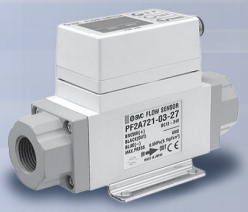
Series PF2A, PF2W

For Air Series PF2A

P.2



50ℓ/min
10ℓ/min



500ℓ/min
200ℓ/min
100ℓ/min

12000ℓ/min
6000ℓ/min
3000ℓ/min

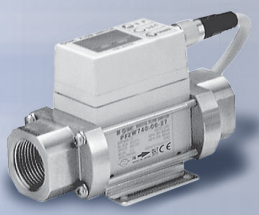
Integrated display type	Remote type		Flow rate measurement range ℓ/min	Output specifications			Port size (Rc, NPT, G)						
	Display unit	Sensor unit		Switch output	Analog output	Accumulated pulse output	1/8	1/4	3/8	1/2	1	1 1/2	2
PF2A710	PF2A30□	PF2A510	1 to 10	○	●	○	○	○					
750		550	5 to 50	○	●	○	○	○					
711	31□	511	10 to 100	○	●	○			○				
721		521	20 to 200	○	●	○			○				
751		551	50 to 500	○	●	○				○			
703H	–	–	150 to 3000	○	●	○				○	○		
706H			300 to 6000	○	●	○					○	○	
712H			600 to 12000	○	●	○						○	○

○: Output from integrated display type and remote display unit type
●: Output from remote sensor unit type

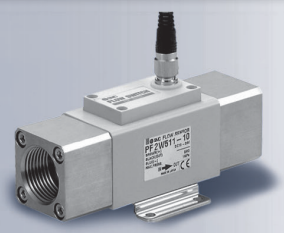
For Water Series PF2W

P.12

16ℓ/min
4ℓ/min



40ℓ/min



100ℓ/min

Integrated display type	Remote type		Flow rate measurement range ℓ/min	Output specifications			Port size (Rc, NPT, G)			
	Display unit	Sensor unit		Switch output	Analog output	Accumulated pulse output	3/8	1/2	3/4	1
PF2W704	PF2W30□	PF2W504	0.5 to 4	○	●	○	○			
720		520	2 to 16	○	●	○	○	○		
740		540	5 to 40	○	●	○		○	○	
711	33□	511	10 to 100	○	●	○			○	○

○: Output from integrated display type and remote display unit type
●: Output from remote sensor unit type

For High Temperature Fluid (Water 90°C) Series PF2W

P.21

Integrated display type	Remote type		Flow rate measurement range ℓ/min	Output specifications			Port size (Rc, NPT, G)		
	Display unit	Sensor unit		Switch output	Analog output	Accumulated pulse output	3/8	1/2	3/4
PF2W704T	PF2W30□	PF2W504T	0.5 to 4	○	●	○	○		
720T		520T	2 to 16	○	●	○	○	○	
740T		540T	5 to 40	○	●	○		○	○

○: Output from integrated display type and remote display unit type
●: Output from remote sensor unit type

For Air

Digital Flow Switch

Series PF2A

Refer to www.smcworld.com for details of products compatible with overseas standards.

How to Order

Integrated Display Type **PF2A7 10 — □ 01 — 27 □ — □**

Flow rate range

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

Thread type

Nil	Rc
N	NPT
F	G

Port size

Symbol	Port size	Flow rate (ℓ/min) 10	50	100	200	500	Applicable models
01	1/8	●	●				PF2A710/PF2A750
02	1/4	●	●				
03	3/8			●	●		PF2A711/PF2A721
04	1/2					●	PF2A751

Wiring specification

Nil	3m lead wire with connector
N	Without lead wire

Output specification

Symbol	Output specification	Applicable models
27	NPN open collector 2 outputs	PF2A710/PF2A750 PF2A711/PF2A721, PF2A751
67	PNP open collector 2 outputs	PF2A710/PF2A750 PF2A711/PF2A721/PF2A751

Unit specification

Nil	With unit switching function
M	Fixed SI unit Note)

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

Specifications

Model		PF2A710	PF2A750	PF2A711	PF2A721	PF2A751
Measured fluid		Air, Nitrogen				
Flow rate measurement range		0.5 to 10.5ℓ/min	2.5 to 52.5ℓ/min	5 to 105ℓ/min	10 to 210ℓ/min	25 to 525ℓ/min
Set flow rate range		0.5 to 10.5ℓ/min	2.5 to 52.5ℓ/min	5 to 105ℓ/min	10 to 210ℓ/min	25 to 525ℓ/min
Flow rate measuring range		1 to 10ℓ/min	5 to 50ℓ/min	10 to 100ℓ/min	20 to 200ℓ/min	50 to 500ℓ/min
Minimum set unit		0.1ℓ/min	0.5ℓ/min	1ℓ/min	2ℓ/min	5ℓ/min
Accumulated pulse flow rate exchange value (Pluse width: 50ms)		0.1ℓ/pulse	0.5 ℓ/pulse	1ℓ/pulse	2ℓ/pulse	5ℓ/pulse
Display units (Note 1, 2)	Real-time flow rate	ℓ/min, CFM x 10^{-2}		ℓ/min, CFM x 10^{-1}		
	Accumulated flow	ℓ, ft^3 x 10^{-1}				
Operating fluid temperature		0 to 50°C				
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, based on 25°C), ±5% F.S. or less (0 to 50°C, based on 25°C)				
Current consumption (No load)		150mA or less		160mA or less		170mA or less
Weight Note 3)		250g		290g		
Port size (Rc, NPT, G)		1/8, 1/4		3/8		1/2
Detection type		Heater type				
Indicator light		3-digit, 7-segment LED				
Operating pressure range		–50kPa to 0.5MPa		–50kPa to 0.75MPa		
Proof pressure		1.0MPa				
Accumulated flow range		0 to 999999ℓ				
Output specifications (Note 4)	Switch output	NPN open collector	Maximum load current: 80mA; Internal voltage drop: 1V or less (with load current of 80mA) Maximum applied voltage: 30V; Two outputs			
		NPN open collector	Maximum load current: 80mA Internal voltage drop: 1.5V or less (with load current of 80mA); Two outputs			
	Accumulated pulse output	NPN or PNP open collector (same as switch output)				
Status LED's		Lights up when output is ON OUT1: Green; OUT2: Red				
Response time		1sec. or less				
Hysteresis		Hysteresis mode: Variable (can be set from 0), Window comparator mode: 3-digit fixed Note 5)				
Power supply voltage		12 to 24VDC (ripple ±10% or less)				
Resistance	Enclosure	IP65				
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)				
	Withstand voltage	1000VAC for 1 min. between external terminal and case				
	Insulation resistance	50MΩ (500VDC) between external terminal and case				
	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 (de-energized)				
	Impact resistance	490m/s^2 in X, Y, Z directions 3 times each				
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns				

Note 1) For digital flow switch with unit switching function. (Fixed SI unit [(ℓ/min, or ℓ, m^3 or m^3 x 10^3)] will be set for switch type without the unit switching function.)
Note 2) Flow rate display can be switched between the basic condition of 0°C, 101.3kPa and the standard condition (ANR) of 20°C, 101.3kPa, and 65% RH.
Note 3) Without lead wire.
Note 4) Switch output and accumulated pulse output can be selected during initial setting.
Note 5) Window comparator mode — Since hysteresis will reach 3 digits, keep P_1 and P_2 or n_1 and n_2 apart by 7 digits or more. (In case of output OUT2, n_1, 2 to be n_3, 4 and P_1, 2 to be P_3, 4.)
Note 6) The flow switch is comformed to CE mark.

How to Order

Remote Type Display Unit

PF2A5 10 — □ 01 □ — □

Flow rate range

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

Thread type

Nil	Rc
N	NPT
F	G

Output specification

Nil	Output for display unit
1	Output for display unit + analog output (1 to 5V)
2	Output for display unit + analog output (4 to 20mA)

Wiring specification

Nil	3m lead wire with connector
N	Without lead wire

Port size

Symbol	Port size	Flow rate (ℓ/min) 10	50	100	200	500	Applicable models
01	1/8	●	●				PF2A510/550
02	1/4	●	●				
03	3/8			●	●		PF2A511/521
04	1/2					●	PF2A551

Specifications

Model		PF2A510	PF2A550	PF2A511	PF2A521	PF2A551
Measured fluid		Air, Nitrogen				
Detection type		Heater type				
Flow rate measuring range		1 to 10ℓ/min	5 to 50ℓ/min	10 to 100ℓ/min	20 to 200ℓ/min	50 to 500ℓ/min
Operating pressure range		–50kPa to 0.5MPa		–50kPa to 0.75MPa		
Proof pressure		1.0MPa				
Operating fluid temperature		0 to 50°C				
Linearity Note 1)		±5% F.S. or less				
Repeatability Note 1)		±1% F.S. or less				
Temperature characteristics		±2% F.S. or less (15 to 35°C, based on 25°C) ±3% F.S. or less (0 to 50°C, based on 25°C)				
Output specifications Note 2)	Output for display unit	Analog voltage output (non-linear) output impedance 1kΩ output for display unit PF2A3□□				
	Analog output	Voltage output 1 to 5V within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 100kΩ or more.				
		Current output 4 to 20mA within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 300Ω or less with 12VDC, 600Ω or less with 24VDC				
Power supply voltage		12 to 24VDC (ripple ±10% or less)				
Current consumption (No load)		100mA or less				110mA or less
Resistance	Enclosure	IP65				
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)				
	Withstand voltage	1000VAC for 1 min. between external terminal and case				
	Insulation resistance	50MΩ (500VDC) between external terminal and case				
	Vibration resistance	10 to 500Hz at whichever is smaller: 1.5mm amplitude or 98m/s^2 acceleration				
	Impact resistance	490m/s^2 in X, Y, Z directions 3 times each				
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns				
Weight Note 3)		200g		240g		
Port size (Rc, NPT, G)		1/8, 1/4		3/8		1/2

Note 1) The system accuracy when combined with PF2A3□□.
Note 2) Output system can be selected during initial setting.
Note 3) Without lead wire. (Add 20g for the types of analog output whether voltage or current output selected.)
Note 4) Flow rate unit measured under the following conditions: 0°C and 101.3kPa.
Note 5) The sensor unitis comformed to CE mark.

How to Order

Remote Type Display Unit

PF2A3 [0] [0] — [A] — [ ]

Flow rate range

Symbol	Flow rate range	Type for sensor unit
0	1 to 10ℓ/min	PF2A510
	5 to 50ℓ/min	PF2A550
1	10 to 100ℓ/min	PF2A511
	20 to 200ℓ/min	PF2A521
	50 to 500ℓ/min	PF2A551

Mounting

A	Panel mounting

Output specification

Symbol	Output specification	Applicable models
0	NPN open collector 2 outputs	PF2A300, 310
1	PNP open collector 2 outputs	PF2A301, 311

Unit specification

Nil	With unit switching function
M	Fixed SI unit Note)

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

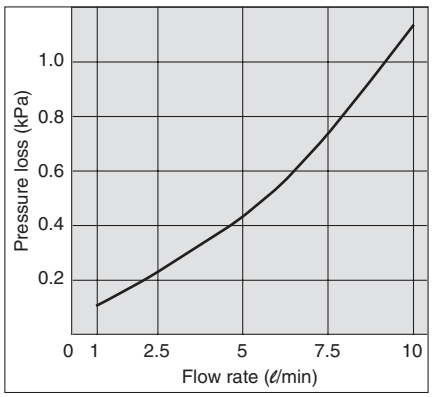
Specifications

Model		PF2A300/301		PF2A310/311		
Flow rate measurement range Note 1)		0.5 to 10.5ℓ/min	2.5 to 52.5ℓ/min	5 to 105ℓ/min	10 to 210ℓ/min	25 to 525ℓ/min
Set flow rate range Note 1)		0.5 to 10.5ℓ/min	2.5 to 52.5ℓ/min	5 to 105ℓ/min	10 to 210ℓ/min	25 to 525ℓ/min
Minimum set unit Note 1)		0.1ℓ/min	0.5ℓ/min	1ℓ/min	2ℓ/min	5ℓ/min
Accumulated pulse flow rate exchange value (Pluse width: 50ms) Note 1)		0.1ℓ/pulse	0.5ℓ/pulse	1ℓ/pulse	2ℓ/pulse	5ℓ/pulse
Note 2, 3) Display units	Real-time flow rate	ℓ/min, CFM x 10^{-2}		ℓ/min, CFM x 10^{-1}		
	Accumulated flow	ℓ, ft^3 x 10^{-1}				
Accumulated flow range		0 to 999999ℓ				
Linearity Note 4)		±5% F.S. or less				
Repeatability Note 4)		±1% F.S. or less				
Temperature characteristics		±1% F.S. or less (15 to 35°C based on 25°C) ±2% F.S. or less (0 to 50°C based on 25°C)				
Current consumption		50mA or less		60mA or less		
Weight		45g				
Output specifications Note 5)	Switch output	NPN open collector (PF2A300, PF2A310)		Maximum load current: 80mA Internal voltage drop: 1V or less (with load current of 80mA) Maximum applied voltage: 30V 2 outputs		
		PNP open collector (PF2A301, PF2A311)		Maximum load current: 80mA Internal voltage drop: 1.5V or less (with load current of 80mA) 2 outputs		
	Accumulated pulse output	NPN or PNP open collector (same as switch output)				
Indicator lights		3-digit, 7-segment LED				
Status LED's		Lights up when output is ON OUT1: Green; OUT2: Red				
Power supply voltage		12 to 24VDC (ripple ±10% or less)				
Response time		1 sec. or less				
Hysteresis		Hysteresis mode: Variable (can be set from 0), Window comparator mode: Fixed (3 digits) Note 6)				
Resistance	Enclosure	IP40				
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)				
	Withstand voltage	1000VAC for 1 min. between external terminal and case				
	Insulation resistance	50MΩ (500VDC) between external terminal and case				
	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				
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns				

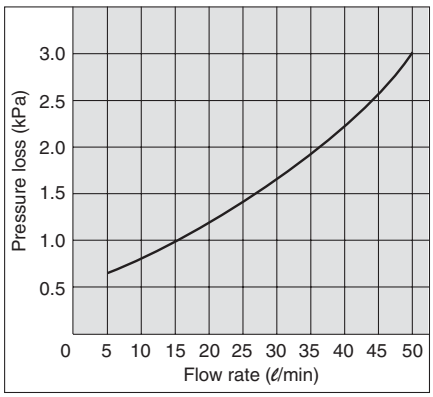
Note 1) The flow rate measurement range can be modified depending on the setting.
Note 2) For digital flow switch with unit switching function. (Fixed SI unit [ℓ/min or ℓ] will be set for switch types without the unit switching function.)
Note 3) Flow rate display can be switched between the basic condition of 0°C, 101.3kPa and the standard condition (ANR) of 20°C, 101.3kPa, and 65% RH.
Note 4) The system accuracy when combined with PF2A5□□.
Note 5) Switch output and accumulated pulse output can be selected during initial setting.
Note 6) Window comparator mode — Since hysteresis will reach 3 digits, keep P_1 and P_2 or n_1 and n_2 apart by 7 digits or more. (In case of output OUT2, n_1, 2 to be n_3, 4 and P_1, 2 to be P_3, 4.)
Note 7) The display unit is comformed to CE mark.

