

# 3-Color Display Digital Flow Switch for Water

CE <sup>\*4</sup> **UL** <sup>\*4</sup> **US**  
\*4 Excludes -X445

**3-color/2-screen display**

**RoHS**

**IP65**



Main screen Instantaneous flow rate\*1  
Sub screen Set value



Instantaneous flow rate\*1

Accumulated value

Peak/Bottom value

Line name

Fluid temperature\*2

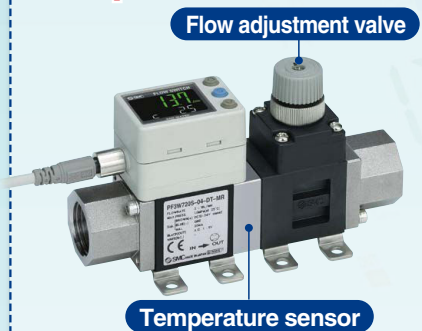
- \*1 Main screen shows the instantaneous flow rate only.
- \*2 Fluid temperature can be displayed only when the digital flow switch with a temperature sensor is selected.
- \*3 Sub screen can be turned off.

**IO-Link** compatible products  
**New** have been added to the integrated display type. **p. 16**



Made to order  
PF3W7□-X445

**Integrated flow adjustment valve and temperature sensor**



**Remote type**



**PVC piping type**



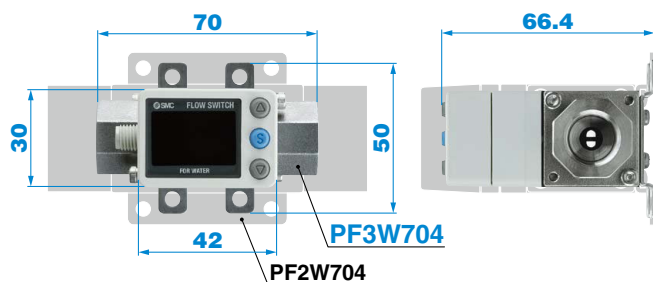
- Applicable fluid: Deionized water, chemical liquids, etc.
- Integrated type and remote type added to series

**PF3W Series**

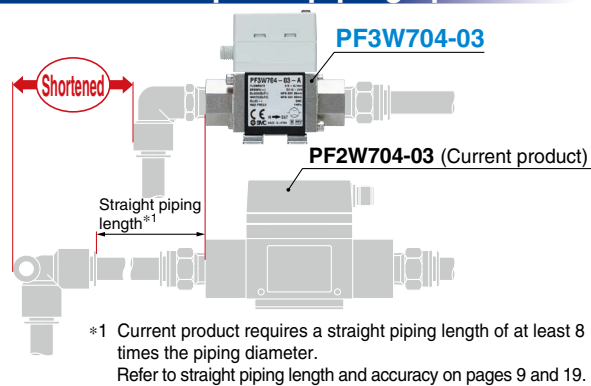
**SMC**

CAT.ES100-80D

**40% smaller than the current product**



**Reduced required piping space**



## Temperature sensor

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

Smallest settable increment: **1°C**

Analog output:  
Current output/Voltage output



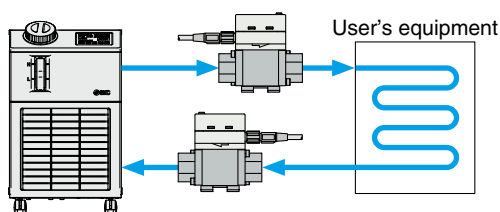
Temperature display



**Fluid temperature: 0 to 90°C**

**Ethylene glycol aqueous solution can be used.**

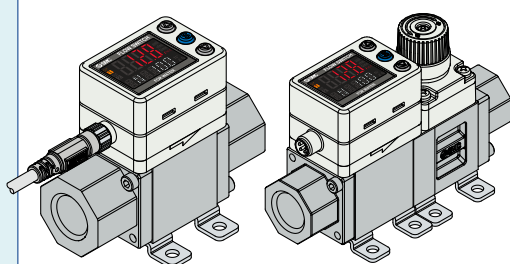
Example) Flow control of the circulating fluid in a chiller



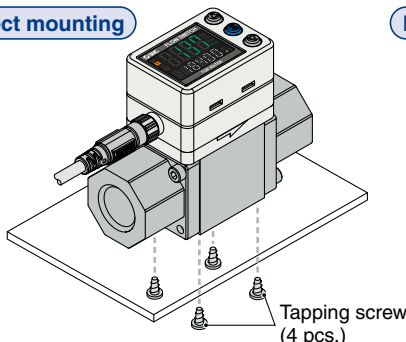
**Non-grease**

## Mounting

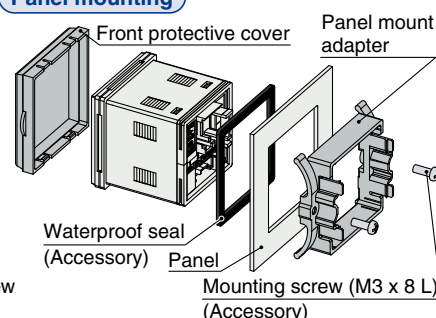
### Bracket mounting



### Direct mounting



### Panel mounting

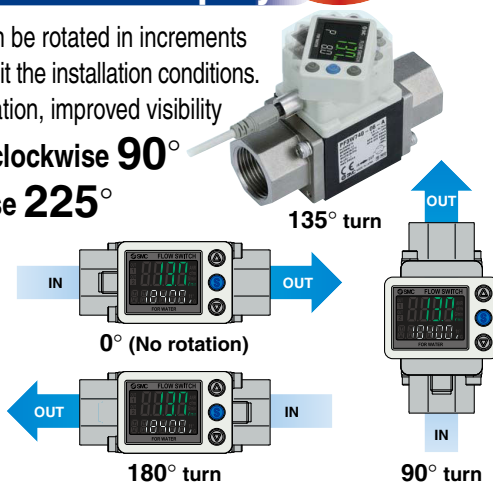


**Rotatable display**

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

Counterclockwise 90°

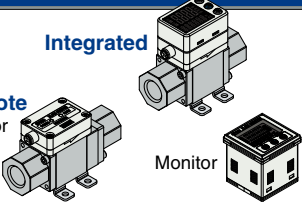
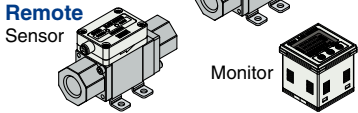
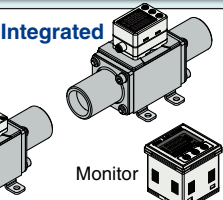
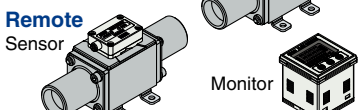
Clockwise 225°





# Added: Measured flow rate **250 L/min** type

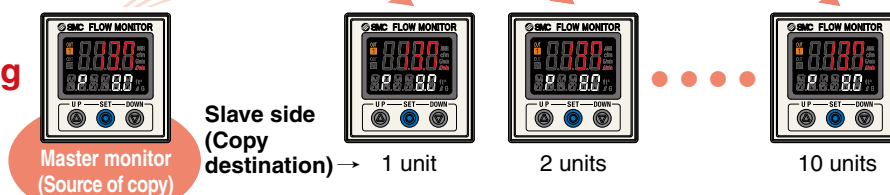
## Variations

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	
<b>Integrated</b>  <b>Remote Sensor</b> 	Water	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
		50 to 250		—		—	1 1/4, 1 1/2
<b>PVC piping type</b> <b>Integrated</b>  <b>Remote Sensor</b> 	Deionized water	10 to 100		—	—	—	25A
	Chemical liquids	30 to 250		—	—	—	30A

## 3-color display Digital flow monitor: The set value can be copied to up to **10** flow monitors simultaneously.

The settings of the master monitor (source of copy) can be copied to the slave monitors.

- **Reduced setting labor**
- **Minimized risk of setting mistakes**



## Indicator

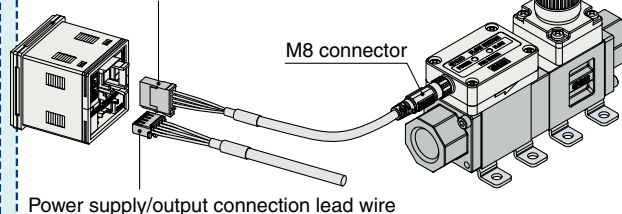
Visually check the status of the sensor via the indicator.



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

## Connector reduces wiring labor

e-con connector:  
No tools or peeling required.



## PVC piping type



Wetted Parts

Pipe	CPVC (Heat-resistant PVC)
Body	PPS
Seal	FKM

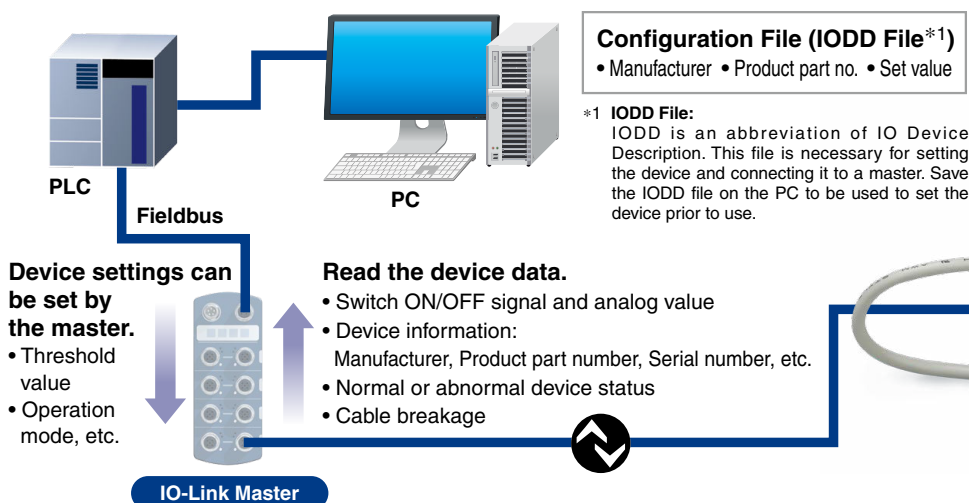
# IO-Link Compatible PF3W7□-X445

p. 16

## Supports the IO-Link communication protocol



IO-Link is an open communication interface technology between the sensor/actuator and the I/O terminal that is an international standard, IEC61131-9.



## Implement diagnostic bits in the process data.

The diagnostic bit in the cyclic process data makes it easy to find problems with the equipment.

It is possible to find problems with the equipment in real time using the cyclic (cycle) data and to monitor such problems in detail with the noncyclic (aperiodic) data.

### Process Data

Process Data

Bit offset	Item	Note	Diagnosis items															
0	OUT1 output	0: OFF 1: ON	<ul style="list-style-type: none"><li>• Over current error</li><li>• Above the rated flow range</li><li>• Accumulated flow error</li><li>• Above the rated temperature range</li><li>• Below the rated temperature range</li><li>• Internal product malfunction</li><li>• Temperature sensor failure</li></ul>															
1	OUT2 output	0: OFF 1: ON																
8	Diagnosis (error)	0: OFF 1: ON																
9	Diagnosis (flow rate)	0: OFF 1: ON																
10	Diagnosis (temperature)	0: OFF 1: ON																
16 to 31	Measured temperature value	Signed 16 bit																
32 to 47	Measured flow rate value	Signed 16 bit																
Bit offset	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32		
Item	Measured flow rate value (PD)																	
Bit offset	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16		
Item	Measured temperature value (PD)																	
Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
Item	Reservation					Temperature	Flow rate	Error	Reservation					OUT2	OUT1			
						Diagnosis								Switch output				

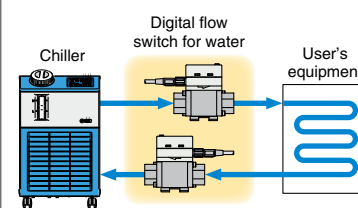
- Diagnosis items**
- Over current error
  - Above the rated flow range
  - Accumulated flow error
  - Above the rated temperature range
  - Below the rated temperature range
  - Internal product malfunction
  - Temperature sensor failure

### Application Examples

#### For the predictive maintenance of cooling water problems

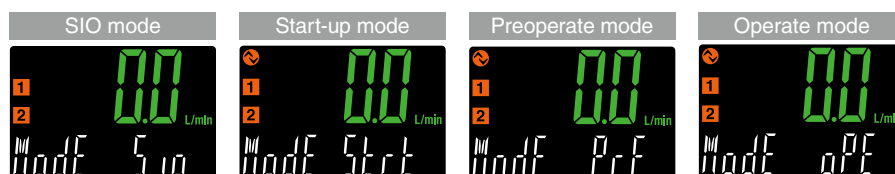
Monitors flow rate and temperature's "switch ON/OFF signals" and "analog values" to determine the cooling status

The process and cooling status can be compared.



