

New

3-color display Digital Flow Switch for Water

3-color/2-screen display



Main screen	Instantaneous flow rate Note 1)
Sub screen Note 3)	Set value



Instantaneous flow rate Note 1)

Accumulated value

Peak/Bottom value

Line name

Fluid temperature Note 2)

Note 1) Main screen shows the instantaneous flow rate only.

Note 2) Fluid temperature can be displayed only when the digital flow switch with a temperature sensor is selected.

Note 3) Sub screen can be turned off.

New Flow range: Line up 250 L type



Integrated flow adjustment valve and temperature sensor

Flow adjustment valve



Temperature sensor

Remote type



Remote sensor unit

Remote type

3-color display Digital flow monitor

PVC piping type



- Applicable fluid: Deionized water, chemical, etc.
- Integrated type and remote type added to series.

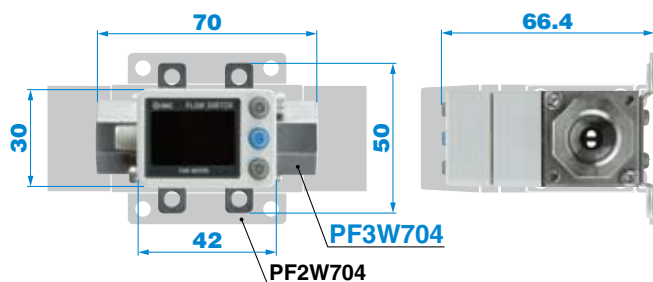
Series PF3W

IP65

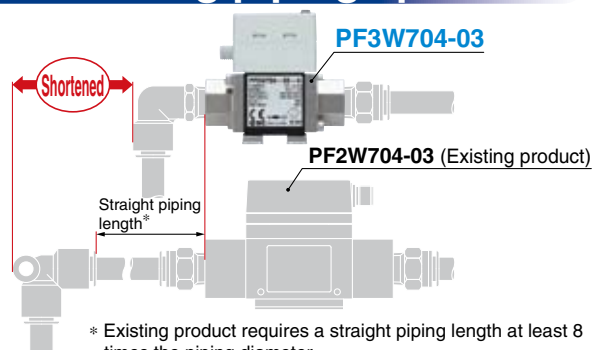


CAT.ES100-80C

40% smaller than existing product



Reducing piping space



* Existing product requires a straight piping length at least 8 times the piping diameter.
Refer to straight piping length and accuracy. (pages 5 and 13)

Temperature sensor

Display range: **-10 to 110°C**
(Temperature sensor alone)

Minimum setting unit: **1°C**

Analog output:
Current output/Voltage output



Temperature display



Flow adjustment valve

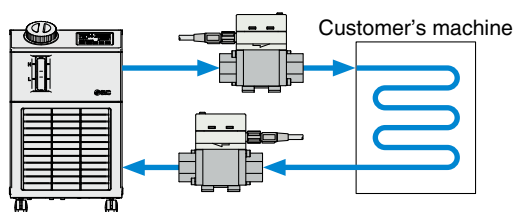
Space saving and reduced piping labor

Temperature sensor

Fluid temperature: 0 to 90°C

Ethylene glycol aqueous solution can be used

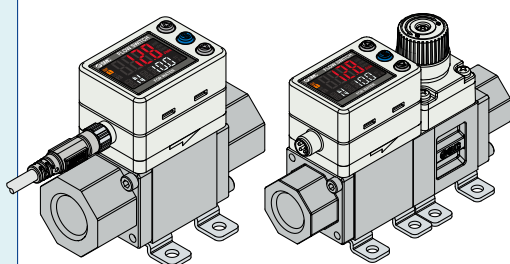
Example) Flow control of the circulating fluid in a chiller



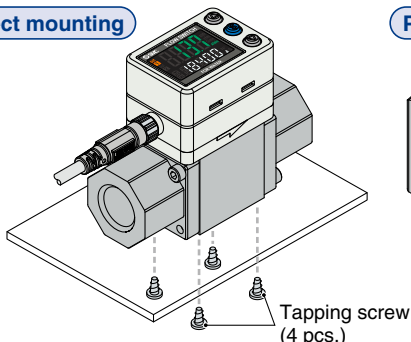
Non-grease

Mounting

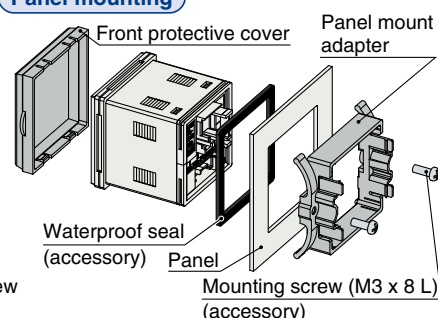
Bracket mounting



Direct mounting



Panel mounting

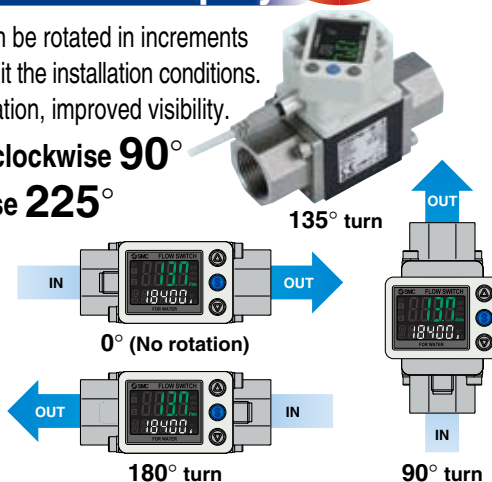


Rotatable display

Display can be rotated in increments of 45° to suit the installation conditions.
Easy operation, improved visibility.

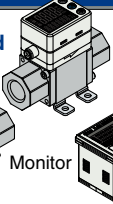
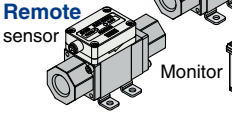
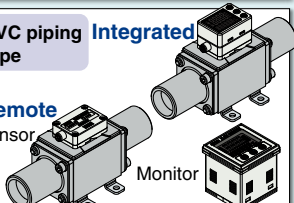
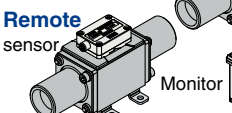
Counterclockwise 90°

Clockwise 225°



Measured flow rate **250 L/min** added

Variations

Type	Applicable fluid	Rated flow range (L/min)	Flow adjustment valve/Temperature sensor				Port size Rc, NPT, G
			None	Flow adjustment valve	Temperature sensor	Flow adjustment valve + Temperature sensor	
Integrated  Remote sensor 	Water Ethylene glycol aqueous solution	0.5 to 4	●	●	●	●	3/8
		2 to 16	●	●	●	●	3/8, 1/2
		5 to 40	●	●	●	●	1/2, 3/4
		10 to 100	●	—	●	—	3/4, 1
		New 50 to 250	●	—	●	—	1 1/4, 1 1/2
PVC piping type  Remote sensor 	Deionized water	10 to 100	●	—	—	—	25A
	Chemical	New 30 to 250	●	—	—	—	30A

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3-Color Display Digital Flow Switch for PVC Piping PF3W

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3-Color Display Digital Flow Monitor for Water PF3W3

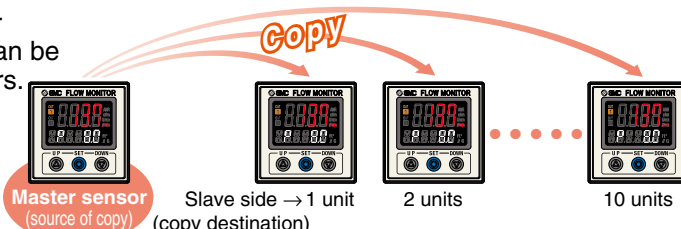
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3-color display Digital flow monitor can copy to up to **10** switches simultaneously.

The settings of the master sensor (source of copy) can be copied to the slave sensors.

- **Reducing setting labor**
- **Minimizing risk of mistakes in setting**



Indicator

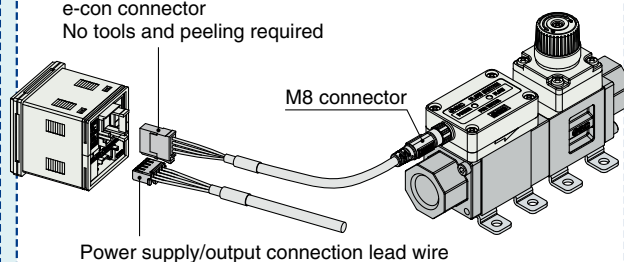
Visually check status of sensor via indicator.



Flow rate: High	● Blinking green/Fast
Flow rate: Low	● Blinking green/Slow
Rated flow or less	● OFF
Rated flow or more	● Red ON

Reducing wiring labor by connector

e-con connector
No tools and peeling required



PVC piping type



Wetted Parts

Pipe	CPVC (Heat resistant PVC)
Body	PPS
Seal	FKM

3-color display

Digital Flow Switch for Water

Series PF3W



RoHS

How to Order

Remote sensor unit Output specification/Temperature sensor

For how to order of remote monitor unit, refer to page 18.



Symbol	OUT1 Flow rate	OUT2 Temperature	Temperature sensor
1	Analog 1 to 5 V	—	None
2	Analog 4 to 20 mA	—	
1T	Analog 1 to 5 V	Analog 1 to 5 V	

* To use in combination with remote monitor (PF3W3 series), select analog output of 1 to 5 V of flow rate (output symbol "1" or "1T").

Note) Analog output of 4 to 20 mA with temperature sensor is made to order. (Refer to page 10.)

Remote sensor unit

Integrated display



PF3W 5 04 — — 03 — 1T — — — —
PF3W 7 04 — — — — 03 — AT — M — — — —

Type

5	Remote sensor unit
7	Integrated display

Rated flow range (Flow range)

Symbol	Rated flow 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
21	50 to 250 L/min

Flow adjustment valve

Symbol	With/without flow adjustment valve	Rated flow range
Nil	None	04 20 40 11 21
S	Yes	04 20 40 11 21

Note 1) 100 and 250 L/min types with flow adjustment valves are not available.

Note 2) The flow adjustment valve of this product is not suitable for applications which require constant adjustment of flow rate.

Note 1) External input: The accumulated value, peak value, and bottom value can be reset.

Note 2) For units with temperature sensor, OUT2 can be set as either temperature output or flow rate output. Setting when shipped is for temperature output.

Integrated display Output specification/Temperature sensor

Symbol	OUT1 Flow rate	OUT2 Flow rate	Temperature	Temperature sensor
A	NPN	NPN	—	None
B	PNP	PNP	—	
C	NPN	Analog 1 to 5 V	—	
D	NPN	Analog 4 to 20 mA	—	
E	PNP	Analog 1 to 5 V	—	
F	PNP	Analog 4 to 20 mA	—	
G	NPN	External input Note 1)	—	
H	PNP	External input Note 1)	—	
AT	NPN	(NPN) Note 2)	NPN	With temperature sensor
BT	PNP	(PNP) Note 2)	PNP	
CT	NPN	(Analog 1 to 5 V) Note 2)	Analog 1 to 5 V	
DT	NPN	(Analog 4 to 20 mA) Note 2)	Analog 4 to 20 mA	
ET	PNP	(Analog 1 to 5 V) Note 2)	Analog 1 to 5 V	
FT	PNP	(Analog 4 to 20 mA) Note 2)	Analog 4 to 20 mA	

Options/Part No.

When optional parts are required separately, use the following part numbers to place an order.

Description	Part no.	Qty.	Note
Bracket Note)	ZS-40-K	1	For PF3W704/720/504/520 With 4 tapping screws (3 x 8)
	ZS-40-L	1	For PF3W740/540 With 4 tapping screws (3 x 8)
	ZS-40-M	1	For PF3W711/511 With 4 tapping screws (4 x 10)
Lead wire with M8 connector	ZS-40-A	1	Lead wire length (3 m)

Note) For units with flow adjustment valve, 2 brackets are required.

Remote sensor unit/Unit printed on label

Symbol	Instantaneous flow rate	Temperature
Nil	L/min	°C
G*	L/min (gal/min)	°C/°F

* Under the New Measurement Law, units other than SI (symbol "Nil") cannot be used in Japan.

Note) G: Made to Order

Reference: 1 [L/min] ↔ 0.2642 [gal/min]

1 [gal/min] ↔ 3.785 [L/min]

°F = 9/5°C + 32

Thread type

Nil	Rc
N	NPT
F	G*

* ISO228 equivalent

Port size

Symbol	Port size	Rated flow range
04	3/8	04 20 40 11 21
03	1/2	04 20 40 11 21
06	3/4	04 20 40 11 21
10	1 1/4	04 20 40 11 21
12	1 1/2	04 20 40 11 21
14	2	04 20 40 11 21

Made to Order

X109	Seal material EPDM
X128	Analog 4 to 20 mA output type Note)
X143	Piping material brass

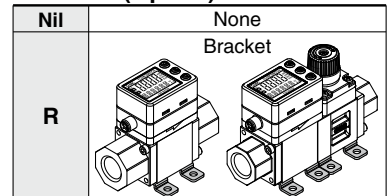
Note) Applicable only for remote type with temperature sensor (Refer to page 10.)

Calibration certificate (Only flow sensor)

Nil	None
A	With calibration certificate

* The certificate is written in both English and Japanese. Integrated display type with temperature sensor can only display flow rate.

Bracket (Option)



Note) With bracket is not available for 250 L/min type.

Integrated display/Unit specification

Symbol	Instantaneous flow rate	Accumulated flow	Temperature
M	L/min	L	°C
G	gal/min	gal	°C
F	gal/min	gal	°F
J	L/min	L	°F

* Under the New Measurement Law, units other than SI (symbol "M") cannot be used in Japan.

