

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) <small>Note 1)</small>				
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 <small>(Flow under 0.35 L/min is displayed as "0.00")</small>	1.7 to 22.0 L/min <small>(Flow under 1.7 L/min is displayed as "0.0")</small>	3.5 to 55.0 L/min <small>(Flow under 3.5 L/min is displayed as "0.0")</small>	7 to 140 L/min <small>(Flow under 7 L/min is displayed as "0")</small>	20 to 350 L/min <small>(Flow under 20 L/min is displayed as "0")</small>
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		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. <small>Note 2)</small>				
Temperature characteristics	±5% F.S. (25°C reference)				
Operating pressure range <small>Note 3)</small>	0 to 1 MPa				
Proof pressure <small>Note 3)</small>	1.5 MPa				
Pressure loss (without flow adjustment valve)	45 kPa or less at the maximum flow				
Accumulated flow range <small>Note 4)</small>	99999999.9 L		999999999 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 <small>Note 2), 5)</small>	0.5 s/1 s/2 s				
Output protection	Short circuit protection				
Output mode	Select from hysteresis mode, window comparator mode, accumulated output mode, or accumulated pulse output mode.				
Flow rate mode	Select from hysteresis mode or window comparator mode.				
Response time <small>Note 6)</small>	0.5 s/1 s/2 s (linked with the switch output)				
Analog 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) 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	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 <small>Note 7)</small>	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 <small>Note 8)</small>	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	890 g
	With temperature sensor/Without flow adjustment valve	285 g	335 g	530 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.

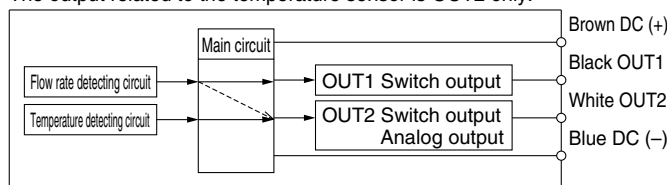
Temperature Sensor Specifications

Rated temperature range	0 to 100°C <small>Note 1)</small>
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 <small>Note 2)</small>
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.

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 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		Non-grease				
Weight		3/8	3/8, 1/2	1/2, 3/4	3/4, 1	1 1/4, 1 1/2
	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 PF3W504	0.5 L/min 0.35 L/min 0.35 L/min	4 L/min	5.5 L/min 5.5 L/min							
PF3W720 PF3W520		2 L/min 1.7 L/min 1.7 L/min	16 L/min 22 L/min 22 L/min							
PF3W740 PF3W540			5 L/min 3.5 L/min 3.5 L/min	40 L/min 55 L/min 55 L/min						
PF3W711 PF3W511			10 L/min 7 L/min 7 L/min	100 L/min			140 L/min 140 L/min			
PF3W721				20 L/min 20 L/min	50 L/min			250 L/min	350 L/min 350 L/min	
PF3W521				20 L/min 20 L/min	50 L/min			250 L/min 280 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.

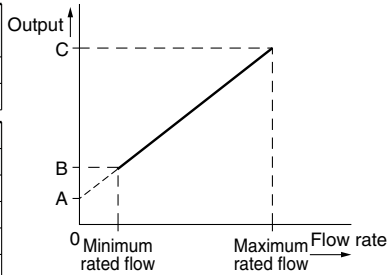
Rated flow range Display flow range Set flow range

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

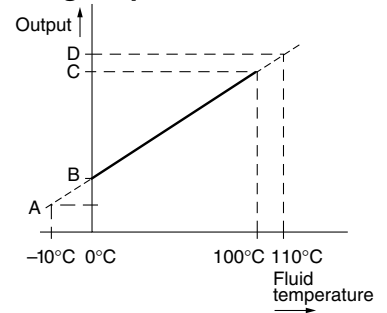
Model	Rated flow [L/min]	
	Minimum	Maximum
PF3W704/504	0.5	4
PF3W720/520	2	16
PF3W740/540	5	40
PF3W711/511	10	100
PF3W721/521	50	250