## Display function

Displays the output communication status and indicates the presence of communication data



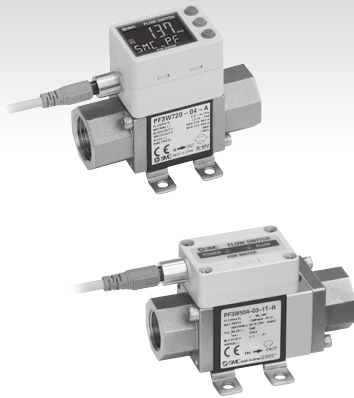
### Operation and Display

Communication with master	IO-Link status indicator light	Status	Screen display	Description
Yes	*1	Normal	Operate	Mode aPE
			Start up	Mode Start
			Preoperate	Mode Pre
	*1 (Flashing)	Abnormal	Version does not match	Er 15 v 1.0
			Lock	Mode Lock
No	OFF	Communication disconnection	Mode aPE	Normal communication was not received for 1 second or longer.
			Mode Start	
			Mode Pre	
		SIO mode	Mode SIO	General switch output

\*1 In IO-Link mode, the IO-Link indicator will be ON or flashing.

# CONTENTS

- 3-Color Display** Digital Flow Switch for Water *PF3W Series*
- 3-Color Display** Digital Flow Switch for PVC Piping *PF3W Series*
- 3-Color Display** Digital Flow Monitor for Water *PF3W3 Series*



## **3-Color Display** Digital Flow Switch for Water PF3W Series

How to Order.....	p. 5
Specifications (Integrated Display) .....	p. 6
Specifications (Remote Sensor Unit) .....	p. 7
Temperature Sensor Specifications .....	p. 6, 7
Set Flow Range and Rated Flow Range.....	p. 7
Analog Output .....	p. 8
Operating Pressure and Proof Pressure.....	p. 8
Flow Rate Characteristics (Pressure Loss: Without Flow Adjustment Valve) .....	p. 9
Straight Piping Length and Accuracy (Reference Value) .....	p. 9
Flow Rate Characteristics of Flow Adjustment Valve.....	p. 10
Measurable Range for Ethylene Glycol Aqueous Solution (Reference Value).....	p. 10
Wetted Parts Construction .....	p. 10
Internal Circuits and Wiring Examples .....	p. 11
Dimensions.....	p. 12
Made to Order	
EPDM seal material (-X109) .....	p. 15
Analog 4 to 20 mA 2-output type (-X128).....	p. 15
Brass piping material specification (-X143) .....	p. 15
IO-Link compatible (-X445) .....	p. 16

## **3-Color Display** Digital Flow Switch for PVC Piping PF3W Series

How to Order.....	p. 17
Specifications (Integrated Display) .....	p. 18
Analog Output .....	p. 18
Operating Pressure and Proof Pressure.....	p. 18
Specifications (Remote Sensor Unit) .....	p. 19
Flow Rate Characteristics (Pressure Loss) .....	p. 19
Straight Piping Length and Accuracy (Reference Value) .....	p. 19
Wetted Parts Construction .....	p. 20
Internal Circuits and Wiring Examples .....	p. 11
Dimensions.....	p. 21
Made to Order	
EPDM seal material (-X109) .....	p. 23

## **3-Color Display** Digital Flow Monitor for Water PF3W3 Series

How to Order.....	p. 24
Specifications .....	p. 25
Analog Output .....	p. 25
Internal Circuits and Wiring Examples .....	p. 26
Dimensions.....	p. 27

Function Details .....	p. 28
Applicable Fluids.....	p. 31
Safety Instructions.....	Back cover

# 3-Color Display

## Digital Flow Switch for Water

# PF3W Series



RoHS

### How to Order

#### Remote sensor unit Output specification/Temperature sensor

For how to order of remote monitor unit, refer to page 24.



Remote sensor unit  
Integrated display



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”).
- \* Analog output of 4 to 20 mA with temperature sensor is made to order. (Refer to page 15.)

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
		04 20 40 11 21
Nil	None	● ● ● ● ●
S	Yes	● ● ● — —

- \* 100 and 250 L/min types with flow adjustment valves are not available.
- \* The flow adjustment valve of this product is not suitable for applications which require constant adjustment of flow rate.

- \*1 External input: The accumulated value, peak value, and bottom value can be reset.

- \*2 For units with temperature sensor, only 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*1	—	
H	PNP	External input*1	—	
AT	NPN	(NPN) *2	NPN	With temperature sensor
BT	PNP	(PNP) *2	PNP	
CT	NPN	(Analog 1 to 5 V) *2	Analog 1 to 5 V	
DT	NPN	(Analog 4 to 20 mA) *2	Analog 4 to 20 mA	
ET	PNP	(Analog 1 to 5 V) *2	Analog 1 to 5 V	
FT	PNP	(Analog 4 to 20 mA) *2	Analog 4 to 20 mA	

### Options/Part Nos.

When only optional parts are required, order with the part numbers listed below.

Description	Part no.	Qty.	Note
Bracket*1	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

- \*1 For units with flow adjustment valve, 2 brackets are required.

#### Remote sensor unit/Unit printed on label

Symbol	Instantaneous flow	Temperature
Nil	L/min	°C
G*1	L/min (gal/min)	°C/°F

- \*1 Under the New Measurement Act, units other than SI (symbol “Nil”) cannot be used in Japan.
- \* 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 for flow rate)

Nil	None
A	With calibration certificate

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

#### Made to order

X109	EPDM seal material
X128	Analog 4 to 20 mA 2-output type*1
X143	Brass piping material specification
X445	IO-Link compatible*2

- \*1 Applicable only for remote type with temperature sensor (Refer to page 15.)
- \*2 Integrated display type only

#### Bracket (Option)

Nil	None
R	With bracket

- \* Bracket is not available for 250 L/min type.

#### Integrated display/Unit specification

Symbol	Instantaneous flow	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 Act, units other than SI (symbol “M”) cannot be used in Japan.
- \* 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 (Option)

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



For flow switch precautions and specific product precautions, refer to the "Operation Manual" on the SMC website.

## 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)* <sup>1</sup>				
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
Smallest settable increment	0.01 L/min	0.1 L/min	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 (No freezing or condensation)				
Display unit	Instantaneous flow: L/min, Accumulated flow: L				
Accuracy	Display value: ±3% F.S. Analog output: ±3% F.S.				
Repeatability	±2% F.S.* <sup>2</sup>				
Temperature characteristics	±5% F.S. (25°C standard)				
Operating pressure range* <sup>3</sup>	0 to 1 MPa				
Proof pressure* <sup>3</sup>	1.5 MPa				
Pressure loss (without flow adjustment valve)	45 kPa or less at the maximum flow				
Accumulated flow range* <sup>4</sup>	99999999.9 L				
	By 0.1 L	By 0.5 L	By 1 L		
Switch output	NPN or PNP open collector output				
Max. load current	80 mA				
Max. applied voltage	28 VDC				
Internal voltage drop	NPN: 1 V or less (at load current of 80 mA) PNP: 1.5 V or less (at load current of 80 mA)				
Response time* <sup>2, 5</sup>	0.5 s/1 s/2 s				
Output protection	Short-circuit protection				
Output mode	Select from Hysteresis, Window comparator, Accumulated output, or Accumulated pulse output modes.				
Flow rate mode	Select from Hysteresis mode or Window comparator mode.				
Temperature mode					
Response time* <sup>6</sup>	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 (No freezing or condensation)				
Operating humidity range	Operation, Storage: 35 to 85% R.H. (No condensation)				
Withstand voltage* <sup>7</sup>	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 (EMC directive/RoHS directive), UL (CSA)				
Wetted parts material* <sup>8</sup>	PPS, Stainless steel 304, FKM, SCS13				
Piping port size* <sup>9</sup>	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
	With temperature sensor/Without flow adjustment valve	285 g	335 g	530 g	860 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	

\*1 Refer to the graph of measurable range for ethylene glycol aqueous solution on page 10. Measurement is possible as long as the fluid does not corrode the wetted parts and viscosity is 3 mPa·s (3 cP) or less. Be aware that water leakage may occur due to internal seal shrinkage or swelling depending on the type of fluid.

\*2 If 0.5 s is selected for the response time of the switch output, the repeatability will be ±3% F.S.

\*3 The operating pressure range and proof pressure may change according to the fluid temperature. Refer to the graphs on page 8.

\*4 Cleared when the power supply is turned off. The hold function can be selected. (Intervals of 2 or 5 minutes can be selected.)

If the 5-minute interval is selected, the life of the memory element (electronic parts) is limited to 1 million times. (If energized for 24 hours, life is calculated as 5 minutes x 1 million = 5 million minutes = about 9.5 years.) Therefore, if using the hold function, calculate the memory life for your operating conditions, and use within this life.

\*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.)

\*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.)

\*7 When the temperature sensor is used, it will be 250 VAC.

\*8 For details, refer to "Wetted Parts Construction" on page 10.

\*9 When the piping diameter or piping passage is restricted, the specifications may not be satisfied.

\* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

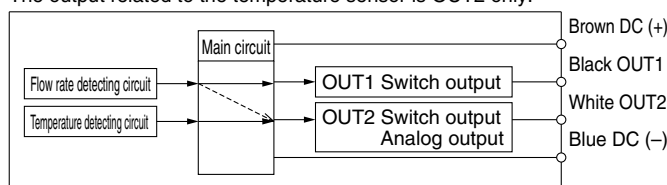
## Temperature Sensor Specifications

Rated temperature range	0 to 100°C* <sup>1</sup>
Set/Display temperature range	-10 to 110°C
Smallest settable increment	1°C
Display unit	°C
Display accuracy	±2°C
Analog output accuracy	±3% F.S.
Response time	7 s* <sup>2</sup>
Ambient temperature characteristics	±5% F.S.

\*1 The rated temperature range refers solely to that of the temperature sensor. The fluid temperature range specification of the flow switch as a whole is 0 to 90°C.

\*2 The response time refers solely to that of the temperature sensor.

The output related to the temperature sensor is OUT2 only.



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

# PF3W Series

For flow switch precautions and specific product precautions, refer to the "Operation Manual" on the SMC website.

## Specifications (Remote Sensor Unit)

Refer to page 25 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)* <sup>1</sup>				
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 (No freezing or condensation)				0 to 70°C (No freezing or condensation)
Accuracy		±3% F.S.				
Repeatability		±2% F.S.				
Temperature characteristics		±5% F.S. (25°C standard)				
Operating pressure range* <sup>2</sup>		0 to 1 MPa* <sup>2</sup>				
Proof pressure* <sup>2</sup>		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* <sup>3</sup>	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 (No freezing or condensation)				
	Operating humidity range	Operation, Storage: 35 to 85% R.H. (No condensation)				
	Withstand voltage* <sup>4</sup>	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 (EMC directive/RoHS directive), UL (CSA)				
Wetted parts material* <sup>5</sup>		PPS, Stainless steel 304, FKM, SCS13				
Piping port size* <sup>6</sup>		Non-grease				
		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				

- \*<sup>1</sup> Refer to the graph of measurable range for ethylene glycol aqueous solution on page 10. Measurement is possible as long as the fluid does not corrode the wetted parts and viscosity is 3 mPa·s (3 cP) or less. Be aware that water leakage may occur due to internal seal shrinkage or swelling depending on the type of fluid.
- \*<sup>2</sup> The operating pressure range and proof pressure may change according to the fluid temperature. Refer to the graphs on page 8.
- \*<sup>3</sup> 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.)
- \*<sup>4</sup> When the temperature sensor is used, it will be 250 VAC.
- \*<sup>5</sup> For details, refer to "Wetted Parts Construction" on page 10.
- \*<sup>6</sup> When the piping diameter or piping passage is restricted, the specifications may not be satisfied.
- \* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

## Temperature Sensor Specifications

Rated temperature range	0 to 100°C* <sup>1</sup>
Analog output accuracy	±3% F.S.
Response time	7 s* <sup>2</sup>
Ambient temperature characteristics	±5% F.S.

- \*<sup>1</sup> The rated temperature range refers solely to that of the temperature sensor. The fluid temperature range specification of the flow switch as a whole is **0 to 90°C**.
- \*<sup>2</sup> The response time refers solely to that of the temperature sensor.

