

Digital Flow Switch For Air

Series **PF2A**

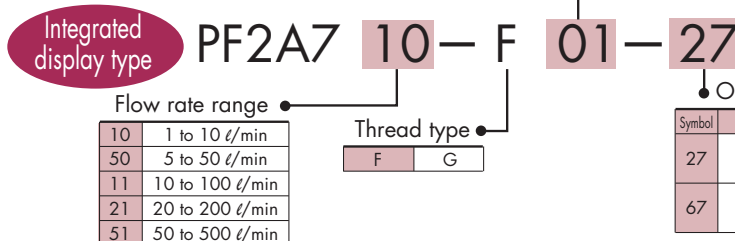
Features

- ➔ Flow switch for air.
- ➔ Thermal detection has no moving parts and very little resistance to airflow.
- ➔ Flow ranges from 1 to 500 ℓ/min .
- ➔ Integrated LED display can show metric or imperial units.
- ➔ Two independent digital outputs.
- ➔ Output modes instantaneous flow, accumulated flow and counting pulse.
- ➔ IP65 splashproof construction.
- ➔ Display can be rotated for ease of viewing.



(Integrated display type)

How to Order



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

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

Specifications

Model	PF2A710	PF2A750	PF2A711	PF2A721	PF2A751
Measured fluid	Air, Nitrogen				
Flow rate measurement range	0.5 to 10.5 ℓ/min	2.5 to 52.5 ℓ/min	5 to 105 ℓ/min	10 to 210 ℓ/min	25 to 525 ℓ/min
Set flow rate range	0.5 to 10.5 ℓ/min	2.5 to 52.5 ℓ/min	5 to 105 ℓ/min	10 to 210 ℓ/min	25 to 525 ℓ/min
Flow rate measuring range	1 to 10 ℓ/min	5 to 50 ℓ/min	10 to 100 ℓ/min	20 to 200 ℓ/min	50 to 500 ℓ/min
Minimum set unit	0.1 ℓ/min	0.5 ℓ/min	1 ℓ/min	2 ℓ/min	5 ℓ/min
Accumulated pulse flow rate exchange value (Pulse width: 50 ms)	0.1 ℓ/pulse	0.5 ℓ/pulse	1 ℓ/pulse	2 ℓ/pulse	5 ℓ/pulse
Display unit	<div> <div>Note 1)</div> <div>Real-time flow rate</div> <div>Accumulated flow</div> </div> ℓ/min , CFM $\times 10^{-2}$				
Operating fluid temperature	0 to 50°C				
Linearity	$\pm 5\%$ F.S. or less				
Repeatability	$\pm 1\%$ F.S. or less				
Temperature characteristics	$\pm 3\%$ F.S. or less (15 to 35°C, based on 25°C), $\pm 5\%$ F.S. or less (0 to 50°C, based on 25°C)				
Current consumption (No load)	150 mA or less				
Weight	250 g				
Port size (NPT, G)	1/8, 1/4				
Detection type	Heater type				
Display	3-digit, 7-segment LED				
Operating pressure range	-50 kPa to 0.5 MPa				
Proof pressure	1.0 MPa				
Accumulated flow range	0 to 999999 ℓ				
Output specifications	<div> <div>Note 3)</div> <div>Switch output</div> <div>Accumulated pulse output</div> </div> NPN open collector Maximum load current: 80 mA; Internal voltage drop: 1 V or less (With load current of 80 mA); Maximum applied voltage: 30 V; Two outputs NPN open collector Maximum load current: 80 mA; Internal voltage drop: 1.5 V or less (With load current of 80 mA); Two outputs NPN or PNP open collector (same as switch output)				
Indicator light	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 24 VDC (Ripple $\pm 10\%$ or less)				
Enclosure	IP65				
Operating temperature range	Operating: 0 to 50°C, Stored: -25 to 85°C (No condensation or freezing)				
Withstand voltage	1000 VAC for 1 min. between external terminal and case				
Insulation resistance	50 M Ω (500 VDC) between external terminal and case				
Noise resistance	1000 Vp-p, Pulse width 1 μs , Rise time 1 ns				

Note 1) Flow rate display can be switched between the basic condition of 0°C, 101.3 kPa and the standard condition (ANR) of 20°C, 101.3 kPa, and 65% RH.

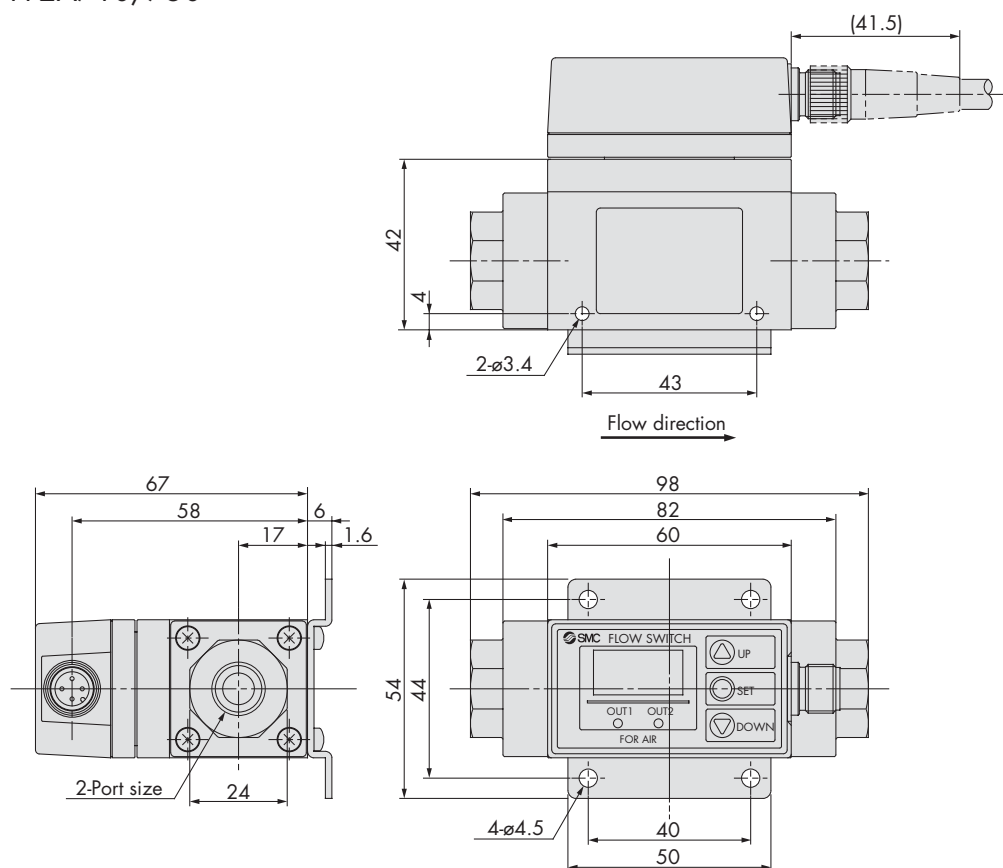
Note 2) Without lead wire.

Note 3) Switch output and accumulated pulse output can be selected during initial setting.