Note) G, F, J: Made to Order

Reference: 1 [L/min] ↔ 0.2642 [gal/min]

1 [gal/min] ↔ 3.785 [L/min]

°F = 9/5°C + 32

Lead wire

Nil	N
With lead wire with M8 connector (3 m)	Without lead wire with M8 connector

Refer to "Handling Precautions for SMC Products" for Flow Switch Precautions and the Operation Manual in our website for Specific Product Precautions.

Specifications (Integrated Display)

Model	PF3W704	PF3W720	PF3W740	PF3W711	PF3W721
Applicable fluid	Water and ethylene glycol aqueous solution (with viscosity of 3 mPa·s [3 cP] or less) Note 1)				
Detection method	Karman vortex				
Rated flow range	0.5 to 4 L/min	2 to 16 L/min	5 to 40 L/min	10 to 100 L/min	50 to 250 L/min
Display flow range	0.35 to 5.50 L/min (Flow under 0.35 L/min is displayed as "0.00")	1.7 to 22.0 L/min (Flow under 1.7 L/min is displayed as "0.0")	3.5 to 55.0 L/min (Flow under 3.5 L/min is displayed as "0.0")	7 to 140 L/min (Flow under 7 L/min is displayed as "0")	20 to 350 L/min (Flow under 20 L/min is displayed as "0")
Set flow range	0.35 to 5.50 L/min	1.7 to 22.0 L/min	3.5 to 55.0 L/min	7 to 140 L/min	20 to 350 L/min
Minimum setting unit	0.01 L/min	0.1 L/min	0.1 L/min	1 L/min	2 L/min
Conversion of accumulated pulse (Pulse width: 50 ms)	0.05 L/pulse	0.1 L/pulse	0.5 L/pulse	1 L/pulse	2 L/pulse
Fluid temperature	0 to 90°C (with no freezing and condensation)				
Display unit	Instantaneous flow rate: L/min, Accumulated flow: L				
Accuracy	Display value: ±3% F.S. Analog output: ±3% F.S.				
Repeatability	±2% F.S. Note 2)				
Temperature characteristics	±5% F.S. (25°C reference)				
Operating pressure range Note 3)	0 to 1 MPa				
Proof pressure Note 3)	1.5 MPa				
Pressure loss (without flow adjustment valve)	45 kPa or less at the maximum flow				
Accumulated flow range Note 4)	99999999.9 L				
	By 0.1 L	By 0.5 L	By 1 L		
Switch output	NPN or PNP open collector output				
Maximum load current	80 mA				
Maximum applied voltage	28 VDC				
Internal voltage drop	NPN: 1 V or less (at 80 mA load current) PNP: 1.5 V or less (at 80 mA load current)				
Response time Note 2), 5)	0.5 s/1 s/2 s				
Output protection	Short circuit protection				
Output Flow rate mode	Select from hysteresis mode, window comparator mode, accumulated output mode, or accumulated pulse output mode.				
Output Temperature mode	Select from hysteresis mode or window comparator mode.				
Response time Note 6)	0.5 s/1 s/2 s (linked with the switch output)				
Analog output	Voltage output: 1 to 5 V Output impedance: 1 kΩ				
Voltage output	Output current: 4 to 20 mA Max. load impedance: 300 Ω for 12 VDC, 600 Ω for 24 VDC				
Current output	Variable				
Hysteresis	Variable				
External input	Voltage free input: 0.4 V or less (Reed or Solid state), input for 30 ms or longer				
Display method	2-screen display (Main screen: 4-digit, 7-segment, 2-color, Red/Green Sub screen: 6-digit, 11-segment, White) Display values updated 5 times per second				
Indicator light	Output 1, Output 2: Orange				
Power supply voltage	12 to 24 VDC ±10%				
Current consumption	50 mA or less				
Environment	IP65				
Operating temperature range	0 to 50°C (with no freezing and condensation)				
Operating humidity range	Operation, Storage: 35 to 85% R.H. (with no condensation)				
Withstand voltage Note 7)	1000 VAC for 1 minute between terminals and housing				
Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing				
Standards and regulations	CE marking, UL (CSA), RoHS				
Wetted parts material Note 8)	PPS, Stainless steel 304, FKM, SCS13				
Piping port size	3/8	3/8, 1/2	1/2, 3/4	3/4, 1	1 1/4, 1 1/2
Weight					
Without temperature sensor/Without flow adjustment valve	210 g	260 g	410 g	720 g	890 g
With temperature sensor/Without flow adjustment valve	285 g	335 g	530 g	860 g	1075 g
Without temperature sensor/With flow adjustment valve	310 g	360 g	610 g	—	—
With temperature sensor/With flow adjustment valve	385 g	435 g	730 g	—	—
With lead wire with connector	+85 g				

Note 1) Refer to "Measurable Range for Ethylene Glycol Aqueous Solution" on page 6. Measurement can be performed with a fluid that does not corrode wetted parts and has viscosity of 3 mPa·s [3 cP] or less. Be aware that water leakage may happen due to internal seal shrinkage or swelling depending on kinds of fluid.

Note 2) When 0.5 s is selected for the response time of the switch output, the repeatability becomes ±3% F.S.

Note 3) Operating pressure range and proof pressure change according to the fluid temperature. Refer to page 4.

Note 4) Cleared by turning off the power supply. It is possible to select the function to memorize it. (Every 2 or 5 minutes) When 5 minutes memorizing is selected, the lifetime of the memory element (electronic part) is 1 million times (5 minutes x 1 million times = 5 million minutes = Approx. 9.5 years for 24 hour energizing). Calculate the lifetime based on your operating conditions before using the memorizing function, and do not exceed it.

Note 5) The response time when the set value is 90% in relation to the step input. (The response time is 7 s when it is output by the temperature sensor.)

Note 6) The response time until the set value reaches 90% in relation to the step input. (The response time is 7 s when it is analog output by the temperature sensor.)

Note 7) When the temperature sensor is used, it will be 250 VAC.

Note 8) Refer to "Wetted Parts Construction" on page 6 for details.

Note 9) External scratch marks and dirt are judged as good parts provided that they do not affect product performance.

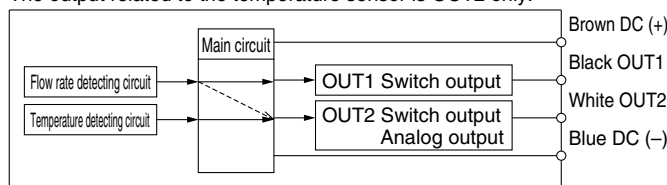
Temperature Sensor Specifications

Rated temperature range	0 to 100°C Note 1)
Setting/Display temperature range	-10 to 110°C
Minimum setting unit	1°C
Display unit	°C
Display accuracy	±2°C
Analog output accuracy	±3% F.S.
Response time	7 s Note 2)
Ambient temperature characteristics	±5% F.S.

Note 1) The rated temperature range is for the temperature sensor alone.
The fluid temperature range specification of the flow switch as a whole is 0 to 90°C.

Note 2) The response time is for the temperature sensor alone.

The output related to the temperature sensor is OUT2 only.



The OUT2 can be selected from the output for temperature or flow rate by button operation.

Specifications (Remote Sensor Unit)

Refer to page 18 for monitor unit specifications.

Model		PF3W504	PF3W520	PF3W540	PF3W511	PF3W521
Applicable fluid		Water and ethylene glycol aqueous solution (with viscosity of 3 mPa·s [3 cP] or less) ^{Note 1)}				
Detection method		Karman vortex				
Rated flow range		0.5 to 4 L/min	2 to 16 L/min	5 to 40 L/min	10 to 100 L/min	50 to 250 L/min
Fluid temperature		0 to 90°C (with no freezing and condensation)				
Accuracy		±3% F.S.				
Repeatability		±2% F.S.				
Temperature characteristics		±5% F.S. (25°C reference)				
Operating pressure range ^{Note 2)}		0 to 1 MPa ^{Note 2)}				
Proof pressure ^{Note 2)}		1.5 MPa				
Pressure loss (without flow adjustment valve)		45 kPa or less at the maximum flow				60 kPa or less at the maximum flow
Analog output	Response time ^{Note 3)}	1s				
	Voltage output	Voltage output: 1 to 5 V Output impedance: 1 kΩ				
	Current output	Output current: 4 to 20 mA Max. load impedance: 300 Ω for 12 VDC, 600 Ω for 24 VDC				
Indicator light		For power supply status, flow rate indicator (Blinking speed changes in response to flow rate), and other error indicator				
Power supply voltage		12 to 24 VDC ±10%				
Current consumption		30 mA or less				
Environment	Enclosure	IP65				
	Operating temperature range	0 to 50°C (with no freezing and condensation)				
	Operating humidity range	Operation, Storage: 35 to 85% R.H. (with no condensation)				
	Withstand voltage ^{Note 4)}	1000 VAC for 1 minute between terminals and housing				
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing				
Standards and regulations		CE marking, UL (CSA), RoHS				
Wetted parts material ^{Note 5)}		PPS, Stainless steel 304, FKM, SCS13				
Piping port size		3/8	3/8, 1/2	1/2, 3/4	3/4, 1	1 1/4, 1 1/2
Weight	Without temperature sensor/Without flow adjustment valve	195 g	245 g	395 g	705 g	875 g
	With temperature sensor/Without flow adjustment valve	270 g	320 g	515 g	840 g	1060 g
	Without temperature sensor/With flow adjustment valve	295 g	345 g	595 g	—	—
	With temperature sensor/With flow adjustment valve	370 g	415 g	715 g	—	—
	With lead wire with connector	+85 g				

- Note 1) Refer to "Measurable Range for Ethylene Glycol Aqueous Solution" on page 6. Measurement can be performed with a fluid that does not corrode wetted parts and has viscosity of 3 mPa·s [3 cP] or less. Be aware that water leakage may happen due to internal seal shrinkage or swelling depending on kinds of fluid.
- Note 2) Operating pressure range and proof pressure change according to the fluid temperature. Refer to the graphs below.
- Note 3) The response time until the set value reaches 90% in relation to the step input. (The response time is 7 s when it is analog output by the temperature sensor.)
- Note 4) When the temperature sensor is used, it will be 250 VAC.
- Note 5) Refer to "Wetted Parts Construction" on page 6 for details.
- Note 6) External scratch marks and dirt are judged as good parts provided that they do not affect product performance.

Temperature Sensor Specifications

Rated temperature range	0 to 100°C ^{Note 1)}
Analog output accuracy	±3% F.S.
Response time	7 s ^{Note 2)}
Ambient temperature characteristics	±5% F.S.

- Note 1) The rated temperature range is for the temperature sensor alone. The fluid temperature range specification of the flow switch as a whole is **0 to 90°C**.
- Note 2) The response time is for the temperature sensor alone.

Set Flow Range and Rated Flow Range



Caution

Set the flow within the rated flow range.

The set flow range is the range of flow rate that is possible in setting.

The rated flow range is the range that satisfies the sensor's specifications (accuracy etc.).

Although it is possible to set a value outside the rated flow range, the specifications will not be guaranteed even if the value stays within the set flow range.

Sensor	Flow range									
	0.5 L/min	2 L/min	5 L/min	20 L/min	40 L/min	100 L/min	140 L/min	250 L/min	350 L/min	
PF3W704	0.5 L/min ————— 4 L/min									
PF3W504	0.35 L/min ————— 5.5 L/min									
PF3W720	2 L/min ————— 16 L/min									
PF3W520	1.7 L/min ————— 22 L/min									
PF3W740	5 L/min ————— 40 L/min									
PF3W540	3.5 L/min ————— 55 L/min									
PF3W711	10 L/min ————— 100 L/min									
PF3W511	7 L/min ————— 140 L/min									
PF3W721	20 L/min ————— 250 L/min									
PF3W521	20 L/min ————— 280 L/min									

* In the case of the PF3W5 series, the displayable and settable ranges are the same as the PF3W3 series flow monitor.