## Set Flow Range and Rated Flow Range



### Caution

**Set the flow rate within the rated flow range.**

The set flow range is the range of flow rate within which setting is possible.

The rated flow range is the range within which the sensor specifications (accuracy, etc.) are satisfied.

It is possible to set a value outside of the rated flow range if it is within the set flow range. However, the satisfaction of the specifications cannot be guaranteed.

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

\* For the PF3W5 series, the display flow range and set flow range are the same as those of the flow monitor PF3W3 series.

Rated flow range Display flow range Set flow range

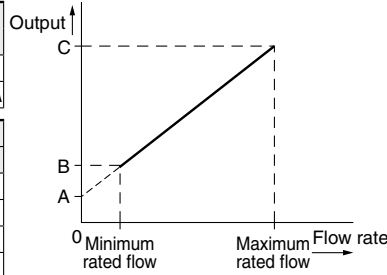


## Analog Output

### Flow rate/Analog output

	A	B			C
Voltage output	1 V	1.5 V	1.4 V	1.8 V	5 V
Current output	4 mA	6 mA	5.6 mA	7.2 mA	20 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

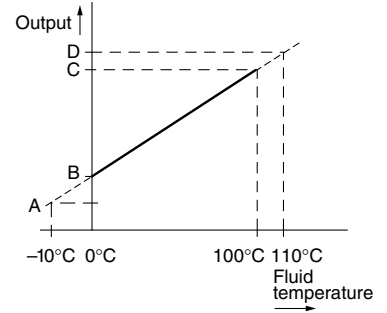


### Fluid temperature/Analog output

#### PF3W7/5

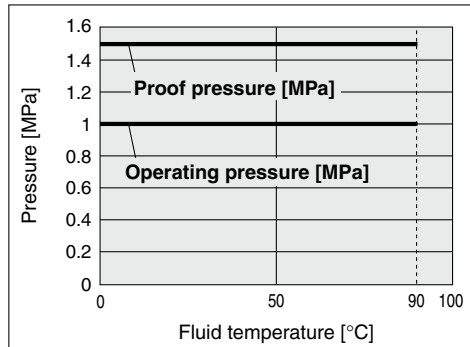
	A	B
Voltage output	0.6 V	1 V
Current output	2.4 mA	4 mA

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

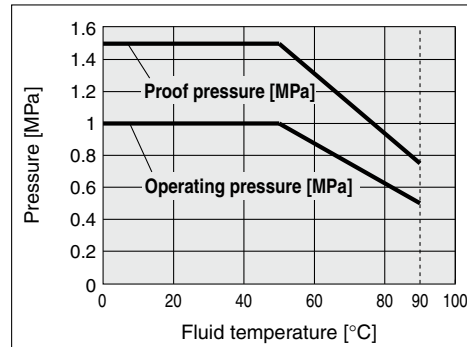


## Operating Pressure and Proof Pressure

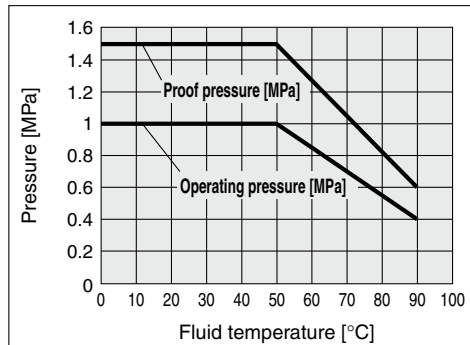
### PF3W704/720/740/504/520/540



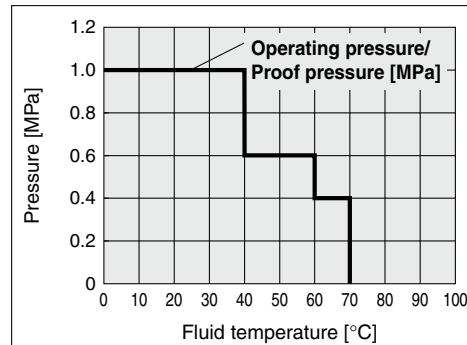
### PF3W704S/720S/740S/504S/520S/540S



### PF3W711/511



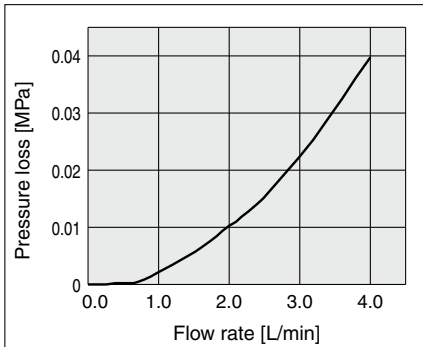
### PF3W721/521



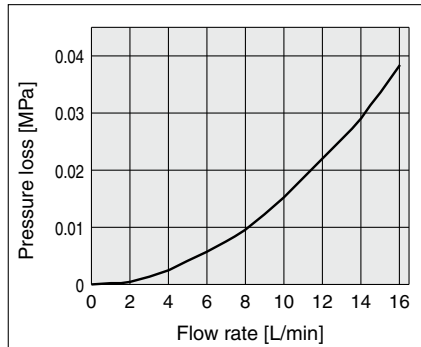
# PF3W Series

## Flow Rate Characteristics (Pressure Loss: Without Flow Adjustment Valve)

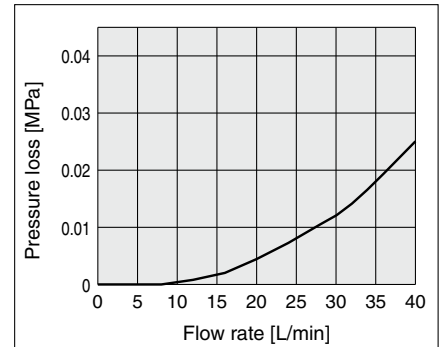
**PF3W704/504**



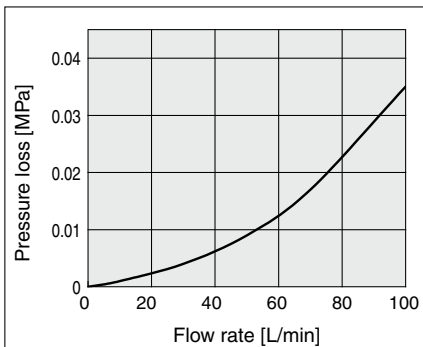
**PF3W720/520**



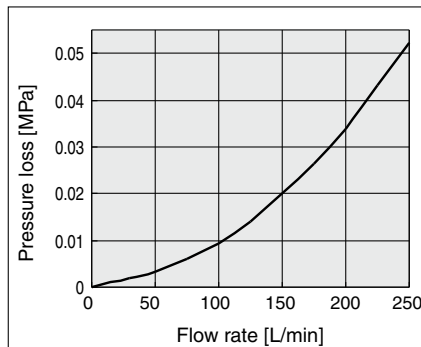
**PF3W740/540**



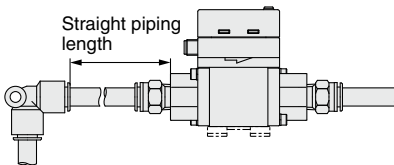
**PF3W711/511**



**PF3W721/521**



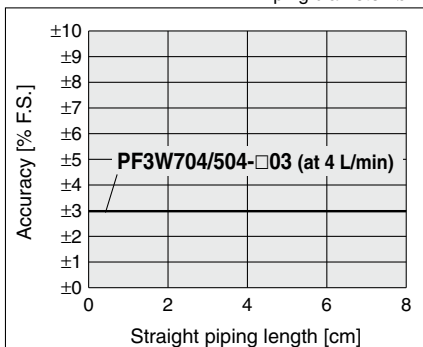
## Straight Piping Length and Accuracy (Reference Value)



- 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)

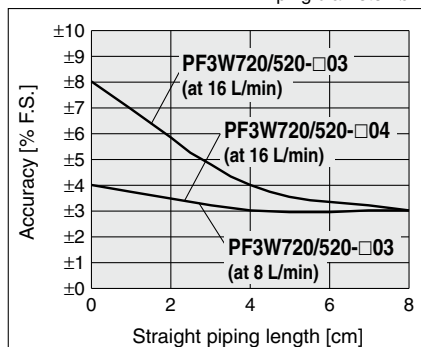
**PF3W704/504**

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



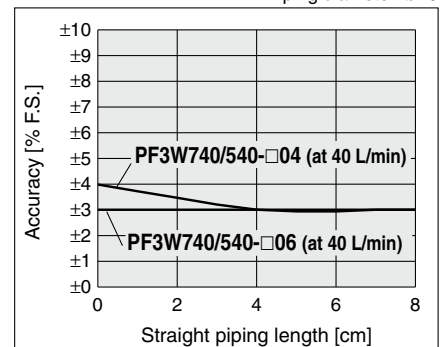
**PF3W720/520**

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



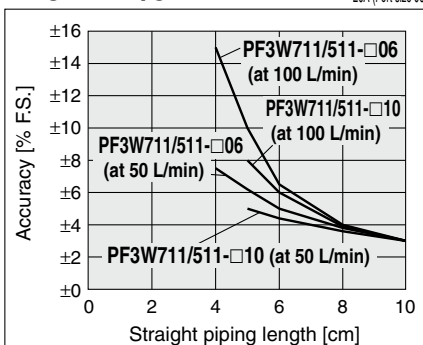
**PF3W740/540**

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



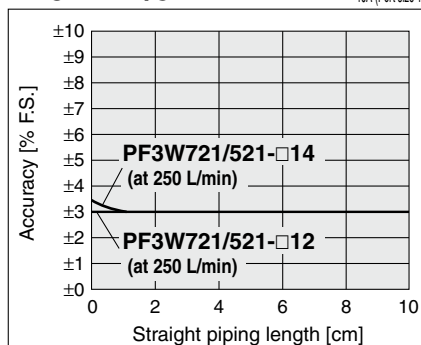
**PF3W711/511**

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



**PF3W721/521**

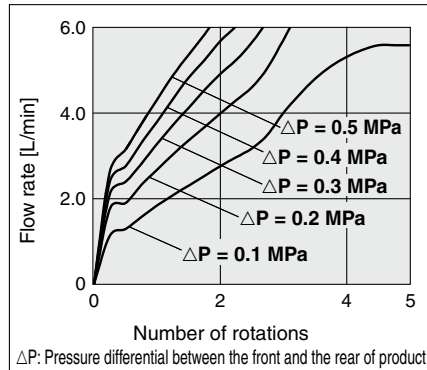
Pressure: 0.3 MPa Piping diameter: 32A (Port size 12)  
40A (Port size 14)



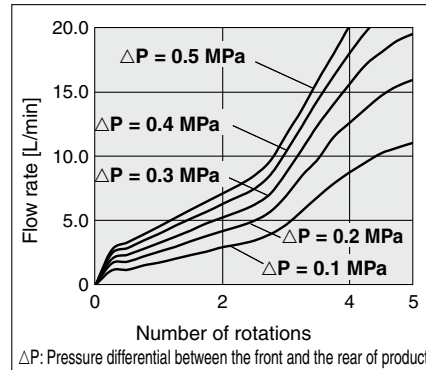
\* No data for 4 cm, or for under 5 cm, as these cannot be used due to piping dimensions.