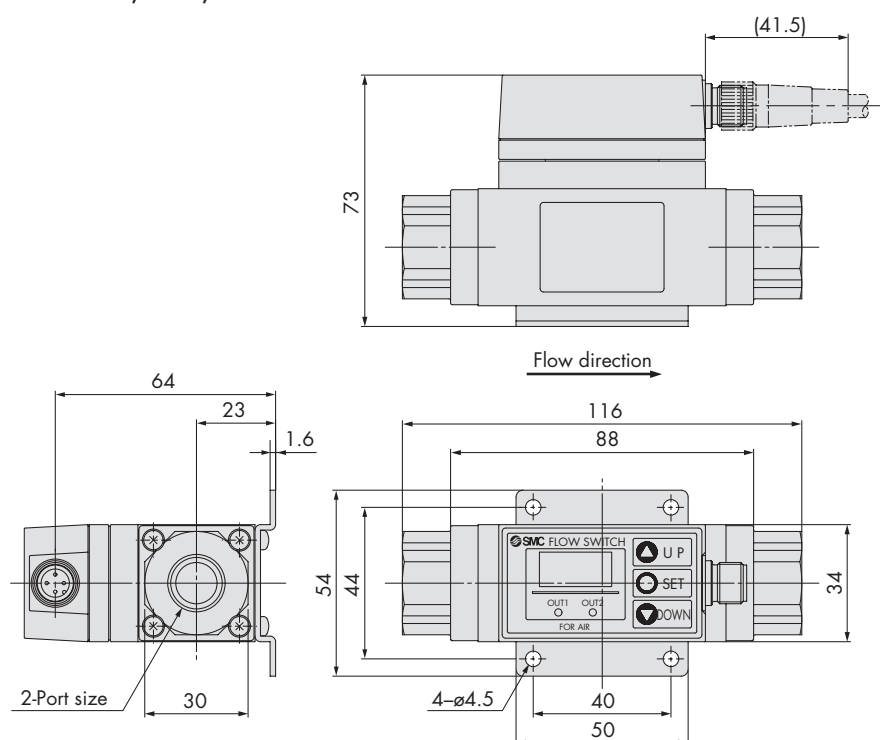
Note 4) Window comparator mode — Since hysteresis will reach 3 digits, keep P_1 and P_2 or n_1 and n_2 apart by 7 digits or more. (In case of output OUT2, n_1, 2 to be n_3, 4 and P_1, 2 to be P_3, 4.)

Dimensions: Integrated Display Type for Air

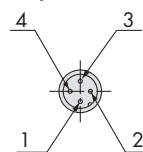
PF2A710/750



PF2A711/721/751



Connector pin numbers



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

Digital Flow Switch For Air

Series **PF2A**

Features

- ➔ Flow switch for air
- ➔ Thermal detection has no moving parts
- ➔ Very little resistance to airflow
- ➔ Flow ranges from 1 to 500 l/min
- ➔ Output for remote display, optional analogue output
- ➔ IP65 splashproof construction



(Remote display sensor unit)

How to Order

Remote type
Display unit

PF2A5

10

F

01

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

Thread type	
F	G

Port size

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

Output specifications

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

Specifications

Model		PF2A510	PF2A550	PF2A511	PF2A521	PF2A551
Measured fluid		Air, Nitrogen				
Detection type		Heater type				
Flow rate measuring range		1 to 10 ℓ/min	5 to 50 ℓ/min	10 to 100 ℓ/min	20 to 200 ℓ/min	50 to 500 ℓ/min
Operating pressure range		−50 kPa to 0.5 MPa		−50 kPa to 0.75 MPa		
Proof pressure		1.0 MPa				
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	Analogue voltage output (Non-linear) output impedance 1 kΩ output for display unit PF2A3□□				
	Analog output	Voltage output 1 to 5 V within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 100 kΩ or more.				
		Current output 4 to 20 mA within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 300Ω or less with 12 VDC, 600Ω or less with 24 VDC				
Power supply voltage		12 to 24 VDC (Ripple ±10% or less)				
Current consumption (No load)		100 mA or less				110 mA or less
Resistance	Enclosure	IP65				
	Operating temperature range	Operating: 0 to 50°C, Stored: −25 to 85°C (No condensation or freezing)				
	Withstand voltage	1000 VAC for 1 min. between external terminal and case				
	Insulation resistance	50 MΩ (500 VDC) between external terminal and case				
	Noise resistance	1000 Vp-p, Pulse width 1 μs, Rise time 1 ns				
Weight ^{Note 3)}		200 g		240 g		
Port size (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.

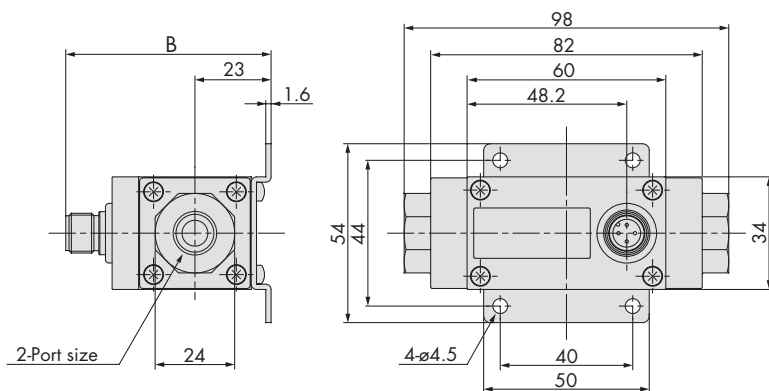
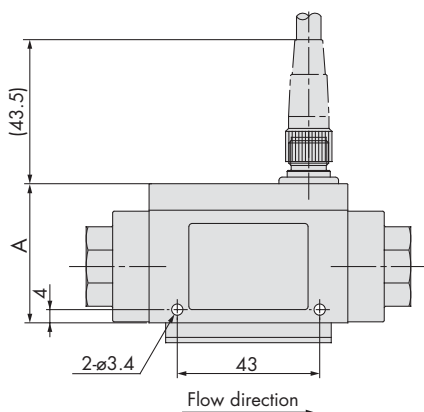
Note 3) Without lead wire. (Add 20 g for the types of analog output whether voltage or current output selected.)

Note 4) Flow rate unit measured under the following conditions: 0°C and 101.3 kPa.

Dimensions: Remote Type Sensor Unit for Air

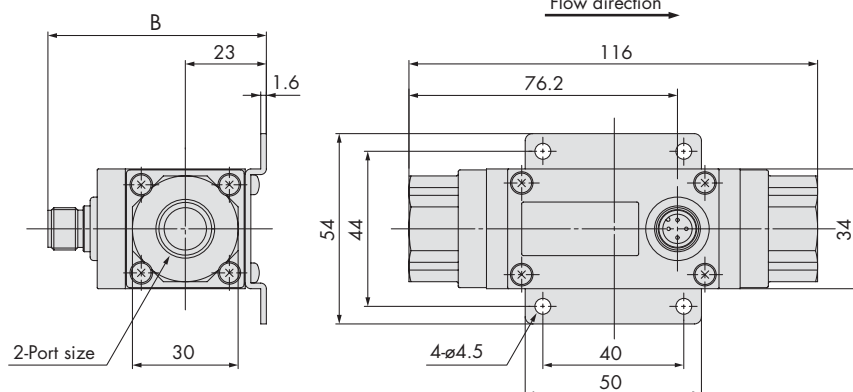
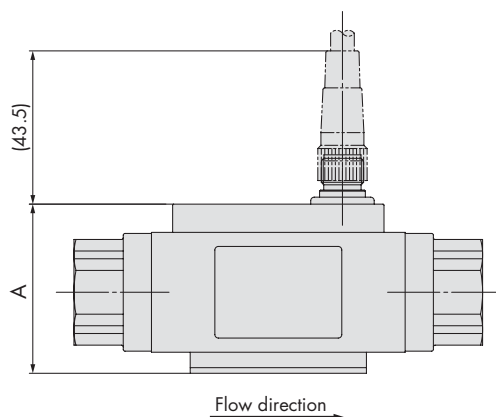
PF2A510/550

Output specifications	(mm)	
	A	B
Pulse output only	42	62
Pulse output + Analog output	52	72

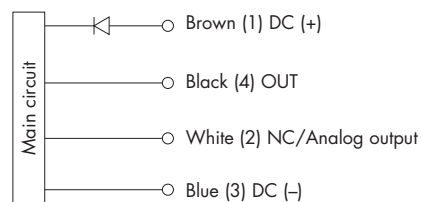


PF2A511/521/551

Output specifications	(mm)	
	A	B
Pulse output only	48	62
Pulse output + Analog output	58	72

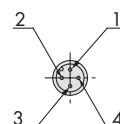


Wiring



* 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

Digital Flow Switch For Air

Series **PF2A**

Features

- ➔ Displays flow information
- ➔ Works with remote sensor units
- ➔ Panel mounting construction
- ➔ Clear LED indication
- ➔ Two independent digital outputs
- ➔ Output modes instantaneous flow, total flow and counting pulse
- ➔ Integrated LED display can show metric or imperial units



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 10 ℓ /min	PF2A510
	5 to 50 ℓ /min	PF2A550
1	10 to 100 ℓ /min	PF2A511
	20 to 200 ℓ /min	PF2A521
	50 to 500 ℓ /min	PF2A551

Mounting

A	Panel mounting
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Output specifications

Symbol	Output specifications	Applicable model
0	NPN open collector 2 outputs	PF2A300/310
1	PNP open collector 2 outputs	PF2A301/311

Specifications

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

Note 1) The flow rate measurement range can be modified depending on the setting.