Flow Characteristics (Pressure Loss)

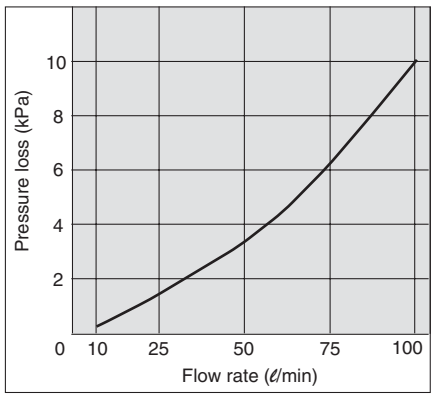
PF2A710,510



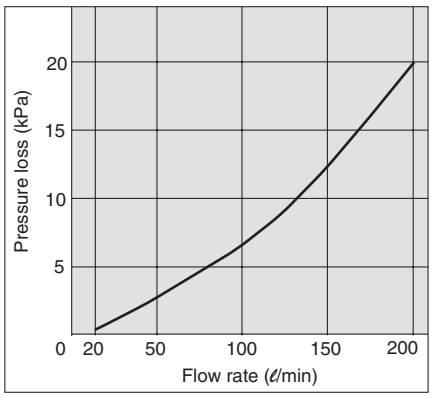
PF2A750,550



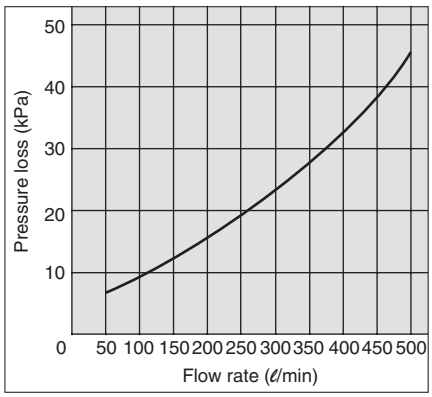
PF2A711,511



PF2A721,521

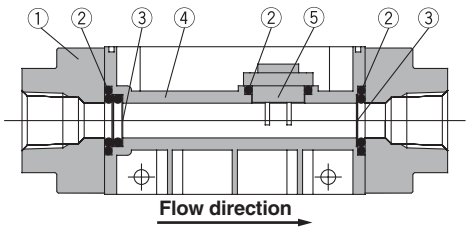


PF2A751,551

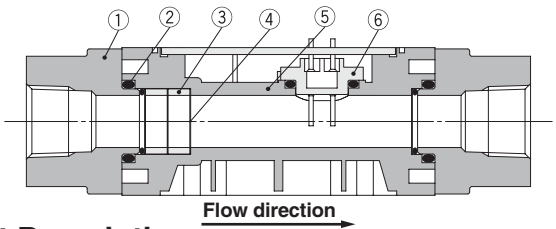


Sensor Unit Construction

PF2A710/750
PF2A510/550



PF2A711/721/751
PF2A511/521/551



Parts list

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

Parts list

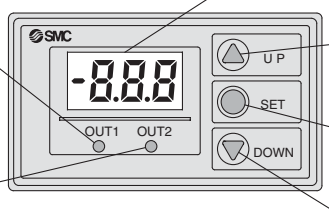
No.	Description	Material
1	**Attachment**	ADC
2	**Seal**	NBR
3	**Spacer**	PBT
4	**Mesh**	Stainless steel
5	**Body**	PBT
6	**Sensor**	PBT

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.

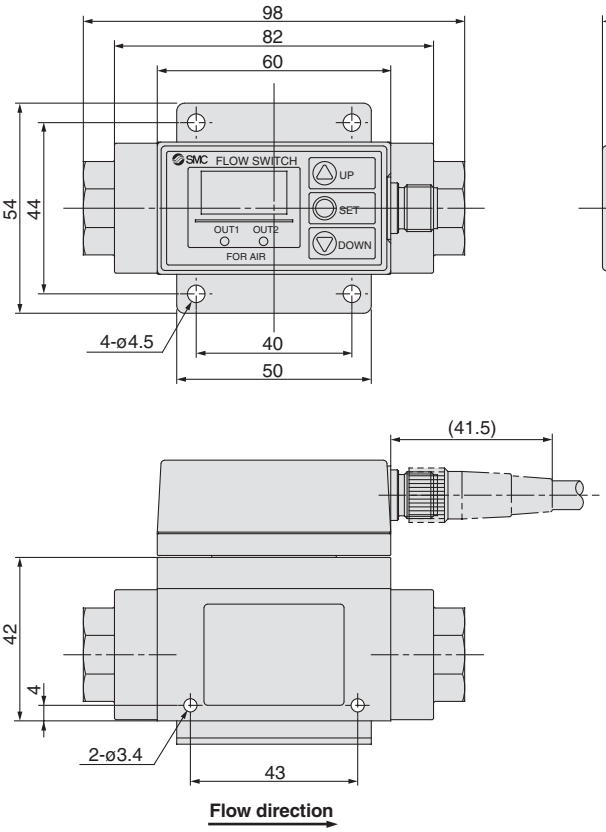
Connectors

Connectors shown below are applicable (female contact).
Contact each manufacturer for details.

Connector size	Number of pins	Manufacturer	Applicable series
M12	4	Correns Corporation	VA-4D
		OMRON Corporation	XS2
		Yamatake Corporation	PA5-4I
		Hirose Electric Co., Ltd.	HR24
		DDK Ltd.	CM01-8DP4S

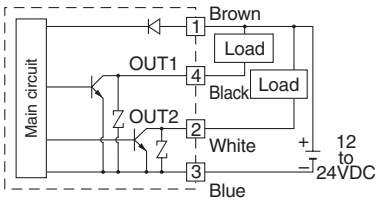
Dimensions: Integrated Display Type for Air

PF2A710, 750

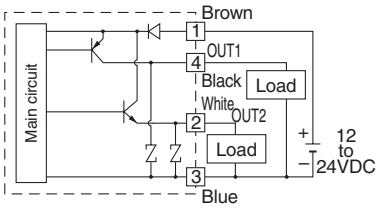


Internal circuits and wiring examples

1 to 4 are terminal numbers.

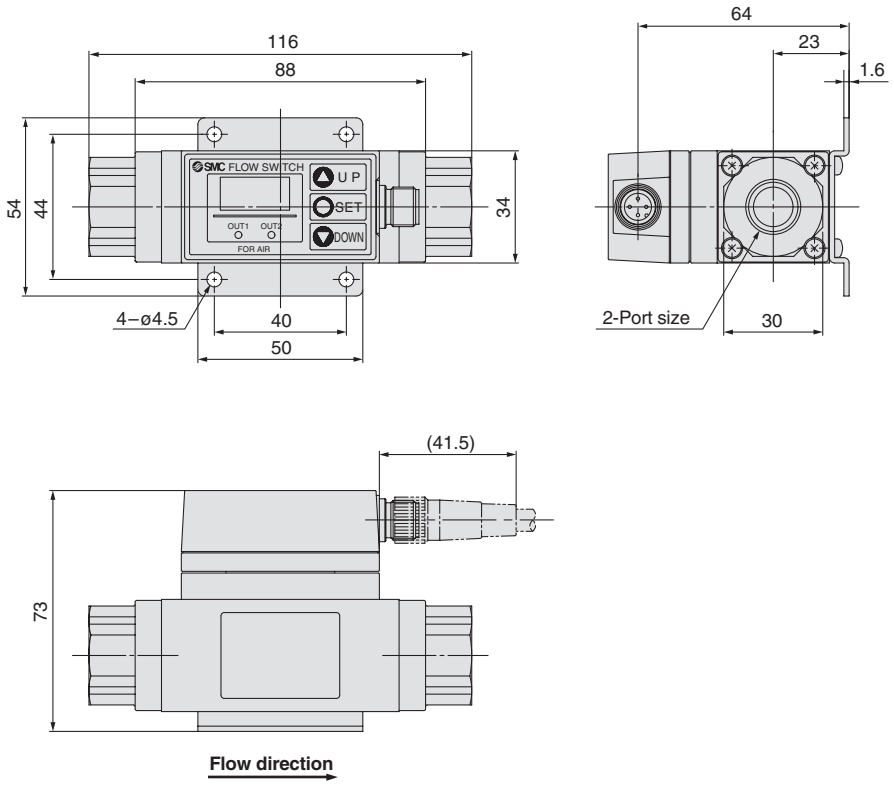


PF2A7□□-□□-27□(-M)

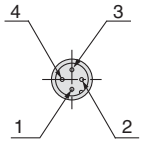


PF2A7□□-□□-67□(-M)

PF2A711, 721, 751



Connector pin numbers

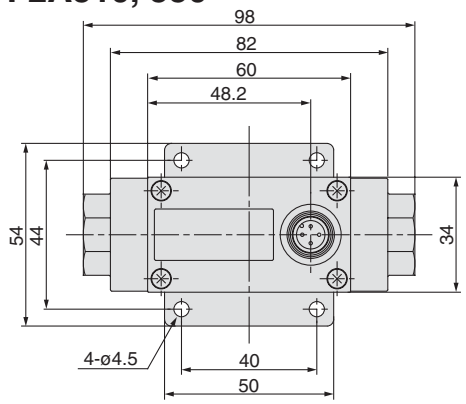


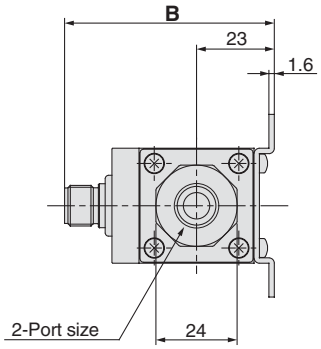
Pin no.	Pin description
1	DC(+)
2	OUT2
3	DC(–)
4	OUT1

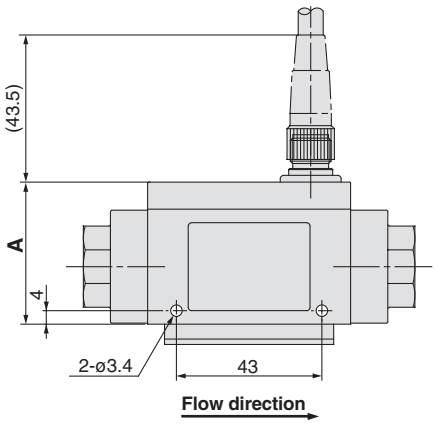
1 to 8 are terminal numbers.

Dimensions: Remote Type Sensor Unit for Air

PF2A510, 550



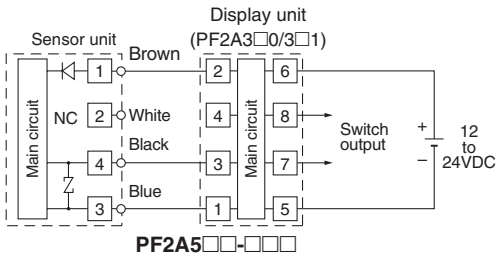




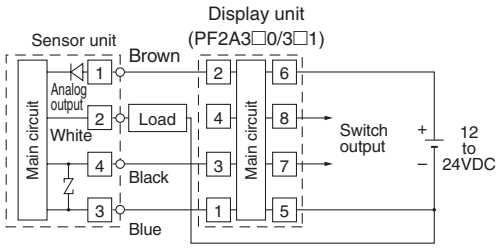
(mm)

Output specification	A	B
Pulse output only	42	62
Pulse output + Analog output	52	72

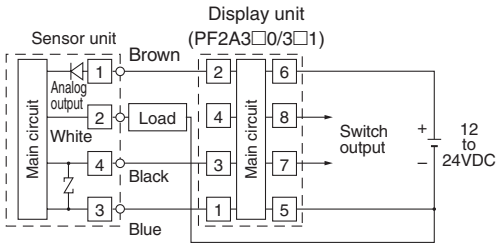
Internal circuits and wiring examples



PF2A5□□-□□□

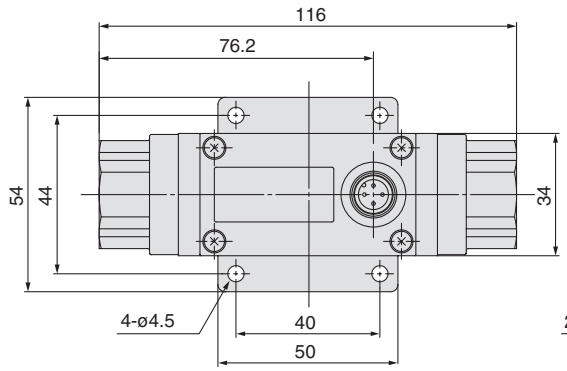


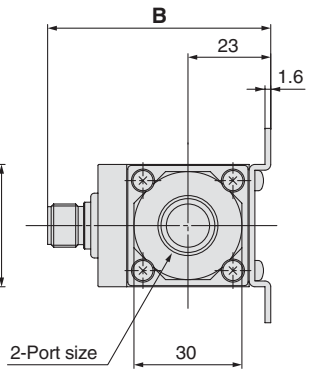
PF2A5□□-□□□-1

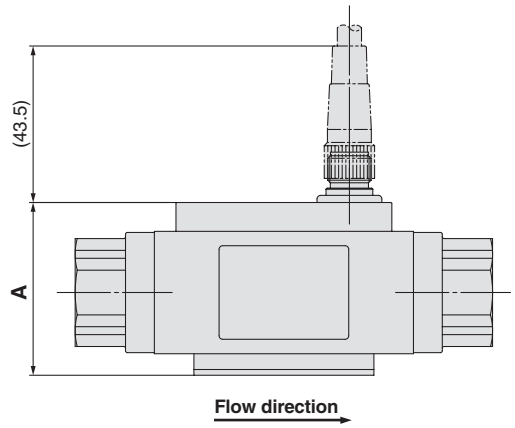


PF2A5□□-□□□-2

PF2A511, 521, 551







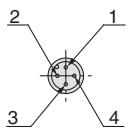
(mm)

Output specification	A	B
Pulse output only	48	62
Pulse output + Analog output	58	72

Wiring

∗ Use this sensor by connecting to SMC remote type display unit Series PF2A3□□.

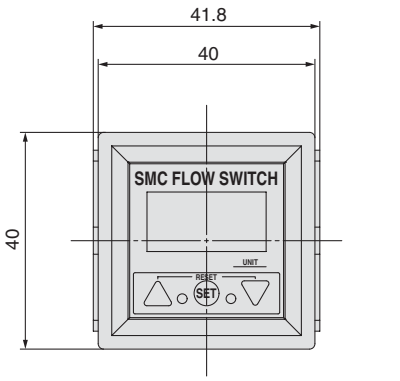
Connector pin numbers

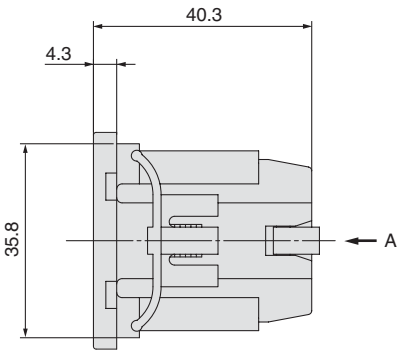


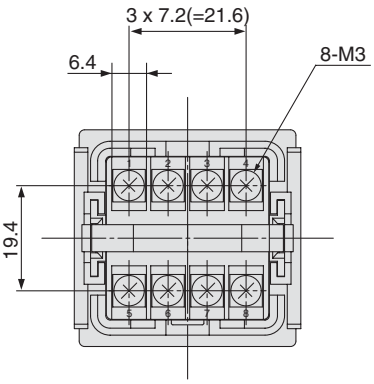
Pin no.	Pin description
1	DC(+)
2	NC/Analog output
3	DC(–)
4	OUT

Dimensions: Remote Type Display Unit for Air

PF2A3□□-A
Panel mounting type

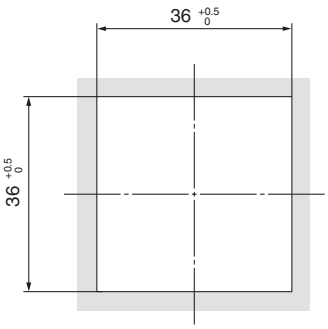






View A

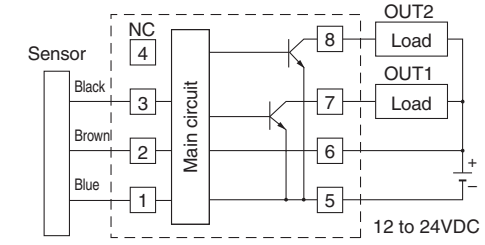
Panel fitting dimensions



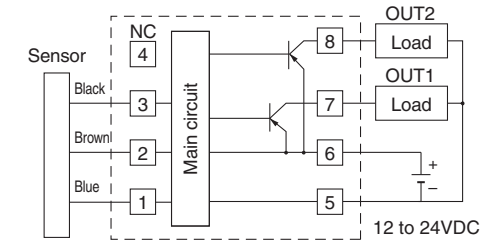
∗ The applicable panel thickness is 1 to 3.2mm.