## Flow Rate Characteristics of Flow Adjustment Valve

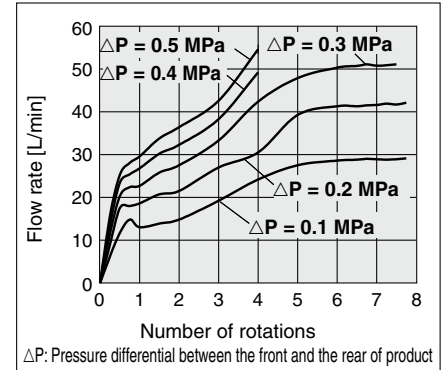
**PF3W704S/504S**



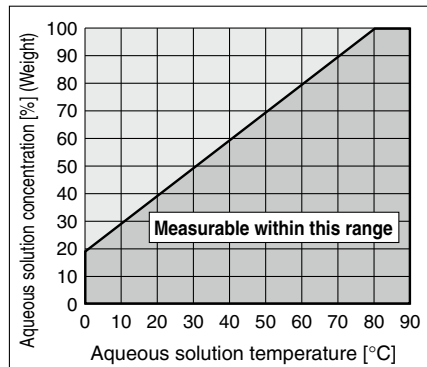
**PF3W720S/520S**



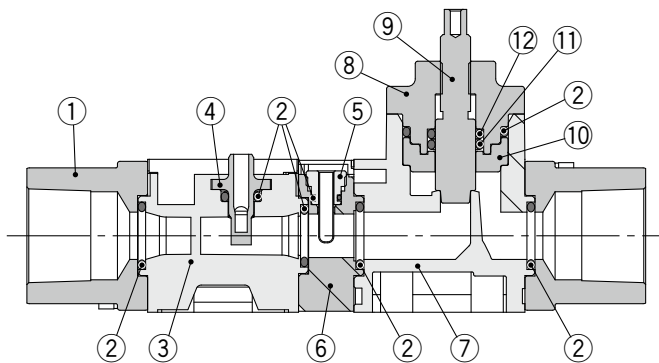
**PF3W740S/540S**



## 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	
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	Seal	FKM	
12	Seal	FKM	

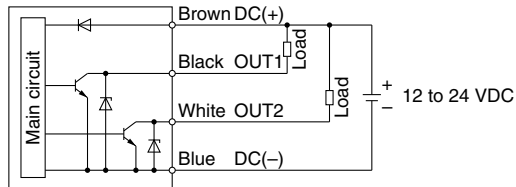


# PF3W Series

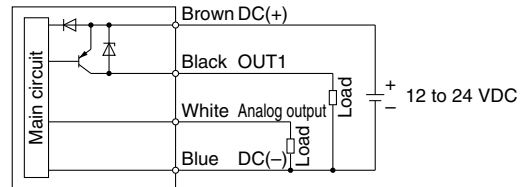
## Internal Circuits and Wiring Examples

### PF3W7□□

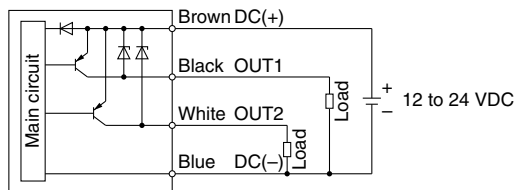
**-A(T)**  
NPN (2 outputs)



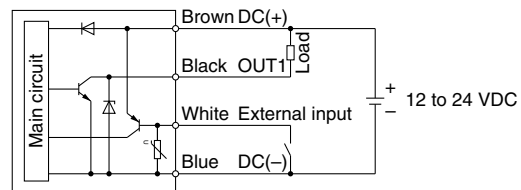
**-E(T)/F(T)**  
E(T): PNP + Analog voltage output  
F(T): PNP + Analog current output



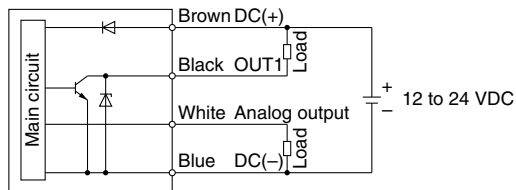
**-B(T)**  
PNP (2 outputs)



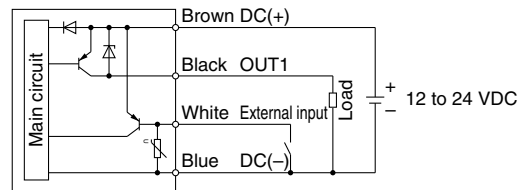
**-G**  
NPN + External input



**-C(T)/D(T)**  
C(T): NPN + Analog voltage output  
D(T): NPN + Analog current output

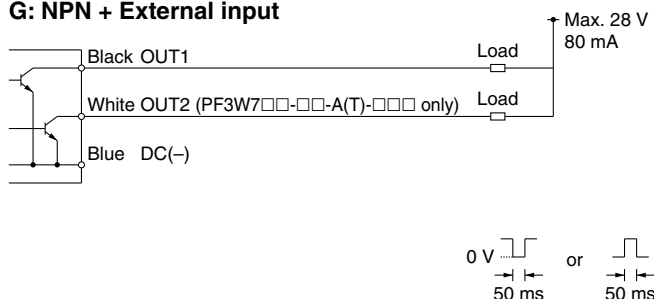


**-H**  
PNP + External input

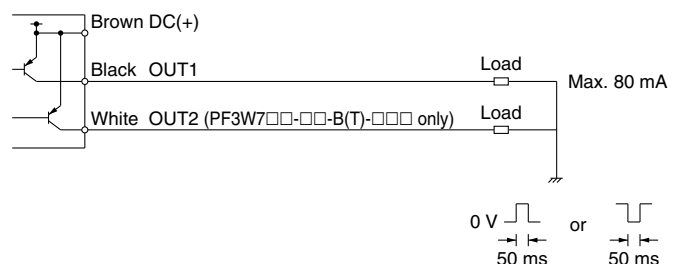


## Accumulated pulse output wiring examples

**-A(T)/C(T)/D(T)/G**  
A(T): NPN (2 outputs)  
C(T), D(T): NPN + Analog output  
G: NPN + External input

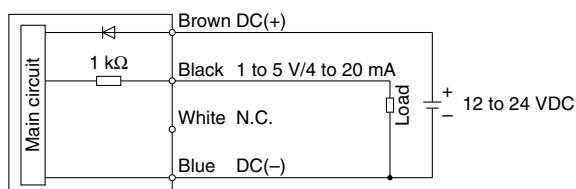


**-B(T)/E(T)/F(T)/H**  
B(T): PNP (2 outputs)  
E(T), F(T): PNP + Analog output  
G: PNP + External input

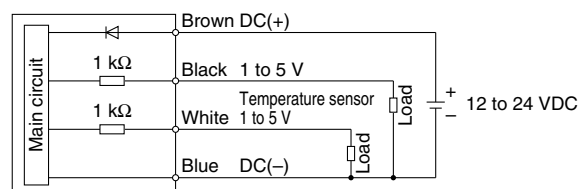


### PF3W5□□

**-1/2**  
1: Analog voltage output  
2: Analog current output



**-1T**  
Analog voltage output  
(With temperature sensor output)



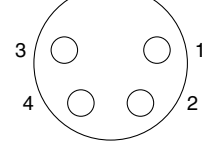
## Dimensions

### PF3W704/720/740/711/721

#### Integrated display

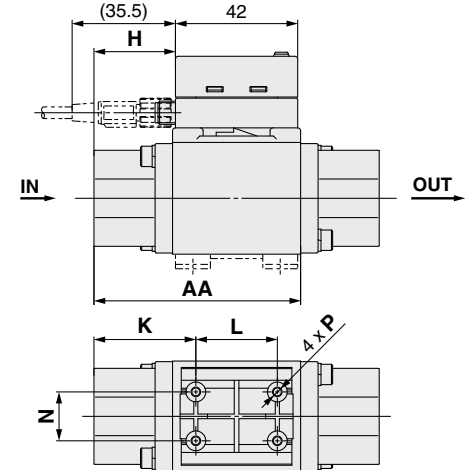
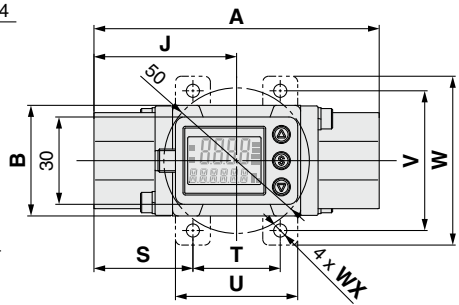
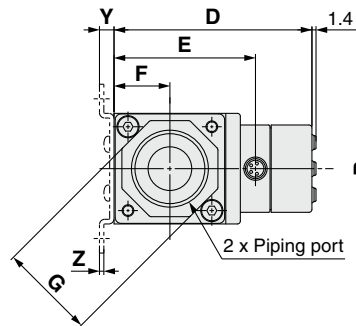
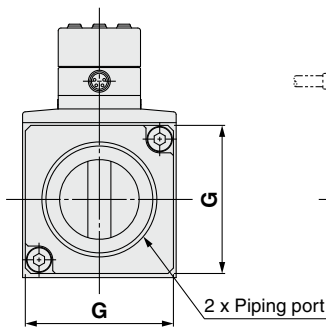
Connector  
pin number

Example



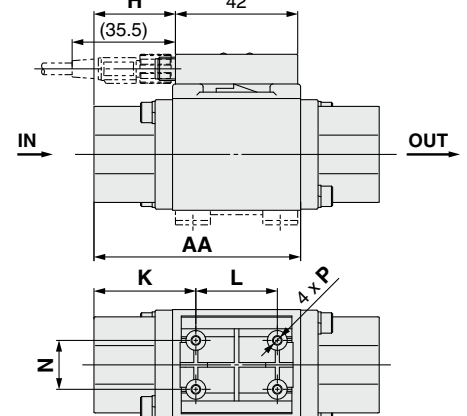
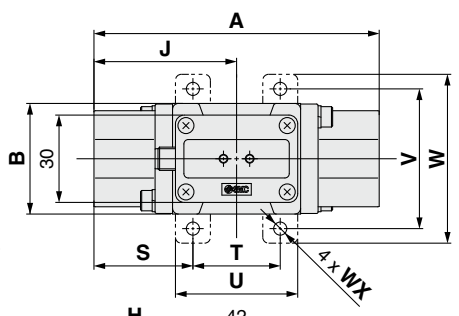
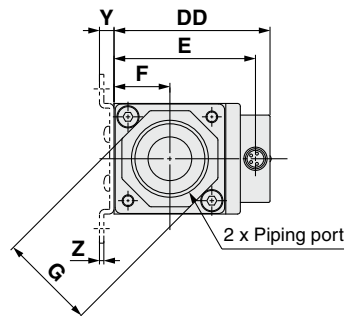
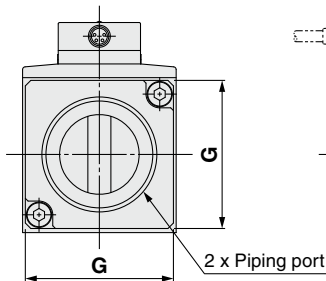
Pin no.	Pin name
1	DC (+)
2	OUT2
3	DC (-)
4	OUT1

#### For PF3W721



### PF3W504/520/540/511/521

#### Remote sensor unit



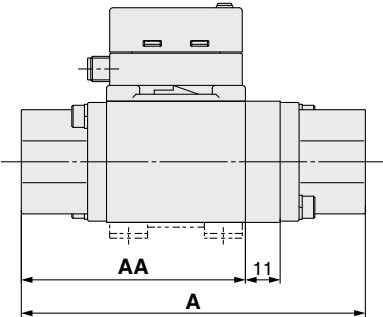
#### For PF3W521

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							31	52	39.5											
	G1 1/4	108	76	56	91	76.6	71.6	28.5	54	33	54	41.5	25	27.5	ø3.5 depth 14	—	—	—	—	—	—	—	—
	G1 1/2	112	78							35	56	43.5											

# PF3W Series

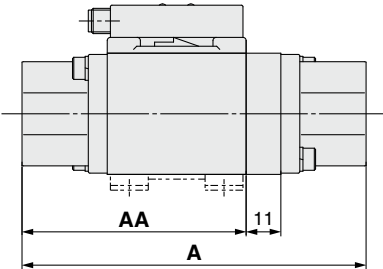
## Dimensions

**PF3W704/720/740/711/721-□-□T**  
 Integrated display: With temperature sensor

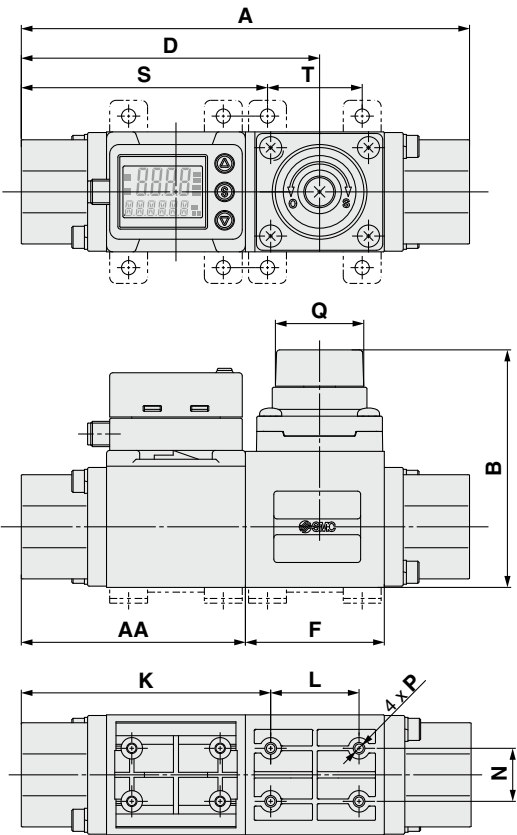


[mm]		
Model	A	AA
PF3W704/504-□-□T	81	50
PF3W720/520-□-□T	89	54
PF3W740/540-□-□T	109	71
PF3W711/511-□-□T	135	92
PF3W721/521-□-□T	115	74
PF3W721/521-F12-□T	119	76
PF3W721/521-F14-□T	123	78