Note 2) Flow rate display can be switched between the basic condition of 0°C, 101.3 kPa and the standard condition (ANR) of 20°C, 101.3 kPa, and 65% RH.

Note 3) The system accuracy when combined with PF2A5□□.

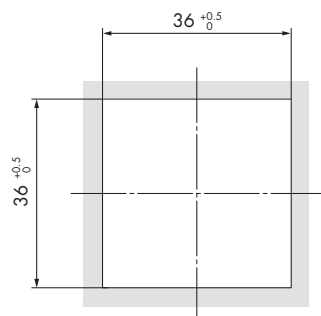
Note 4) Switch output and accumulated pulse output can be selected during initial setting.

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.)

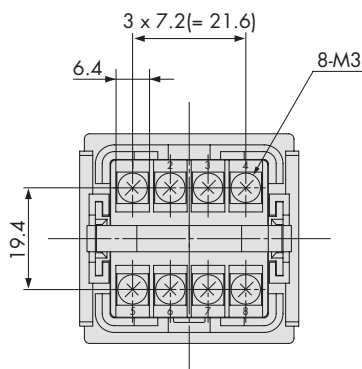
Dimensions: Remote Type Display Unit for Air

PF2A3□□-A
Panel mounting type

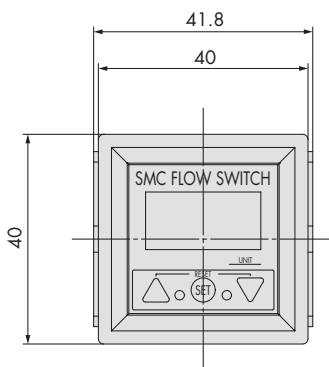
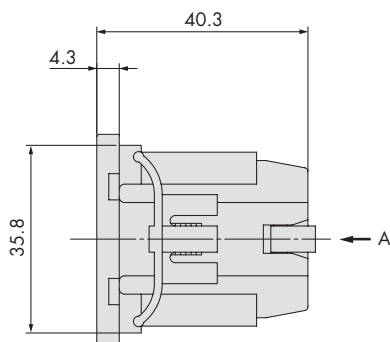
Panel fitting dimensions



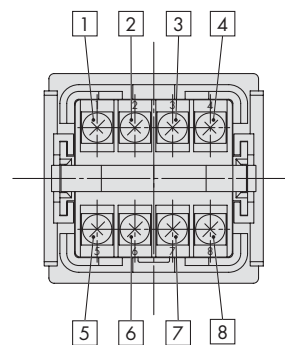
* The applicable panel thickness is 1 to 3.2 mm.



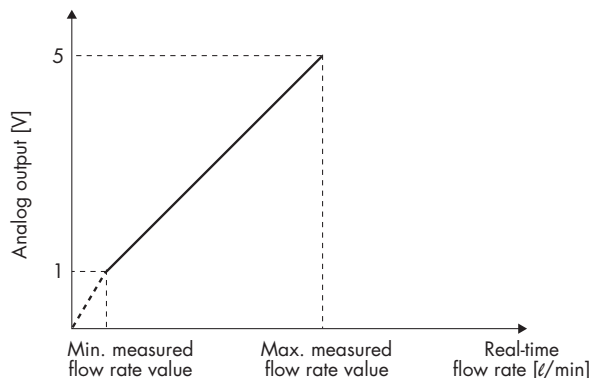
View A



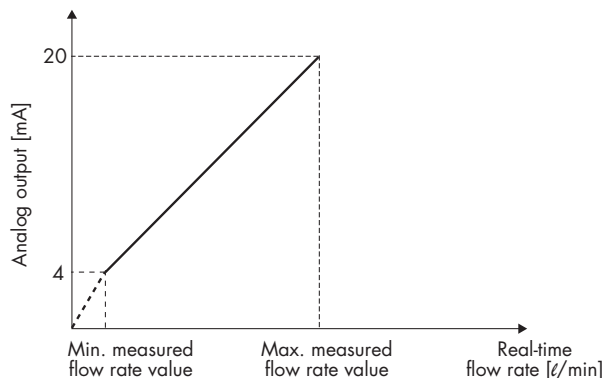
Terminal block number



Analog output 1 to 5 VDC



4 to 20 mADC



Part no.	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 no.	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



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Digital Flow Switch, Large Flow Type For Air



Series **PF2A**

Features

- ➔ High volume flow switch for air
- ➔ Thermal detection has no moving parts
- ➔ Very little resistance to airflow
- ➔ Flow ranges from 150 to 12000 l/min
- ➔ Integrated LED display can show metric or imperial units
- ➔ Digital and analogue outputs
- ➔ Digital output gives instantaneous flow, accumulated flow or counting pulse
- ➔ IP65 splashproof construction
- ➔ Display can be rotated for ease of viewing



How to Order

Integrated display type

PF2A7 03H - F 10 - 68

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

High flow type

Port specifications
F G

Port size

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

Output specifications

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

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

Specifications

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

Note 1) Flow rate display can be switched between the basic condition of 0°C, 101.3 kPa and the standard condition (ANR) of 20°C, 101.3 kPa, and 65% RH.

Note 2) The high flow rate type is CE marked; however, the linearity with applied noise is ±5% F.S. or less.

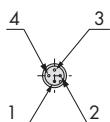
Note 3) Switch output and accumulated pulse output selections are made using the button controls.

Note 4) The analog output operates only for real-time flow rate, and does not operate for accumulated flow.

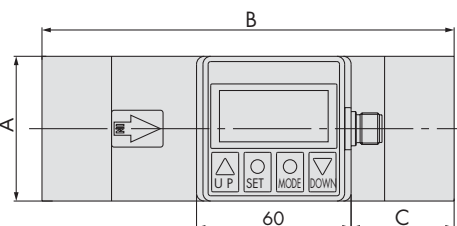
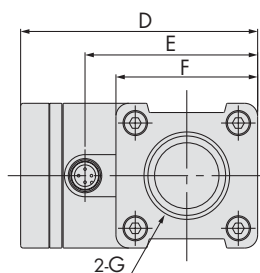
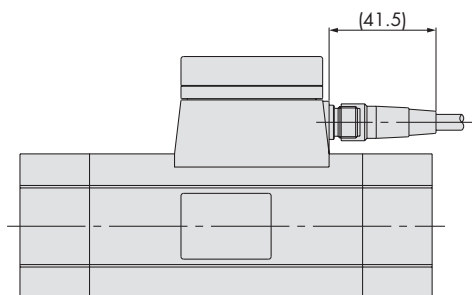
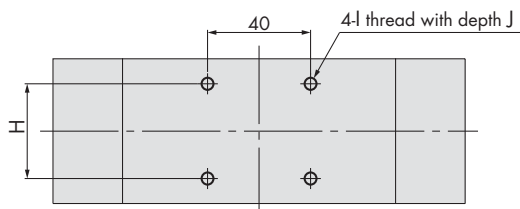
Dimensions