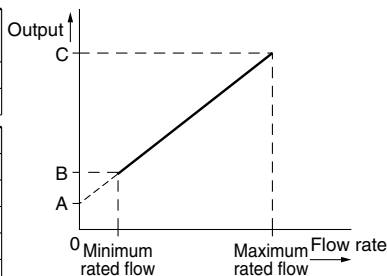
Rated flow range Display flow range Set flow range

Analog Output

Flow rate/Analog output

	A	B		C
Voltage output	1 V	1.5 V	1.4 V	1.8 V
Current output	4 mA	6 mA	5.6 mA	7.2 mA

Model	Rated flow [L/min]	
	Minimum	Maximum
PF3W704/504	0.5	4
PF3W720/520	2	16
PF3W740/540	5	40
PF3W711/511	10	100
PF3W721/521	50	250

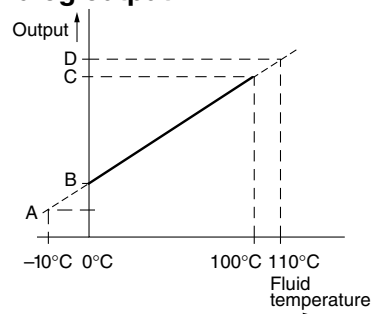


Fluid temperature/Analog output

PF3W7/5

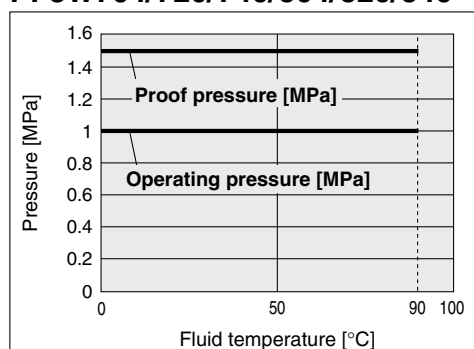
	A	B
Voltage output	0.6 V	1 V
Current output	2.4 mA	4 mA

	C	D
Voltage output	5 V	5.4 V
Current output	20 mA	21.6 mA

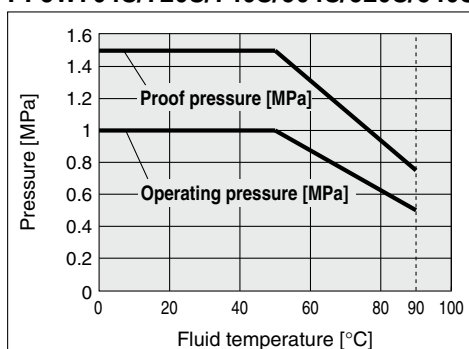


Operating Pressure and Proof Pressure

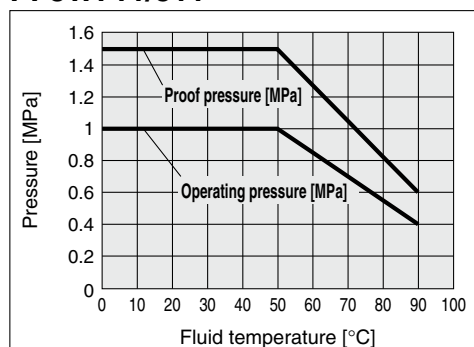
PF3W704/720/740/504/520/540



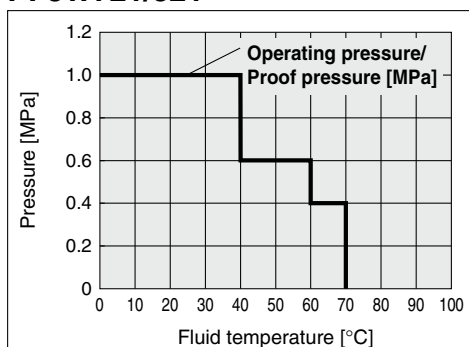
PF3W704S/720S/740S/504S/520S/540S



PF3W711/511

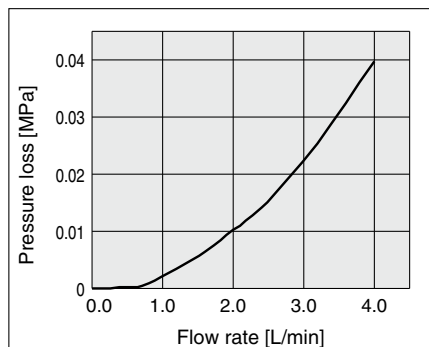


PF3W721/521

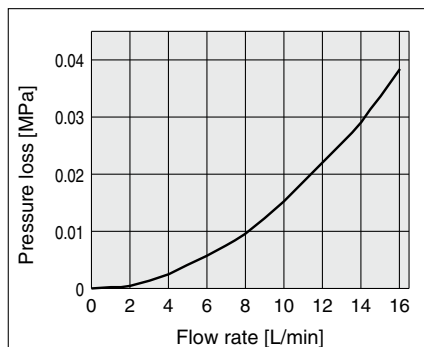


Flow-rate Characteristics (Pressure Loss: Without Flow Adjustment Valve)

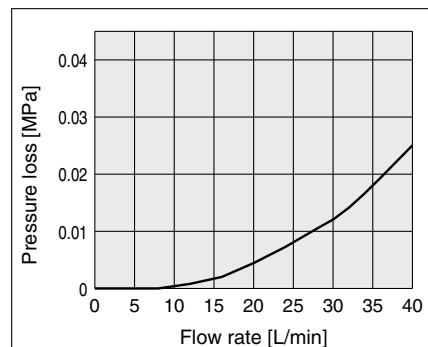
PF3W704/504



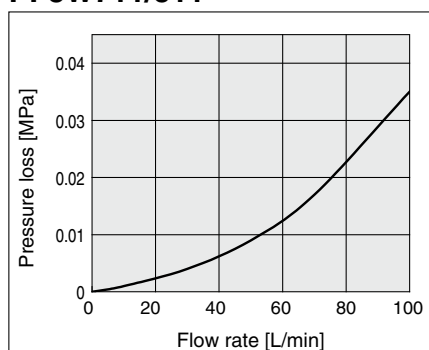
PF3W720/520



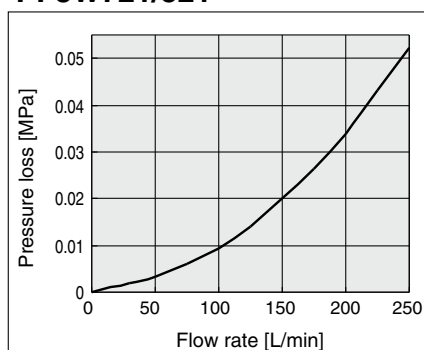
PF3W740/540



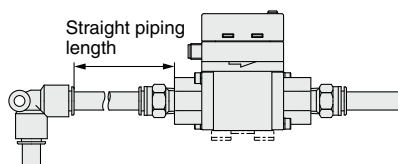
PF3W711/511



PF3W721/521



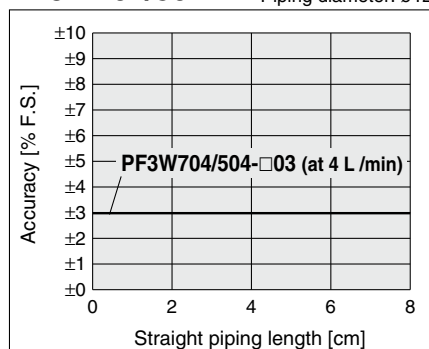
Straight Piping Length and Accuracy (Reference Value)



- The smaller the piping size, the more the product is affected by the straight piping length.
- Fluid pressure has almost no affect.
- Low flow rate lessens the effect of the straight piping length.
- Use a straight pipe that is 8 cm or longer in length to satisfy the $\pm 3\%$ F.S. specification.
(11 cm or longer for 100 L/min and 250 L/min types)

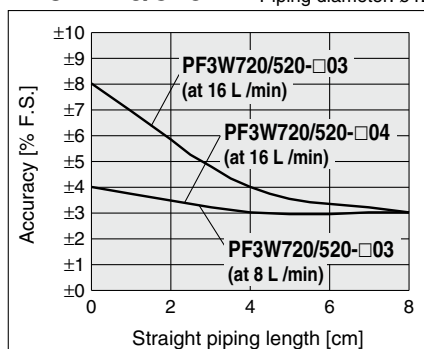
PF3W704/504

Pressure: 0.3 MPa
Piping diameter: $\phi 12$



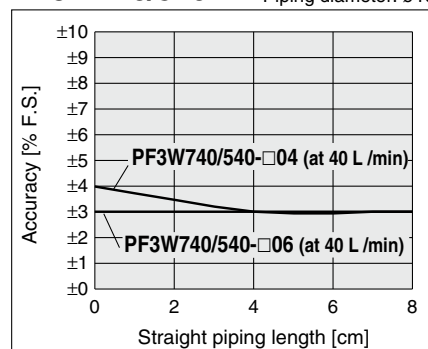
PF3W720/520

Pressure: 0.3 MPa
Piping diameter: $\phi 12$



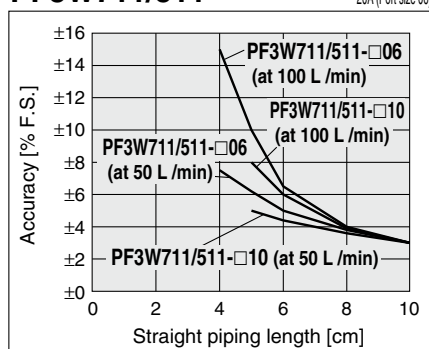
PF3W740/540

Pressure: 0.3 MPa
Piping diameter: $\phi 16$



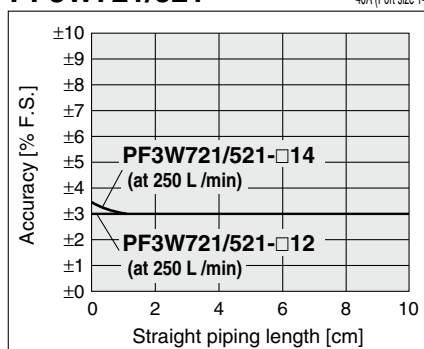
PF3W711/511

Pressure: 0.3 MPa Piping diameter: 25A (Port size 10)
20A (Port size 06)



PF3W721/521

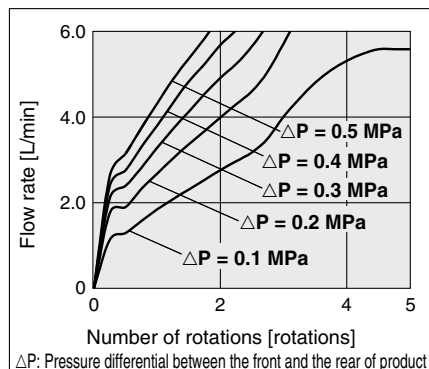
Pressure: 0.3 MPa Piping diameter: 32A (Port size 12)
40A (Port size 14)



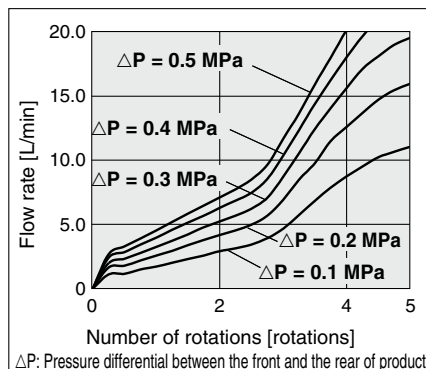
* No data for 4 cm, or for under 5 cm, as these cannot be used due to piping dimensions.

Flow-rate Characteristics of Flow Adjustment Valve

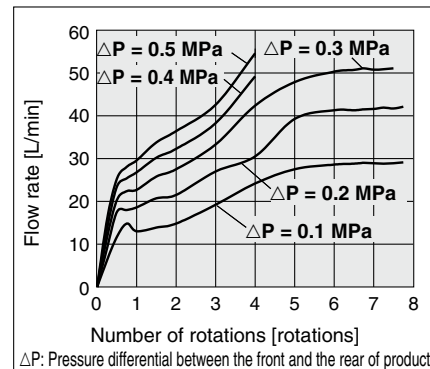
PF3W704S/504S



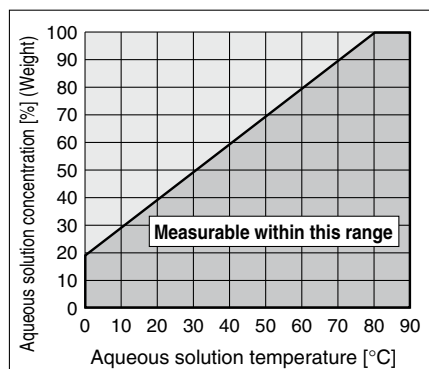
PF3W720S/520S



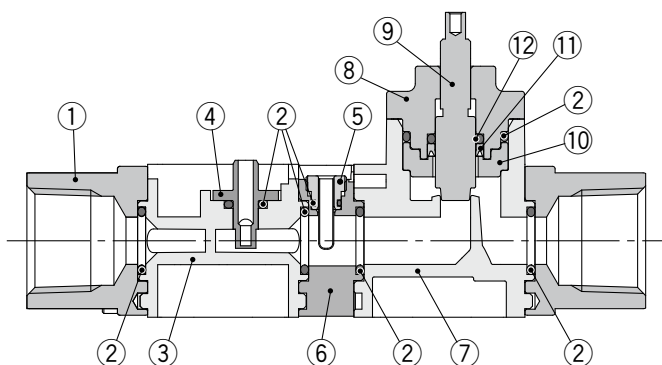
PF3W740S/540S



Measurable Range for Ethylene Glycol Aqueous Solution (Reference Value)



Wetted Parts Construction



Component Parts

No.	Description	Material	Note
1	Attachment	SCS13	Stainless steel 304 equivalent PF3W704/720/740/711/504/520/540/511
		Stainless steel 304	PF3W721/521
2	Seal	FKM	
3	Body	PPS	
4	Sensor	PPS	
5	Temperature sensor	Stainless steel 304	With brazing (JIS Z 3261: BAg-7, ISO 3677: B-Ag56CuZnSn-620/650)
6	Temperature sensor body	Stainless steel 304	
7	Flow adjustment valve body	PPS	
8	Flow adjustment valve cover	PPS	
9	Flow adjustment valve shaft	Stainless steel 304	
10	Shaft support	PPS	
11	Y seal	FKM	
12	Cap seal	FKM	

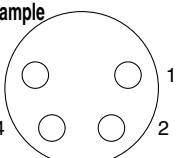
Series PF3W

Dimensions

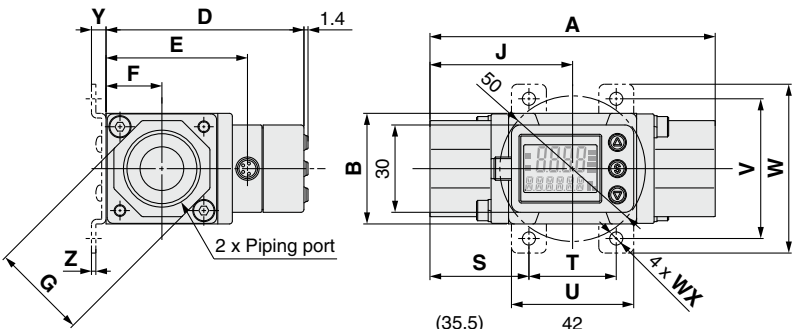
PF3W704/720/740/711/721
Integrated display