Fluid temperature/Analog output

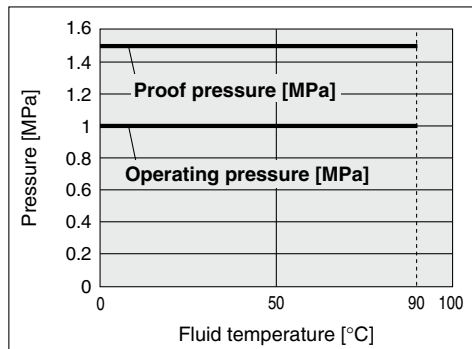
	A	B
Voltage output	0.6 V	1 V
Current output	2.4 mA	4 mA

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

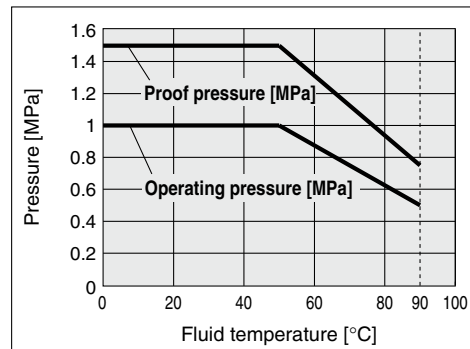


Operating Pressure and Proof Pressure

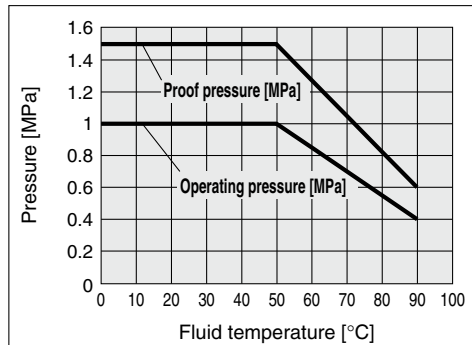
PF3W704/720/740/504/520/540



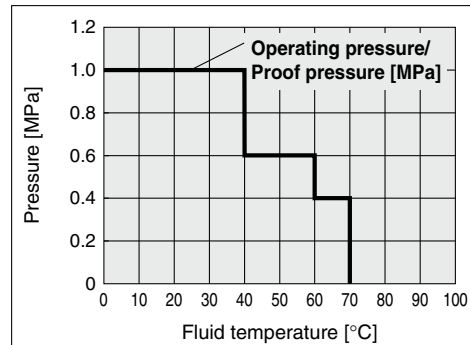
PF3W704S/720S/740S/504S/520S/540S



PF3W711/511



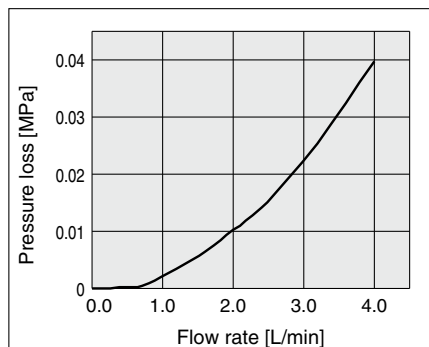
PF3W721/521



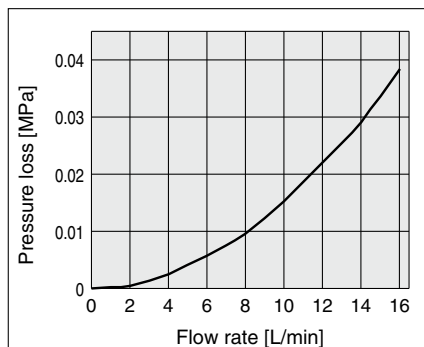
Series PF3W

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

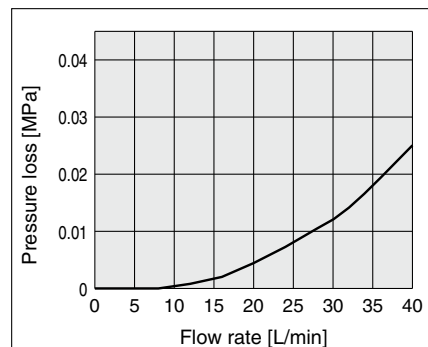
PF3W704/504



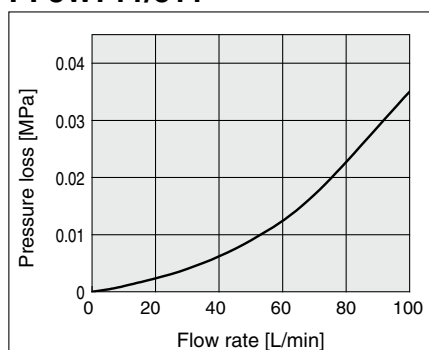
PF3W720/520



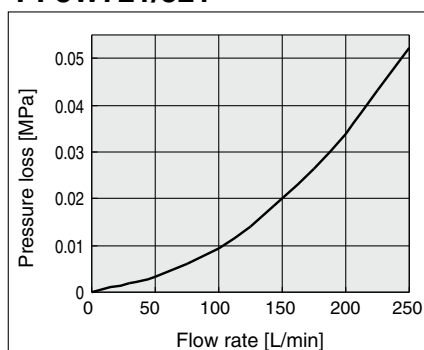
PF3W740/540