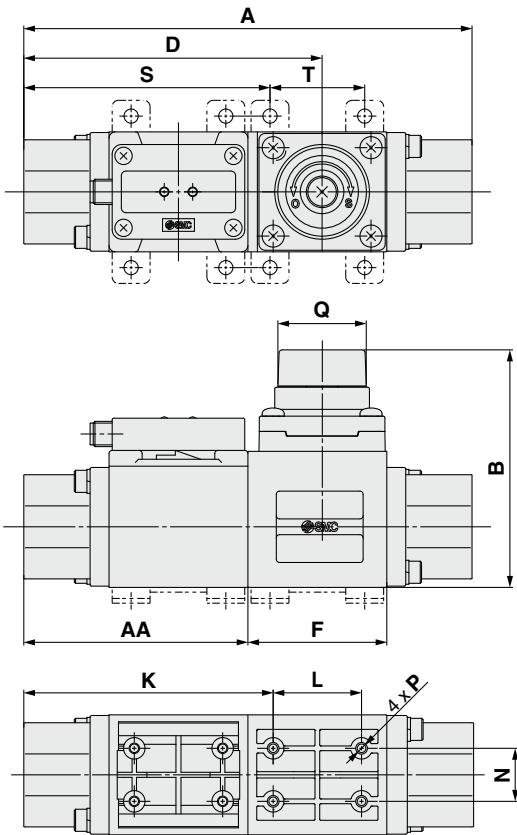
**PF3W504/520/540/511/521-□-□T**  
 Remote sensor unit: With temperature sensor



**PF3W704S/720S/740S**  
 Integrated display: With flow adjustment valve



**PF3W504S/520S/540S**  
 Remote sensor unit: With flow adjustment valve



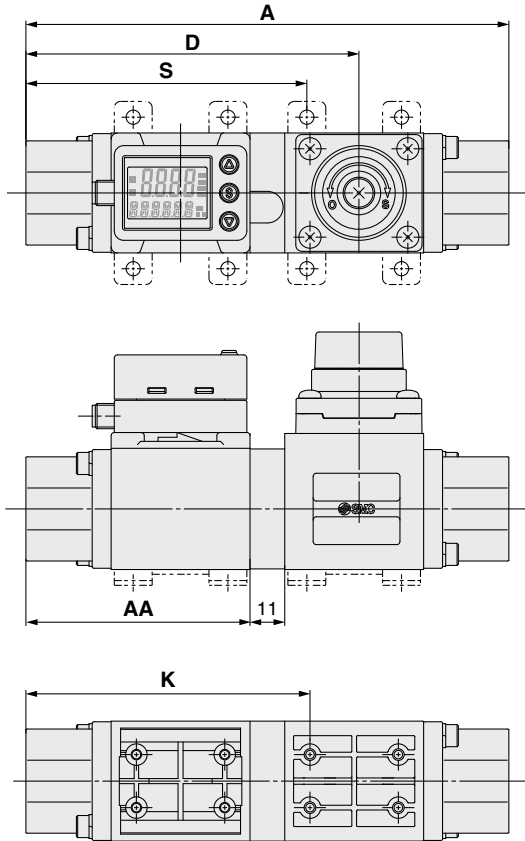
[mm]													
Model	A	AA	B	D	F	K	L	N	P	Q	Q number of rotations	Bracket dimensions	
PF3W704S/504S	104	50	63.6 (Max. 68.6)	70.2	34	58.5	18	13.6	ø2.7 depth 10	ø19	6	S	T
PF3W720S/520S	112	54	63.6 (Max. 68.6)	74.2	34	62.5	18	13.6	ø2.7 depth 10	ø19	6	60.5	22
PF3W740S/540S	142	71	75.25 (Max. 81)	94.5	44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



## Dimensions

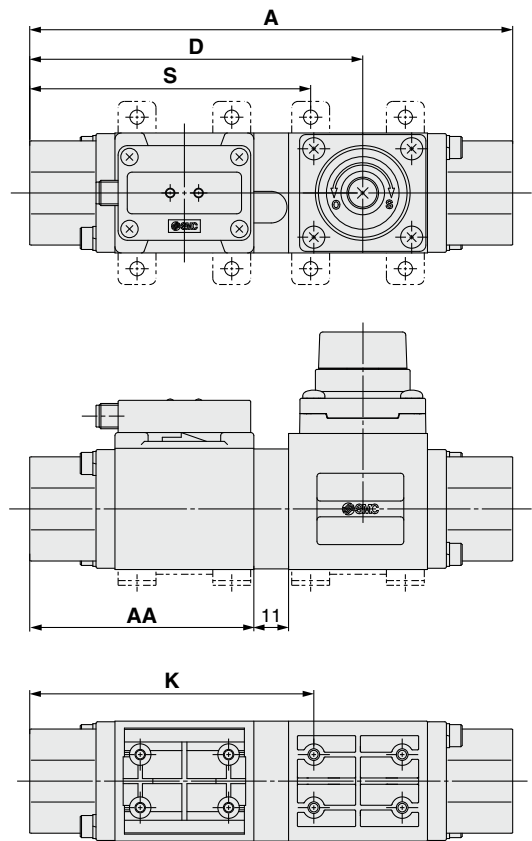
### PF3W704S/720S/740S-□-□T

Integrated display: With temperature sensor and flow adjustment valve



### PF3W504S/520S/540S-□-□T

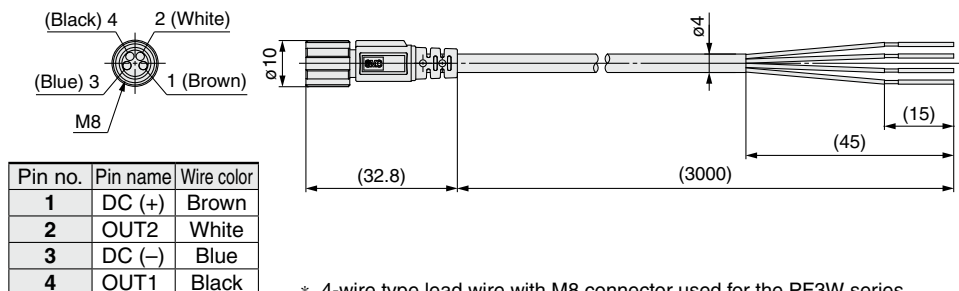
Remote sensor unit: With temperature sensor and flow adjustment valve



[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



- \* 4-wire type lead wire with M8 connector used for the PF3W series
- \* For wiring, refer to the "Operation Manual" on the SMC website (<http://www.smcworld.com>).

## 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

# PF3W Series

## Made to Order

Please contact SMC for detailed dimensions, specifications, and lead times.



### 1 EPDM seal material

Symbol

**-X109**

Seal material for wetted parts changed to EPDM

PF3W5  -   -   -    - X109

PF3W7  -   -   -    - X109

• EPDM seal material

Refer to page 5 for details of How to Order.

\* Not compatible with units with flow adjustment valve  
Please special-order separately.

### 2 Analog 4 to 20 mA 2-output type

Symbol

**-X128**

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

PF3W5   -   - 2T  -    - X128

• Analog 4 to 20 mA 2-output type

Refer to page 5 for details of How to Order.

\* Remote monitor unit is equipped as standard.

### 3 Brass piping material specification

Symbol

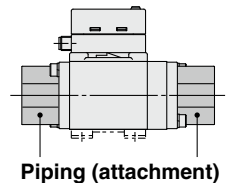
**-X143**

Piping (attachment) material changed to brass

PF3W5  -   -   -    - X143

PF3W7  -   -   -    - X143

• Brass piping (attachment) material specification



Refer to page 5 for details of How to Order.

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

## 4 IO-Link compatible

Supports the IO-Link communication protocol

Symbol  
**-X445**

### How to Order

PF3W 7 **20** - **04** - **LT** **Q** - **M** - **X445**  
Integrated display • 1 2 3 4 5 6 7 8 • IO-Link compatible

#### 1 Rated flow range (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

#### 2 Thread type

Nil	Rc
N	NPT
F	G*1

\*1 ISO 228 compliant

#### 3 Piping port size

Symbol	Port size	04	20	40	11	21
03	3/8	●	●	—	—	—
04	1/2	—	●	●	—	—
06	3/4	—	—	●	●	—
10	1	—	—	—	●	—
12	1 1/4	—	—	—	—	●
14	1 1/2	—	—	—	—	●

#### 4 Output specification/Temperature sensor

Symbol	Output specification	Temperature sensor
	OUT1	OUT2
LT	IO-Link: Switch output (N/P)	—
		Yes

#### 5 Lead wire (Option)

Nil	With lead wire with M8 connector (3 m)
N	Without lead wire with M8 connector
Q	With M12-M8 conversion lead wire (0.1 m)*2

\*2 A cable (3 m) with an M12 connector is also available separately.

[Click here for details.](#)

#### 6 Unit specification

Symbol	Instantaneous flow	Accumulated flow	Temperature
Nil	gal/min	gal	°C
M	L/min	L	°C

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

\* Reference: 1 [L/min] = 0.2642 [gal/min]  
1 [gal/min] = 3.785 [L/min]

#### 7 Bracket (Option)

Nil	None
R	With bracket

#### 8 Calibration certificate (Only for flow rate)

Nil	None
A	Yes

\* The certificate is written in both Japanese and English. The integrated display type with temperature sensor can only display the flow rate. The temperature sensor is not calibrated.

### Specifications

Model			PF3W704	PF3W720	PF3W740	PF3W711	PF3W721
Accumulated flow range*1			999999999.9 L			9999999999 L	
			By 0.1 L			By 1 L	
Switch output	Maximum applied voltage		30 V (NPN output)				
	Internal voltage drop		1.5 V or less (at load current of 80 mA)				
	Delay time*2		3.5 ms				
			Variable from 0 to 60 s/0.01 s increments				
	Output mode	Flow rate	Select from Hysteresis, Window comparator, Accumulated output, Accumulated pulse output, Error output, or Switch output OFF modes.				
Power supply voltage	When used as a switch output device		12 to 24 VDC, including ripple (p-p) 10%				
	When used as an IO-Link device		18 to 30 VDC, including ripple (p-p) 10%				
Digital filter*3			Select from 0.5 s, 1.0 s, 2.0 s, 5.0 s, 10.0 s, 15.0 s, 20.0 s, or 30.0 s.				
Environment	Withstand voltage		250 VAC for 1 minute between external terminals and case				
Standards and regulations			CE marking (EMC directive/RoHS directive)				

\*1 Cleared when the power supply is turned off. The hold function can be selected. If the 5-minute interval is selected, the life of the memory element (electronic parts) is limited to 3.7 million times. (If energized for 24 hours, life is calculated as 5 minutes x access times (3.7 million) = 18.5 million minutes = about 35 years.) Therefore, if using the hold function, calculate the memory life for your operating conditions, and use within this life.

\*2 Does not include the value of the digital filter

\*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 output by the temperature sensor.)

### Communication Specifications (IO-Link mode)

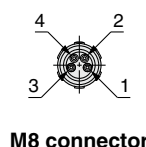
IO-Link type	Device
IO-Link version	V1.1
Communication speed	COM2 (38.4 kbps)
Configuration file	IODD file*1
Minimum cycle time	3.5 ms
Process data length	Input data: 6 bytes, Output data: 0 byte
On request data communication	Yes
Data storage function	Yes
Event function	Yes
Vendor ID	131 (0x0083)
Device ID*2	PF3W704-□-LT□-M-X445: 330 (0x014A) PF3W720-□-LT□-M-X445: 310 (0x0136) PF3W740-□-LT□-M-X445: 317 (0x013D) PF3W711-□-LT□-M-X445: 331 (0x014B) PF3W721-□-LT□-M-X445: 332 (0x014C)

\*1 The configuration file can be downloaded from the SMC website, <http://www.smcworld.com>

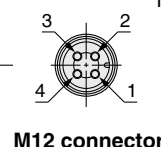
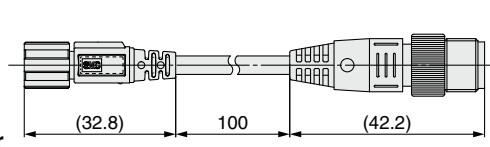
\*2 The device ID differs according to each product type (flow range, whether or not a temperature sensor is provided, etc.).