Connector
pin number

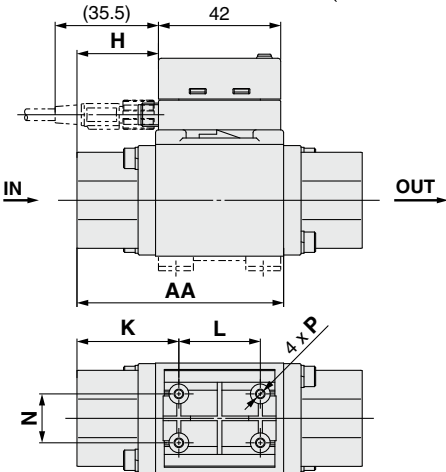
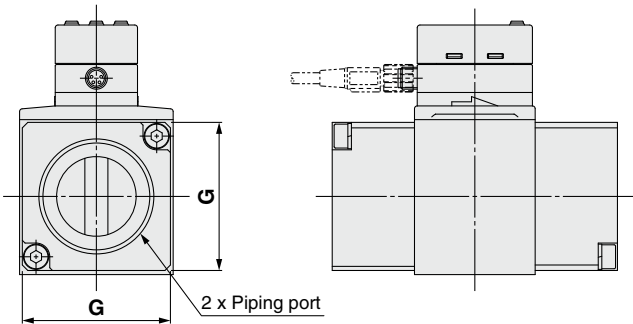
Example



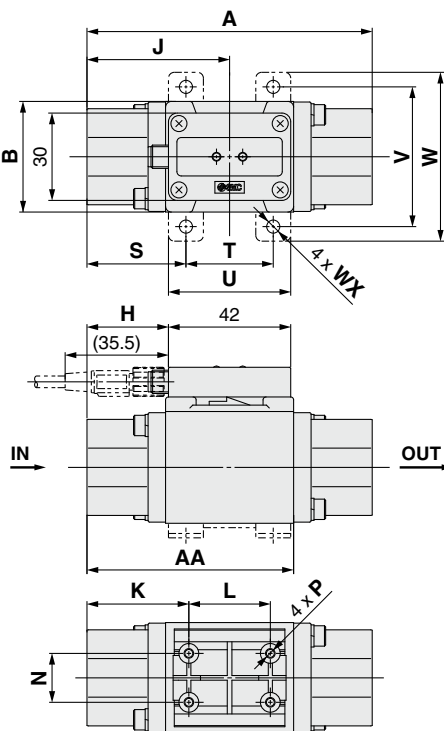
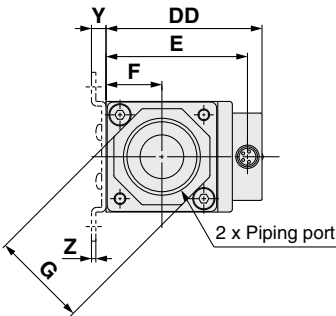
Pin no.	Pin name
1	DC (+)
2	OUT2
3	DC (-)
4	OUT1



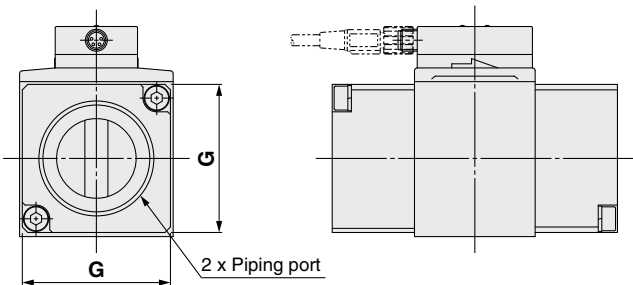
For PF3W721



PF3W504/520/540/511/521
Remote sensor unit



For PF3W521

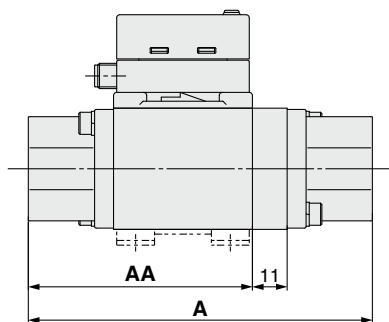


Model	Port size (Rc, NPT, G)	A	AA	B	D	DD	E	F	G	H	J	K	L	N	P	Bracket dimensions							
																S	T	U	V	W	WX	Y	Z
PF3W704/504	3/8	70	50	30	60	45.6	40.6	15.2	24	14	35	26	18	13.6	ø2.7 depth 14	24	22	32	40	50	4.5	5	1.5
PF3W720/520	3/8, 1/2	78	54	30	60	45.6	40.6	15.2	27	18	39	30	18	13.6	ø2.7 depth 12	28	22	32	40	50	4.5	5	1.5
PF3W740/540	1/2, 3/4	98	71	38	68	53.6	48.6	19.2	32	28	49	35	28	16.8	ø2.7 depth 12	34	30	42	48	58	4.5	5	1.5
PF3W711/511	3/4, 1	124	92	46	77	62.6	57.6	23.0	41	42	63	48	28	18.0	ø3.5 depth 14	44	36	48	58	70	5.5	7	2.0
PF3W721/521	1 1/4, 1 1/2	104	74	56	91	76.6	71.6	28.5	54	31	52	39.5	25	27.5	ø3.5 depth 14	—	—	—	—	—	—	—	—
	G1 1/4	108	76							33	54	41.5											
	G1 1/2	112	78							35	56	43.5											

Dimensions

PF3W704/720/740/711-□-□T

Integrated display: With temperature sensor

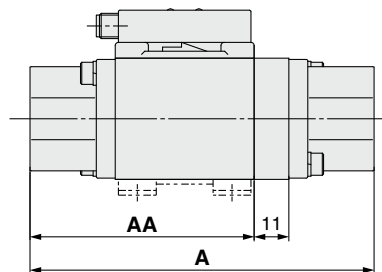


(mm)

Model	A	AA
PF3W704/504-□-□T	81	50
PF3W720/520-□-□T	89	54
PF3W740/540-□-□T	109	71
PF3W711/511-□-□T	135	92
PF3W721/521-□-□T	115	74
PF3W721/521-F12-□T	119	76
PF3W721/521-F14-□T	123	78

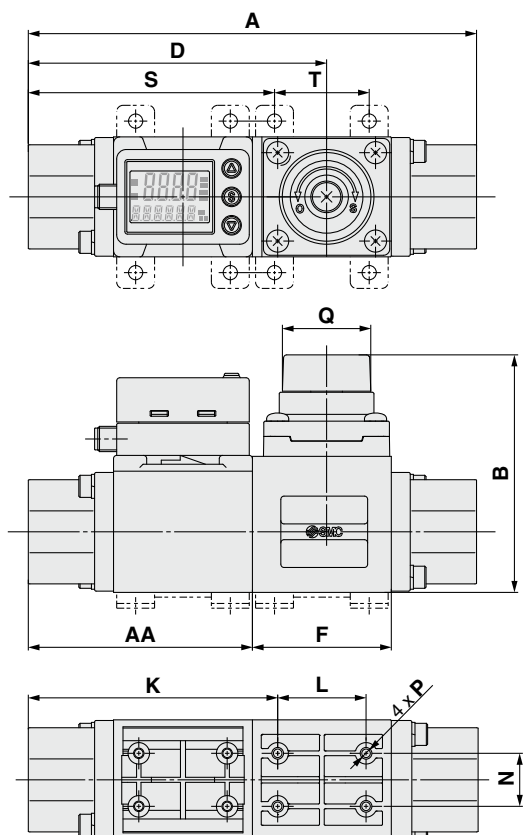
PF3W504/520/540/511-□-□T

Remote sensor unit: With temperature sensor



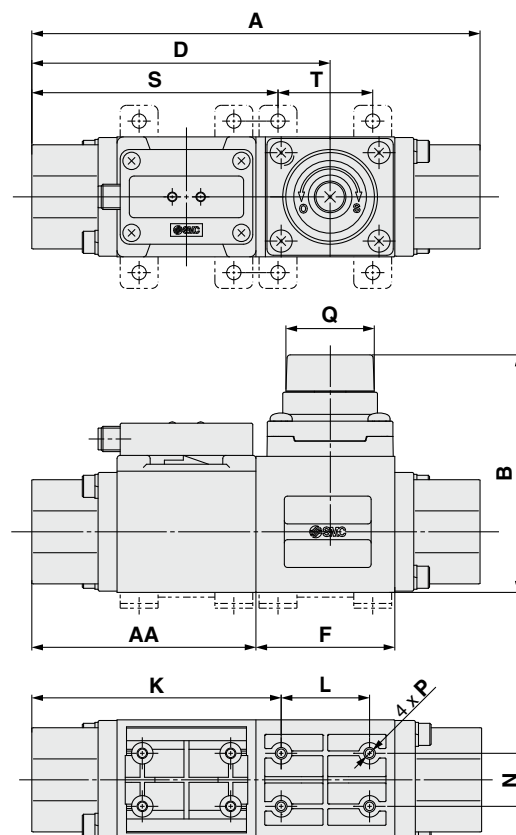
PF3W704S/720S/740S

Integrated display: With flow adjustment valve



PF3W504S/520S/540S

Remote sensor unit: With flow adjustment valve



(mm)

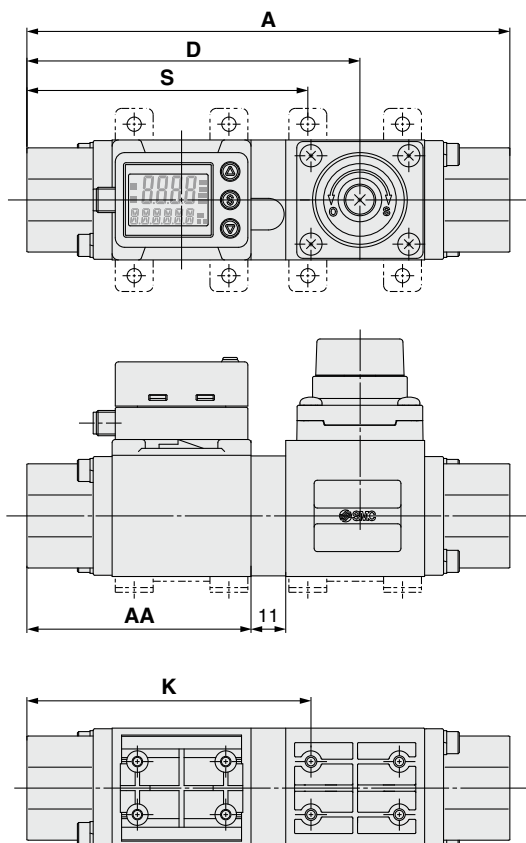
Model	A	AA	B	D	F	K	L	N	P	Q	Q number of rotations	Bracket dimensions	
												S	T
PF3W704S/504S	104	50	63.6 (Max. 68.6)	70.2	34	58.5	18	13.6	ø2.7 depth 10	ø19	6	56.5	22
PF3W720S/520S	112	54	63.6 (Max. 68.6)	74.2	34	62.5	18	13.6	ø2.7 depth 10	ø19	6	60.5	22
PF3W740S/540S	142	71	75.25 (Max. 81)	94.5	44	79.0	28	16.8	ø2.7 depth 10	ø28	7	78.0	30

Series PF3W

Dimensions

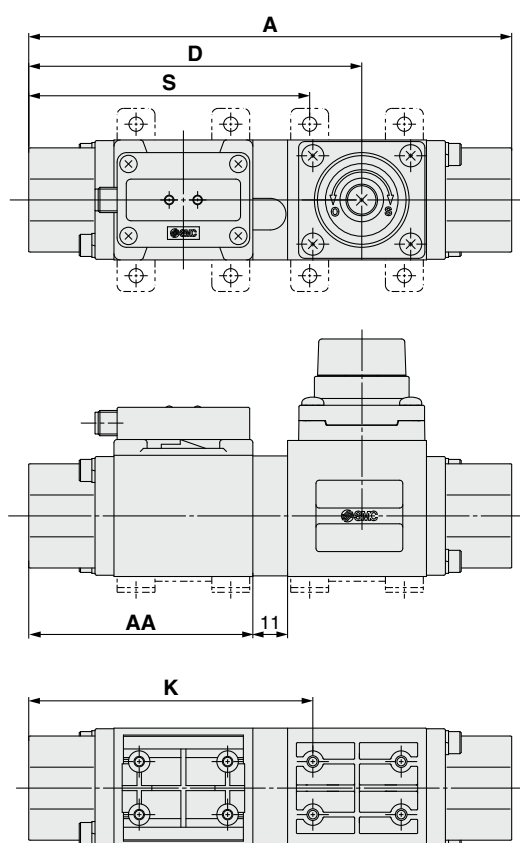
PF3W704S/720S/740S-□-□T

Integrated display: With temperature sensor and flow adjustment valve



PF3W504S/520S/540S-□-□T

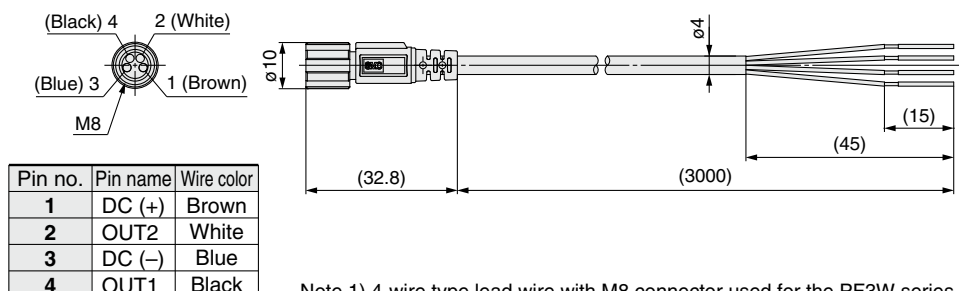
Remote sensor unit: With temperature sensor and flow adjustment valve



(mm)					
Model	A	AA	D	K	S
PF3W704S/504S-□-□T	115	50	81.2	69.5	67.5
PF3W720S/520S-□-□T	123	54	85.2	73.5	71.5
PF3W740S/540S-□-□T	153	71	105.5	90.0	89.0

ZS-40-A

Lead wire with M8 connector



Note 1) 4-wire type lead wire with M8 connector used for the PF3W series.