PF2A703H/706H/712H

Connector pin numbers

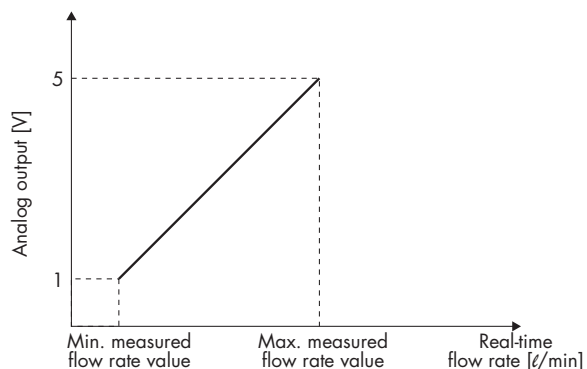


Pin no.	Pin description
1	DC (+)
2	Analog output
3	DC (-)
4	OUT1

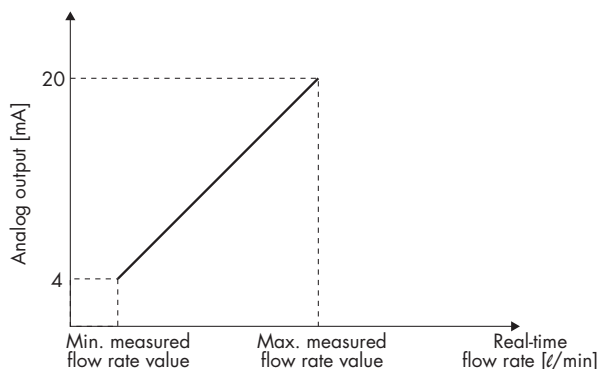


Model	A	B	C	D	E	F	G	H	I	J
PF2A703H	55	160	40	92	67	55	1"	36	M5 x 0.8	8
PF2A706H	65	180	45	104	79	65	1 1/2"	46	M6 x 1	9
PF2A712H	75	220	55	114	89	75	2"	56	M6 x 1	9

Analogue output
1 to 5 VDC



4 to 20 mADC



Part no.	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

Part no.	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



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CATALOGUE ES100-48A AVAILABLE



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Digital Flow Switch For Water

Series **PF2W**

Features

- ➔ Flow switch for water
- ➔ Karmann vortex detection method
- ➔ No moving parts inside the unit
- ➔ Very little resistance to water flow
- ➔ Flow ranges from 0.5 to 100 l/min
- ➔ Integrated LED display can show metric or imperial units
- ➔ Two independent digital outputs
- ➔ Output modes instantaneous flow, accumulated flow and counting pulse
- ➔ IP65 splashproof construction
- ➔ Display can be rotated for ease of viewing



(Integrated display type)

How to Order

Integrated display type

PF2W7 20 — F 03 — 27

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

Thread type	
F	G

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

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

Specifications

Model	PF2W704	PF2W720	PF2W740	PF2W711
Measured fluid	Water			
Flow rate measurement range	0.35 to 4.5 ℓ/min	1.7 to 17.0 ℓ/min	3.5 to 45 ℓ/min	7 to 110 ℓ/min
Set flow rate range	0.35 to 4.5 ℓ/min	1.7 to 17.0 ℓ/min	3.5 to 45 ℓ/min	7 to 110 ℓ/min
Flow rate measuring range	0.5 to 4 ℓ/min	2 to 16 ℓ/min	5 to 40 ℓ/min	10 to 100 ℓ/min
Minimum set unit	0.05 ℓ/min	0.1 ℓ/min	0.5 ℓ/min	1 ℓ/min
Accumulated pulse flow rate exchange value (Pulse width: 50 ms)	0.05 ℓ/pulse	0.1 ℓ/pulse	0.5 ℓ/pulse	1 ℓ/pulse
Linearity	±5% F.S. or less			
Repeatability	±3% 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)	70 mA or less			
Weight	460 g	520 g	700 g	1150 g
Port size	3/8	3/8, 1/2	1/2, 3/4	3/4, 1
Detection type	Karmann vortex			
Display	3-digit, 7-segment LED			
Display unit	Real-time flow rate ℓ/min, gal (US)/min Accumulated flow ℓ, gal (US)			
Operating pressure range	0 to 1 MPa			
Proof pressure	1.5 MPa			
Accumulated flow range	0 to 999999 ℓ			
Ambient temperature range	Operating: 0 to 50°C, Stored: -25 to 85°C (No condensation or freezing)			
Output specifications	Note 2) Switch output NPN open collector Maximum load current: 80 mA; Internal voltage drop: 1 V or less (With load current of 80 mA) Maximum applied voltage: 30 V; 2 outputs PNP open collector Maximum load current: 80 mA Internal voltage drop: 1.5 V or less (With load current of 80 mA); 2 outputs NPN or PNP open collector (same as switch output)			
Indicator light	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 3)			
Power supply voltage	12 to 24 VDC (Ripple ±10% or less)			
Enclosure	IP65			
Operating temperature range	0 to 50°C			
Withstand voltage	1000 VAC for 1 min. between external terminal and case			
Insulation resistance	50 MΩ (500 VDC) between external terminal and case			
Noise resistance	1000 Vp-p, Pulse width 1 μs, Rise time 1 ns			

Note 1) In the case of PF2W711, ±3% of F.S. or less (15°C to 35°C, based on 25°C).

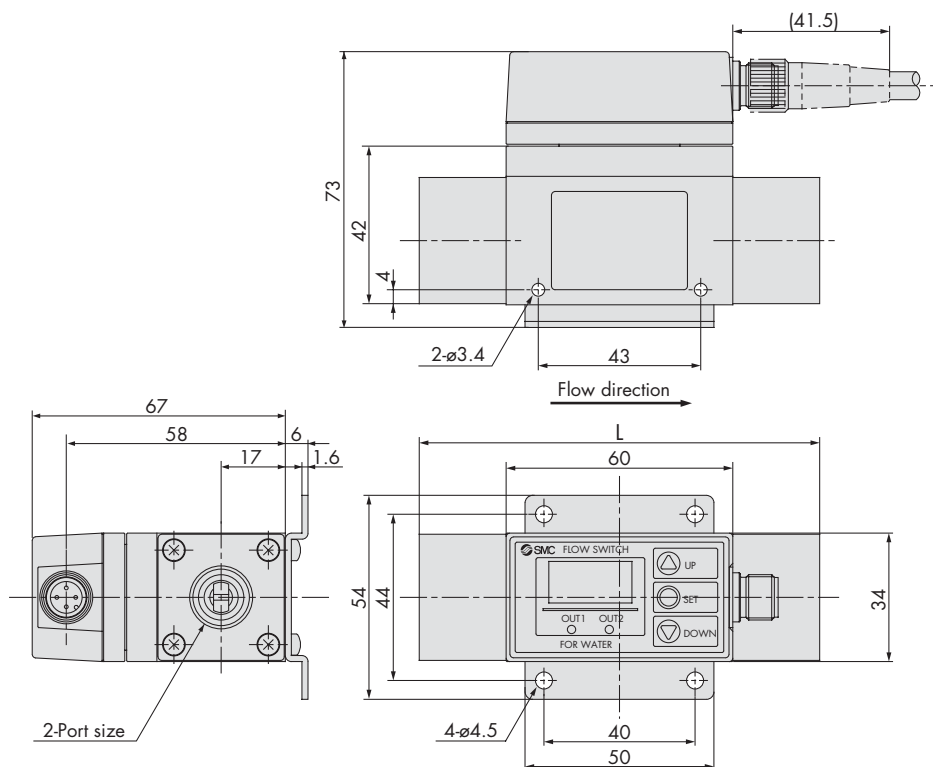
Note 2) Switch output and accumulated pulse output can be selected during initial setting.

Note 3) 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 1 digit. (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.)

