

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

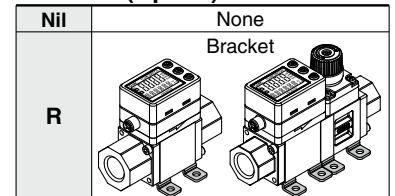
Note) Applicable only for remote type with temperature sensor (Refer to page 10.)

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) <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 (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. <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				
	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 Flow rate mode	Select from hysteresis mode, window comparator mode, accumulated output mode, or accumulated pulse output mode.				
Temperature 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	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	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.

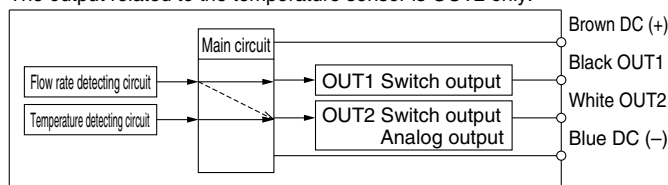
Temperature Sensor Specifications

Rated temperature range	0 to 100°C <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.