Internal circuits and wiring examples

1 to 8 are terminal numbers.



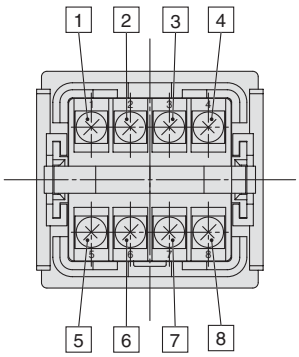
Series PF2A5□□ **PF2A3□0-A**



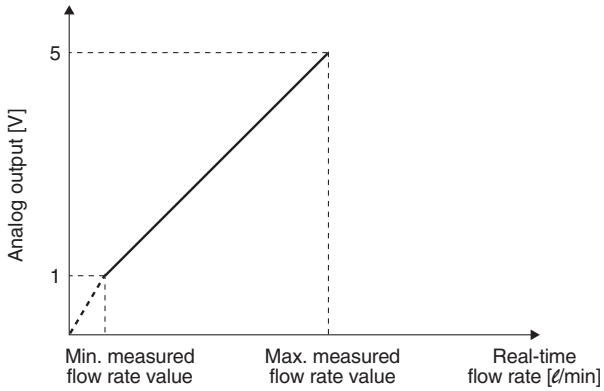
Series PF2A5□□ **PF2A3□1-A**

∗ Do not connect the white wire of the sensor to 3.

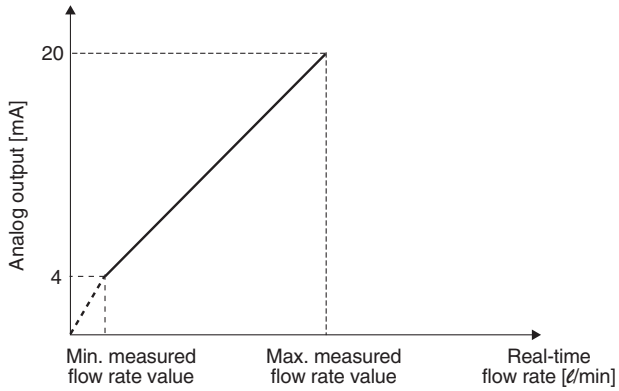
Terminal block number



Analog output
1 to 5VDC



4 to 20mADC



Part nos.	Basic condition		Standard condition	
	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]
PF2A510-□-1	1	10	1.1	10.7
PF2A550-□-1	5	50	5.4	53.5
PF2A511-□-1	10	100	11	107
PF2A521-□-1	20	200	21	214
PF2A551-□-1	50	500	54	535

Part nos.	Basic condition		Standard condition	
	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]
PF2A510-□-2	1	10	1.1	10.7
PF2A550-□-2	5	50	5.4	53.5
PF2A511-□-2	10	100	11	107
PF2A521-□-2	20	200	21	214
PF2A551-□-2	50	500	54	535

For Air

Digital Flow Switch/High Flow Rate Type

Series PF2A

Refer to www.smcworld.com for details of products compatible with overseas standards.

How to Order

Integrated Display Type **PF2A7 □ H — □ □ — □ □ — □**

Flow rate range

03	150 to 3000ℓ/min
06	300 to 6000ℓ/min
12	600 to 12000ℓ/min

High flow rate type

Port specification

Nil	Rc
N	NPT
F	G

Port size

Symbol	Port size	Flow rate (ℓ/min) 3000	6000	12000	Applicable model
10	1	●			PF2A703H
14	1 1/2		●		PF2A706H
20	2			●	PF2A712H

Output specification

28	NPN open collector 1 output + Analog output (1 to 5V)
29	NPN open collector 1 output + Analog output (4 to 20mA)
68	PNP open collector 1 output + Analog output (1 to 5V)
69	PNP open collector 1 output + Analog output (4 to 20mA)

∗ Switching of switch output and accumulated pulse output is possible with NPN or PNP open collector outputs.

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: ℓ/min
Accumulated flow: ℓ, m^3, $m^3 \times 10^3$

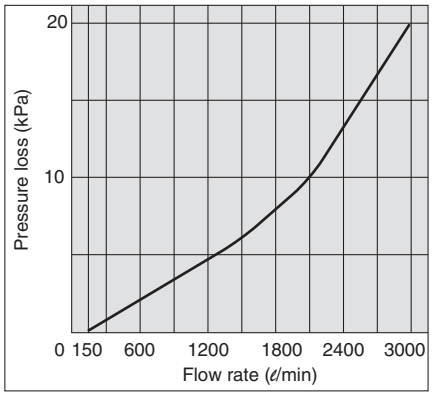
Specifications

Model		PF2A703H	PF2A706H	PF2A712H
Measured fluid		Dry air		
Detection type		Heater type		
Flow rate measuring range Note 1)		150 to 3000ℓ/min	300 to 6000ℓ/min	600 to 12000ℓ/min
Minimum setting unit Note 1)		5ℓ/min	10ℓ/min	
Display units Note 2)	Real-time flow rate	ℓ/min, CFM		
	Accumulated flow	ℓ, m^3, $m^3 \times 10^3$, ft^3, $ft^3 \times 10^3$, $ft^3 \times 10^6$		
Operating pressure range		0.1 to 1.5MPa		
Proof pressure		2.25MPa		
Pressure loss		20kPa (at maximum flow rate)		
Accumulated flow range		0 to 9,999,999,999ℓ		
Linearity Note 3)		±1.5% F.S. or less (0.7MPa, at 20°C)		
Repeatability		±1.0% F.S. or less (0.7MPa, at 20°C), ±3.0% of F.S. or less in case of analog output		
Pressure characteristics		±1.5% F.S. or less (0.1 to 1.5MPa, based on 0.7MPa)		
Temperature characteristics		±2.0% F.S. or less (0 to 50°C, based on 25°C)		
Output specifications	Switch output Note 4)	NPN open collector Max. load current: 80mA; Max. applied voltage: 30V; Internal voltage drop: 1V or less (with load current of 80mA)		
		PNP open collector Max. load current: 80mA; Internal voltage drop: 1.5V or less (with load current of 80mA)		
	Accumulated pulse output Note 4)	NPN or PNP open collector	Flow rate per pulse: 100ℓ/pulse, 10.0ft^3/pulse Pulse width: 50msec	
	Analog output Note 5)	Output voltage: 1 to 5V; Load impedance: 100kΩ or more		
		Output current: 4 to 20mA; Load impedance: 250Ω or less		
Response time		1 sec. or less		
Hysteresis		Hysteresis mode: Variable (can be set from 0); Window comparator mode: (can be set from 0 to 3% F.S.)		
Power supply voltage		24VDC (ripple ±10% or less)		
Current consumption		150mA or less		
Resistance	Enclosure	IP65		
	Operating temperature range	0 to 50°C (with no condensation)		
	Withstand voltage	1000VAC for 1 min. between external terminal and case		
	Insulation resistance	50MΩ (500VDC) between external terminal and case		
	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		
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns		
Weight		1.1kg (without lead wire)	1.3kg (without lead wire)	2.0kg (without lead wire)
Port size (Rc, NPT, G)		1	1 1/2	2

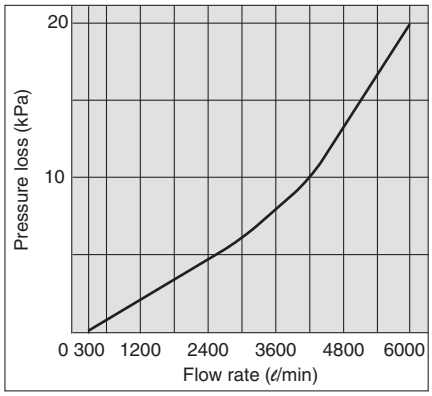
Note 1) Flow rate display can be switched between the basic condition of 0°C, 101.3kPa and the standard condition (ANR) of 20°C, 101.3kPa, and 65% RH.
Note 2) For digital flow switch with unit switching function. (Fixed SI unit [(ℓ/min, or ℓ, m^3 or $m^3 \times 10^3$)] will be set for switch type without the unit switching function.)
Note 3) The high flow rate type is CE marked; however, the linearity with applied noise is ±5% F.S. or less.
Note 4) Switch output and accumulated pulse output selections are made using the button controls.
Note 5) The analog output operates only for real-time flow rate, and does not operate for accumulated flow.

Flow Characteristics (Pressure Loss)

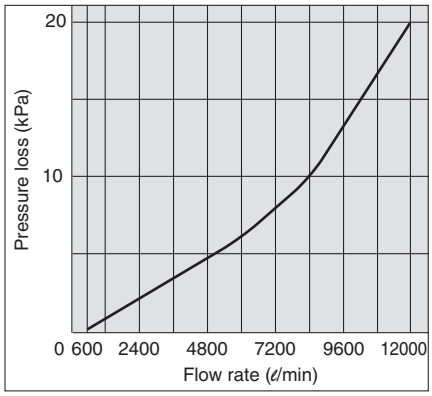
PF2A703H



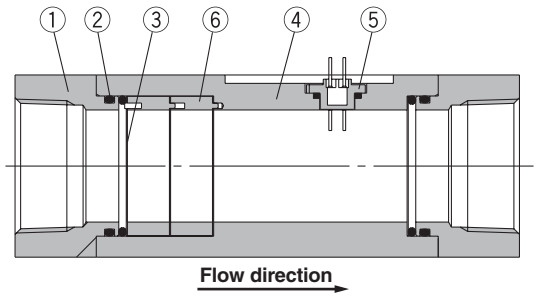
PF2A706H



PF2A712H



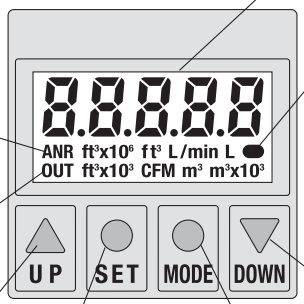
Construction



Parts list

No.	Description	Material	Note
1	**Attachment**	Aluminum alloy	Anodized
2	**Seal**	HNBR	—
3	**Mesh**	Stainless steel	—
4	**Body**	Aluminum alloy	Anodized
5	**Sensor**	PPS	—
6	**Spacer**	PBT	—

Operating Unit Descriptions



RESET Buttons

Press the UP and DOWN buttons simultaneously to activate the RESET function.
This clears the unit when an abnormality occurs and resets the accumulated flow display to "0".

Unit Display

Displays the selected unit.
Fixed SI unit (ℓ/min, or ℓ, m^3 or m^3 x 10^3) will be set for switches without the unit switching function.

Output (OUT1) Indicator

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

UP Button (▲ Button)

Use this button to increase a set value.

SET Button (● Button)

Use this button to select a function.

Flow Rate Display

Displays the real-time flow rate, accumulated flow, and set value.

Flow Rate Confirmation Indicator

The blinking intervals change depending on the flow rate value.

DOWN Button (▼ Button)

Use this button to decrease a set value.

MODE Button (● Button)

Use this button to change a function.

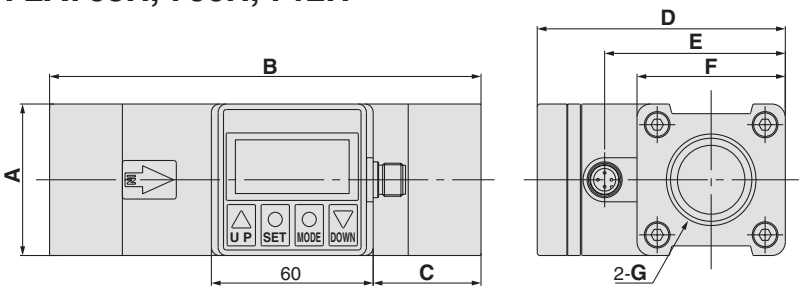
Connectors

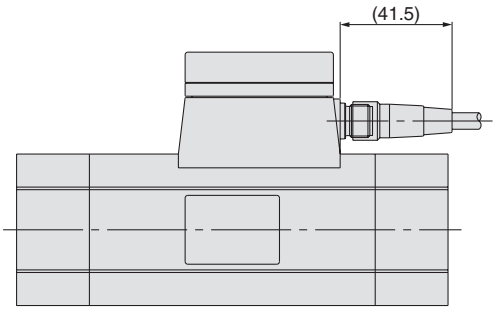
Connectors shown below are applicable (female contact).
Contact each manufacturer for details.

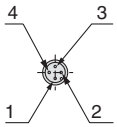
Connector size	Number of pins	Manufacturer	Applicable series
M12	4	Correns Corporation	VA-4D
		OMRON Corporation	XS2
		Yamatake Corporation	PA5-4I
		Hirose Electric Co., Ltd.	HR24
		DDK Ltd.	CM01-8DP4S

Dimensions

PF2A703H, 706H, 712H

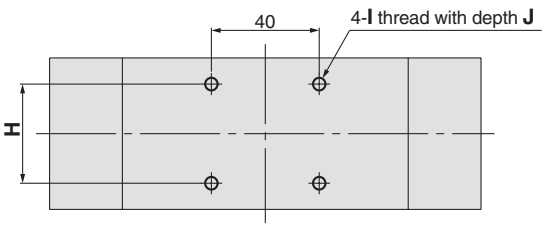






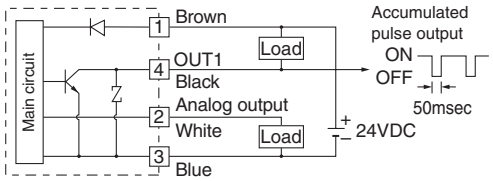
Connector pin numbers

Pin no.	Pin description
1	DC(+)
2	Analog output
3	DC(–)
4	OUT1

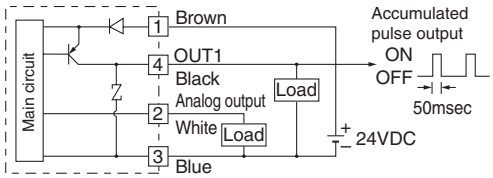


Internal circuits and wiring examples

1 to 4 are terminal numbers.