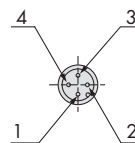
Dimensions: Integrated Display Type for Water

PF2W704, PF2W720



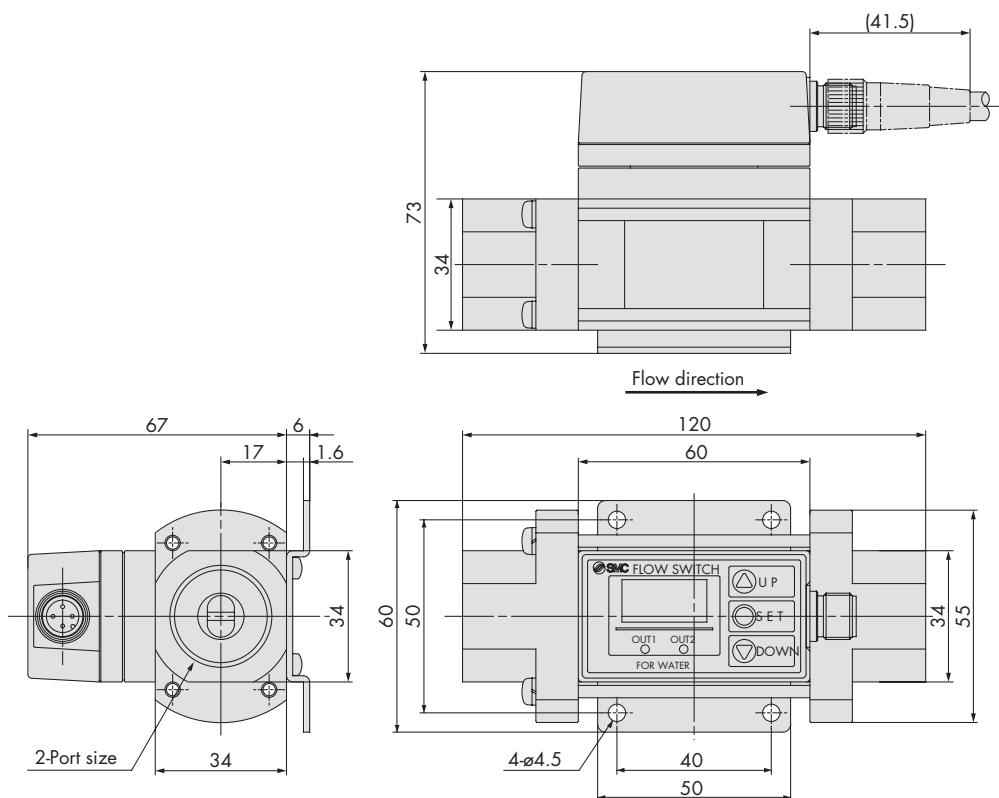
Model	L dimension
PF2W704	100
PF2W720	106

Connector pin numbers



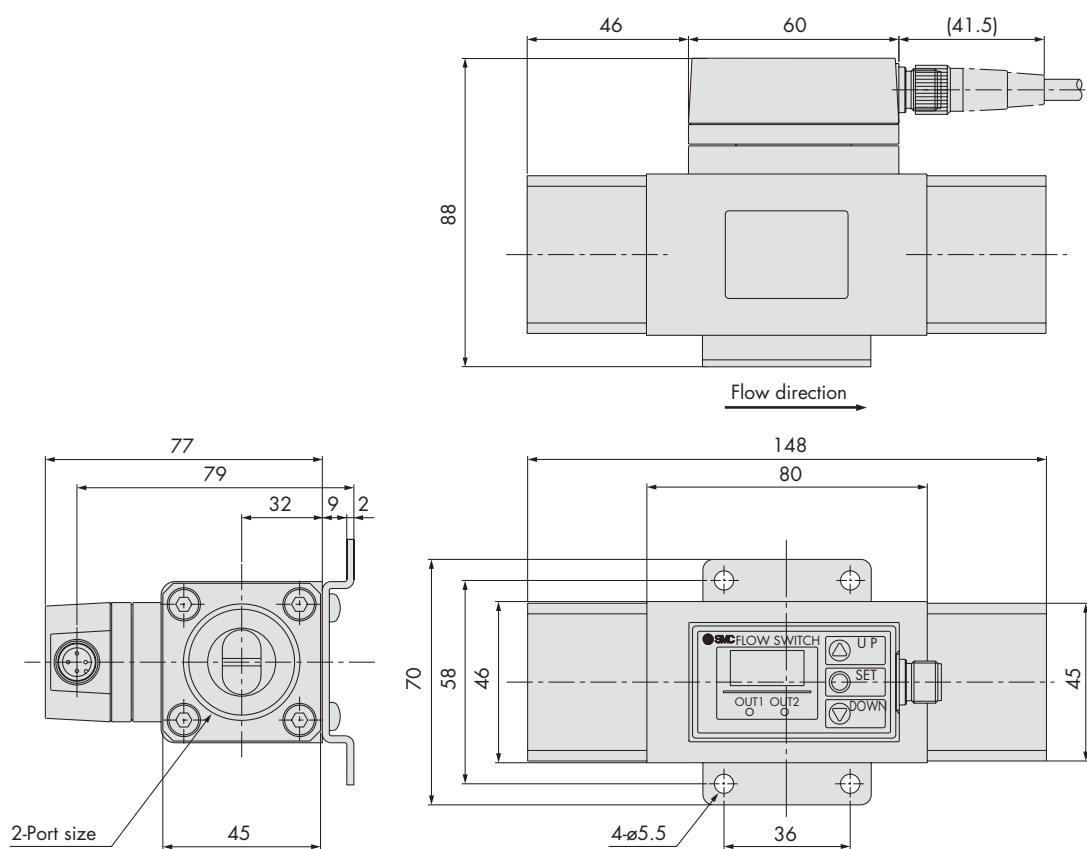
Pin no.	Pin description
1	DC (+)
2	OUT2
3	DC (-)
4	OUT1

PF2W740



Dimensions: Integrated Display Type for Water

PF2W711



2-Port size

Digital Flow Switch For Water



Series **PF2W**

Features

- ➔ Flow switch for water
- ➔ Remote display type
- ➔ Karmann vortex detection method
- ➔ No moving parts inside the sensor
- ➔ Very little resistance to passage of water
- ➔ Units with flow ranges from 0.5 to 100 l/min
- ➔ Output for remote display, optional analogue output
- ➔ IP65 splashproof construction



(Remote display sensor unit)

How to Order

Remote type
Sensor unit

PF2W5 20 - F 03 -

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

Thread type	
F	G

Port size

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

Output specifications

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 20 mA)

Specifications

Model		PF2W504	PF2W520	PF2W540	PF2W511
Measured fluid		Water			
Detection type		Karmann vortex			
Flow rate measuring range		0.5 to 4 ℓ/min	2 to 16 ℓ/min	5 to 40 ℓ/min	10 to 100 ℓ/min
Operating pressure range		0 to 1 MPa			
Withstand pressure		1.5 MPa			
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 30 V)			
	Analog output	Voltage output 1 to 5V within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 100 kΩ or more.			
		Current output 4 to 20 mA within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 300 Ω or less with 12 VDC, 600 Ω or less with 24 VDC			
Power supply voltage		12 to 24 VDC (Ripple ±10% or less)			
Current consumption (No load)		20 mA or less			
Resistance	Enclosure	IP65			
	Operating temperature range	Operating: 0 to 50°C, Stored: -25 to 85°C (No condensation or freezing)			
	Withstand voltage	1000 VAC for 1 min. between external terminal and case			
	Insulation resistance	50 MΩ (500 VDC) between external terminal and case			
	Noise resistance	1000 Vp-p, Pulse width 1 μs, Rise time 1 ns			
Weight ^{Note 3)}		410 g	470 g	650 g	1,100 g
Port size (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 20 g for the types of analog output whether voltage or current output selected.)