Other specifications and dimensions that are not indicated are the same as those of the standard product. For details, refer to page 6 and later.

### ZS-40-M12M8-A M12-M8 conversion lead wire



M8 connector



M12 connector

M8 (Female)	M12 (Male)
① Brown	①
② White	②
③ Blue	③
④ Black	④

Wiring diagram

\* For wiring, refer to the "Operation Manual" on the SMC website (<http://www.smcworld.com>).





# 3-Color Display

## Digital Flow Switch for PVC Piping

# PF3W Series



RoHS

### How to Order

For how to order of remote monitor unit, refer to page 24.



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
Nil	L/min
G*1	L/min (gal/min)

\*1 Under the New Measurement Act, units other than SI (symbol "Nil") cannot be used in Japan.

\* G: Made to order

Reference: 1 [L/min] ↔ 0.2642 [gal/min]  
1 [gal/min] ↔ 3.785 [L/min]

#### Calibration certificate (Only for flow rate)

Nil	None
A	With calibration certificate

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

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.*1
25	25A	●	32 mm
30	30A	—	38 mm

\*1 JIS K 6742 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	EPDM seal material
------	--------------------

(Refer to page 23.)

#### Bracket (Option)

Nil	None
R	With bracket

\* Bracket is not available for 250 L/min type.

#### Integrated display/Unit specification

Symbol	Instantaneous flow	Accumulated flow
M	L/min	L
G	gal/min	gal

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

\* G: Made to order

Reference: 1 [L/min] ↔ 0.2642 [gal/min]  
1 [gal/min] ↔ 3.785 [L/min]

#### Lead wire (Option)

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

### Options/Part Nos.

When only optional parts are required, order with the part numbers listed below.

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

For flow switch precautions and specific product precautions, refer to the "Operation Manual" on the SMC website.

## Specifications (Integrated Display)

Model	PF3W711	PF3W721
Applicable fluid	Water and ethylene glycol aqueous solution (with viscosity of 3 mPa·s [3 cP] or less)*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
Smallest settable increment	1 L/min	2 L/min
Conversion of accumulated pulse	1 L/pulse	2 L/pulse
Fluid temperature	0 to 70°C (No freezing or condensation)	
Display unit	Instantaneous flow: L/min, Accumulated flow: L, Display values updated 5 times per second	
Accuracy	Display value: $\pm 3\%$ F.S. Analog output: $\pm 3\%$ F.S.	
Repeatability	$\pm 2\%$ F.S.*2	
Temperature characteristics	$\pm 5\%$ F.S. (25°C standard)	
Operating pressure range*3	0 to 1 MPa	
Proof pressure*3	1 MPa	
Pressure loss	45 kPa or less at the maximum flow	
Accumulated flow range*4	999999999 L By 1 L	
Switch output	NPN or PNP open collector output	
Max. load current	80 mA	
Max. applied voltage	28 VDC	
Internal voltage drop	NPN: 1 V or less (at load current of 80 mA) PNP: 1.5 V or less (at load current of 80 mA)	
Response time*2, 5	0.5 s/1 s/2 s	
Output protection	Short-circuit protection	
Output mode   Flow rate	Select from Hysteresis, Window comparator, Accumulated output, or Accumulated pulse output modes.	
Analog output	Response time*6 0.5 s/1 s/2 s (linked with the switch output)	
Voltage output	Voltage output: 1 to 5 V Output impedance: 1 k $\Omega$	
Current output	Output current: 4 to 20 mA Max. load impedance: 300 $\Omega$ for 12 VDC, 600 $\Omega$ 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 $\pm 10\%$	
Current consumption	50 mA or less	
Environment	Enclosure IP65	
Operating temperature range	0 to 50°C (No freezing or condensation)	
Operating humidity range	Operation, Storage: 35 to 85% R.H. (No condensation)	
Withstand voltage	1000 VAC for 1 minute between terminals and housing	
Insulation resistance	50 M $\Omega$ or more (500 VDC measured via megohmmeter) between terminals and housing	
Standards and regulations	CE marking (EMC directive/RoHS directive), UL (CSA)	
Wetted parts material*7	PPS, FKM, CPVC	
	Non-grease	
Piping port size*8	25A	30A
Weight	Without lead wire with connector 285 g With lead wire with connector 370 g	340 g 425 g

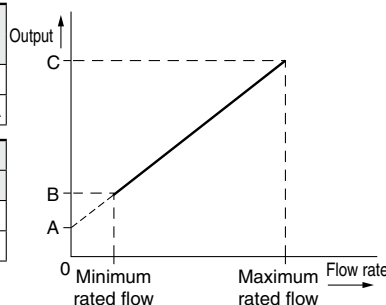
- \*1 Refer to the graph of measurable range for ethylene glycol aqueous solution on page 10. Measurement is possible as long as the fluid does not corrode the wetted parts and viscosity is 3 mPa·s (3 cP) or less. Refer to the list of applicable fluids on page 31. Be aware that water leakage may occur due to internal seal shrinkage or swelling depending on the type of fluid.
- \*2 If 0.5 s is selected for the response time of the switch output, the repeatability will be  $\pm 3\%$  F.S.
- \*3 The operating pressure range and proof pressure may change according to the fluid temperature. Refer to the graph below.
- \*4 Cleared when the power supply is turned off. The hold function can be selected. (Intervals of 2 or 5 minutes can be selected.)  
If the 5-minute interval is selected, the life of the memory element (electronic parts) is limited to 1 million times. (If energized for 24 hours, life is calculated as 5 minutes  $\times$  1 million = 5 million minutes = about 9.5 years.) Therefore, if using the hold function, calculate the memory life for your operating conditions, and use within this life.
- \*5 The response time when the set value is 90% in relation to the step input
- \*6 The response time until the set value reaches 90% in relation to the step input
- \*7 For details, refer to "Wetted Parts Construction" on page 20.
- \*8 When the piping diameter or piping passage is restricted, the specifications may not be satisfied.
- \* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

## Analog Output

### Flow rate/Analog output

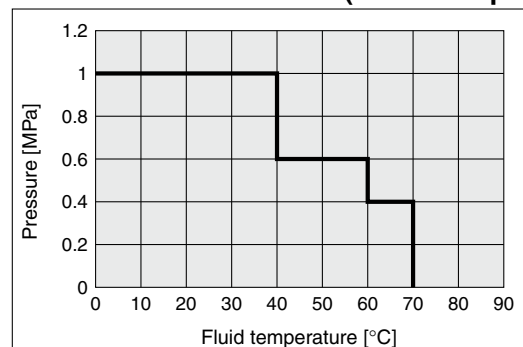
	A	B		C
		11	21	
Voltage output	1 V	1.4 V	1.5 V	5 V
Current output	4 mA	5.6 mA	5.9 mA	20 mA

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



## Operating Pressure and Proof Pressure

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



For flow switch precautions and specific product precautions, refer to the "Operation Manual" on the SMC website.

## Specifications (Remote Sensor Unit)

Refer to page 25 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)* <sup>1</sup>	
Detection method	Karman vortex	
Rated flow range	10 to 100 L/min	30 to 250 L/min
Fluid temperature	0 to 70°C (No freezing or condensation)	
Accuracy	±3% F.S.	
Repeatability	±2% F.S.	
Temperature characteristics	±5% F.S. (25°C standard)	
Operating pressure range* <sup>2</sup>	0 to 1 MPa* <sup>2</sup>	
Proof pressure* <sup>2</sup>	1 MPa	
Pressure loss	45 kPa or less at the maximum flow	
Analog output	Response time* <sup>3</sup>	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 (No freezing or condensation)
	Operating humidity range	Operation, Storage: 35 to 85% R.H. (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 (EMC directive/RoHS directive), UL (CSA)	
Wetted parts material* <sup>4</sup>	PPS, FKM, CPVC	
Piping port size* <sup>5</sup>	Non-grease	
	25A	30A
Weight	Without lead wire with connector	270 g
	With lead wire with connector	355 g

\*<sup>1</sup> Refer to the graph of measurable range for ethylene glycol aqueous solution on page 10. Measurement is possible as long as the fluid does not corrode the wetted parts and viscosity is 3 mPa·s (3 cP) or less. Refer to the list of applicable fluids on page 31.

\*<sup>2</sup> The operating pressure range and proof pressure may change according to the fluid temperature. Refer to the graphs below.

\*<sup>3</sup> The response time until the set value reaches 90% in relation to the step input

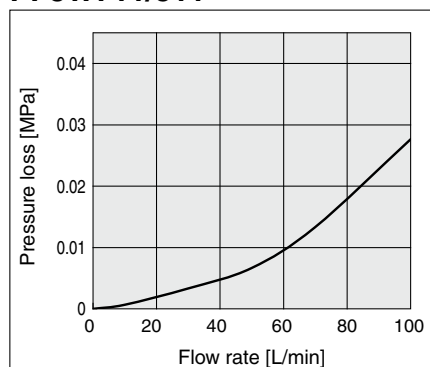
\*<sup>4</sup> For details, refer to "Wetted Parts Construction" on page 20.

\*<sup>5</sup> When the piping diameter or piping passage is restricted, the specifications may not be satisfied.

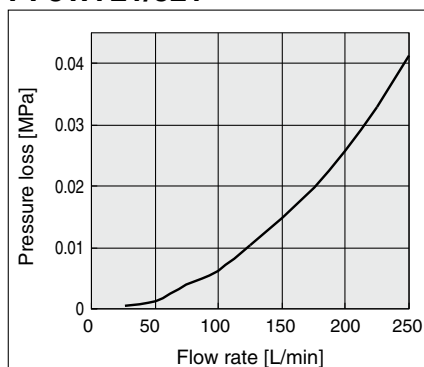
\* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

## Flow Rate Characteristics (Pressure Loss)

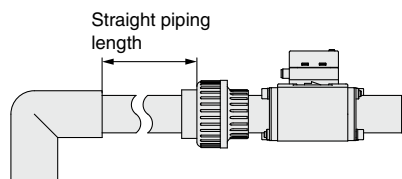
PF3W711/511



PF3W721/521



## Straight Piping Length and Accuracy (Reference Value)

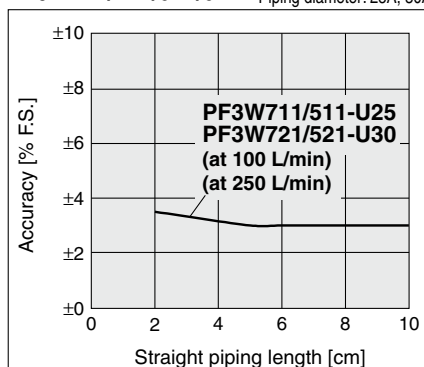


- Fluid pressure has almost no effect.
- To maintain ±3% F.S. in the specifications, use a straight pipe that is 11 cm or longer in length.