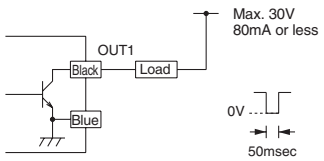


PF2A7□□H-□□-28/29 (-M)

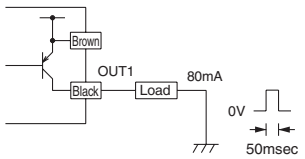


PF2A7□□H-□□-68/69 (-M)

Accumulated pulse output wiring examples



PF2A7□□H-□□-28/29 (-M)

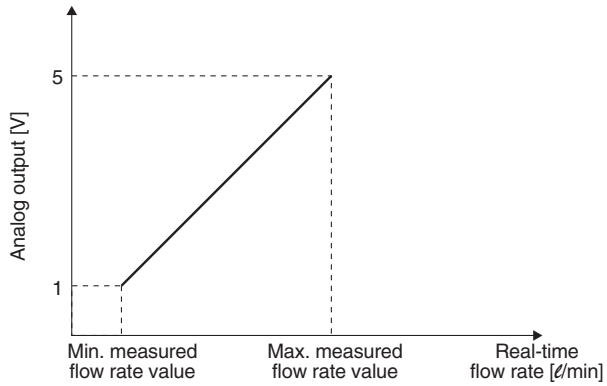


PF2A7□□H-□□-68/69 (-M)

Model	A	B	C	D	E	F	G	H	I	J
PF2A703H	55	160	40	92	67	55	Rc 1, NPT 1, G 1	36	M5 x 0.8	8
PF2A706H	65	180	45	104	79	65	Rc 1 1/2, NPT 1 1/2, G 1 1/2	46	M6 x 1	9
PF2A712H	75	220	55	114	89	75	Rc 2, NPT 2, G 2	56	M6 x 1	9

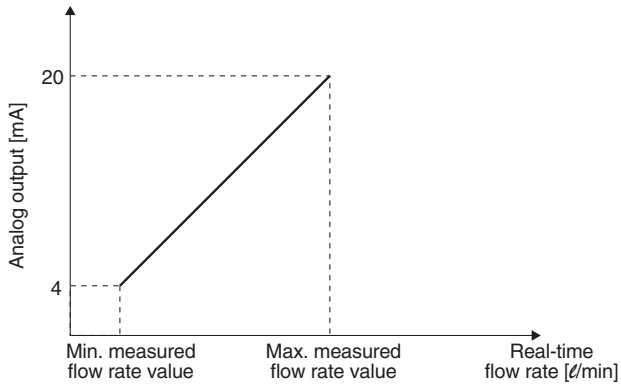
Analog output

1 to 5VDC



Part nos.	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]
PF2A703H-□-28 **PF2A703H-□-68**	150	3000
PF2A706H-□-28 **PF2A706H-□-68**	300	6000
PF2A712H-□-28 **PF2A712H-□-68**	600	12000

4 to 20mADC



Part nos.	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]
PF2A703H-□-29 **PF2A703H-□-69**	150	3000
PF2A706H-□-29 **PF2A706H-□-69**	300	6000
PF2A712H-□-29 **PF2A712H-□-69**	600	12000

For Water

Digital Flow Switch

Series PF2W

Refer to www.smcworld.com for details of products compatible with overseas standards.

How to Order

Integrated Display Type

PF2W7 20 – □ 03 – 27 □ – □

Flow rate range

04	0.5 to 4ℓ/min
20	2 to 16ℓ/min
40	5 to 40ℓ/min
11	10 to 100ℓ/min

Thread type

Nil	Rc
N	NPT
F	G

Port size

Symbol	Port size	Flow rate (ℓ/min) 4	16	40	100	Applicable models
03	3/8	●	●			PF2W704, PF2W720
04	1/2		●	●		PF2W720, PF2W740
06	3/4			●	●	PF2W740, PF2W711
10	1				●	PF2W711

Wiring specification

Nil	3m lead wire with connector
N	Without lead wire

Output specification

27	NPN open collector 2 outputs
67	PNP open collector 2 outputs

Unit specification

Nil	With unit switching function
M	Fixed SI unit Note)

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

Specifications

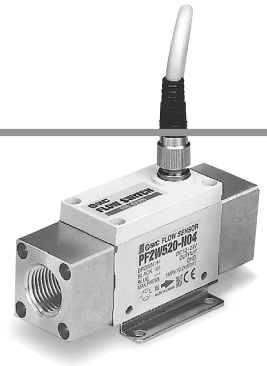
Model		PF2W704	PF2W720	PF2W740	PF2W711
Measured fluid		Water			
Flow rate measurement range		0.35 to 4.5ℓ/min	1.7 to 17.0ℓ/min	3.5 to 45ℓ/min	7 to 110ℓ/min
Set flow rate range		0.35 to 4.5ℓ/min	1.7 to 17.0ℓ/min	3.5 to 45ℓ/min	7 to 110ℓ/min
Flow rate measuring range		0.5 to 4ℓ/min	2 to 16ℓ/min	5 to 40ℓ/min	10 to 100ℓ/min
Minimum set unit		0.05ℓ/min	0.1ℓ/min	0.5ℓ/min	1ℓ/min
Accumulated pulse flow rate exchange value (Pluse width: 50ms)		0.05ℓ/pulse	0.1ℓ/pulse	0.5ℓ/pulse	1ℓ/pulse
Linearity		±5% F.S. or less			±3% F.S. or less
Repeatability		±3% F.S. or less			±2% F.S. or less
Temperature characteristics Note 1)		±5% F.S. or less (0° to 50°C, based on 25°C)			
Current consumption (No load)		70mA or less			80mA or less
Weight Note 2)		460g	520g	700g	1150g
Port size (Rc, NPT, G)		3/8	3/8, 1/2	1/2, 3/4	3/4, 1
Detection type		Karman vortex			
Indicator light		3-digit, 7-segment LED			
Display units Note 3)	Real-time flow rate	ℓ/min, gal(US)/min			
	Accumulated flow	ℓ, gal(US)			
Operating pressure range		0 to 1MPa			
Proof pressure		1.5MPa			
Accumulated flow range		0 to 999999ℓ			
Ambient temperature range		Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)			
Output specifications Note 4)	Switch output	NPN open collector	Maximum load current: 80mA; Internal voltage drop: 1V or less (with load current of 80mA) Maximum applied voltage: 30V; 2 outputs		
		PNP open collector	Maximum load current: 80mA Internal voltage drop: 1.5V or less (with load current of 80mA); 2 outputs		
	Accumulated pulse output	NPN or PNP open collector (same as switch output)			
Status LED's		Lights up when output is ON, OUT1: Green; OUT2: Red			
Response time		1 sec. or less			
Hysteresis		Hysteresis mode: Variable (can be set from 0), Window comparator mode: 3-digit fixed Note 5)			
Power supply voltage		12 to 24VDC (ripple ±10% or less)			
Resistance	Enclosure	IP65			
	Operating temperature range	0 to 50°C			
	Withstand voltage	1000VAC for 1 min. between external terminal and case			
	Insulation resistance	50MΩ (500VDC) between external terminal and case			
	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			
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns			

Note 1) In the case of PF2W711, ±3% of F.S. or less (15°C to 35°C, based on 25°C). Note 2) Without lead wire.
Note 3) For digital flow switch with unit switching function. (Fixed SI unit [ℓ/min or ℓ] will be set for switch type without the unit switching function.)
Note 4) Switch output and accumulated pulse output can be selected during initial setting.
Note 5) Window comparator mode — Since hysteresis will reach 3 digits, keep P_1 and P_2 or n_1 and n_2 apart by 7 digits or more. The minimum setting unit is 1digit. (refer to the table above).
(In case of output OUT2, n_1, 2 to be n_3, 4 and P_1, 2 to be P_3, 4.)
Note 6) The flow switch is comformed to CE mark.

How to Order

Remote Type Sensor Unit

PF2W5 20 — □ 03 □ — □



Flow rate range

04	0.5 to 4ℓ/min
20	2 to 16ℓ/min
40	5 to 40ℓ/min
11	10 to 100ℓ/min

Thread type

Nil	Rc
N	NPT
F	G

Wiring specification

Nil	Lead wire with connector 3m
N	Without lead wire

Port size

Symbol	Port size	Flow rate (ℓ/min) 4	16	40	100	Applicable models
03	3/8	●	●			PF2W504, PF2W520
04	1/2		●	●		PF2W520, PF2W540
06	3/4			●	●	PF2W540, PF2W511
10	1				●	PF2W511

Output specification

Nil	Output for display unit (sensor output) only
1	Output for display unit + Analog output (1 to 5V)
2	Output for display unit + Analog output (4 to 20mA)

Specifications

Model		PF2W504	PF2W520	PF2W540	PF2W511
Measured fluid		Water			
Detection type		Karman vortex			
Flow rate measuring range		0.5 to 4ℓ/min	2 to 16ℓ/min	5 to 40ℓ/min	10 to 100ℓ/min
Operating pressure range		0 to 1MPa			
Withstand pressure		1.5MPa			
Operating fluid temperature		0 to 50°C			0 to 50°C
Linearity Note 1)		±5% F.S. or less			±3% F.S. or less
Repeatability Note 1)		±2% F.S. or less			±1% F.S. or less
Temperature characteristics		±2% F.S. or less (15 to 35°C based on 25°C), ±3% F.S. or less (0 to 50°C based on 25°C)			
Output specifications Note 2)	Output for display unit	Pulse output, N channel, open drain, output for display unit PF2W3□□. (Specifications: Maximum load current of 10mA; Maximum applied voltage of 30V)			
	Analog output	Voltage output 1 to 5V within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 100kΩ or more.			
		Current output 4 to 20mA within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 300Ω or less with 12VDC, 600Ω or less with 24VDC			
Power supply voltage		12 to 24VDC (ripple ±10% or less)			
Current consumption (No load)		20mA or less			
Resistance	Enclosure	IP65			
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)			
	Withstand voltage	1000VAC for 1 min. between external terminal and case			
	Insulation resistance	50MΩ (500VDC) between external terminal and case			
	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			4.9m/s^2
	Impact resistance	490m/s^2 in X, Y, Z directions 3 times each			
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns			
Weight Note 3)		410g	470g	650g	1,100g
Port size (Rc, NPT, G)		3/8	3/8, 1/2	1/2, 3/4	3/4, 1

Note 1) The system accuracy when combined with PF2W3□□.
Note 2) Output system can be selected during initial setting.
Note 3) Without lead wire. (Add 20g for the types of analog output whether voltage or current output selected.)
Note 4) The sensor unitis comformed to CE mark.

How to Order

Remote Type Display Unit

PF2W3 [0] [0] — A — [ ]

Flow rate range

Symbol	Flow rate range	Type for sensor unit
0	0.5 to 4ℓ/min	PF2W504
	2 to 16ℓ/min	PF2W520
	5 to 40ℓ/min	PF2W540
3	10 to 100ℓ/mim	PF2W511

Output specification

0	NPN open collector 2 outputs
1	PNP open collector 2 outputs

Mounting

A	Panel mounting

Unit specification

Nil	With unit switching function
M	Fixed SI unit Note)

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

Panel mount adapter part no.

Description	Panel adapter B
Part No.	ZS-22-02

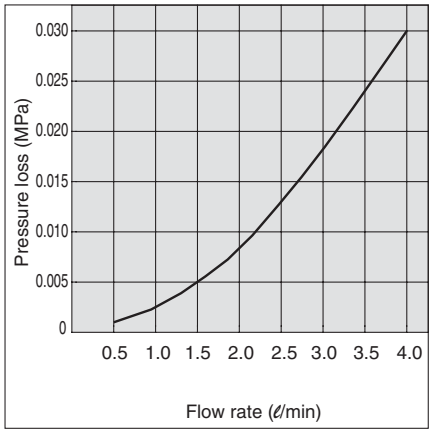
Specifications

Model		PF2W300/301			PF2W330/331
Flow rate measurement range Note 1)		0.35 to 4.5ℓ/min	1.7 to 17.0ℓ/min	3.5 to 45ℓ/min	7 to 110ℓ/min
Set flow rate range Note 1)		0.35 to 4.5ℓ/min	1.7 to 17.0ℓ/min	3.5 to 45ℓ/min	7 to 110ℓ/min
Minimum setting unit Note 1)		0.05ℓ/min	0.1ℓ/min	0.5ℓ/min	1ℓ/min
Accumulated pulse flow rate exchange value (Pluse width: 50ms) Note 1)		0.05ℓ/pulse	0.1ℓ/pulse	0.5ℓ/pulse	1ℓ/pulse
Note 2) Display units	Real-time flow rate	ℓ/min, gal(US)/min			
	Accumulated flow	ℓ, gal(US)			
Accumulated flow range		0 to 999999ℓ			
Linearity Note 3)		±5% F.S. or less			±3% F.S. or less
Repeatability Note 3)		±3% F.S. or less			±1% F.S. or less
Temperature characteristics		±2% F.S. or less (0 to 50°C, based on 25°C), ±1% F.S. or less (15 to 35°C, based on 25°C)			
Current consumption (No load)		50mA or less			60mA or less
Weight		45g			
Output specifications Note 4)	Switch output	NPN open collector (PF2W300, PF2W330)	Maximum load current: 80mA Internal voltage drop: 1V or less (with load current of 80mA) Maximum applied voltage: 30V 2 outputs		
		PNP open collector (PF2W301, PF2W331)	Maximum load current: 80mA Internal voltage drop: 1.5V or less (with load current of 80mA) 2 outputs		
	Accumulated pulse output	NPN or PNP open collector (same as switch output)			
Resistance	Enclosure	IP40			
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)			
	Withstand voltage	1000VAC for 1 min. between external terminal and case			
	Insulation resistance	50MΩ (500VDC) between external terminal and case			
	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			
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns			
Indicator lights		3-digit, 7-segment LED			
Status LED's		Lights up when output is ON, OUT1: Green; OUT2: Red			
Power supply voltage		12 to 24VDC (ripple ±10% or less)			
Response time		1sec. or less			
Hysteresis		Hysteresis mode: Variable (can be set from 0) Window comparator mode: 3-digit fixed Note 5)			

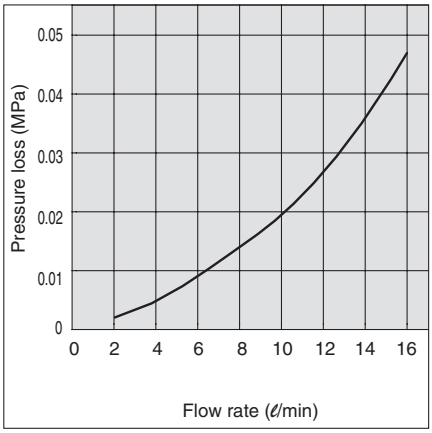
Note 1) Values vary depending on each set flow rate range.
Note 2) For digital flow switch with unit switching function. (Fixed SI unit [ℓ/min or ℓ] will be set for switch types without the unit switching function.)
Note 3) The system accuracy when combined with PF2W5.
Note 4) Switch output and accumulated pulse output can be selected during initial setting.
Note 5) Window comparator mode — Since hysteresis (H) will reach 3 digits, keep P_1 and P_2 or n_1 and n_2 apart by 7 digits or more. (In case of output OUT2, n_1, 2 to be n_3, 4 and P_1, 2 to be P_3, 4.)
Note 6) The display unit is comformed to CE mark.