Note 2) Refer to the Operation Manual in our website (<http://www.smcworld.com>) for wiring.

Lead Wire Specifications

Conductor	Nominal cross section	AWG23
	O.D.	Approx. 0.7 mm
Insulator	Material	Heat resistant PVC
	O.D.	Approx. 1.1 mm
Sheath	Color	Brown, White, Black, Blue
	Material	Heat and oil resistant PVC
Finished O.D.		ø4

Series PF3W

Made to Order

Please consult SMC for detailed dimensions, specifications and delivery.



1 Seal material EPDM

Symbol
-X109

Seal material for wetted parts changed to EPDM

PF3W5 - - - - X109

PF3W7 - - - - X109

• Seal material EPDM

Refer to "How to Order," page 1 for details.

Note) Not compatible with units with flow adjustment valve.
Please special-order separately.

2 Analog 4 to 20 mA 2 output

Symbol
-X128

Output specification of remote type with a temperature sensor: Analog 4 to 20 mA 2 output

PF3W5 - - - - X128

• Analog 4 to 20 mA 2 output

Refer to "How to Order," page 1 for details.

Note) Remote monitor unit is equipped as standard.

3 Piping material brass

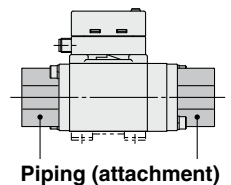
Symbol
-X143

Piping (attachment) material changed to brass

PF3W5 - - - - X143

PF3W7 - - - - X143

• Piping (attachment) material brass



Piping (attachment)

Refer to "How to Order," page 1 for details.

Note) Not compatible with units with flow adjustment valve.
Please special-order separately.
Surface treatment is not applied on piping.

3-Color Display Digital Flow Switch for Water
PF3W

3-Color Display Digital Flow Switch for PVC Piping
PF3W

3-Color Display Digital Flow Monitor for Water
PF3W3

Function
Details

3-color display

Digital Flow Switch for PVC Piping

Series PF3W



RoHS

How to Order

For how to order of remote monitor unit, refer to page 18.



Remote sensor unit

Integrated display



Remote sensor unit Output specification

Symbol	OUT1
1	Analog 1 to 5 V
2	Analog 4 to 20 mA

* To use in combination with remote monitor (PF3W3 series), select analog output of 1 to 5 V of flow rate (output symbol "-1").

Remote sensor unit/Unit printed on label

Symbol	Instantaneous flow rate	Temperature
Nil	L/min	°C
G*	L/min (gal/min)	°C/°F

* Under the New Measurement Law, units other than SI (symbol "Nil") cannot be used in Japan.

Note) G: Made to Order

Reference: 1 [L/min] ↔ 0.2642 [gal/min]

1 [gal/min] ↔ 3.785 [L/min]

°F = 9/5°C + 32

Calibration certificate (Only flow sensor)

Nil	None
A	With calibration certificate

* The certificate is written in both English and Japanese.

PF3W 5 - U - 1 - - - - -
PF3W 7 11 - U 25 - A - M - - - - -

Type

5	Remote sensor unit
7	Integrated display

Rated flow range (Flow range)

Symbol	Rated flow range
11	10 to 100 L/min
21	30 to 250 L/min

Connection type

U	PVC pipe
---	----------

PVC pipe O.D.

Symbol	Port size	Rated flow range		Pipe O.D.*
		11	21	
25	25A	●	—	32 mm
30	30A	—	●	38 mm

* JIS K6742 equivalent

Integrated display

Output specification

Symbol	OUT1	OUT2
A	NPN	NPN
B	PNP	PNP
C	NPN	Analog 1 to 5 V
D	NPN	Analog 4 to 20 mA
E	PNP	Analog 1 to 5 V
F	PNP	Analog 4 to 20 mA
G	NPN	External input
H	PNP	External input

External input: The accumulated value, peak value, and bottom value can be reset.

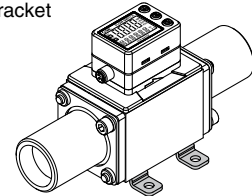
Made to Order

X109	Seal material EPDM
------	--------------------

(Refer to page 17.)

Bracket (Option)

Nil	None
R	Bracket



Note) With bracket is not available for 250 L/min type.

Integrated display/Unit specification

Symbol	Instantaneous flow rate	Accumulated flow	Temperature
M	L/min	L	°C
G	gal/min	gal	°C
F	gal/min	gal	°F
J	L/min	L	°F

* Under the New Measurement Law, units other than SI (symbol "M") cannot be used in Japan.

Note) G, F, J: Made to Order

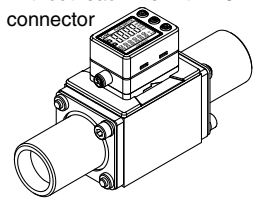
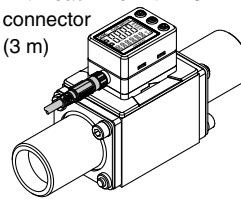
Reference: 1 [L/min] ↔ 0.2642 [gal/min]

1 [gal/min] ↔ 3.785 [L/min]

°F = 9/5°C + 32

Lead wire

Nil	N
With lead wire with M8 connector (3 m)	Without lead wire with M8 connector



Options/Part No.

When optional parts are required separately, use the following part numbers to place an order.

Description	Part no.	Qty.	Note
Bracket	ZS-40-M	1	For PF3W711/511 With 4 tapping screws (4 x 10)
Lead wire with M8 connector	ZS-40-A	1	Lead wire length (3 m)

Refer to "Handling Precautions for SMC Products" for Flow Switch Precautions and the Operation Manual in our website for Specific Product Precautions.

Specifications (Integrated Display)

Model	PF3W711	PF3W721
Applicable fluid	Water and ethylene glycol aqueous solution (with viscosity of 3 mPa·s [3 cP] or less) ^{Note 1)}	
Detection method	Karman vortex	
Rated flow range	10 to 100 L/min	30 to 250 L/min
Display flow range	7 to 140 L/min (Flow under 7 L/min is displayed as "0")	20 to 350 L/min (Flow under 20 L/min is displayed as "0")
Set flow range	7 to 140 L/min	20 to 350 L/min
Minimum setting unit	1 L/min	2 L/min
Conversion of accumulated pulse	1 L/pulse	2 L/pulse
Fluid temperature	0 to 70°C (with no freezing and condensation)	
Display unit	Instantaneous flow rate: L/min, Accumulated flow: L, Display values updated 5 times per second	
Accuracy	Display value: ±3% F.S. Analog output: ±3% F.S.	
Repeatability	±2% F.S. ^{Note 2)}	
Temperature characteristics	±5% F.S. (25°C reference)	
Operating pressure range ^{Note 3)}	0 to 1 MPa	
Proof pressure ^{Note 3)}	1 MPa	
Pressure loss	45 kPa or less at the maximum flow	
Accumulated flow range ^{Note 4)}	999999999 L	
Switch output	NPN or PNP open collector output	
Maximum load current	80 mA	
Maximum applied voltage	28 VDC	
Internal voltage drop	NPN: 1 V or less (at 80 mA load current) PNP: 1.5 V or less (at 80 mA load current)	
Response time ^{Note 2), 5)}	0.5 s/1 s/2 s	
Output protection	Short circuit protection	
Output mode ^{Note 6)}	Select from hysteresis mode, window comparator mode, accumulated output mode, or accumulated pulse output mode.	
Response time ^{Note 6)}	0.5 s/1 s/2 s (linked with the switch output)	
Voltage output	Voltage output: 1 to 5 V Output impedance: 1 kΩ	
Current output	Output current: 4 to 20 mA Max. load impedance: 300 Ω for 12 VDC, 600 Ω for 24 VDC	
Hysteresis	Variable	
External input	Voltage free input: 0.4 V or less (Reed or Solid state), input for 30 ms or longer	
Display method	2-screen display (Main screen: 4-digit, 7-segment, 2-color, Red/Green Sub screen: 6-digit, 11-segment, White)	
Indicator light	Output 1, Output 2: Orange	
Power supply voltage	12 to 24 VDC ±10%	
Current consumption	50 mA or less	
Environment	IP65	
Operating temperature range	0 to 50°C (with no freezing and condensation)	
Operating humidity range	Operation, Storage: 35 to 85% R.H. (with no condensation)	
Withstand voltage	1000 VAC for 1 minute between terminals and housing	
Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing	
Standards and regulations	CE marking, UL (CSA), RoHS	
Wetted parts material ^{Note 7)}	PPS, FKM, CPVC	
Piping port size	25A	30A
Weight	Without lead wire with connector: 285 g With lead wire with connector: 370 g	Without lead wire with connector: 340 g With lead wire with connector: 425 g

Note 1) Refer to "Measurable Range for Ethylene Glycol Aqueous Solution" on page 6. Measurement can be performed with a fluid that does not corrode wetted parts and has viscosity of 3 mPa·s [3 cP] or less. Refer to the list of applicable fluids on page 24.

Note 2) When 0.5 s is selected for the response time of the switch output, the repeatability becomes ±3% F.S.

Note 3) Operating pressure range and proof pressure change according to the fluid temperature. Refer to the graph below.

Note 4) Cleared by turning off the power supply. It is possible to select the function to memorize it. (Every 2 or 5 minutes) When 5 minutes memorizing is selected, the lifetime of the memory element (electronic part) is 1 million times (5 minutes × 1 million times = 5 million minutes = Approx. 9.5 years for 24 hour energizing). Calculate the lifetime based on your operating conditions before using the memorizing function, and do not exceed it.

Note 5) The response time when the set value is 90% in relation to the step input.

Note 6) The response time until the set value reaches 90% in relation to the step input.

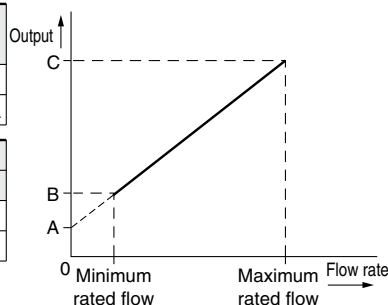
Note 7) Refer to "Wetted Parts Construction" on page 14 for details.

Analog Output

Flow rate/Analog output

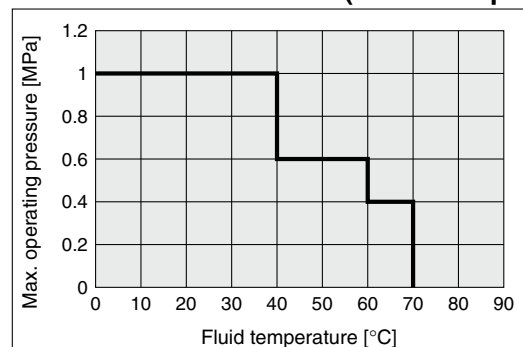
	A	B		C
		11	21	
Voltage output	1 V	1.4 V	1.5 V	5 V
Current output	4 mA	5.6 mA	5.9 mA	20 mA

Model	Rated flow [L/min]	
	Minimum	Maximum
PF3W711/511	10	100
PF3W721/521	30	250



Operating Pressure/Proof Pressure

PF3W711/721/511/521 (for PVC Piping)



Refer to "Handling Precautions for SMC Products" for Flow Switch Precautions and the Operation Manual in our website for Specific Product Precautions.

Specifications (Remote Sensor Unit)

Refer to page 19 for monitor unit specifications.

Model	PF3W511	PF3W521
Applicable fluid	Water and ethylene glycol aqueous solution (with viscosity of 3 mPa·s [3 cP] or less) ^{Note 1)}	
Detection method	Karman vortex	
Rated flow range	10 to 100 L/min	30 to 250 L/min
Fluid temperature	0 to 70°C (with no freezing and condensation)	
Accuracy	±3% F.S.	
Repeatability	±2% F.S.	
Temperature characteristics	±5% F.S. (25°C reference)	
Operating pressure range ^{Note 2)}	0 to 1 MPa ^{Note 2)}	
Proof pressure ^{Note 2)}	1 MPa	
Pressure loss	45 kPa or less at the maximum flow	
Analog output	Response time ^{Note 3)}	1 s
	Voltage output	Voltage output: 1 to 5 V Output impedance: 1 kΩ
	Current output	Output current: 4 to 20 mA Max. load impedance: 300 Ω for 12 VDC, 600 Ω for 24 VDC
Indicator light	For power supply status, flow rate indicator (Blinking speed changes in response to flow rate), and other error indicator	
Power supply voltage	12 to 24 VDC ±10%	
Current consumption	30 mA or less	
Environment	Enclosure	IP65
	Operating temperature range	0 to 50°C (with no freezing and condensation)
	Operating humidity range	Operation, Storage: 35 to 85% R.H. (with no condensation)
	Withstand voltage	1000 VAC for 1 minute between terminals and housing
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing
Standards and regulations	CE marking, UL (CSA), RoHS	
Wetted parts material ^{Note 4)}	PPS, FKM, CPVC	
	Non-grease	
Piping port size	25A	30A
Weight	Without lead wire with connector	270 g
	With lead wire with connector	355 g

Note 1) Refer to "Measurable Range for Ethylene Glycol Aqueous Solution" on page 6. Measurement can be performed with a fluid that does not corrode wetted parts and has viscosity of 3 mPa·s [3 cP] or less. Refer to the list of applicable fluids on page 24.

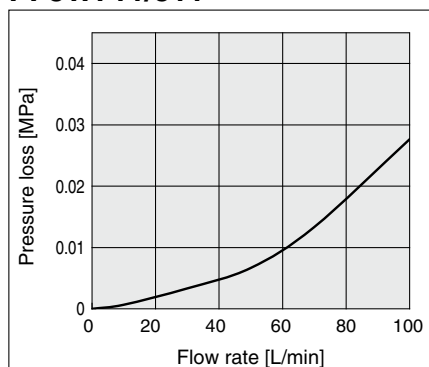
Note 2) Operating pressure range and proof pressure change according to the fluid temperature. Refer to the graphs below.