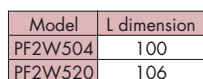
CAD CD-ROM AVAILABLE


CATALOGUE **ES100-48A** AVAILABLE

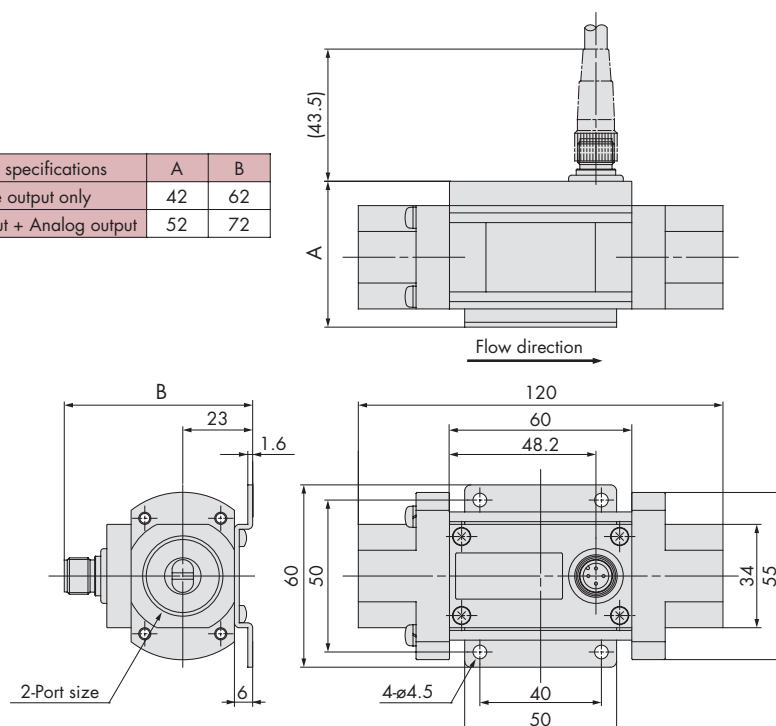

PDF AVAILABLE ONLINE

PF2W504/520-□(N)-□

Technical drawing of the front view of a valve assembly. The drawing shows a central body with a square flange. A vertical stem with a handle is attached to the top. Dimensions include a total height of 43.5, a flange thickness of 4, a distance of 43 between mounting holes, and two mounting holes of diameter 3.4. The flow direction is indicated by an arrow pointing to the right.



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



Main circuit

- Brown (1) DC (+)
- Black (4) OUT
- White (2) NC/Analog output
- Blue (3) DC (-)

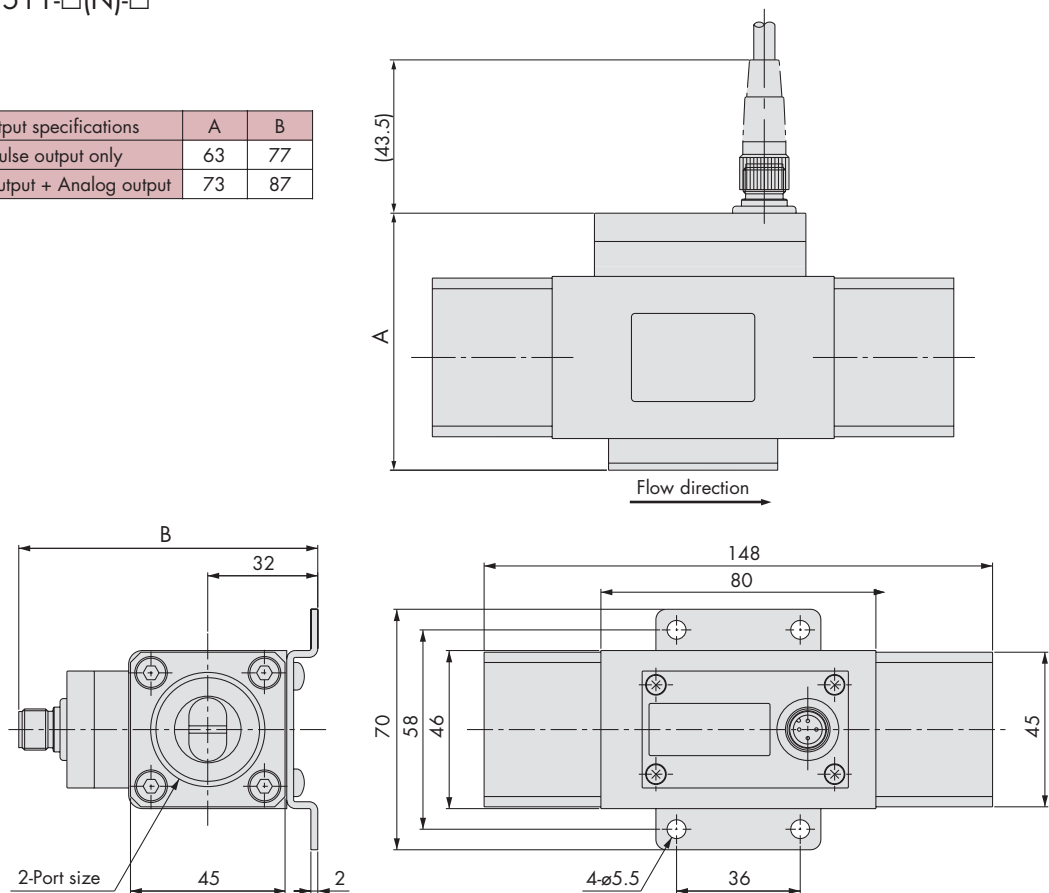
* Use this sensor by connecting to SMC remote type display unit Series PF2W3□□.

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

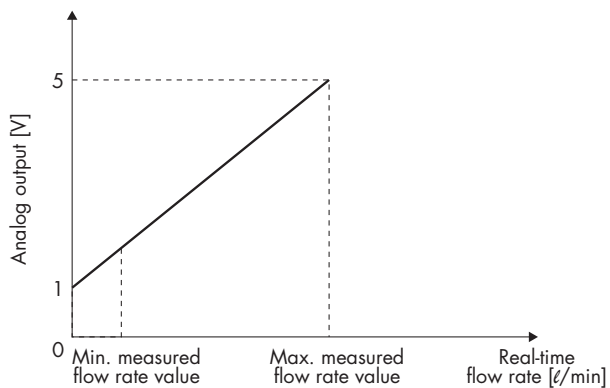
Dimensions: Remote Type Sensor Unit for Water

PF2W511-□(N)-□

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

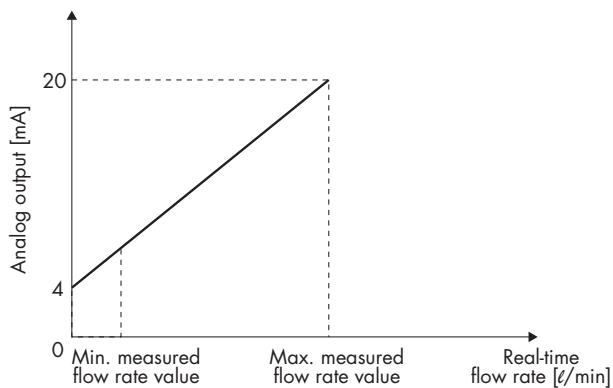


Analog output 1 to 5 VDC



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 20 mADC



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

Digital Flow Switch For Water

Series **PF2W**

Features

- Displays flow information
- Works with remote sensor units
- Panel mounting construction
- Clear LED indication and can display metric or imperial units
- Two independent digital outputs
- Output modes instantaneous flow, total flow and counting pulse