Flow Characteristics (Pressure Loss)

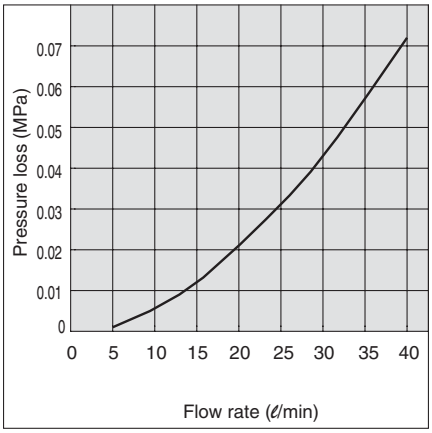
PF2W704, PF2W504



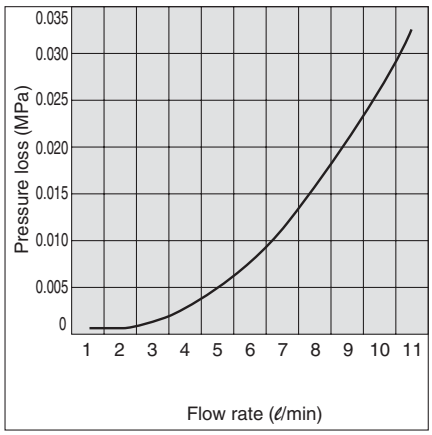
PF2W720, PF2W520



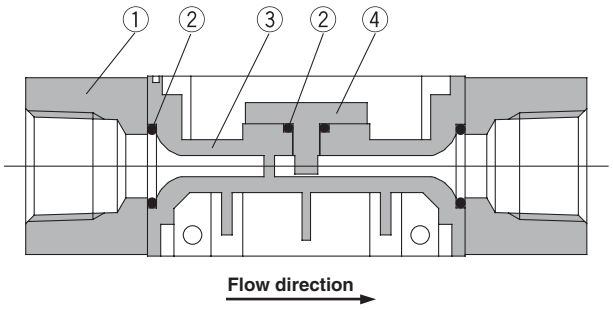
PF2W740, PF2W540



PF2W711, PF2W511



Sensor Unit Construction



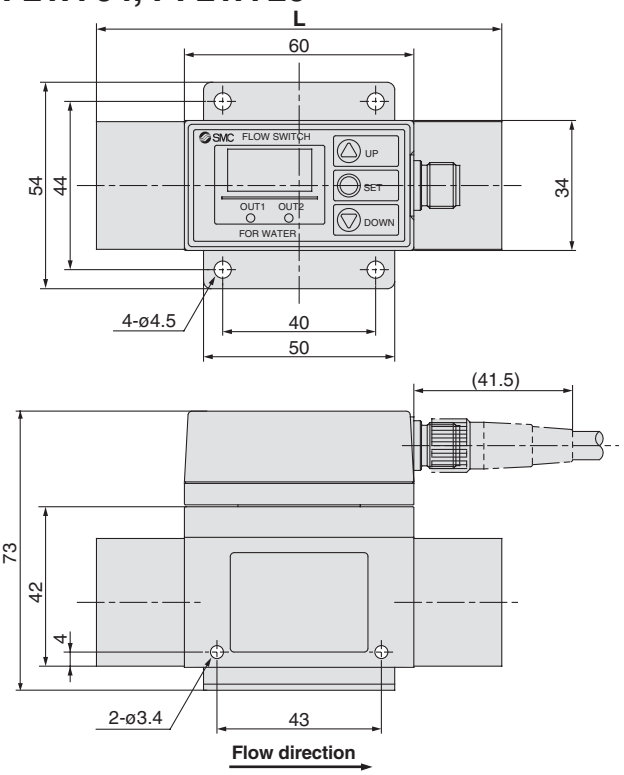
Parts list

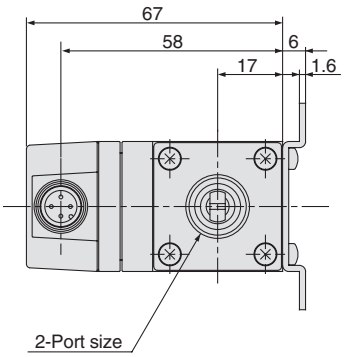
No.	Description	Material
1	**Attachment**	SUS
2	**Seal**	NBR
3	**Body**	PPS
4	**Sensor**	PPS

Connectors and operating unit descriptions are the same as series PF2A for air. Refer to page 5.

Dimensions: Integrated Display Type for Water

PF2W704, PF2W720

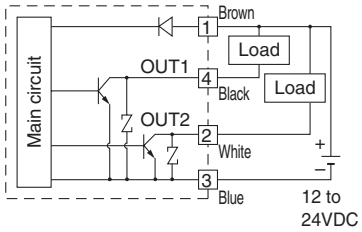




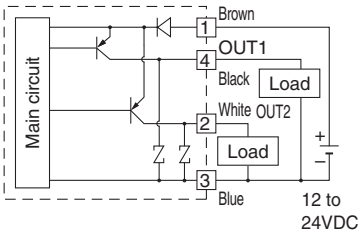
Model	L Dimension
PF2W704	100
PF2W720	106

Internal circuits and wiring examples

1 to 4 are terminal numbers.

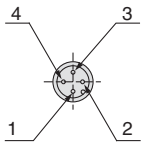


PF2W7□□-□□-27□(-M)



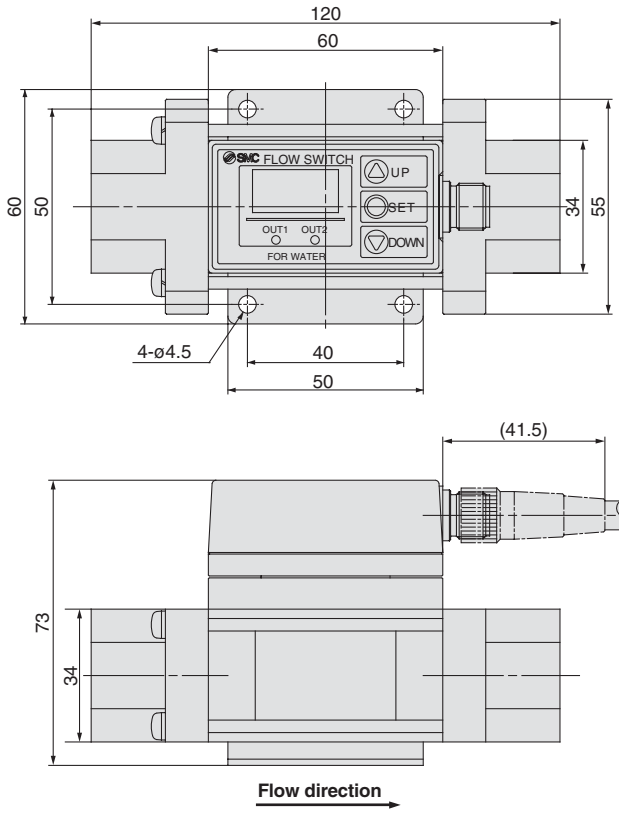
PF2W7□□-□□-67□(-M)

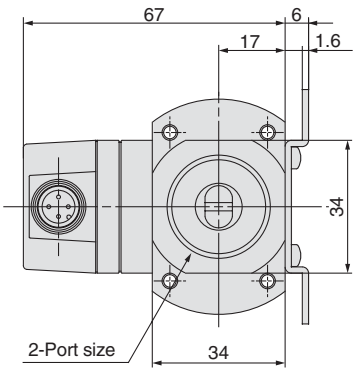
Connector pin numbers



Pin no.	Pin description
1	DC(+)
2	OUT2
3	DC(–)
4	OUT1

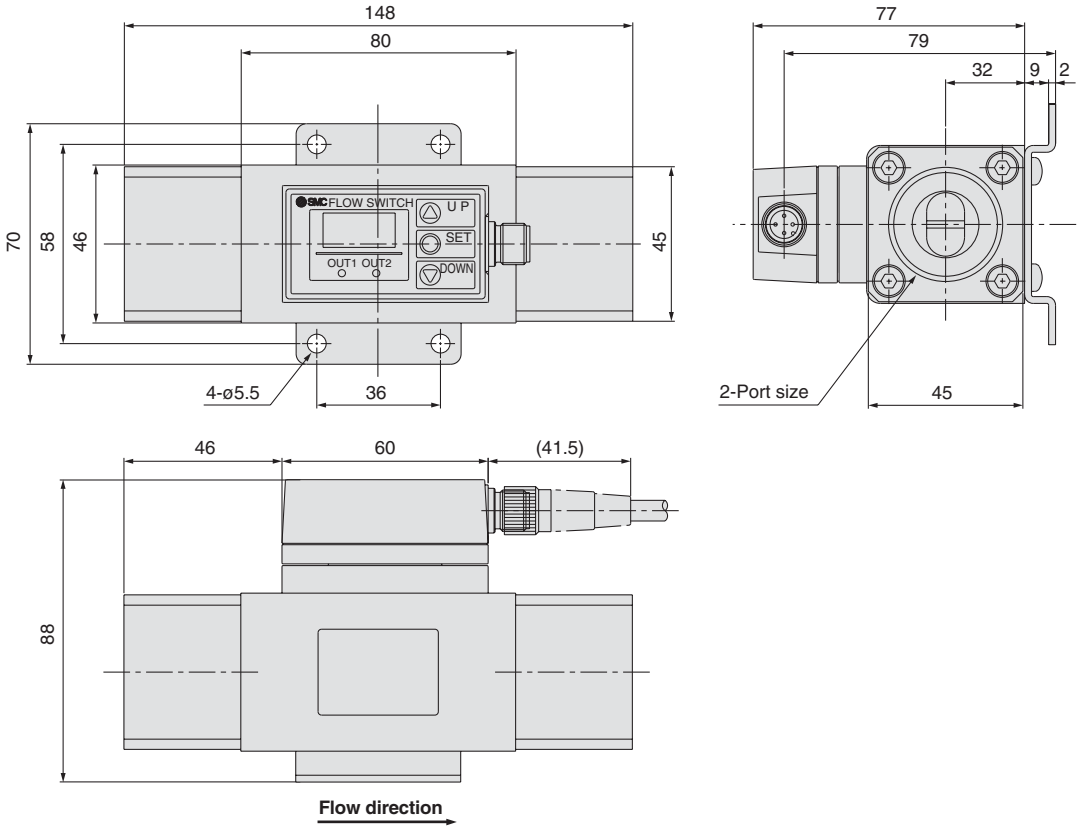
PF2W740





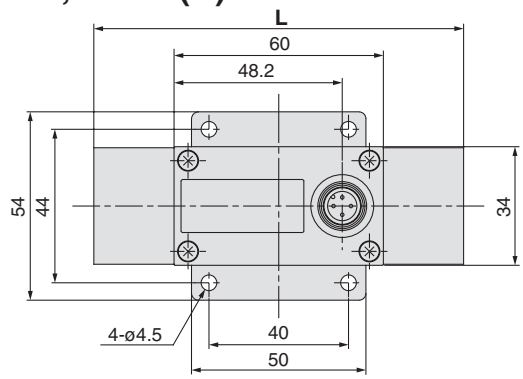
Dimensions: Integrated Display Type for Water

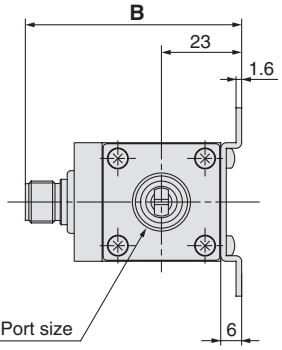
PF2W711

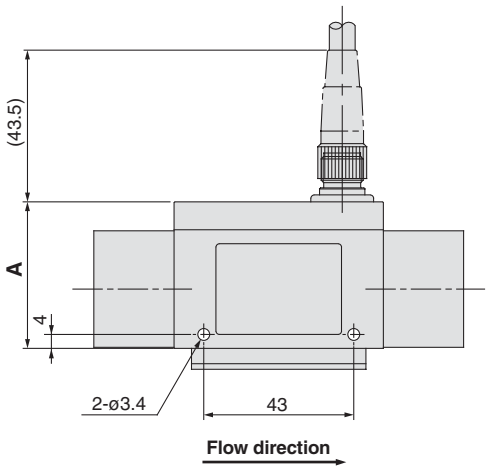


Dimensions: Remote Type Sensor Unit **for Water**

PF2W504, 520-□(N)-□





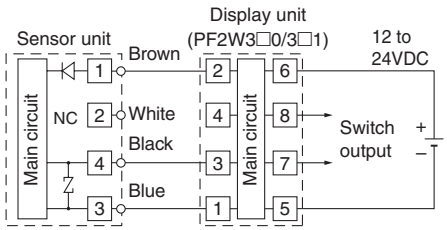


Model	L dimension
PF2W504	100
PF2W520	106

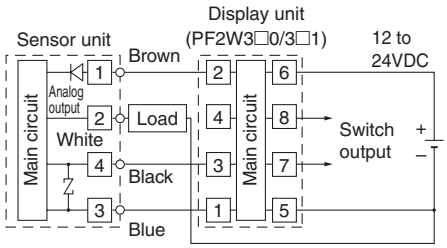
Output specification	A	B
Pulse output only	42	62
Pulse output + Analog output	52	72

Internal circuits and wiring examples

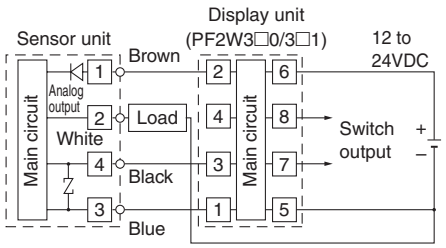
1 to 8 are terminal numbers.



PF2W5□□-□□□

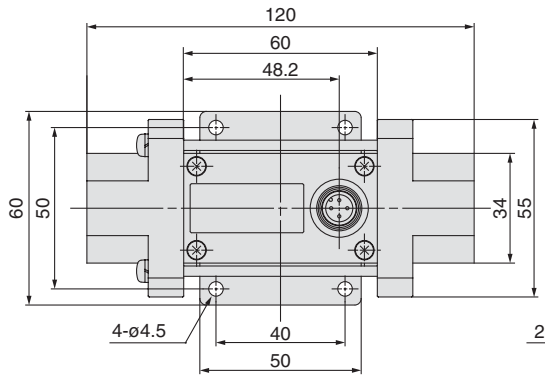


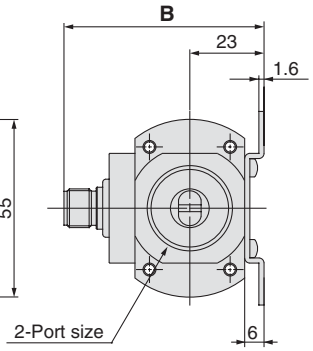
PF2W5□□-□□□-1

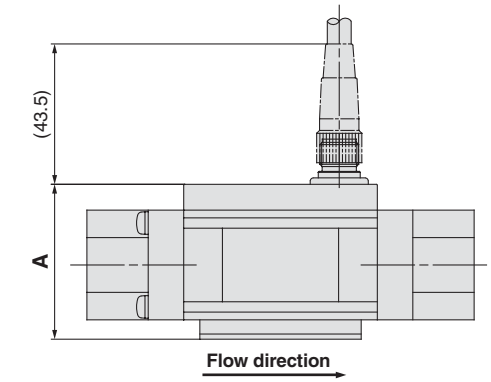


PF2W5□□-□□□-2

PF2W504-□(N)-□

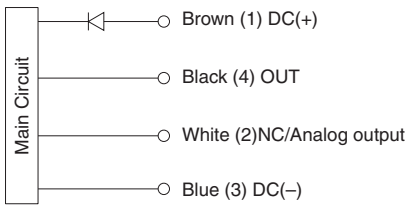






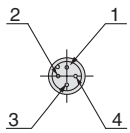
Output specification	A	B
Pulse output only	42	62
Pulse output + Analog output	52	72

Wiring



∗ Use this sensor by connecting to SMC remote type display unit Series PF2W3□□.