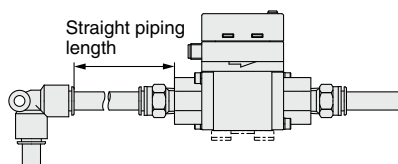
PF3W711/511



PF3W721/521



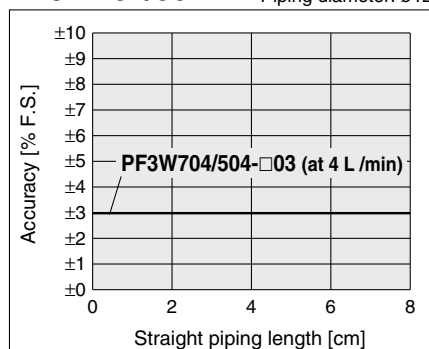
Straight Piping Length and Accuracy (Reference Value)



- 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)

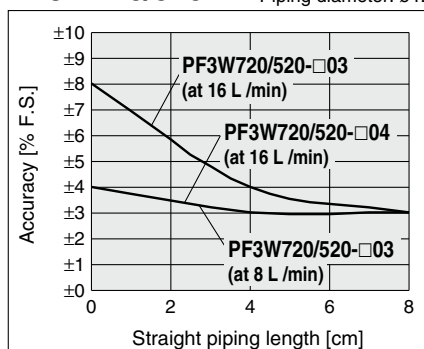
PF3W704/504

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



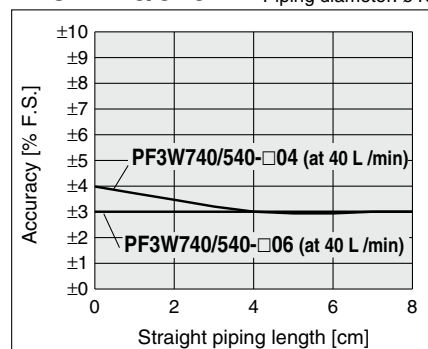
PF3W720/520

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



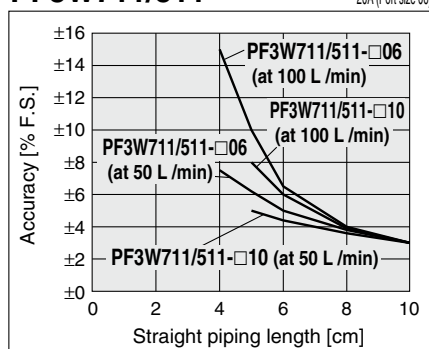
PF3W740/540

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



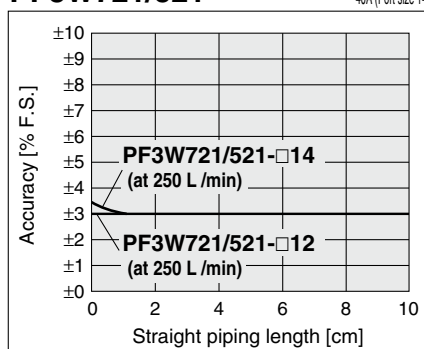
PF3W711/511

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



PF3W721/521

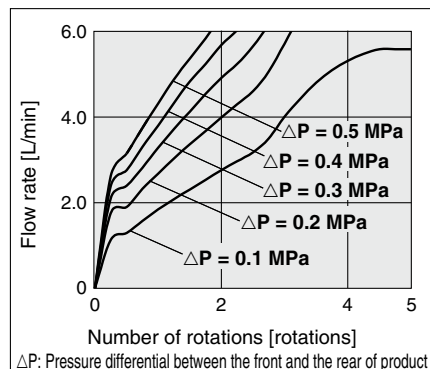
Pressure: 0.3 MPa Piping diameter: 32A (Port size 12)
40A (Port size 14)