Note 3) The response time until the set value reaches 90% in relation to the step input.

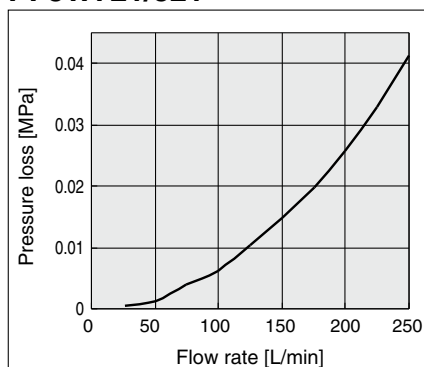
Note 4) Refer to "Wetted Parts Construction" on page 14 for details.

Flow-rate Characteristics (Pressure Loss)

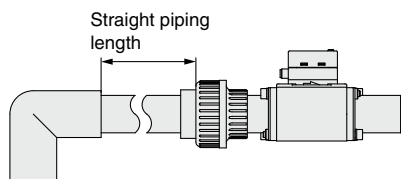
PF3W711/511



PF3W721/521



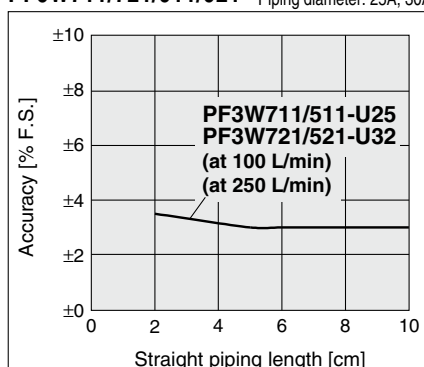
Straight Piping Length and Accuracy (Reference Value)



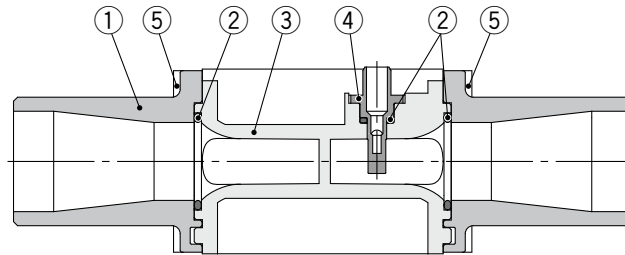
- Fluid pressure has almost no effect.
- To maintain ±3% F.S. in the specifications, use a straight pipe that is 11 cm or longer in length.

PF3W711/721/511/521

Pressure: 0.3 MPa
Piping diameter: 25A, 30A



Wetted Parts Construction



Component Parts

No.	Description	Material	Note
1	PVC pipe	CPVC	
2	Seal	FKM	
3	Body	PPS	
4	Sensor	PPS	

Replacement Parts

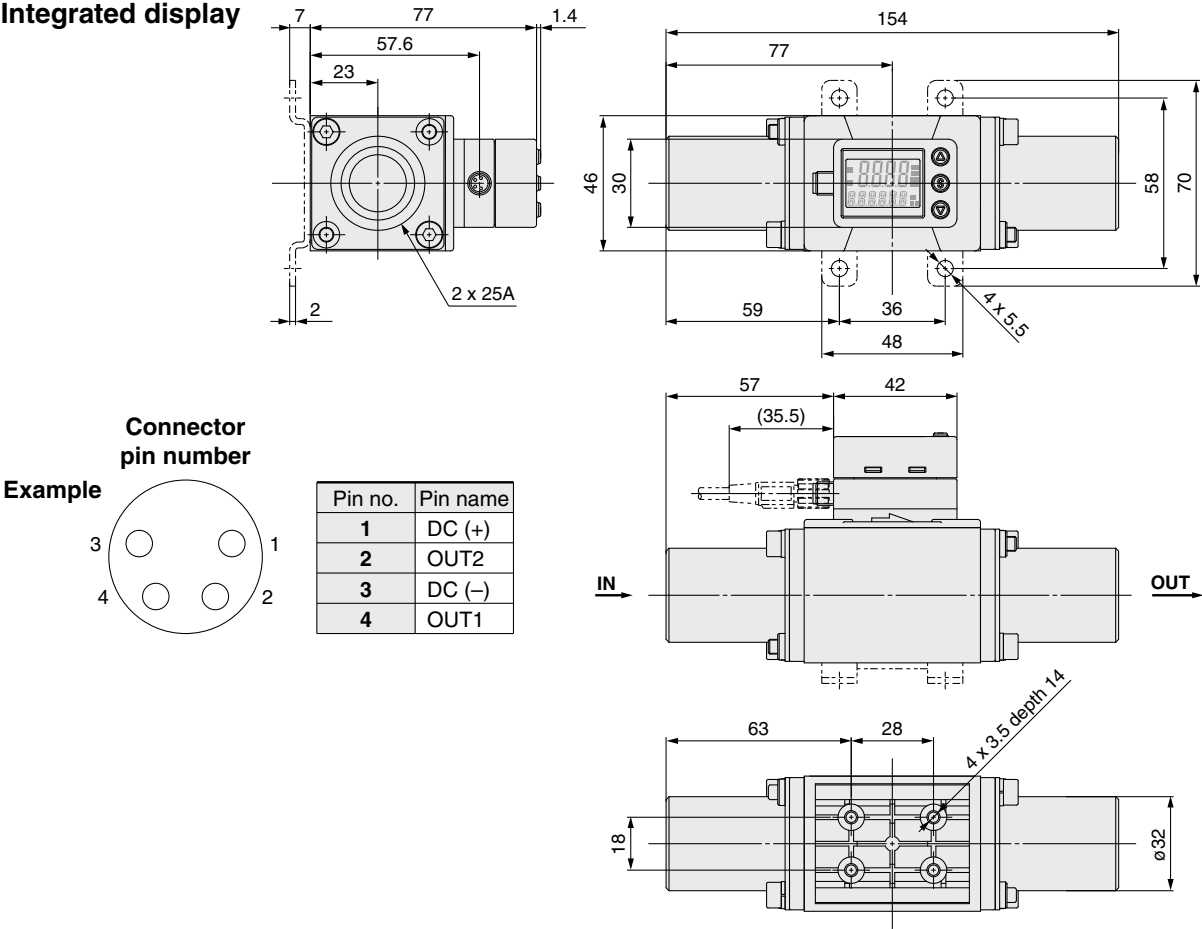
No.	Description	Part no.	Qty.
1	PVC pipe (25A)	ZS-40-U25	1
	PVC pipe (30A)	ZS-40-U30	1
5	25A retaining plate (M5 x 80 with two hexagonal socket head cap screws)	ZS-40-U25-A	1
	30A retaining plate (M5 x 80 with two hexagonal socket head cap screws)	ZS-40-U30-A	1

* Replacing the PVC pipe may cause accuracy to fluctuate by 1 to 2%.

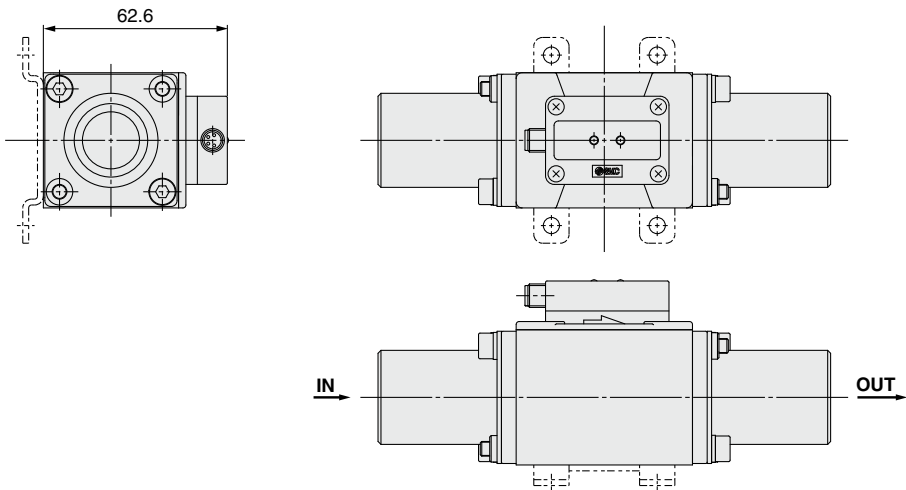
Series PF3W

Dimensions

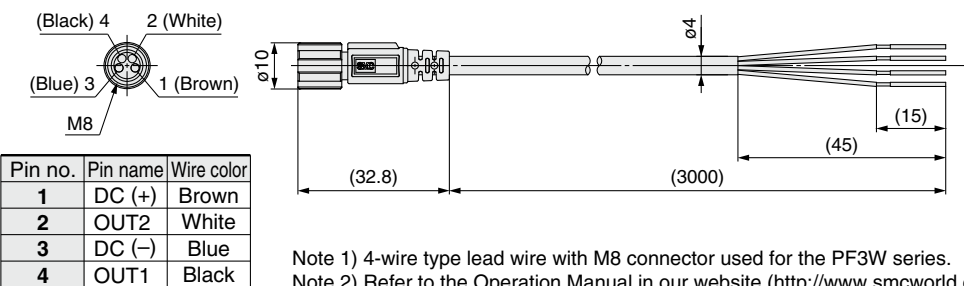
PF3W711-U25 Integrated display



PF3W511-U25 Remote sensor unit



ZS-40-A Lead wire with M8 connector



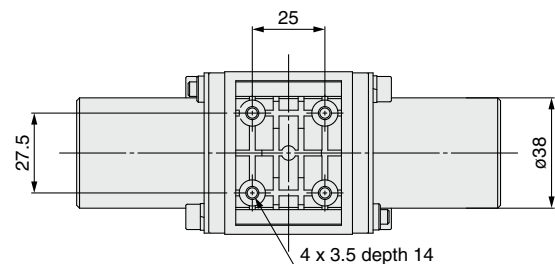
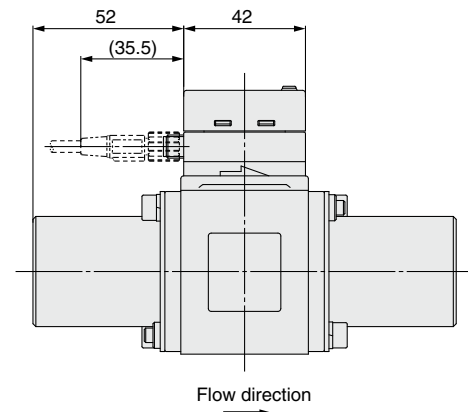
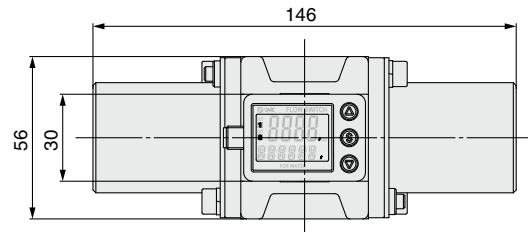
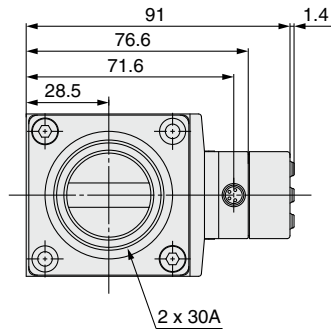
Lead Wire Specifications

Conductor	Nominal cross section	AWG23
	O.D.	Approx. 0.7 mm
Insulator	Material	Heat resistant PVC
	O.D.	Approx. 1.1 mm
Sheath	Material	Heat and oil resistant PVC
	Finished O.D.	ø4

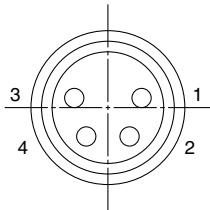
Note 1) 4-wire type lead wire with M8 connector used for the PF3W series.
Note 2) Refer to the Operation Manual in our website (<http://www.smcworld.com>) for wiring.

Dimensions

PF3W721-U30 Integrated display

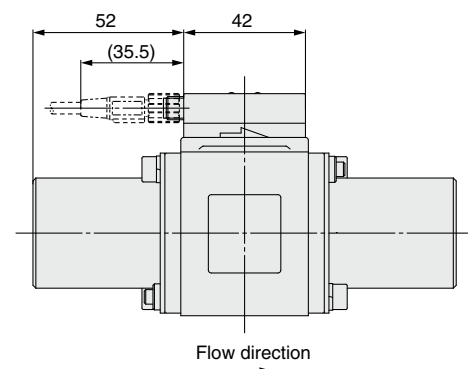
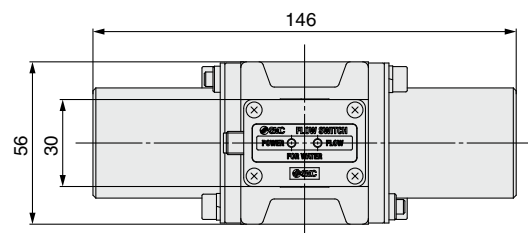
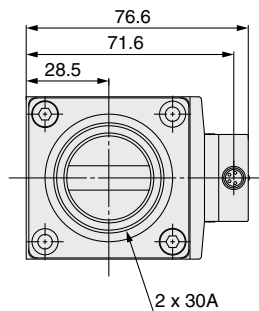


Body side
Connector pin number

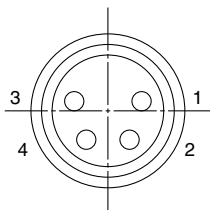


Pin no.	Pin name
1	DC (+)
2	OUT2
3	DC (-)
4	OUT1

PF3W521-U30 Remote sensor unit



Body side
Connector pin number



Pin no.	Pin name
1	DC (+)
2	Not used
3	DC (-)
4	OUT1

3-Color Display Digital Flow Switch for Water
PF3W

3-Color Display Digital Flow Switch for PVC Piping
PF3W

3-Color Display Digital Flow Monitor for Water
PF3W3

Function
Details

Series *PF3W* Made to Order

Please consult SMC for detailed dimensions, specifications and delivery.