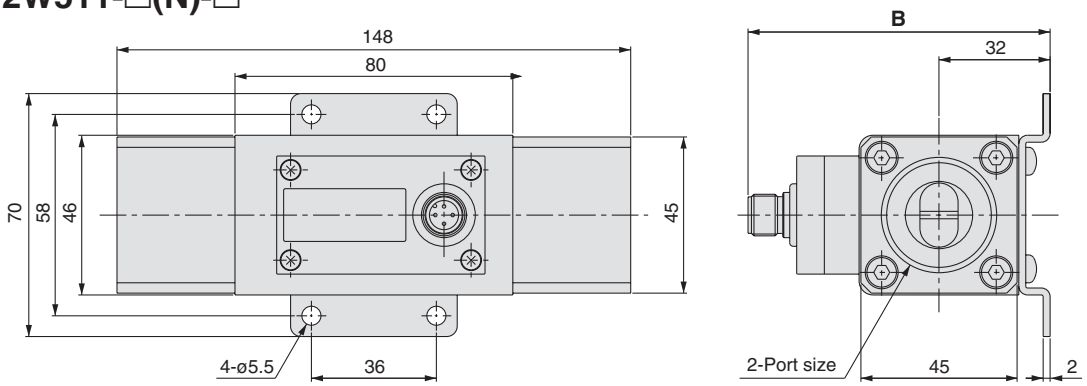
Connector pin numbers

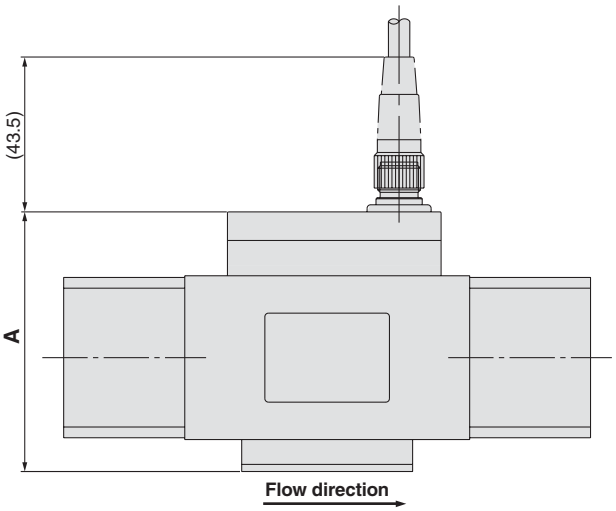


Pin no.	Pin description
1	DC(+)
2	NC/Analog output
3	DC(–)
4	OUT

Dimensions: Remote Type Sensor Unit for Water

PF2W511-□(N)-□

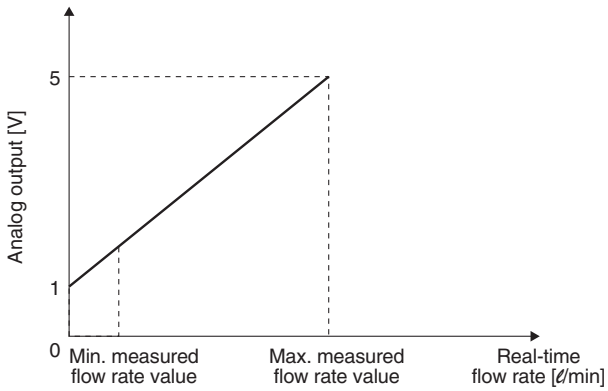




Output specification	A	B
Pulse output only	63	77
Pulse output + Analog output	73	87

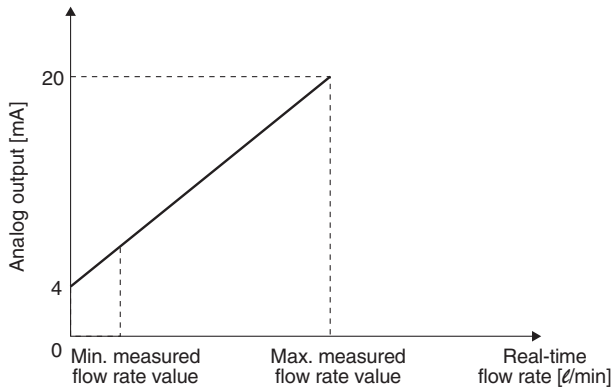
Analog output

1 to 5VDC



Part no.	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]
PF2W504-□-1	0.5	4
PF2W520-□-1	2	16
PF2W540-□-1	5	40
PF2W511-□-1	10	100

4 to 20mADC

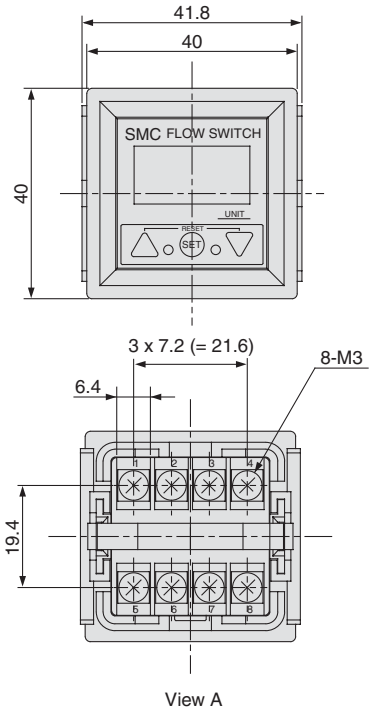


Part no.	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]
PF2W504-□-2	0.5	4
PF2W520-□-2	2	16
PF2W540-□-2	5	40
PF2W511-□-2	10	100

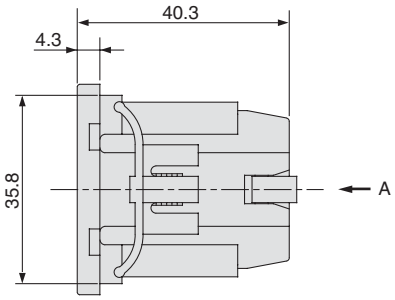
Dimensions: Remote Type Display Unit for Water

to are terminal numbers.

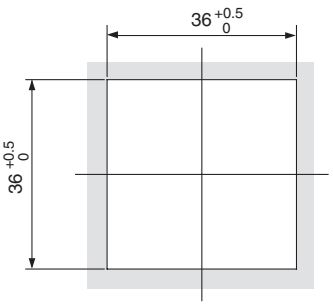
PF2W3□□-A
Panel mounting type



View A



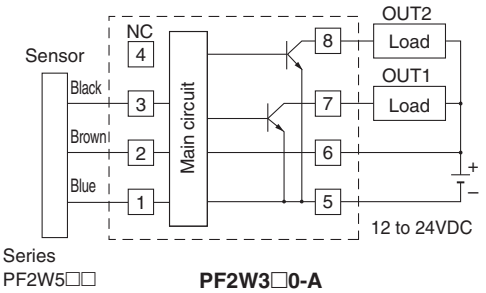
Panel fitting dimension



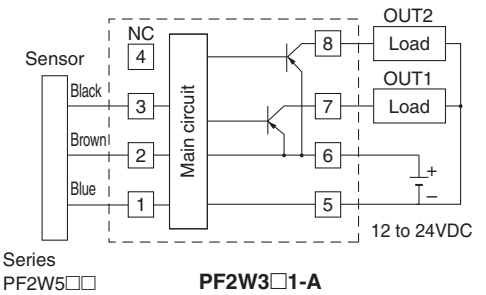
∗ The applicable panel thickness is 1 to 3.2mm.

Internal circuits and wiring examples

1 8



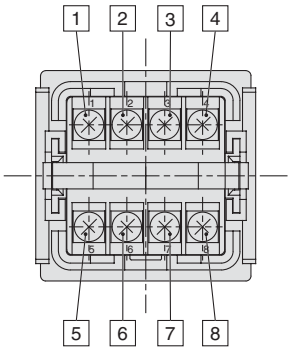
Series PF2W5□□ **PF2W3□0-A**



Series PF2W5□□ **PF2W3□1-A**

∗ Do not connect the white wire of the sensor to 3.

Terminal block number

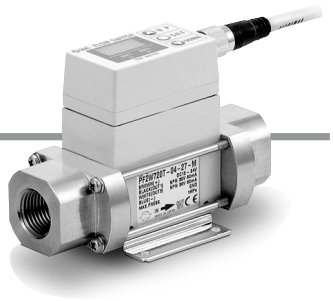


For Water

Digital Flow Switch/High Temperature Fluid Type

Series PF2W

Refer to www.smcworld.com for details of products compatible with overseas standards.



How to Order

Integrated Display Type

PF2W7 20 T – □ 03 – 27 □ – □

Flow rate range

04	0.5 to 4ℓ/min
20	2 to 16ℓ/min
40	5 to 40ℓ/min

Temperature range

T	0 to 90°C

Thread type

Nil	Rc
N	NPT
F	G

Port size

Symbol	Port size	Flow rate (ℓ/min) 4	16	40	Applicable models
03	3/8	●	●		PF2W704T, PF2W720T
04	1/2		●	●	PF2W720T, PF2W740T
06	3/4			●	PF2W740T

Output specification

27	PNP open collector 2 outputs
67	NPN open collector 2 outputs

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: ℓ/min
Accumulated flow: ℓ

Specifications

Model		PF2W704T	PF2W720T	PF2W740T
Measured fluid		Water, Mixture of water (50%) and ethylene glycol (50%)		
Flow rate measurement range		0.35 to 4.5ℓ/min	1.7 to 17.0ℓ/min	3.5 to 45ℓ/min
Set flow rate range		0.35 to 4.5ℓ/min	1.7 to 17.0ℓ/min	3.5 to 45ℓ/min
Flow rate measuring range		0.5 to 4ℓ/min	2 to 16ℓ/min	5 to 40ℓ/min
Minimum setting unit		0.05ℓ/min	0.1ℓ/min	0.5ℓ/min
Accumulated pulse flow rate exchange value (Pluse width: 50ms)		0.05ℓ/pulse	0.1ℓ/pulse	0.5ℓ/pulse
Operating fluid temperature		0 to 90°C (with no cavitation)		
Linearity		±5% F.S. or less		
Repeatability		±3% F.S. or less		
Temperature characteristics Note 1)		±5% F.S. or less (0 to 90°C, based on 25°C)		
Current consumption (No load)		70mA or less		
Weight Note 2)		710g		
Port size (Rc, NPT, G)		3/8	3/8, 1/2	1/2, 3/4
Detection type		Karman vortex		
Indicator light		3-digit, 7-segment LED		
Display units Note 3)	Real-time flow rate	ℓ/min, gal(US)/min		
	Accumulated flow	ℓ, gal(US)		
Operating pressure range		0 to 1MPa		
Withstand pressure		1.5MPa		
Accumulated flow range		0 to 999999ℓ		
Output specifications Note 4)	Switch output	NPN open collector	Maximum load current: 80mA; Internal voltage drop: 1V or less (with load current of 80mA) Maximum applied voltage: 30V; 2 outputs	
		PNP open collector	Maximum load current: 80mA; Internal voltage drop: 1.5V or less (with load current of 80mA); 2 outputs	
	Accumulated pulse output	NPN or PNP open collector (same as switch output)		
Status LED's		Lights up when output is ON OUT1: Green; OUT2: Red		
Response time		1 sec. or less		
Hysteresis		Hysteresis mode: Variable (can be set from 0); Window comparator mode: 3-digit fixed		
Power supply voltage		12 to 24VDC (ripple ±10% or less)		
Resistance	Enclosure	IP65		
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)		
	Withstand voltage	1000VAC for 1 min. between external terminal and case		
	Insulation resistance	50MΩ (500VDC) between external terminal and case		
	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		
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns		

Note 1) ±5% F.S. or less (0 to 50°C, based on 25°C), ±3% F.S. or less (15 to 35°C, based on 25°C)
Note 2) Without lead wire.
Note 3) For digital flow switch with unit switching function. (Fixed SI unit [ℓ/min or ℓ] will be set for switch type without the unit switching function.)
Note 4) Switch output and accumulated pulse output can be selected during initial setting.
Note 5) Window comparator mode — Since hysteresis will reach 3 digits, keep P_1 and P_2 or n_1 and n_2 apart by 7 digits or more.
(In case of output OUT2, n_1, 2 to be n_3, 4 and P_1, 2 to be P_3, 4.)
Note 6) The flow switch is comformed to CE mark.

How to Order

Remote Type Display Unit

PF2W5 [20] [T] — [ ] [03] [ ] — [ ]

Flow rate range

04	0.5 to 4ℓ/min
20	2 to 16ℓ/min
40	5 to 40ℓ/min

Temperature range

T	0 to 90°C

Thread type

Nil	Rc
N	NPT
F	G

Wiring specification

Nil	3m lead wire with connector
N	Without lead wire

Port size

Symbol	Port size	Flow rate (ℓ/min) 4	16	40	Applicable models
03	3/8	●	●		PF2W504T, 520T
04	1/2		●	●	PF2W520T, 540T
06	3/4			●	PF2W540T

Output specification

Nil	Output for display unit
1	Output for display unit + Analog output (1 to 5V)
2	Output for display unit + Analog output (4 to 20mA)

Specifications

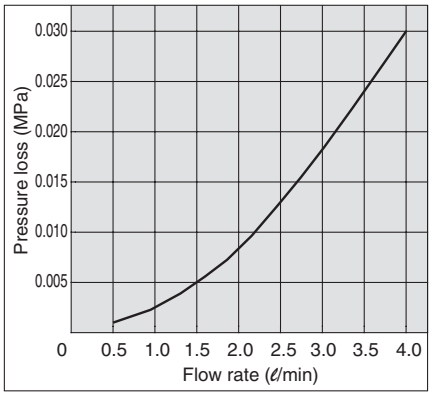
Model		PF2W504T	PF2W520T	PF2W540T
Measured fluid		Water, Mixture of water (50%) and ethylene glycol (50%)		
Detection type		Karman vortex		
Flow rate measuring range		0.5 to 4ℓ/min	2 to 16ℓ/min	5 to 40ℓ/min
Operating pressure range		0 to 1MPa		
Withstand pressure		1.5MPa		
Operating fluid temperature		0 to 90°C (with no cavitation)		
Linearity Note 1)		±5% F.S. or less		
Repeatability Note 1)		±2% F.S. or less		
Temperature characteristics		±2% F.S. or less (15 to 35°C based on 25°C), ±3% F.S. or less (0 to 50°C based on 25°C)		
Output specifications Note 2)	Output for display unit	Pulse output, N channel, open drain, output for display unit PF2W3□□. (Specifications: Maximum load current of 10mA; Maximum applied voltage of 30V)		
	Analog output	Voltage output 1 to 5V within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 100kΩ or more.		
		Current output 4 to 20mA within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 300Ω or less with 12VDC, 600Ω or less with 24VDC		
Power supply voltage		12 to 24VDC (ripple ±10% or less)		
Current consumption (No load)		20mA or less		
Resistance	Enclosure	IP65		
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)		
	Withstand voltage	1000VAC for 1 min. between external terminal and case		
	Insulation resistance	50MΩ (500VDC) between external terminal and case		
	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		
	Noise resistance	1000Vp-p, Pulse width 1μs, Rise time 1ns		
Weight Note 3)		660g		
Port size (Rc, NPT, G)		3/8	3/8, 1/2	1/2, 3/4

Note 1) The system accuracy when combined with PF2W3□□.
Note 2) Output system can be selected during initial setting.
Note 3) Without lead wire. (Add 20g for the types of analog output whether voltage or current output selected.)
Note 4) The sensor unitis comformed to CE mark.

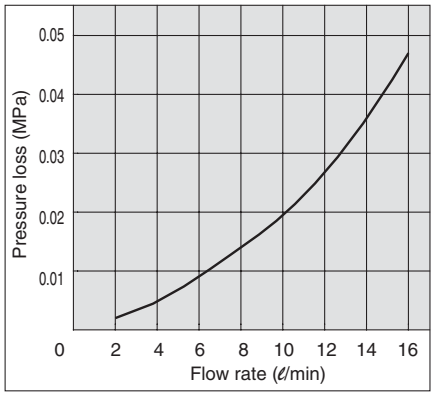
Display units are the same as those of remote type digital flow switch for water (series PF2W3□□). Refer to page 14 for details.