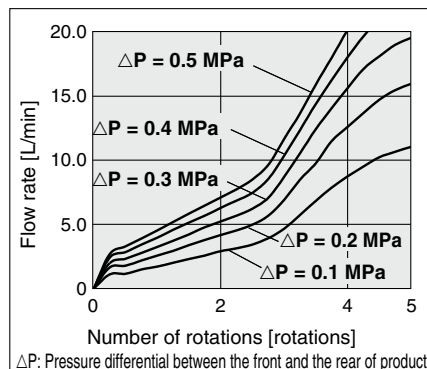
* No data for 4 cm, or for under 5 cm, as these cannot be used due to piping dimensions.

Flow-rate Characteristics of Flow Adjustment Valve

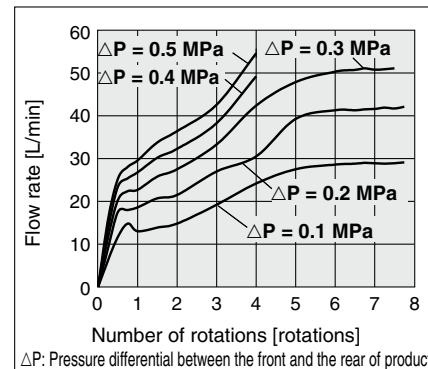
PF3W704S/504S



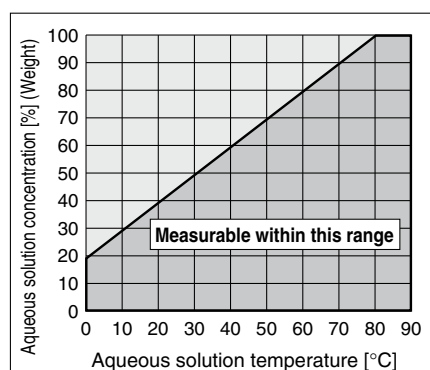
PF3W720S/520S



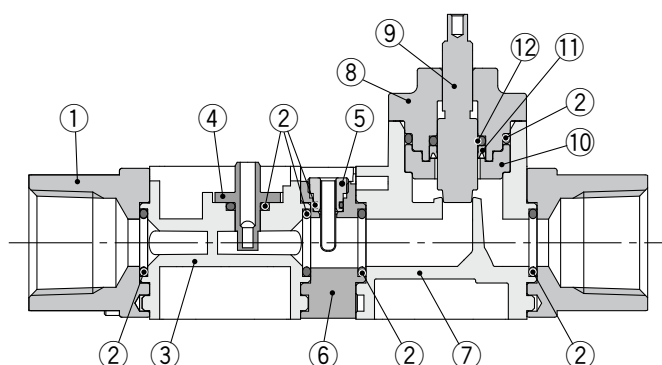
PF3W740S/540S



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	

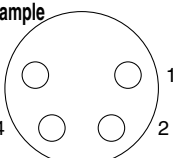
Series PF3W

Dimensions

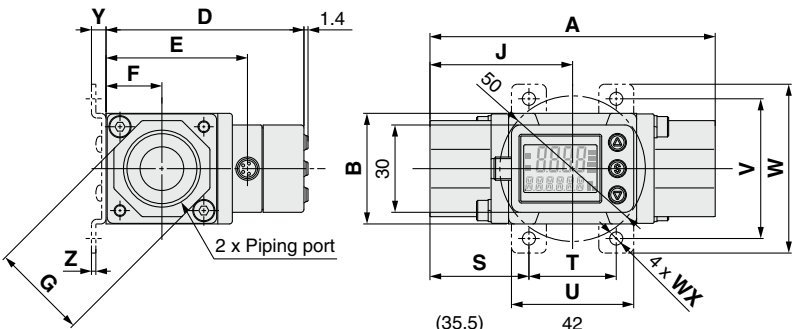
PF3W704/720/740/711/721
Integrated display