How to Order

Remote type
Display unit

PF2W3 0 0 - A

Flow rate range

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

Output specifications

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

Mounting

A	Panel mounting
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 4.5 ℓ/min	1.7 to 17.0 ℓ/min	3.5 to 45 ℓ/min	7 to 110 ℓ/min
Set flow rate range ^{Note 1)}		0.35 to 4.5 ℓ/min	1.7 to 17.0 ℓ/min	3.5 to 45 ℓ/min	7 to 110 ℓ/min
Minimum setting unit ^{Note 1)}		0.05 ℓ/min	0.1 ℓ/min	0.5 ℓ/min	1 ℓ/min
Accumulated pulse flow rate exchange value (Pulse width: 50 ms) ^{Note 1)}		0.05 ℓ/pulse	0.1 ℓ/pulse	0.5 ℓ/pulse	1 ℓ/pulse
Display unit	Real-time flow rate	ℓ/min, gal (US)/min			
	Accumulated flow	ℓ, gal (US)			
Accumulated flow range		0 to 999999 ℓ			
Linearity ^{Note 2)}		±5% F.S. or less			±3% F.S. or less
Repeatability ^{Note 2)}		±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)		50 mA or less			60 mA or less
Weight		45 g			
Output specifications ^{Note 3)}	Switch output	NPN open collector (PF2W300, PF2W330)	Maximum load current: 80 mA Internal voltage drop: 1V or less (With load current of 80 mA) Maximum applied voltage: 30 V 2 outputs		
		PNP open collector (PF2W301, PF2W331)	Maximum load current: 80 mA Internal voltage drop: 1.5 V or less (With load current of 80 mA) 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 (No condensation or freezing)			
	Withstand voltage	1000 VAC for 1 min. between external terminal and case			
	Insulation resistance	50 MΩ (500 VDC) between external terminal and case			
	Vibration resistance	10 to 500 Hz at whichever is smaller: 1.5 mm amplitude or 98 m/s ² acceleration in X, Y, Z directions for 2 hrs. each			
Display		3-digit, 7-segment LED			
Indicator light		Lights up when output is ON, OUT1: Green; OUT2: Red			
Power supply voltage		12 to 24 VDC (Ripple ±10% or less)			
Response time		1 sec. or less			
Hysteresis		Hysteresis mode: Variable (can be set from 0) Window comparator mode: 3-digit fixed ^{Note 4)}			

Note 1) Values vary depending on each set flow rate range.

Note 2) The system accuracy when combined with PF2W5.

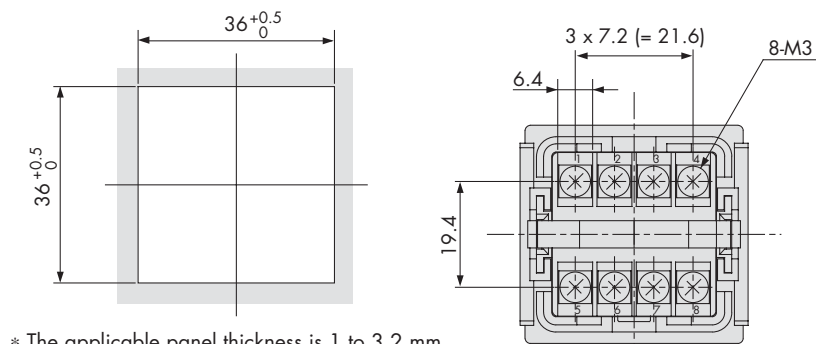
Note 3) Switch output and accumulated pulse output can be selected during initial setting.

Note 4) 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.)

Dimensions: Remote Type Display Unit for Water

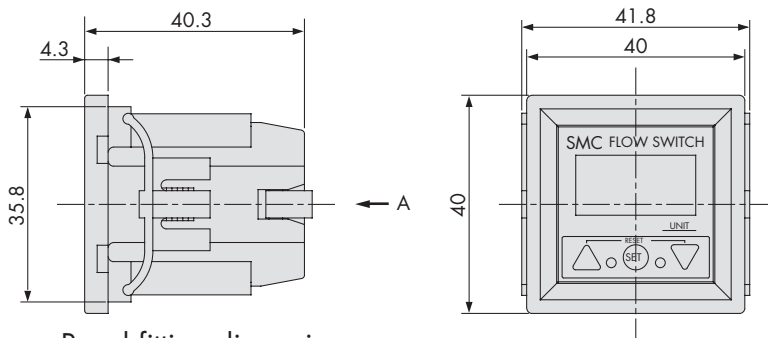
PF2W3□□-A

Panel mounting type



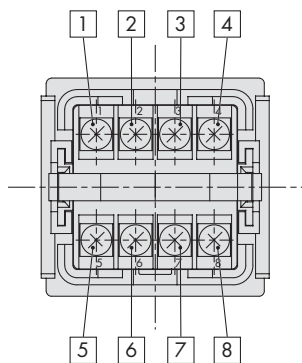
* The applicable panel thickness is 1 to 3.2 mm.

View A



Panel fitting dimension

Terminal block number



Digital Flow Switch, High Temperature Fluid Type For Water



Series **PF2W**

Features

- ➔ Flow switch for heated water up to 90°C
- ➔ Karmann vortex detection method
- ➔ No moving parts inside the unit and very little resistance to water flow
- ➔ Flow ranges from 0.5 to 40 l/min
- ➔ Integrated LED display can show metric or imperial units
- ➔ One digital output plus analogue output
- ➔ Digital Output modes instantaneous flow, accumulated flow and counting pulse
- ➔ IP65 splashproof construction with all stainless body parts



(Integrated display type)

How to Order

Integrated display type **PF2W7 20 T — F 03 — 27**

Flow rate range: 04 0.5 to 4 l/min, 20 2 to 16 l/min, 40 5 to 40 l/min

Temperature range: T 0 to 90°C

Thread type: F, G

Port size: 03 3/8, 04 1/2, 06 3/4

Output specifications: 27 PNP open collector 2 outputs, 67 NPN open collector 2 outputs

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

Specifications

Model		PF2W704T	PF2W720T	PF2W740T
Measured fluid		Water, Mixture of water (50%) and ethylene glycol (50%)		
Flow rate measurement range		0.35 to 4.5 ℓ/min	1.7 to 17.0 ℓ/min	3.5 to 45 ℓ/min
Set flow rate range		0.35 to 4.5 ℓ/min	1.7 to 17.0 ℓ/min	3.5 to 45 ℓ/min
Flow rate measuring range		0.5 to 4 ℓ/min	2 to 16 ℓ/min	5 to 40 ℓ/min
Minimum setting unit		0.05 ℓ/min	0.1 ℓ/min	0.5 ℓ/min
Accumulated pulse flow rate exchange value (Pulse width: 50 ms)		0.05 ℓ/pulse	0.1 ℓ/pulse	0.5 ℓ/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)		70 mA or less		
Weight		710 g		
Port size		3/8	3/8, 1/2	1/2, 3/4
Detection type		Karmann vortex		
Display		3-digit, 7-segment LED		
Display unit	Real-time flow rate	ℓ/min, gal (US)/min		
	Accumulated flow	ℓ, gal (US)		
Operating pressure range		0 to 1 MPa		
Withstand pressure		1.5 MPa		
Accumulated flow range		0 to 999999 ℓ		
^{Note 2)} Output specifications	Switch output	NPN open collector	Maximum load current: 80 mA; Internal voltage drop: 1 V or less (With load current of 80 mA) Maximum applied voltage: 30 V; 2 outputs	
		PNP open collector	Maximum load current: 80 mA; Internal voltage drop: 1.5 V or less (With load current of 80 mA); 2 outputs	
	Accumulated pulse output	NPN or PNP open collector (Same as switch output)		
Indicator light		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 24 VDC (Ripple ±10% or less)		
Resistance	Enclosure	IP65		
	Operating temperature range	Operating: 0 to 50°C, Stored: -25 to 85°C (No condensation or freezing)		
	Withstand voltage	1000 VAC for 1 min. between external terminal and case		
	Insulation resistance	50 MΩ (500 VDC) between external terminal and case		
	Noise resistance	1000 Vp-p, Pulse width 1 μs, Rise time 1 ns		

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)

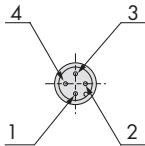
Note 2) Switch output and accumulated pulse output can be selected during initial setting.

Note 3) 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.)