Flow Characteristics (Pressure Loss)

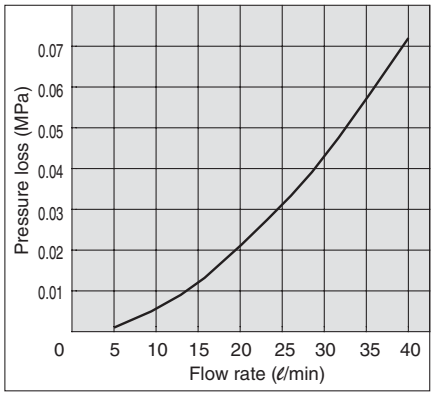
PF2W704T,504T



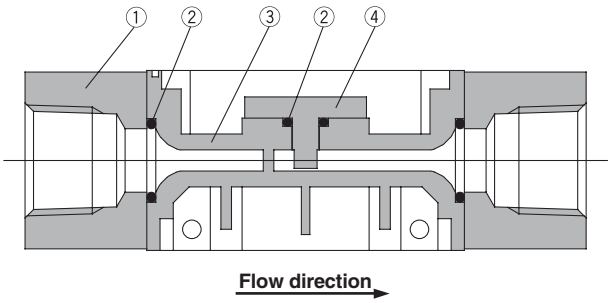
PF2W720T,520T



PF2W740T,540T



Sensor Unit Construction

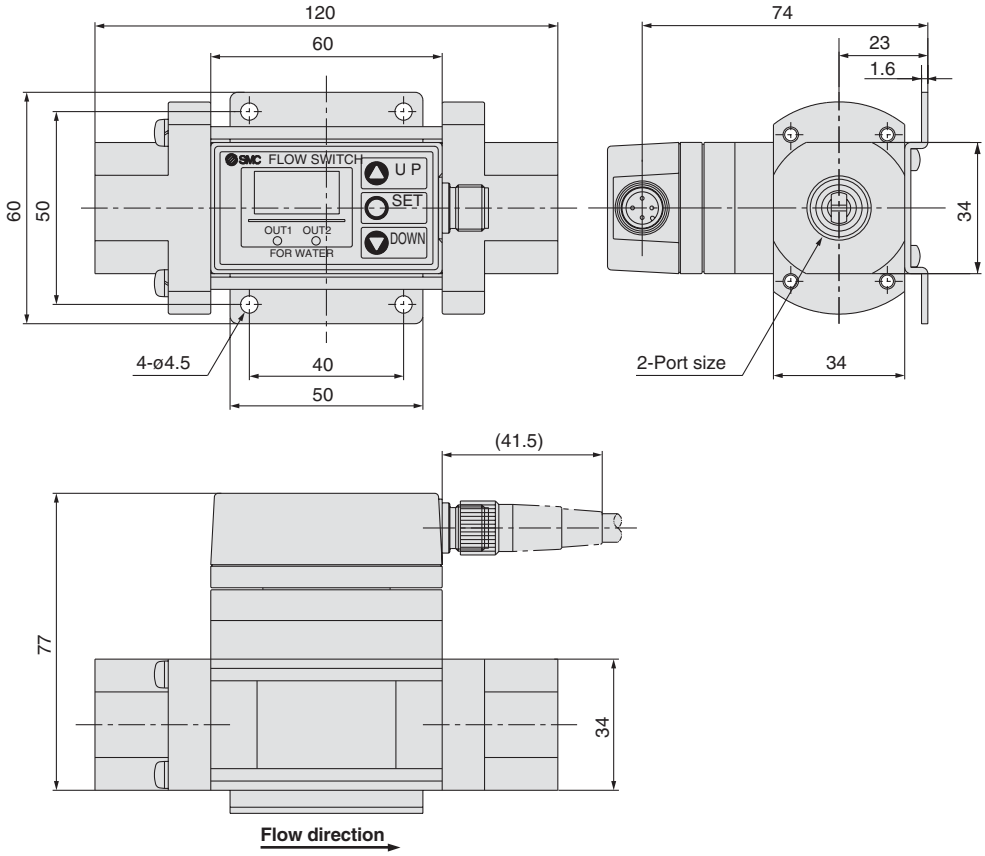


Parts list

No.	Description	Material
1	**Attachment**	Stainless steel
2	**Seal**	FKM
3	**Body**	PPS
4	**Sensor**	PPS

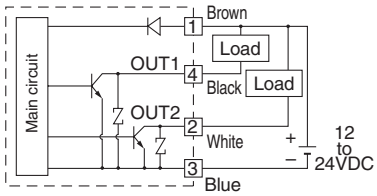
Connectors and operating unit descriptions are the same as series PF2A for air. Refer to page 5.

Dimensions: Integrated Display Type for Water

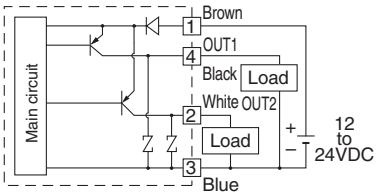


Internal circuits and wiring examples

1 to 4 are terminal numbers.

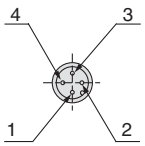


PF2W7□□T-□□-27□(-M)



PF2W7□□T-□□-67□(-M)

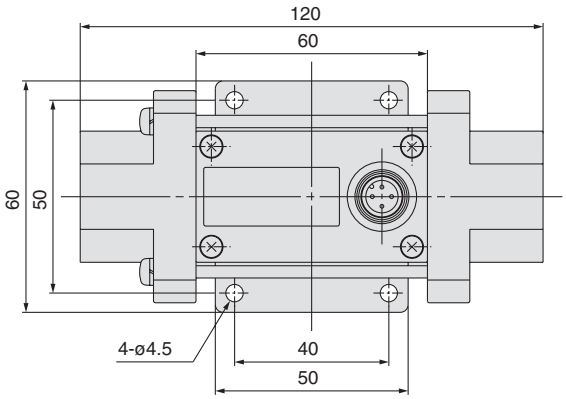
Connector pin numbers

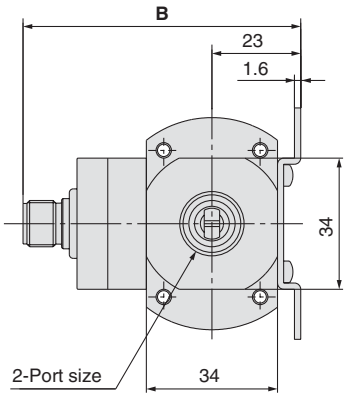


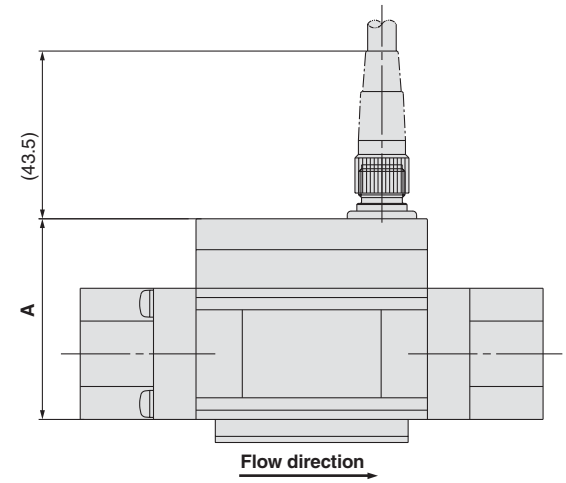
Pin no.	Pin description
1	DC(+)
2	OUT2
3	DC(–)
4	OUT1

Dimensions: Remote Type Sensor Unit for Water

PF2W504T, 520T, 540T-□(N)



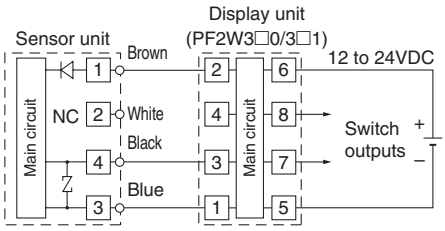




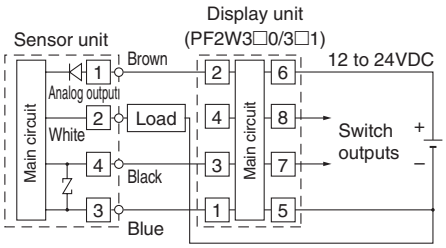
Output specification	A	B
Pulse output only	52	72
Pulse output + Analog output	62	82

Internal circuits and wiring examples

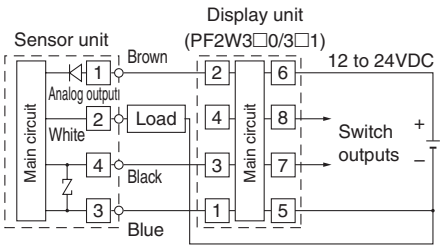
1 to 8 are terminal numbers.



PF2W5□□T-□□□



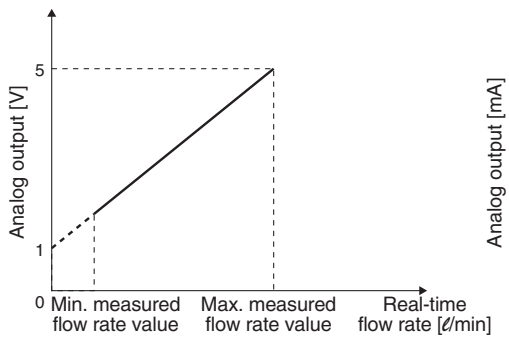
PF2W5□□T-□□□-1



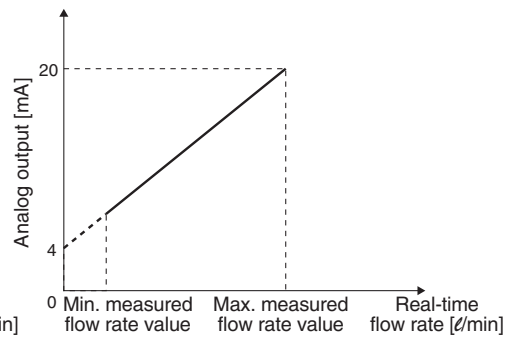
PF2W5□□T-□□□-2

Analog output

1 to 5VDC



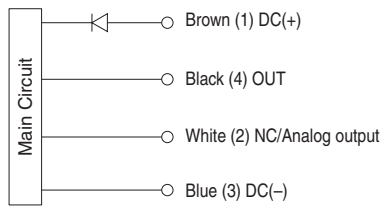
4 to 20mADC



Part no.	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]
PF2W504T-□-1	0.5	4
PF2W520T-□-1	2	16
PF2W540T-□-1	5	40

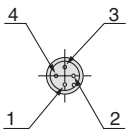
Part no.	Minimum measured flow rate value [ℓ/min]	Maximum measured flow rate value [ℓ/min]
PF2W504T-□-2	0.5	4
PF2W520T-□-2	2	16
PF2W540T-□-2	5	40

Wiring



∗ Use this sensor by connecting to SMC remote type display unit Series PF2W3□□.

Connector pin numbers



Pin no.	Pin description
1	DC(+)
2	NC/Analog output
3	DC(–)
4	OUT

Refer to PF2W3□□ on page 20 for dimensions of remote type display unit.

Functions/PF2A, PF2W

Refer to the operation manual how to set and to operate.

Flow rate measurement selection

Real-time flow rate and accumulated flow rate can be selected. Up to 999999 of flow rate value can be accumulated.

Unit switching

For air

Display	Real-time flow rate	Accumulated flow
U_1	ℓ/min	ℓ
U_2	CFM x 10^{-2}, CFM x 10^{-1}	ft^3 x 10^{-1}

CFM=ft^3/min

High Flow Rate Type (For Air)

Display	Real-time flow rate	Accumulated flow
U_1	ℓ/min	ℓ, m^3, m^3 x 10^3
U_2	CFM	ft^3, ft^3 x 10^3, ft^3 x 10^6

For Water / High Temperature Fluid Type (For Water)

Display	Real-time flow rate	Accumulated flow
U_1	ℓ/min	ℓ
U_2	GPM	gal (US)

GPM=gal (US)/min

Note) Fixed SI unit [ℓ/min or ℓ] will be set for the type without the unit switching function.

Flow rate conversion

Basic state: 0°C, 101.3kPa
Standard state: 20°C, 101.3kPa, 65%RH (ANR)
Switchable between these states.

Flow rate measuring unit confirmation

This function allows to confirm the accumulated flow rate when real-time flow rate is selected and to confirm the real-time flow rate when accumulated flow rate is selected.

Error Correction

LED display	Contents	Solution
Er1 Note 1) / Err_1 Note 2)	A current of more than 80mA is flowing to OUT1	Check the load and wiring for OUT1.
Er2 Note 1)	A current of more than 80mA is flowing to OUT2.	Check the load and wiring for OUT2.
Err_3 Note 2) / Er4 Note 1)	The setting data has changed for whatever reasons.	Perform the RESET operation, and reset all data again.
--- Note 1) / ----- Note 2)	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.

Note 1) Applicable for all integrated display types other than series PF2A7□□H and remote type sensor display units.
Note 2) Only for series PF2A7□□H.

Key lock

This function prevents incorrect operations such as changing the set value accidentally.

Accumulation clearance

This is to clear the accumulated value.

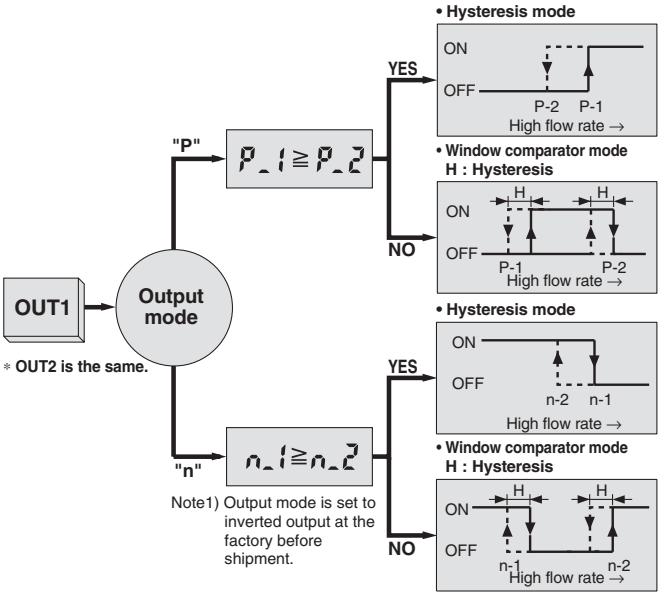
Initialization of setting (only for series PF2A7□□H)

This is to restore the setting to the initial state when dispatched from the factory.

Output types

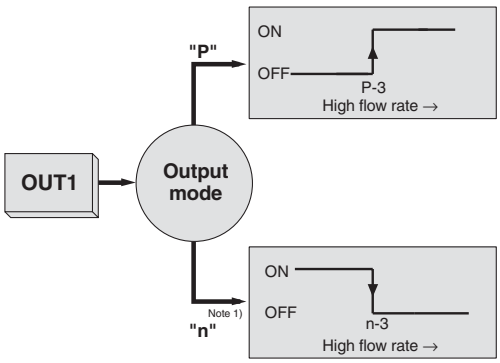
Real-time switch output, accumulated switch output, or accumulated pulse output can be selected as an output type.