Connector
pin number

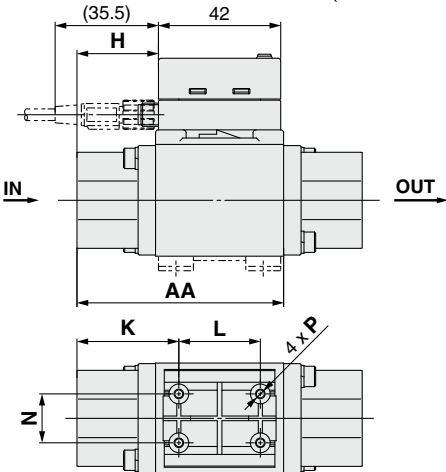
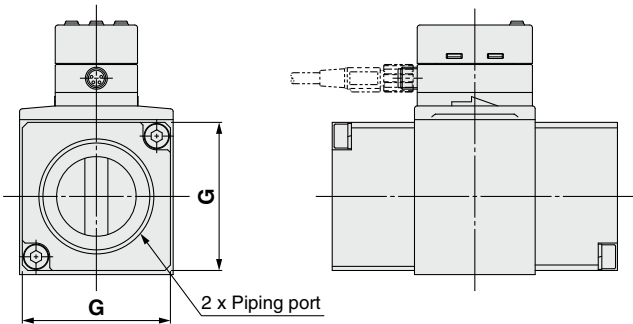
Example



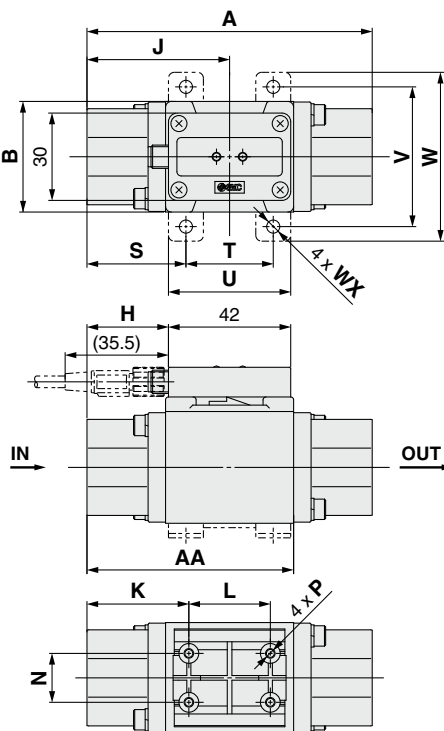
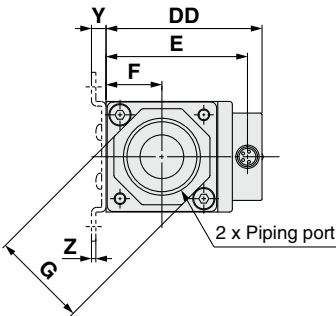
Pin no.	Pin name
1	DC (+)
2	OUT2
3	DC (-)
4	OUT1