Symbol

-X109

1 Seal material EPDM

Seal material for wetted parts changed to EPDM

PF3W5 - U - - - X109

PF3W7 - U - - - X109

• Seal material EPDM

Refer to "How to Order," page 11 for details.

3-color display



Digital Flow Monitor for Water

RoHS

Series PF3W3



How to Order

PF3W 30 A - M V C

Type

3 Remote monitor unit

For remote sensor units, select the analog output 1 to 5 V type.
Applicable sensors: PF3W5□□-□□-1(T)

Output specification

Symbol	OUT1	OUT2
A	NPN	NPN
B	PNP	PNP
C	NPN	Analog 1 to 5 V
D	NPN	Analog 4 to 20 mA
E	PNP	Analog 1 to 5 V
F	PNP	Analog 4 to 20 mA
G	NPN	External input
H	PNP	External input
J	Analog 1 to 5 V	Analog 1 to 5 V
K	Analog 4 to 20 mA	Analog 4 to 20 mA

In combination with remote sensor unit with temperature sensor, only OUT2 can be set for temperature sensor output.

Lead wire

Nil	With power supply/output connection lead wire (2 m) Power supply/output connection lead wire ZS-40-W
N	Without power supply/output connection lead wire

Lead wire is not connected, but shipped together.

Remote monitor unit/Unit specification

Symbol	Instantaneous flow rate	Accumulated flow	Temperature
M	L/min	L	°C
G	gal/min	gal	°C
F	gal/min	gal	°F
J	L/min	L	°F

* Under the New Measurement Law, units other than SI (symbol "M") cannot be used in Japan.

Note) G, F, J: Made to Order

Reference: 1 [L/min] ↔ 0.2642 [gal/min]

1 [gal/min] ↔ 3.785 [L/min]

°F = 9/5°C + 32

Calibration certificate (Only flow monitor)

Nil	None
A	With calibration certificate

* The certificate is written in both English and Japanese.

Option 2

Nil	None
C	Sensor connector (1 pc.) Sensor connector (e-con)

Connector is not connected, but shipped together.

Option 1

Nil	None
T	Panel mount adapter Waterproof seal (accessory) Panel mount adapter Mounting screw (M3 x 8 L) (accessory) Panel
V	Front protective cover + Panel mount adapter Front protective cover Panel mount adapter Mounting screw (M3 x 8 L) (accessory) Waterproof seal (accessory) Panel

Options/Part No.

When optional parts are required separately, use the following part numbers to place an order.

Description	Part no.	Note
Panel mount adapter	ZS-26-B	With waterproof seal and screws
Front protective cover + Panel mount adapter	ZS-26-C	With waterproof seal and screws
Front protective cover only	ZS-26-01	Separately order panel mount adapter etc.
Power supply/output connection lead wire	ZS-40-W	Lead wire length (2 m)
Sensor connector (e-con)	ZS-28-CA-4	1 pc.
Lead wire with connector for copying	ZS-40-Y	Connect up to 10 slave units

Series PF3W3

Refer to "Handling Precautions for SMC Products" for Flow Switch Precautions and the Operation Manual in our website for Specific Product Precautions.

Specifications

Model		PF3W30□				
Display flow range		0.35 to 4.50 L/min (Flow under 0.35 L/min is displayed as "0.00")	1.7 to 18.0 L/min (Flow under 1.7 L/min is displayed as "0.0")	3.5 to 45.0 L/min (Flow under 3.5 L/min is displayed as "0.0")	7 to 112 L/min (Flow under 7 L/min is displayed as "0")	20 to 280 L/min (Flow under 20 L/min is displayed as "0")
Set flow range		0.35 to 4.50 L/min	1.7 to 18.0 L/min	3.5 to 45.0 L/min	7 to 112 L/min	20 to 280 L/min
Minimum setting unit		0.01 L/min	0.1 L/min		1 L/min	2 L/min
Conversion of accumulated pulse		0.05 L/pulse	0.1 L/pulse	0.5 L/pulse	1 L/pulse	2 L/pulse
Display unit		Instantaneous flow rate: L/min, Accumulated flow: L				
Accuracy		Display value: ±0.5% F.S. Analog output: ±0.5% F.S.				
Repeatability		±0.5% F.S.				
Temperature characteristics		±0.5% F.S. (25°C reference)				
Accumulated flow range Note 1)		99999999.9 L		999999999 L		
Switch output		By 0.1 L	By 0.5 L	By 1 L		
	NPN or PNP open collector output					
	Maximum load current					
	Maximum applied voltage					
	Internal voltage drop					
	Response time Note 2)					
	Output protection					
	Output Flow rate mode					
Analog output	Temperature	Select from hysteresis mode, window comparator mode, accumulated output mode, or accumulated pulse output mode.				
	Response time Note 3)	Select from hysteresis mode or window comparator mode.				
	Voltage output	1 s/2 s (linked with the switch output)				
	Current output	Voltage output: 1 to 5 V Output impedance: 1 kΩ				
Hysteresis		Output current: 4 to 20 mA Max. load impedance: 300 Ω for 12 VDC, 600 Ω for 24 VDC				
External input		Variable				
Input/output		Voltage free input: 0.4 V or less (Reed or Solid state), input for 30 ms or longer				
Display method		Input for copy mode				
Indicator light		2-screen display (Main screen: 4-digit, 7-segment, 2-color, Red/Green Sub screen: 6-digit, 11-segment, White), Display values updated 5 times per second				
Power supply voltage		Output 1, Output 2: Orange				
Current consumption		12 to 24 VDC ±10%				
Connection		50 mA or less				
Environment	Enclosure	Power supply output 5P connector, sensor connection 4P connector (e-con)				
	Operating temperature range	IP40 (Only front face of the panel is IP65 when panel mount adapter and waterproof seal of optional parts are used.)				
	Operating humidity range	0 to 50°C (with no freezing and condensation)				
	Withstand voltage	Operation, Storage: 35 to 85% R.H. (with no condensation)				
Insulation resistance		1000 VAC for 1 minute between terminals and housing				
Standards and regulations		50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing				
Weight	Without power supply/output connection lead wire	CE marking, UL (CSA), RoHS				
	With power supply/output connection lead wire	50 g				
		100 g				

Note 1) Cleared by turning off the power supply. It is possible to select the function to memorize it. (Every 2 or 5 minutes) When 5 minutes memorizing is selected, the lifetime of the memory element (electronic part) is 1 million times (5 minutes x 1 million times = 5 million minutes = Approx. 9.5 years for 24 hour energizing). Calculate the lifetime based on your operating conditions before using the memorizing function, and do not exceed it.

Note 2) The response time when the set value is 90% in relation to the step input. (The response time is 7 s when it is output by the temperature sensor.)

Note 3) The response time until the set value reaches 90% in relation to the step input. (The response time is 7 s when it is analog output by the temperature sensor.)

Temperature Sensor Specifications

Rated temperature range	0 to 100°C ^{Note 1)}
Setting/Display temperature range	-10 to 110°C
Minimum setting unit	1°C
Display unit	°C
Analog output accuracy	$\pm 3\%$ F.S.
Response time	7 s ^{Note 2)}
Ambient temperature characteristics	$\pm 5\%$ F.S.

Note 1) The rated temperature range is for the temperature sensor alone. The fluid temperature range specification of the flow switch as a whole is 0 to 90°C.

Note 2) The response time is for the temperature sensor alone.

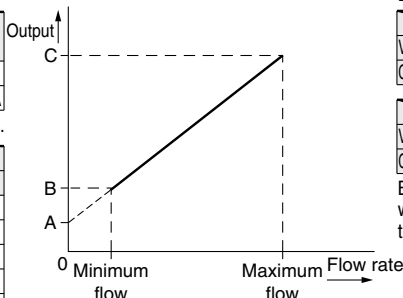
Analog Output

Flow rate/Analog output

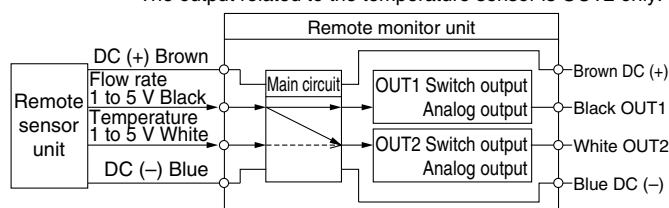
	A	B		C
		04/20/40	11	21
Voltage output	1 V	1.5 V	1.4 V	1.5 V
Current output	4 mA	6 mA	5.6 mA	5.9 mA

The values of B vary according to the range.

Model	Flow rate [L/min]	
	Minimum	Maximum
PF3W504	0.5	4
PF3W520	2	16
PF3W540	5	40
PF3W511	10	100
PF3W521	30	250



The output related to the temperature sensor is OUT2 only.

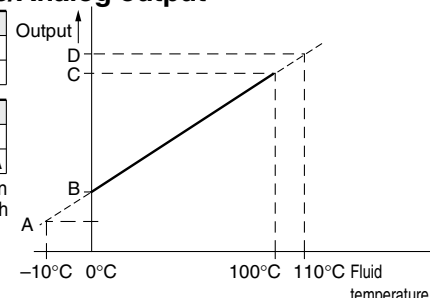


The OUT2 can be selected from the output for temperature or flow rate by button operation.

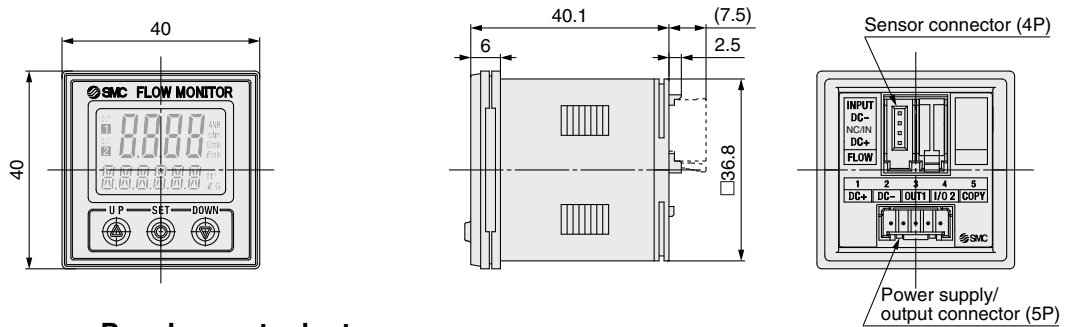
Fluid temperature/Analog output

	A	B
Voltage output	0.6 V	1 V
Current output	2.4 mA	4 mA

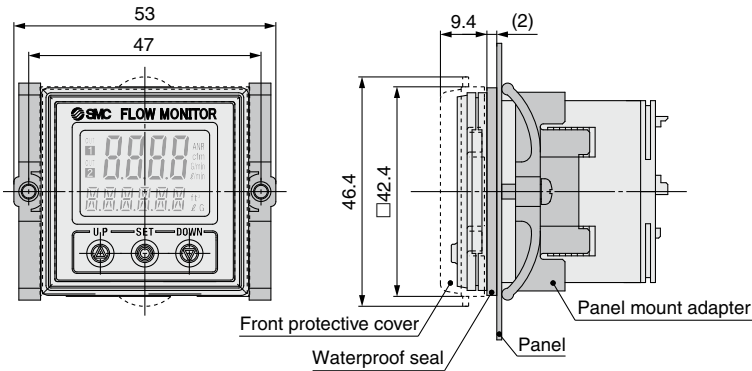
Be sure to use in combination with remote sensor unit with temperature sensor.



Dimensions

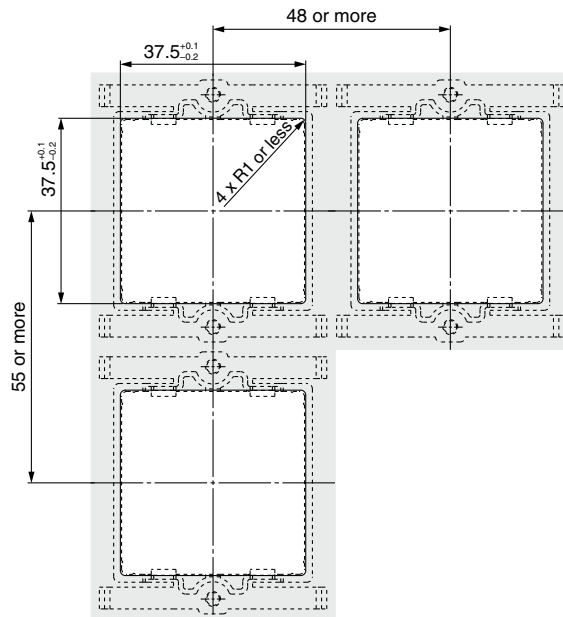


Front protective cover + Panel mount adapter

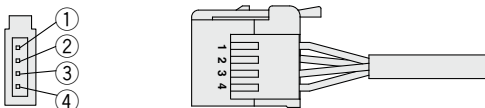


Panel fitting dimensions

Applicable panel thickness:
0.5 to 8 mm (Without waterproof seal)
0.5 to 6 mm (With waterproof seal)



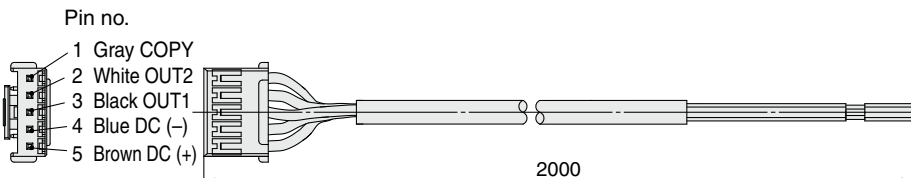
Sensor connector



Pin no.	Terminal	Connector no.	Lead wire color*
①	DC (+)	1	Brown
②	N.C./IN	2	White (Not used/Temperature sensor 1 to 5 V input)
③	DC (-)	3	Blue
④	INPUT	4	Black (Flow rate sensor 1 to 5 V input)

* When using the lead wire with M8 connector included with the PF3W5 series

Power supply/output connection lead wire



Lead Wire Specifications

Conductor	Nominal cross section	AWG26
O.D.	Approx. 0.5 mm	
Insulator	Material	Cross-linked vinyl
O.D.	Approx. 1.0 mm	
Color	Brown, Blue, Black, White, Gray	
Sheath Material	Oil and heat resistant vinyl	
Finished O.D.	ø3.5	

Note) Refer to the Operation Manual in our website (<http://www.smcworld.com>) for wiring.