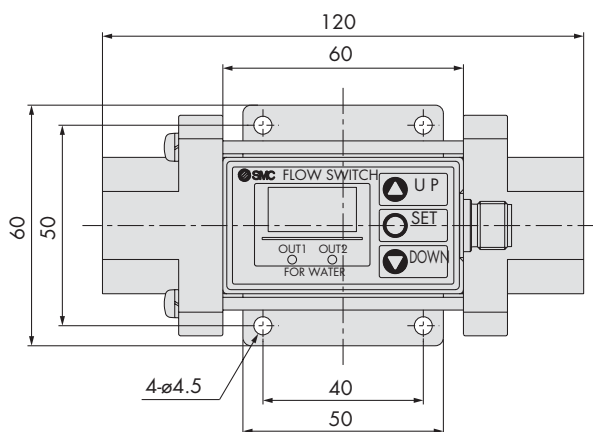
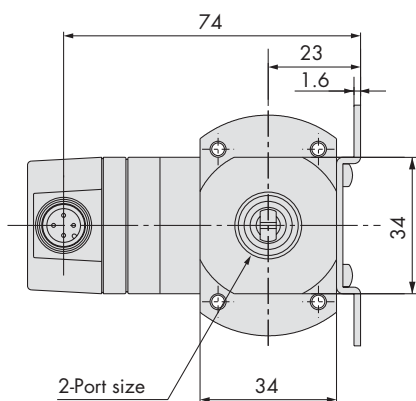
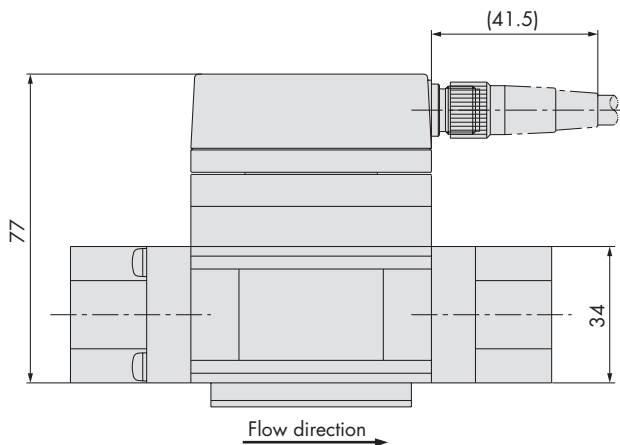
Note 4) The flow switch is conformed to CE mark.

Dimensions: Integrated Display Type for Water

Connector pin numbers



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



Digital Flow Switch, High Temperature Fluid Type For Water



Series **PF2W**

Features

- Flow switch for hot water
- Remote display type
- Karmann vortex detection method
- No moving parts inside the sensor
- Very little resistance to passage of water
- Units with flow ranges from 0.5 to 100 l/min
- Output for remote display, optional analogue output
- IP65 splashproof construction



(Remote type display unit)

How to Order

Remote type
Display unit

PF2W5

20

T

- F

03

Output specifications

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

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

Temperature range	
T	0 to 90°C

Thread type	
F	G

Port size

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

Specifications

Model		PF2W504T	PF2W520T	PF2W540T
Measured fluid		Water, Mixture of water (50%) and ethylene glycol (50%)		
Detection type		Karmann vortex		
Flow rate measuring range		0.5 to 4 ℓ/min	2 to 16 ℓ/min	5 to 40 ℓ/min
Operating pressure range		0 to 1 MPa		
Withstand pressure		1.5 MPa		
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 10 mA; Maximum applied voltage of 30 V)		
	Analogue output	Voltage output 1 to 5 V within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 100 kΩ or more.		
		Current output 4 to 20 mA within the flow rate range Linearity: ±5% F.S. or less; allowable load resistance: 300 Ω or less with 12 VDC, 600 Ω or less with 24 VDC		
Power supply voltage		12 to 24 VDC (Ripple ±10% or less)		
Current consumption (No load)		20 mA or less		
Resistance	Enclosure	IP65		
	Operating temperature range	Operating: 0 to 50°C, Stored: −25 to 85°C (No condensation or freezing)		
	Withstand voltage	1000 VAC for 1 min. between external terminal and case		
	Insulation resistance	50 MΩ (500 VDC) between external terminal and case		
	Noise resistance	1000 Vp-p, Pulse width 1 μs, Rise time 1 ns		
Weight		660 g		
Port size		3/8	3/8, 1/2	1/2, 3/4

Note 1) The system accuracy when combined with PF2W3□□.

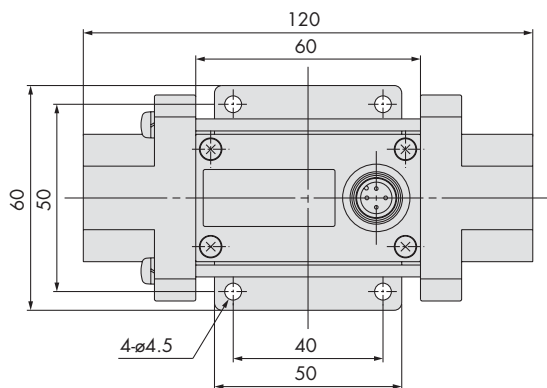
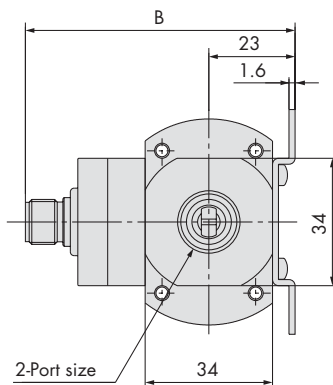
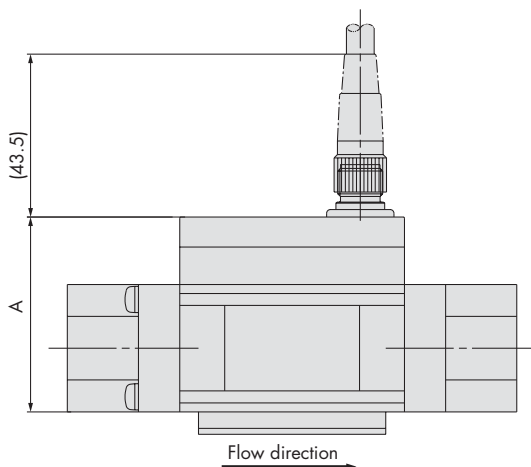
Note 2) Output system can be selected during initial setting.

Note 3) The sensor unit is conformed to CE mark.

Dimensions: Remote Type Sensor Unit for Water

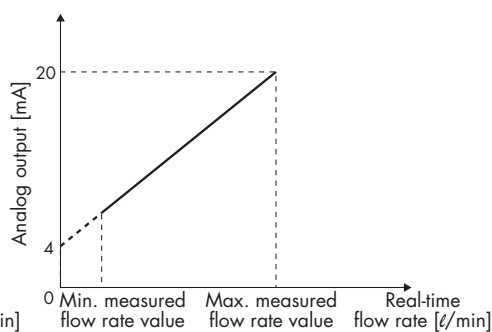
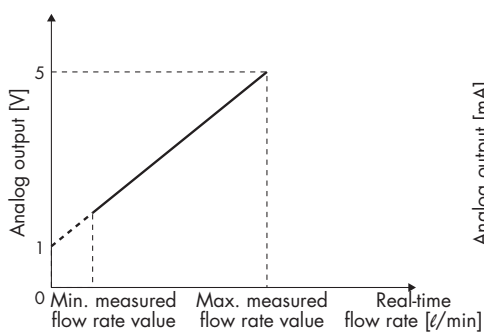
PF2W504T/520T/540T-□(N)

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

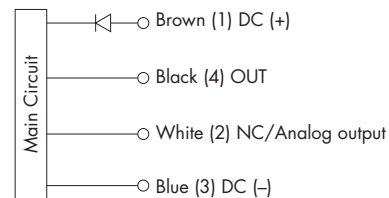


Analog output
1 to 5 VDC

4 to 20 mADC

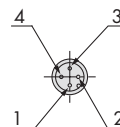


Wiring



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

Connector pin numbers



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

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