PF3W711/721/511/521

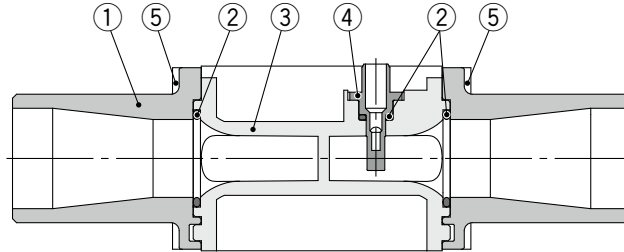
Pressure: 0.3 MPa

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 (With two M5 x 80 hexagonal socket head cap screws)	ZS-40-U25-A	1
	30A retaining plate (With two M5 x 65 hexagonal socket head cap screws)	ZS-40-U30-A	1

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

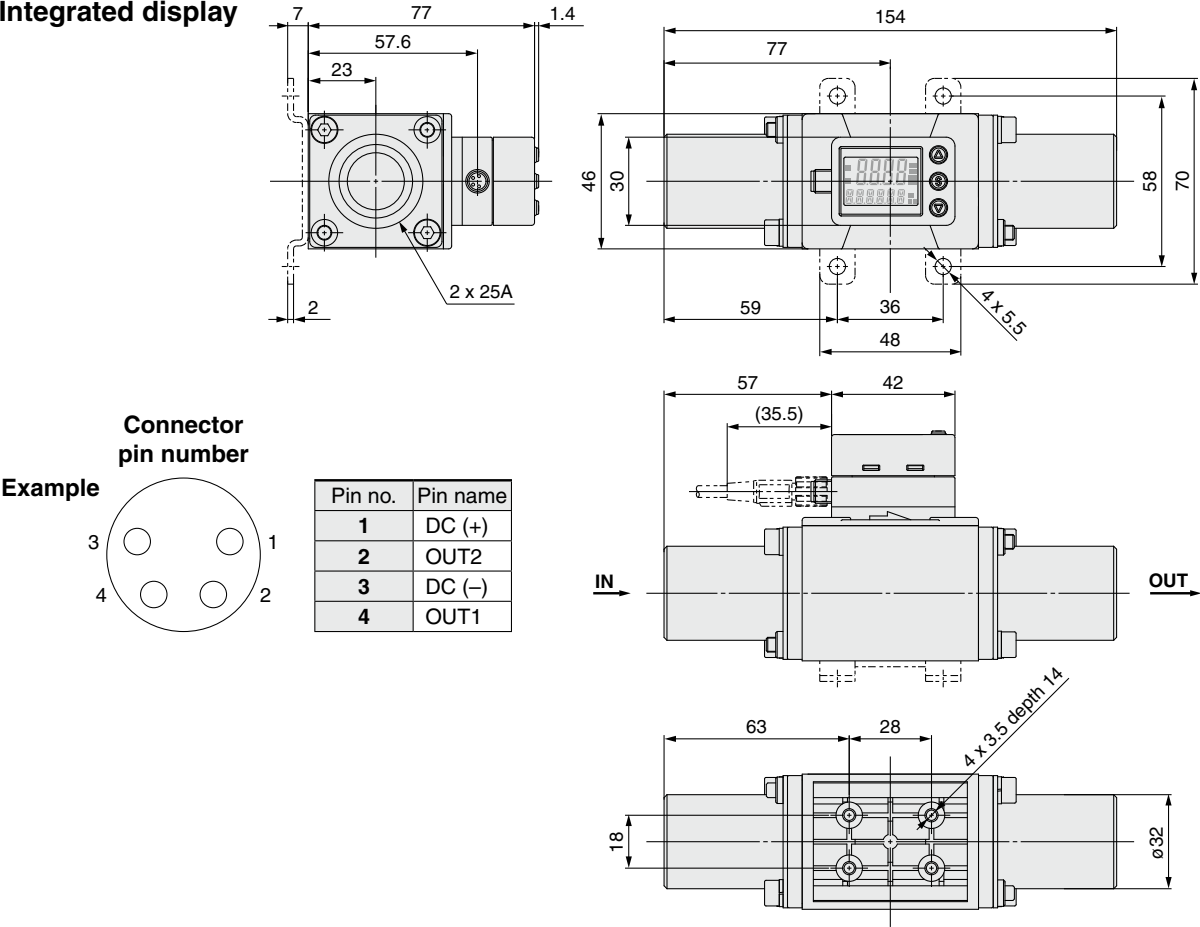
## Internal Circuits and Wiring Examples

Refer to page 11.

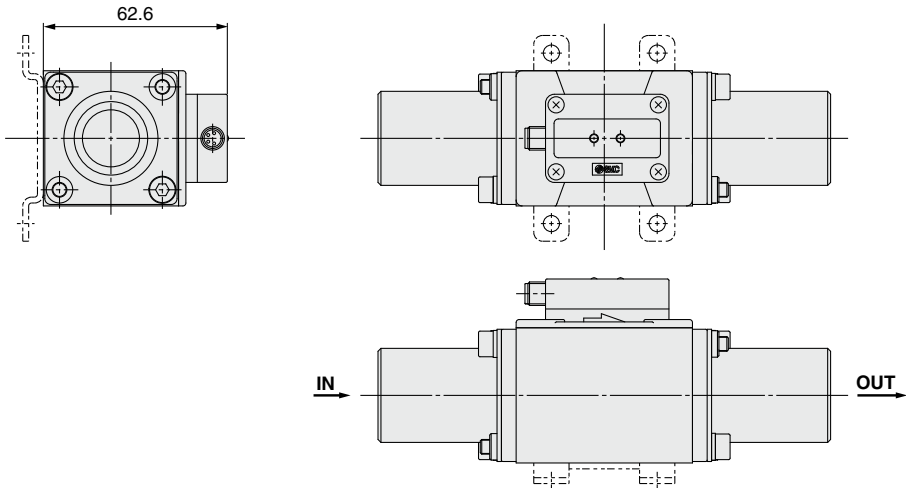
# PF3W Series

## Dimensions

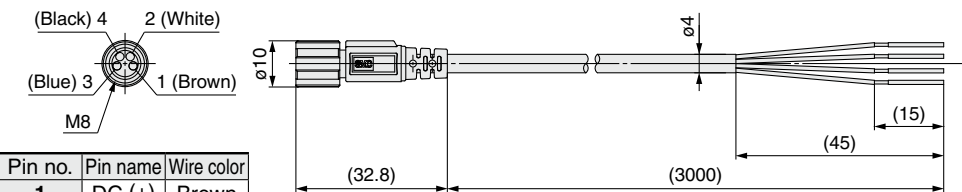
### PF3W711-U25 Integrated display



### PF3W511-U25 Remote sensor unit



### ZS-40-A Lead wire with M8 connector



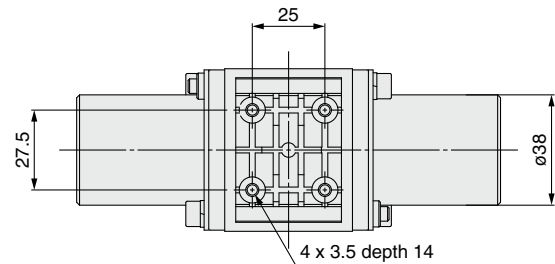
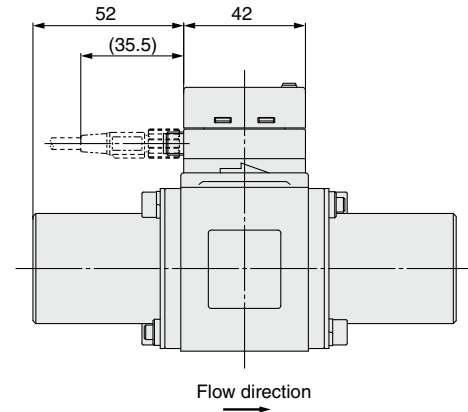
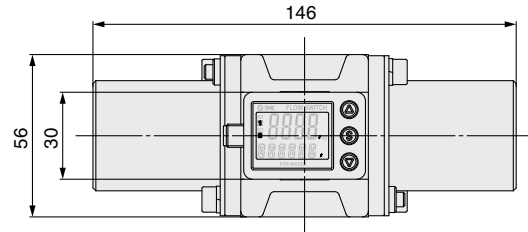
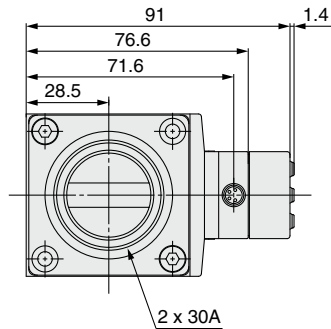
#### Lead Wire Specifications

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

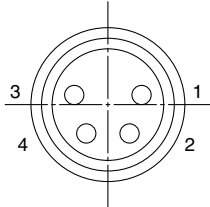
\* 4-wire type lead wire with M8 connector used for the PF3W series  
\* For wiring, refer to the "Operation Manual" on the SMC website (<http://www.smcworld.com>).

## Dimensions

### PF3W721-U30 Integrated display

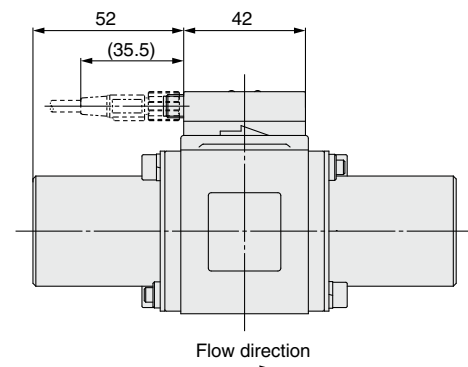
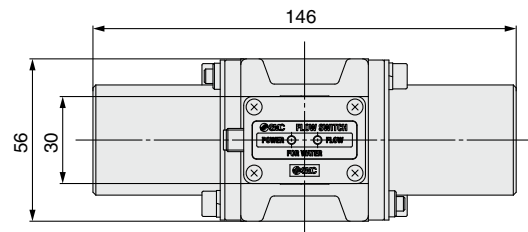
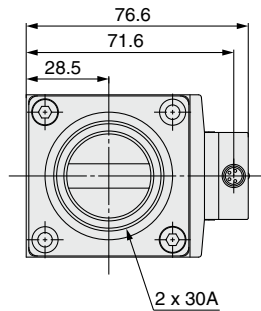


Body side  
Connector pin number

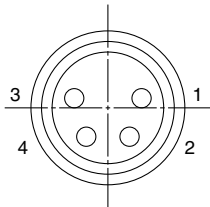


Pin no.	Pin name
1	DC (+)
2	OUT2
3	DC (-)
4	OUT1

### PF3W521-U30 Remote sensor unit



Body side  
Connector pin number



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

# PF3W Series

## Made to Order

Please contact SMC for detailed dimensions, specifications, and lead times.



### 1 EPDM seal material

Symbol

**-X109**

Seal material for wetted parts changed to EPDM

PF3W5  - U  -   -    - X109

PF3W7  - U  -   -    - X109

• EPDM seal material

Refer to page 17 for details of How to Order.

# 3-Color Display

## Digital Flow Monitor for Water

# PF3W3 Series



RoHS



### 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
<b>A</b>	NPN	NPN
<b>B</b>	PNP	PNP
<b>C</b>	NPN	Analog 1 to 5 V
<b>D</b>	NPN	Analog 4 to 20 mA
<b>E</b>	PNP	Analog 1 to 5 V
<b>F</b>	PNP	Analog 4 to 20 mA
<b>G</b>	NPN	External input
<b>H</b>	PNP	External input
<b>J</b>	Analog 1 to 5 V	Analog 1 to 5 V
<b>K</b>	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

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

The lead wire does not come connected, but it is shipped together with the product.

#### Remote monitor unit/Unit specification

Symbol	Instantaneous flow	Accumulated flow	Temperature
<b>M</b>	L/min	L	°C
<b>G</b>	gal/min	gal	°C
<b>F</b>	gal/min	gal	°F
<b>J</b>	L/min	L	°F

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

\* 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)

<b>Nil</b>	None
<b>A</b>	With calibration certificate

\* The certificate is written in both Japanese and English.

#### Option 2

<b>Nil</b>	None
<b>C</b>	Sensor connector (1 pc.)  Sensor connector (e-con)

The connector does not come connected, but it is shipped together with the product.

#### Option 1

<b>Nil</b>	None
<b>T</b>	Panel mount adapter  Waterproof seal (Accessory) Panel Mounting screw (M3 x 8 L) (Accessory)
<b>V</b>	Front protective cover + Panel mount adapter  Front protective cover Panel mount adapter Waterproof seal (Accessory) Panel Mounting screw (M3 x 8 L) (Accessory)

### Options/Part Nos.

When only optional parts are required, order with the part numbers listed below.

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





# PF3W3 Series

For flow switch precautions and specific product precautions, refer to the "Operation Manual" on the SMC website.

## Specifications

Model		PF3W30□				
Display flow range		0.35 to 4.50 L/min <small>(Flow under 0.35 L/min is displayed as "0.00")</small>	1.7 to 18.0 L/min <small>(Flow under 1.7 L/min is displayed as "0.0")</small>	3.5 to 45.0 L/min <small>(Flow under 3.5 L/min is displayed as "0.0")</small>	7 to 112 L/min <small>(Flow under 7 L/min is displayed as "0")</small>	20 to 280 L/min <small>(Flow under 20 L/min is displayed as "0")</small>
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
Smallest settable increment		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: 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 standard)				
Accumulated flow range*1		99999999.9 L		999999999 L		
		By 0.1 L	By 0.5 L	By 1 L		
Switch output		NPN or PNP open collector output				
	Max. load current	80 mA				
	Max. applied voltage	28 VDC				
	Internal voltage drop	NPN: 1 V or less (at load current of 80 mA) PNP: 1.5 V or less (at load current of 80 mA)				
	Response time*2	1 s/2 s				
	Output protection	Short-circuit protection				
	Output mode	Select from Hysteresis, Window comparator, Accumulated output, or Accumulated pulse output modes.				
	Flow rate	Select from Hysteresis mode or Window comparator mode.				
	Temperature	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				
Input/output		Input for copy mode				
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				
Connection		Power supply output 5P connector, sensor connection 4P connector (e-con)				
Environment	Enclosure	IP40 (Only front face of the panel is IP65 when panel mount adapter and waterproof seal of optional parts are used.)				
	Operating temperature range	0 to 50°C (No freezing or condensation)				
	Operating humidity range	Operation, Storage: 35 to 85% R.H. (No condensation)				
	Withstand voltage	1000 VAC for 1 minute between terminals and housing				
		50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing				
Standards and regulations		CE marking (EMC directive/RoHS directive), UL (CSA)				
Weight	Without power supply/output connection lead wire	50 g				
	With power supply/output connection lead wire	100 g				

\*1 Cleared when the power supply is turned off. The hold function can be selected. (Intervals of 2 or 5 minutes can be selected.)