Real-time switch output (oU1_0)



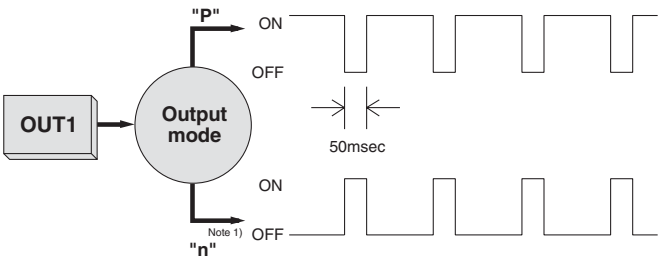
Note1) Output mode is set to inverted output at the factory before shipment.

Accumulated switch output (oU1_1)



Note1) Output mode is set to inverted output at the factory before shipment.

Accumulated pulse output (oU1_2)



Note1) For digital flow switch with unit switching function. (Fixed SI unit [ℓ/min, or ℓ, m^3 or m^3 x 10^3] will be set for switch types without unit switching function.)
Refer to the specifications of display unit for the flow rate value per pulse.

Series PF2A/PF2W
Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of **"Caution", "Warning"** or **"Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠Caution : Operator error could result in injury or equipment damage.

⚠Warning : Operator error could result in serious injury or loss of life.

⚠Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power – General Rules for Pneumatic Equipment
Note 2) JIS B 8370: Pneumatic system axiom

⚠ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or maintenance of pneumatic systems should be performed by trained and experienced operators.

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

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, and therefore requires special safety analysis.

Series PF2A/PF2W
Specific Product Precautions 1

Be sure to read before handling. Refer to page 27 for safety instructions.

Design and Selection

⚠Warning

1. Operate the switch only within the specified voltage.

Use of the switch outside the range of the specified voltage can cause not only malfunction and damage of the switch but also electrocution and fire.

2. Do not exceed the maximum allowable load specification.

A load exceeding the maximum load specification can cause damage to the switch.

3. Do not use a load that generates surge voltage.

Although surge protection is installed in the circuit at the output side of the switch, damage may still occur if a surge is applied repeatedly. When a surge generating a load such as a relay or solenoid is directly driven, use a type of switch with a built-in surge absorbing element.

4. Since the type of fluid varies depending on the product, be sure to verify the specifications.

The switches do not have an explosion proof rating. To prevent a possible fire hazard, do not use with flammable gases or fluids.

5. Monitor the internal voltage drop of the switch.

When operating below a specified voltage, it is possible that the load may be ineffective even though the pressure switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

Supply voltage − Internal voltage drop of switch > Minimum operating voltage of load

[For air]

6. Use the switch within the specified flow rate measurement and operating pressure.

Operating beyond the specified flow rate and operating pressure can damage the switch.

[For water]

7. Use the switch within the specified flow rate measurement and operating pressure.

Operating beyond the specified flow rate and operating pressure can damage the switch. Avoid especially the application of pressure above specifications through a water hammer.

<Examples of pressure reduction measures>

a) Use a device such as a water hammer relief valve to slow the valve's closing speed.

b) Absorb impact pressure by using an accumulator or elastic piping material such as a rubber hose.

c) Keep the piping length as short as possible.

8. Design the system so that the fluid always fills the detection passage.

Especially for vertical mounting, introduce the fluid from the bottom to the top.

9. Operate at a flow rate within the flow rate measurement range.

If operated outside of the flow rate measurement range, the Karman vortex will not be generated and normal measurement will not be possible.

Design and Selection

[Series PF2A7□□H]

10. Sudden increase of flow rate may destroy the flow sensor. Ensure to open/close the flow control valve not to exceed the maximum flow rate measurement values.

⚠Caution

1. Data of the flow switch will be stored even after the power is turned off.

Input data will be stored in EEPROM so that the data will not be lost after the flow switch is turned off. (Data can be rewritten for up to one million times, and data will be stored for up to 20 years.)

Mounting

⚠Warning

1. Mount switches using the proper tightening torque.

When a switch is tightened beyond the specified tightening torque, the switch may be damaged. On the other hand, tightening below the specified tightening torque may cause the installation screws to come loose during operation.

Thread	Tightening torque N·m
Rc 1/8	7 to 9
Rc 1/4	12 to 14
Rc 3/8	22 to 24
Rc 1/2	28 to 30

Thread	Tightening torque N·m
Rc 3/4	28 to 30
Rc 1	36 to 38
Rc 1 1/2	48 to 50
Rc 2	48 to 50

2. Apply wrench only to the metal part of the pipings when installing the flow switch onto the system piping.

Do not apply wrench to anything other than the piping attachment as this may damage the switch.

3. Monitor the flow direction of the fluid.

Install and connect piping so that fluid flows in the direction of the arrow indicated on the body.

4. Remove dirt and dust from inside the piping using an air blower before connecting piping to the switch.

5. Do not drop or bump.

Do not drop, bump, or apply excessive impacts (490m/s^2) while handling. Although the external body of the switch (switch case) may not be damaged, the inside of the switch could be damaged and cause a malfunction.

6. Hold the body of the switch when handling.

The tensile strength of the cord is 49N. Applying a greater pulling force on it can cause a malfunction. When handling, hold the body of the switch – do not dangle it from the cord.

7. Do not use until you can verify that equipment can operate properly.

Following mounting, repair, or retrofit, verify correct mounting by conducting suitable function and leakage tests after piping and power connections have been made.

8. Avoid the mounting orientation with the bottom of the body facing up.

The switch can be mounted in any way such as vertically or horizontally, however, avoid the mounting orientation with the bracket on the bottom of the body facing upward.

Series PF2A/PF2W
Specific Product Precautions 2

Be sure to read before handling. Refer to page 27 for safety instructions.

Mounting

⚠Warning

[For air]

9. Never mount a switch in a place that will be used as a scaffold during piping.

Damage may occur if an excessive load is applied to the switch.

10. Be sure to allow straight pipe length that is minimum 8 times the port size upstream and downstream of the switch piping.

When abruptly reducing the size of piping or when there is a restriction such as a valve on the upstream side, the pressure distribution in the piping changes and makes accurate measurement impossible. Therefore, flow restriction measures such as these should be implemented on the downstream side of the switch.

[For water]

11. Never mount a switch in a place that will be used as a scaffold during piping.

Damage may occur if an excessive load is applied to the switch. Especially when the switch supports the piping, do not apply a load of 15N·m or more to the metal part of the switch.

12. Be sure to allow straight pipe length that is minimum 8 times the port size upstream and downstream of the switch piping.

When abruptly reducing the size of piping or when there is a restriction such as a valve on the upstream side, the pressure distribution in the piping changes and makes accurate measurement impossible. Therefore, flow restriction measures such as these should be implemented on the downstream side of the switch.

When used with the downstream side open, be careful of the cavitation that is prone to occur.

Wiring

⚠Warning

1. Verify the color and terminal number when wiring.

Incorrect wiring can cause the switch to be damaged and malfunction. Verify the color and the terminal number in the instruction manual when wiring.

2. Avoid repeatedly bending or stretching the lead wire.

Repeatedly applying bending stress or stretching force to the lead wire will cause it to break.

3. Confirm proper insulation of wiring.

Make sure that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

4. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines and high voltage lines, avoiding wiring in the same conduit with these lines. Control circuits including switches may malfunction due to noise from these other lines.

5. Do not allow loads to short circuit.

Although switches indicate excess current error if loads are short circuited, all incorrect wiring connections cannot be protected. Take precautions to avoid incorrect wiring.

Usage

⚠ Warning

1. When using a switch for high temperature fluid, the switch itself also becomes hot due to the high temperature fluid. Avoid touching the switch directly as this may cause a burn.

Operating Environment

⚠Warning

1. Never use in the presence of explosive gases.

The switches do not have an explosion proof rating. Never use in the presence of an explosive gas as this may cause a serious explosion.

2. Mount switches in locations where there is no vibration greater than 98m/s², or impact greater than 490m/s².

3. Do not use in an area where surges are generated.

When there are units that generate a large amount of surge in the area around pressure switches, (e.g., solenoid type lifters, high frequency induction furnaces, motors, etc.) this may cause deterioration or damage to the switches' internal circuitry. Avoid sources of surge generation and crossed lines.

4. Switches are not equipped with surge protection against lightning.

Flow switches are CE compliant; however, they are not equipped with surge protection against lightning. Lightning surge protection measures should be applied directly to system components as necessary.

5. Avoid using switches in an environment where the likelihood of splashing or spraying of liquids exists.

Switches are dustproof and splashproof; however, avoid using in an environment where the likelihood of heavy splashing or spraying of liquids exists. Since the display unit of the remote type switches featured here is not dust or splash proof, the use in an environment where liquid splashing or spraying exists must be avoided.

[For air]

6. Use the switch within the specified fluid and ambient temperature range.

Fluid and ambient temperatures are 0° to 50°C. Take measures to prevent freezing fluid when below 5°C, since this may cause damage to the switch and lead to a malfunction. The installation of an air dryer is recommended for eliminating condensate and moisture. Never use the switch in an environment where there are drastic temperature changes even when these temperatures are operated within the specified temperature range.

[For water]

7. Use the switch within the specified fluid and ambient temperature range.

The fluid and ambient temperatures range for the switches is 0° to 50°C (and 0° to 90°C for high temperature fluid). Take measures to prevent freezing fluid when below 5°C, since this may cause damage to the switch and lead to a malfunction. Never use the switch in an environment where there are drastic temperature changes even when these temperatures fall within the specified temperature range.

Series PF2A/PF2W
Specific Product Precautions 3

Be sure to read before handling. Refer to page 27 for safety instructions.

Maintenance

⚠Warning

1. Perform periodical inspections to ensure proper operation of the switch.

Unexpected malfunctions may cause possible danger.

2. Take precautions when using the switch for an interlock circuit.

When a pressure switch is used for an interlock circuit, devise a multiple interlock system to prevent trouble or malfunctioning, verify the operation of the switch and interlock function on a regular basis.

3. Do not disassemble or perform any conversion work on flow switches.

Measured Fluid

⚠Warning

1. Check regulators and flow adjustment valves before introducing the fluid.

If pressure or flow rate beyond the specified range are applied to the switch, the sensor unit may be damaged.

[For air]

2. The fluids that the switch can measure accurately are nitrogen and dry air. However, only dry air can be measured with the high flow rate type.

Please note that accuracy cannot be guaranteed when other fluids are used.

3. Never use flammable fluids.

The flow velocity sensor heats up to approximately 150°C.

4. Install a filter or mist separator on the upstream side when there is a possibility of condensate and foreign matter being mixed in with the fluid.

The rectifying device built into the switch will be clogged up and accurate measurement will no longer be possible.

[For water]

5. The fluid that the switch can measure accurately is water.

Please note that accuracy cannot be guaranteed when other fluids are used.

Measured Fluid

⚠Warning

6. Never use flammable fluids.

7. Install a filter on the inlet side when there is a possibility of condensate and foreign matter being mixed in with the fluid.

If foreign matter adheres to the switch's vortex generator or vortex detector, accurate measurement will no longer be possible.

Others

⚠Warning

1. Since switch output remains OFF while a message is displayed after the power is turned on, start measurement after a value is displayed.

2. Perform settings after stopping control systems.

When the switch's initial setting and flow rate setting are performed, output maintains the condition prior to the settings. With the 100, 200, and 500ℓ/min type switches for air, output turns OFF when the switch's initial setting and flow rate setting are preformed.

3. Do not apply excessive rotational force to the display unit.

The integrated type display unit can rotate 360°. Rotation is controlled by the stopper; however, the stopper may be damaged if the display unit is turned with excessive force.

[For air]

4. Be certain to turn on the power when the flow rate is at zero.

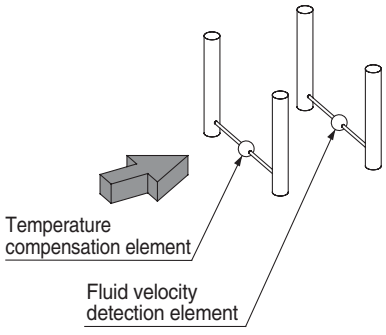
Allow an interval of 10 minutes after turning on the power, as there are some changes in the display.

5. Flow rate unit

Switch measures at mass flow rates without being influenced by temperature and pressure. The switches use ℓ/min as the flow rate indicator unit, in which the volumetric flow is substituted for mass flow at 0°C and 101.3kPa. The volumetric flow rate at 20°C, 101.3kPa, and 65%RH (ANR) can be displayed with the high flow rate type switches for air.

Detection principle of digital flow switch for air

A heated thermistor is installed in the passage, and fluid absorbs heat from the thermistor as it is introduced to the passage. The thermistor's resistance value increases as it loses heat. Since the resistance value increase ratio has a uniform relationship to the fluid velocity, the fluid velocity can be detected by measuring the resistance value. To further compensate the fluid and ambient temperature, the temperature sensor is also built into the switch to allow stable measurement within the operating temperature range.



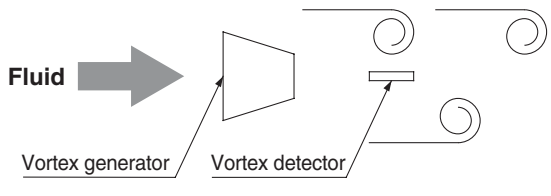
This flow switch uses ℓ/min as the flow rate indicator unit. The mass flow is converted and displayed under the conditions of 0°C and 101.3kPa.
The conversion conditions can be switched to 20°C and 101.3kPa with high flow type switches.

Detection principle of digital flow switch for water

When an elongated object (vortex generator) is placed in the flow, reciprocal vortexes are generated on the downstream side. These vortexes are stable under certain conditions, and their frequency is proportional to the flow velocity, resulting the following formula.

$$f = k \times v$$

f: Frequency of vortex v: Flow velocity k: Proportional constant (determined by the vortex generator's dimensions and shape).
Therefore, the flow rate can be measured by detecting this frequency.



∗ Top view

Series PF2A/PF2W
Specific Product Precautions 4

Be sure to read before handling. Refer to page 27 for safety instructions.

Set Flow Rate Range and Rated Flow Rate Range

⚠ Caution

Set the flow rate within the rated flow rate range.

The regulating flow rate range is the range of flow rate that can be set on the controller.
The rated flow rate range is the range of flow rate that satisfies the specifications (accuracy, linearity, etc.) of the sensor.
Although it is possible to set a value outside the rated flow rate range, the specifications will not be guaranteed even if the value stays within the regulating flow rate range.

<For Air/PF2A>

Sensor	Flow rate range
	1ℓ/min 5ℓ/min 10ℓ/min 20ℓ/min 50ℓ/min 100ℓ/min 200ℓ/min 500ℓ/min
PF2A510	1ℓ/min – 10ℓ/min 0.5ℓ/min – 10.5ℓ/min
PF2A550	5ℓ/min – 50ℓ/min 2.5ℓ/min – 52.5ℓ/min
PF2A511	10ℓ/min – 100ℓ/min 5ℓ/min – 105ℓ/min
PF2A521	20ℓ/min – 200ℓ/min 10ℓ/min – 210ℓ/min
PF2A551	50ℓ/min – 500ℓ/min 25ℓ/min – 525ℓ/min

<For Water/PF2W>

Sensor	Flow rate range
	0.5ℓ/min 2ℓ/min 5ℓ/min 10ℓ/min 20ℓ/min 40ℓ/min 100ℓ/min
PF2W504 PF2W504T	0.5ℓ/min – 4ℓ/min 0.35ℓ/min – 4.5ℓ/min
PF2W520 PF2W520T	2ℓ/min – 16ℓ/min 1.7ℓ/min – 17ℓ/min
PF2W540 PF2W540T	5ℓ/min – 40ℓ/min 3.5ℓ/min – 45ℓ/min
PF2W511	10ℓ/min – 100ℓ/min 7ℓ/min – 110ℓ/min

Rated flow rate range of sensor
Set flow rate range of sensor

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