Function Details 1

Integrated Display (Series PF3W7)/Remote Monitor Unit (Series PF3W3)

Output operation

The output operation can be selected from the following:
 Output (hysteresis mode and window comparator mode) corresponding to instantaneous flow rate,
 Output corresponding to accumulated flow,
 Accumulated pulse output
 Note) At the time of shipment from the factory, it is set to hysteresis mode and normal output.
 When a temperature sensor is attached, the output to the temperature sensor is selectable only for OUT2.
 (Refer to "How to Order" for details.)

Indication color

The indication color can be selected for each output condition. The selection of the indication color provides visual identification of abnormal values. (The indication color depends on OUT1 setting.)

ON: Green, OFF: Red
ON: Red, OFF: Green
Always: Red
Always: Green

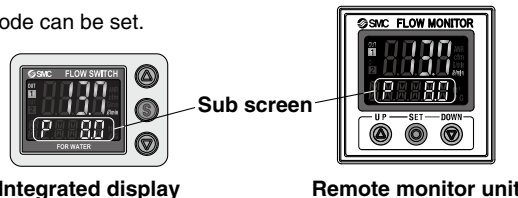
Response time

The response time can be selected depending on the application. (1 second for default setting)
 Abnormalities can be detected more quickly by setting the response time to 0.5 seconds.
 The effect of the pump fluctuation and flickering of the display can be reduced by setting the response time to 2 seconds.
 Note) The temperature sensor output is fixed to 7 seconds.

Response time	Applicable model	
	Integrated display Series PF3W7	Remote monitor unit Series PF3W3
0.5 seconds	●	—
1 second	●	●
2 seconds	●	●

Selection of display on sub screen

The display on the sub screen in measuring mode can be set.



Set value display	Accumulated value display	Peak value display	Bottom value display
Displays the set value. (The set value of OUT2 cannot be displayed.) 	Displays the accumulated value. (The accumulated value of OUT2 cannot be displayed.) 	Displays the peak value. 	Displays the bottom value.
Line name display	Fluid temperature display	OFF	
Displays the line name. (Up to 6 alphanumeric characters can be input.) 	Displays the fluid temperature. (When the temperature sensor type is selected.) 	Displays nothing. 	

* The above are examples of integrated displays. (Same as remote monitor unit)

Power saving mode

The display can be turned off to reduce the power consumption.
 In power saving mode, decimal points blink on the main screen.
 If any button is pressed during power saving mode, the display is recovered for 30 seconds to check the flow, etc.

Setting of secret code

Users can select whether a secret code must be entered to release key lock. At the time of shipment from the factory, it is set such that the secret code is not required.

External input function

This function can be used when external input is available. The accumulated value, peak value, and bottom value can be reset by remote control.

Accumulated flow external reset:

This function resets the accumulated value to "0" when an input signal is applied.

In accumulated increment mode, the value will be zero when reset, and the accumulated value will increase from zero.

In accumulated decrement mode, the value will be the set value when reset, and the accumulated value will decrease from the set value.

* When the accumulated value is memorized, every time the accumulated value external reset is activated, the memory element (EEPROM) will be accessed. Take into consideration the maximum number of times the memory element can be accessed, 1 million times. The total of external input times and accumulated value memorizing time interval should not exceed 1 million times.

Peak and bottom reset: Peak and bottom values are reset.

Forced output function

Output is turned ON/OFF compulsorily when starting the system or during maintenance. This enables confirmation of the wiring and prevents system errors due to unexpected output.

For the analog output type, the output will be 5 V or 20 mA for ON and 1 V or 4 mA for OFF.

* Also, the increase or decrease of the flow and temperature will not change the on/off status of the output while the forced output function is activated.

Accumulated value hold function

Accumulated value can be saved on the unit even when the power supply is turned off.

The accumulated value is memorized every 2 or 5 minutes during measurement, and continues from the last memorized value when the power supply is turned on again.

The lifetime of the memory element is 1 million access cycles. Take this into consideration before using this function.

Peak/Bottom value indication

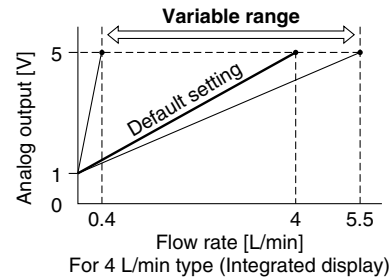
The maximum (minimum) flow is detected and updated from when the power supply is turned on. In peak (bottom) value indication mode, this maximum (minimum) flow is displayed.

Keylock function

Prevents operation errors such as accidentally changing setting values.

■ Analog output free range function

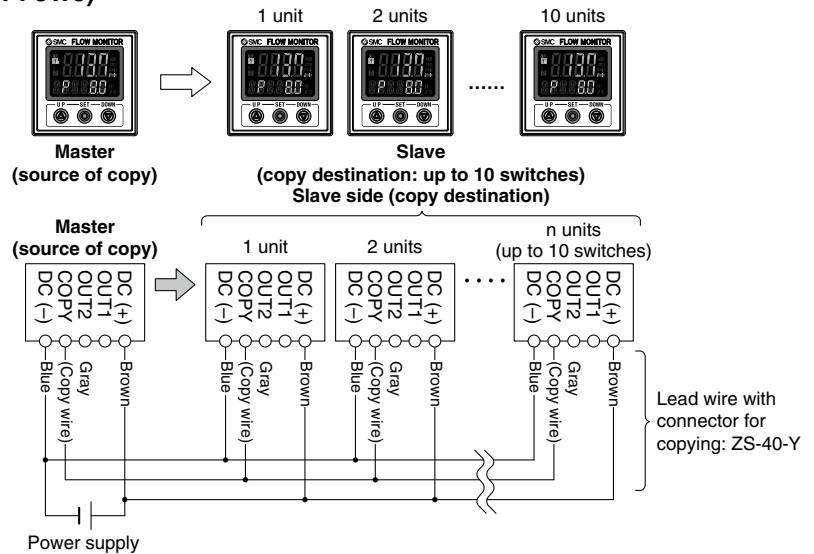
Flow rate value that generates an output of 5 V or 20 mA can be changed. (This function is not available for the analog output to the temperature.) This function is available if the analog output type is used. The value can be changed within 10% of the maximum rated flow to the maximum display flow range.



■ Copy function (Remote monitor unit/Series PF3W3)

The settings of the master sensor (source of copy) can be copied to the slave sensors, reducing setting labor and minimizing risk of mistakes in setting.

Can copy to up to 10 switches simultaneously.
(Maximum transmission distance 4 m)



■ Error indication function

When a failure or error arises, the location and contents are displayed.

Indication	Description	Contents	Action	Applicable model	
				Integrated display Series PF3W7	Remote monitor unit Series PF3W3
Er1	OUT1 over current error	Load current of 80 mA or more is applied to the switch output (OUT1).	Eliminate the cause of the over current by turning off the power supply, and then turn on it again.	●	●
Er2	OUT2 over current error	Load current of 80 mA or more is applied to the switch output (OUT2).		●	●
HHH	Excessive instantaneous flow rate	Flow exceeds the upper limit of indicated flow rate range (rated flow x approx. 1.4).	Decrease the flow.	●	●
LLL	Unconnected sensor error	Remote sensor unit is not connected to the monitor unit. Or, sensor output is less than 0.6 V.	Connect the sensor or check the sensor output voltage.	—	●
999999999 (alternately displays [999] and [999999])	Excessive accumulated flow	Flow exceeds the accumulated flow range. (Decimal points start blinking due to the flow range.)	Reset the accumulated flow value. (This error does not matter when the accumulated flow is not used.)	●	●
cHHH	Over upper limit of temperature	Fluid temperature exceeds 110°C.	Lower the fluid temperature.	●	●
cLLL	Under lower limit of temperature	Fluid temperature is under -10°C.	Raise the fluid temperature.	●	●
	Unconnected temperature sensor error	Temperature sensor output wire is not connected.	Connect the temperature output wire.	—	●
	Temperature sensor failure	Temperature sensor is not connected to the remote sensor unit.	Check if or not the remote sensor unit is connected to a temperature sensor.	—	●
Er0	System error	Internal data error	Turn off the power supply and then turn on it again. If the failure cannot be solved, please contact SMC for investigation.	●	●
Er4				●	●
Er6				●	●
Er8				●	●
Er12	Temperature sensor failure	Temperature sensor may be damaged.		●	—

If the failure cannot be solved after the above instructions are performed, please contact SMC for investigation.

Series PF3W

Function Details 2

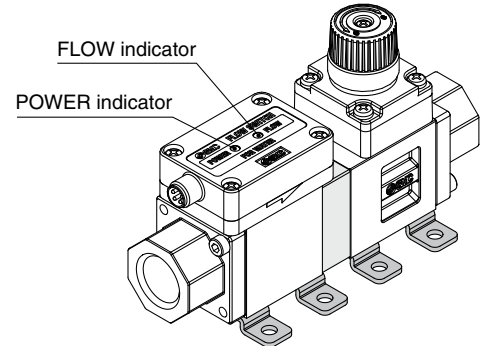
Remote Sensor Unit (Series PF3W5)

■POWER indicator function

It is possible to check whether power supply is reaching the product. When power is supplied to the product, the indicator lights up green.

■FLOW indicator function

Status of the flow rate can be checked visually. When the flow rate increases, the green lamp blinks faster. When below the measurable lower limit of flow rate, the lamp turns off, when above the measurable upper limit of flow rate, red lamp turns on.



■Error indication function

When a failure or error arises, the location and contents are displayed.

LED display	Description	Contents	Action
POWER Green Red FLOW FLOW indicator: Red ON	Over upper limit of flow rate	Flow is approximately 110% or more of the rated flow.	Decrease the flow.
POWER Red POWER indicator: Blinking red	Temperature measurement range error	Fluid temperature is either below -10°C or above 110°C .	Adjust the fluid temperature within the measurable temperature range.
POWER Red Red FLOW POWER indicator: Blinking red FLOW indicator: Red ON	Over upper limit of flow rate and temperature measurement range error	Refer to above.	Refer to above.

LED display	Description	Contents	Action
POWER Red Red FLOW POWER indicator: Red ON FLOW indicator: Red ON	System error	Internal data error or other errors occur.	Turn off the power supply and then turn on it again. If the failure cannot be solved, please contact SMC for investigation.
POWER Red Red FLOW POWER indicator: Red ON FLOW indicator: Blinking red			
POWER Red OFF FLOW POWER indicator: Red ON FLOW indicator: OFF		Temperature sensor may be damaged.	

If the failure cannot be solved after the above actions are performed, please contact SMC for investigation.



Applicable Fluids

Material and Fluid Compatibility Check List (Guide)

Chemical		Compatibility
Ammonium hydroxide		×
Isobutyl alcohol		× Note 3)
Isopropyl alcohol		○ Note 1), 2)
Hydrochloric acid	Concentration 30% or less	○ Note 2)
Hydrogen peroxide	Concentration 5% or less	○
Nitric acid (except fuming nitric acid)	Concentration 10% or less	○ Note 2)
Deionized water		○
Sodium hydroxide (caustic soda)	Concentration 50% or less	× Note 3)
Sulfuric acid (except fuming sulfuric acid)		○
Phosphoric acid		○



The material and fluid compatibility check list provides reference values as a guide only, therefore we do not guarantee the application to our product.

Note 1) Since static electricity may be generated, implement suitable countermeasures.

Note 2) Fluid may pass through. Fluid that has passed through may have an impact on components made of different materials.

Note 3) Karman vortex measurement cannot be carried out due to high viscosity.

• SMC is not responsible for its accuracy and any damage happened because of this data.

Table symbols

- : Can be used
- : Can be used under certain conditions
- ×: Cannot be used

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- *1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

- The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- Only personnel with appropriate training should operate machinery and equipment.**
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
 - The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
 - When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
 - Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 - Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 - Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
 - An application which could have negative effects on people, property, or animals requiring special safety analysis.
 - Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

- The product is provided for use in manufacturing industries.**
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

- The warranty period of the product is 1 year in service or 1.5 years after the product is delivered whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
- For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

- The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Revision history

- Edition B**
- Addition of remote type
 - Addition of units with flow adjustment valve
 - Addition of 100 L/min type
 - Addition of PVC piping type
 - Number of pages from 16 to 32

PR

- Edition C**
- Addition of 250 L/min type
 - Addition of analog output 4 to 20 mA 2 output (-X128) as made to order
 - Addition of piping material brass (-X143) as made to order
 - Number of pages from 32 to 28

QW

 **Safety Instructions** Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

SMC Corporation

Akihabara UDX 15F,
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN
Phone: 03-5207-8249 Fax: 03-5298-5362
<http://www.smcworld.com>
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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

D-DN

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