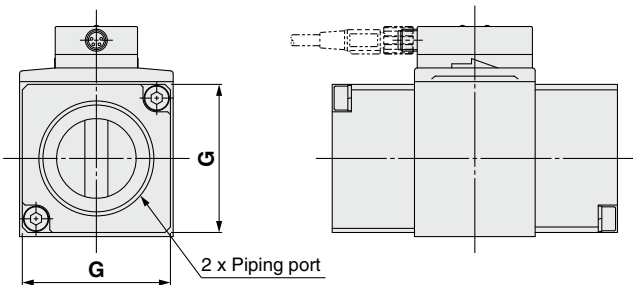
For PF3W721



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



For PF3W521

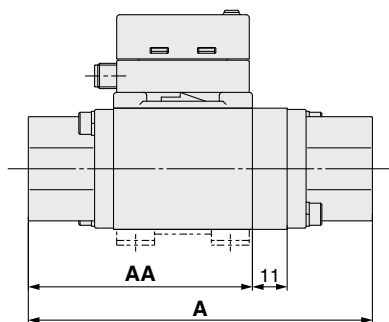


Model	Port size (Rc, NPT, G)	A	AA	B	D	DD	E	F	G	H	J	K	L	N	P	Bracket dimensions							
																S	T	U	V	W	WX	Y	Z
PF3W704/504	3/8	70	50	30	60	45.6	40.6	15.2	24	14	35	26	18	13.6	ø2.7 depth 14	24	22	32	40	50	4.5	5	1.5
PF3W720/520	3/8, 1/2	78	54	30	60	45.6	40.6	15.2	27	18	39	30	18	13.6	ø2.7 depth 12	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

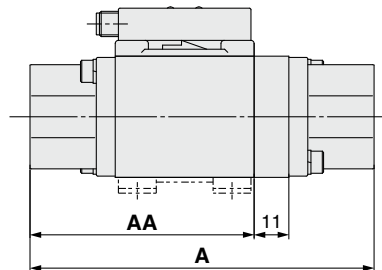


(mm)

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

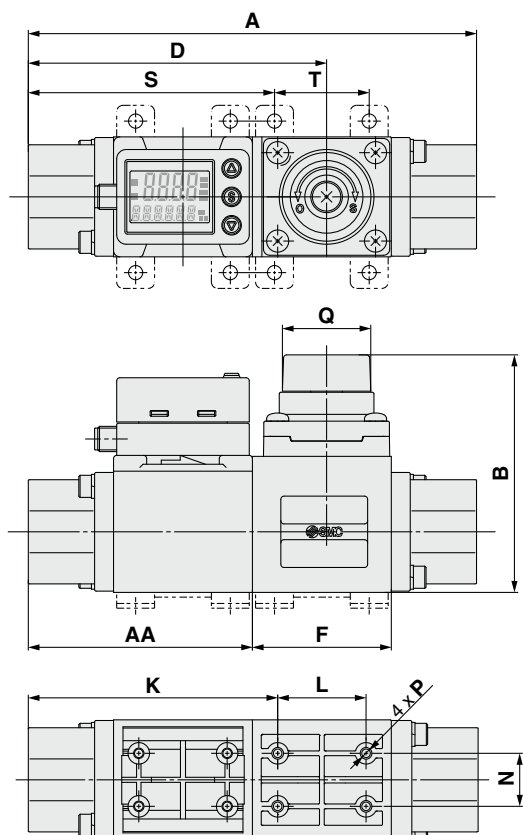
PF3W504/520/540/511-□-□T

Remote sensor unit: With temperature sensor



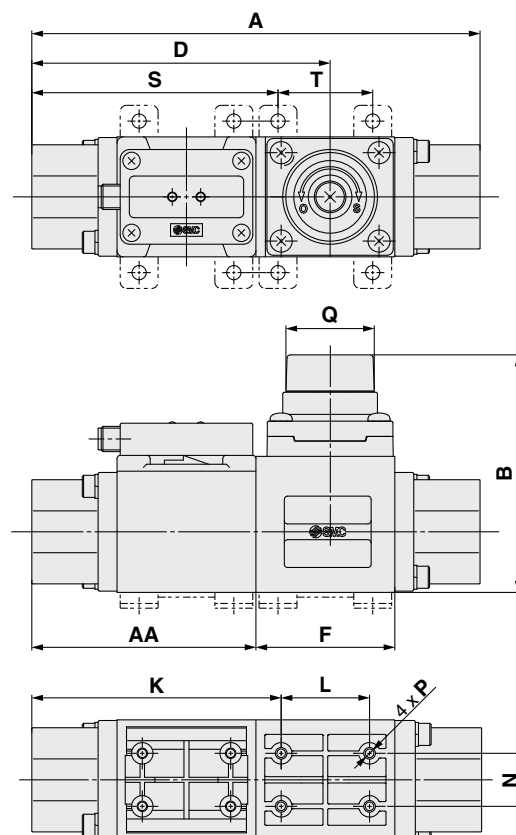
PF3W704S/720S/740S

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