If the 5-minute interval is selected, the life of the memory element (electronic parts) is limited to 1 million times. (If energized for 24 hours, life is calculated as 5 minutes x 1 million = 5 million minutes = about 9.5 years.) Therefore, if using the hold function, calculate the memory life for your operating conditions, and use within this life.

\*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.)

\*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.)

\* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

## Temperature Sensor Specifications

Rated temperature range	0 to 100°C*1
Set/Display temperature range	-10 to 110°C
Smallest settable increment	1°C
Display unit	°C
Analog output accuracy	$\pm 3\%$ F.S.
Response time	7 s*2
Ambient temperature characteristics	$\pm 5\%$ F.S.

\*1 The rated temperature range refers solely to that of the temperature sensor. The fluid temperature range specification of the flow switch as a whole is 0 to 90°C.

\*2 The response time refers solely to that of the temperature sensor.

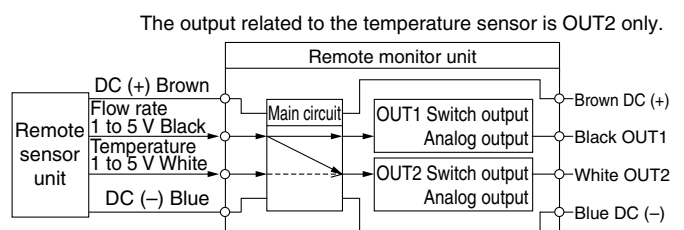
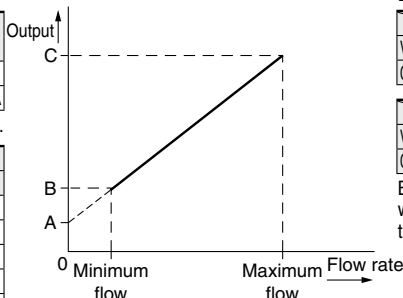
## Analog Output

### 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



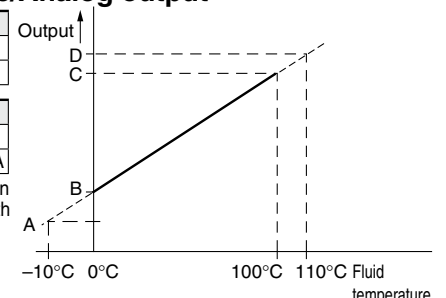
The OUT2 can be selected from either the output for temperature or flow rate by button operation.

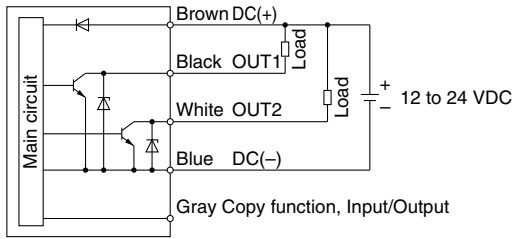
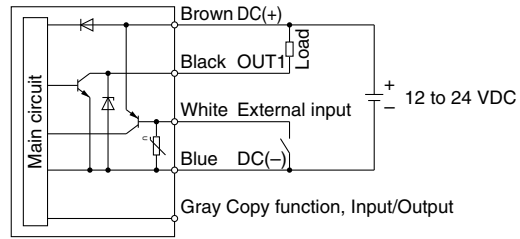
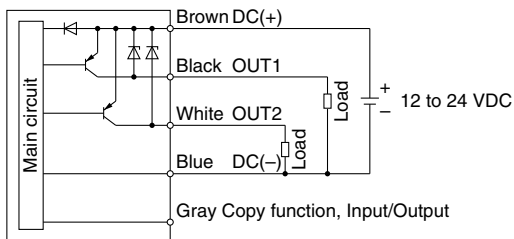
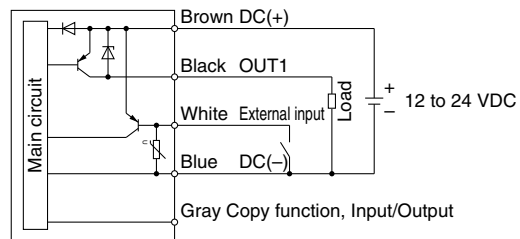
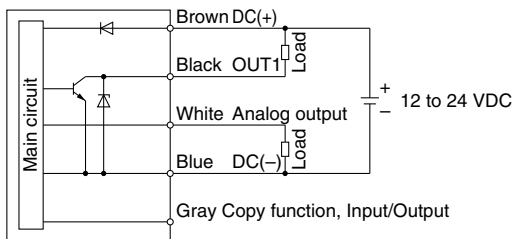
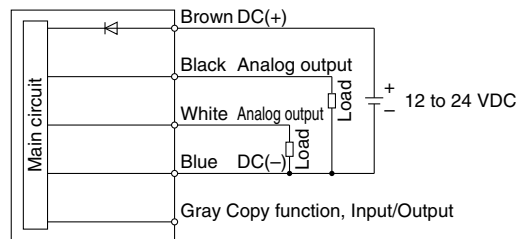
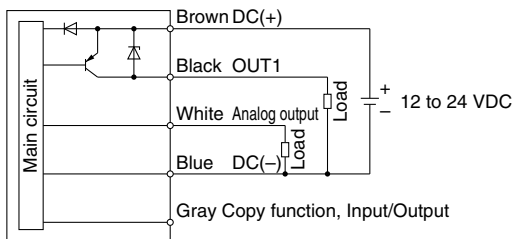
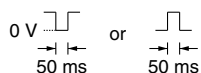
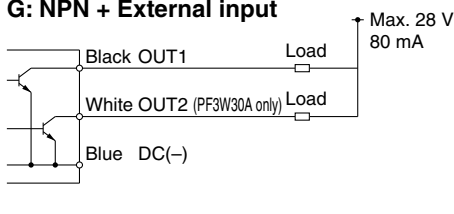
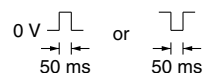
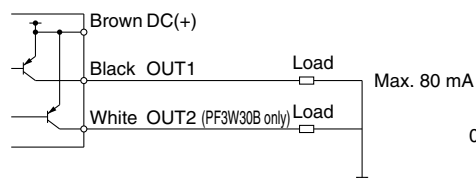
### Fluid temperature/Analog output

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

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

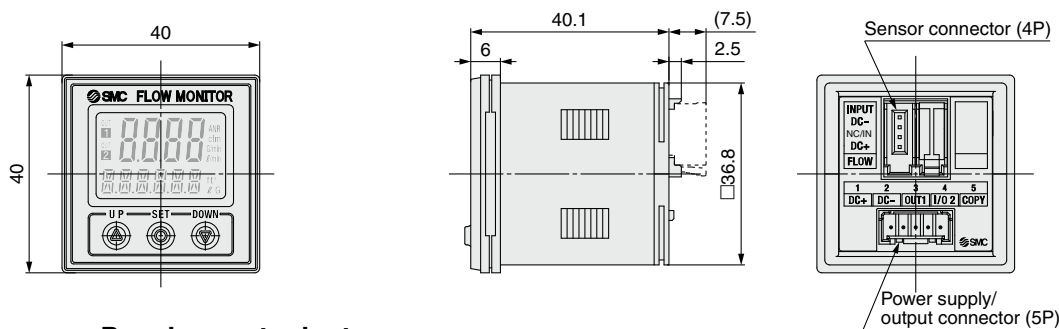
Be sure to use in combination with remote sensor unit with temperature sensor.



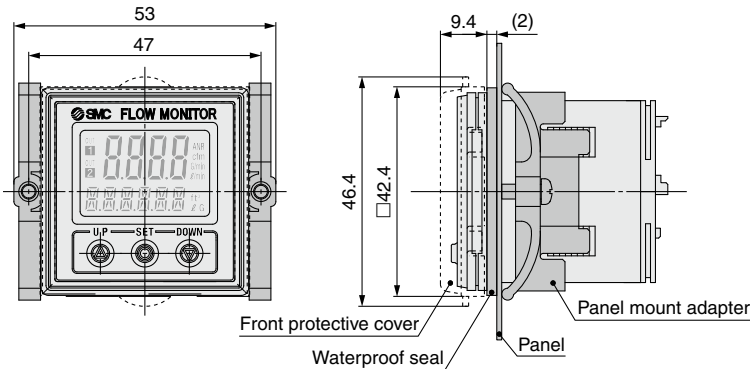
**Internal Circuits and Wiring Examples****-A**  
**NPN (2 outputs)****-G**  
**NPN + External input****-B**  
**PNP (2 outputs)****-H**  
**PNP + External input****-C/D**  
**C: NPN + Analog voltage output**  
**D: NPN + Analog current output****-J/K**  
**J: Analog voltage output**  
**K: Analog current output****-E/F**  
**E: PNP + Analog voltage output**  
**F: PNP + Analog current output****Accumulated pulse output wiring examples****-A/C/D/G**  
**A: NPN (2 outputs)**  
**C, D: NPN + Analog output**  
**G: NPN + External input****-B/E/F/H**  
**B: PNP (2 outputs)**  
**E, F: PNP + Analog output**  
**H: PNP + External input**

# PF3W3 Series

## Dimensions

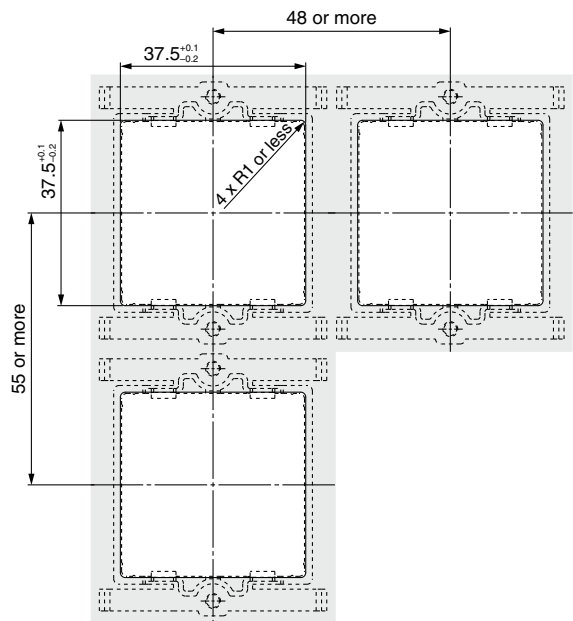


### Front protective cover + Panel mount adapter

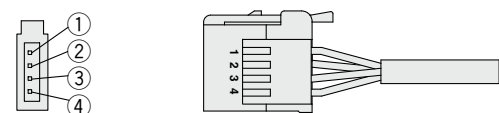


### Panel fitting dimensions

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



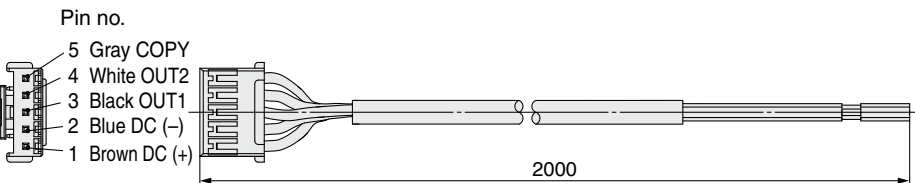
### Sensor connector



Pin no.	Terminal	Connector no.	Lead wire color*1
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)

\*1 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	

# Function Details

## Integrated Display (PF3W7 series)/Remote Monitor Unit (PF3W3 series)

### 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, or accumulated pulse output.

\* 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.)

### Display color

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

Green for ON, Red for OFF
Red for ON, Green for OFF
Red all the time
Green all the time

### Response time

The response time can be selected to suit the application. (1 second for default setting)

Abnormalities can be detected more quickly by setting the response time to 0.5 seconds.

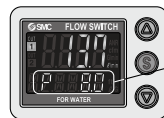
The effect of the pump fluctuation and flickering of the display can be reduced by setting the response time to 2 seconds.

\* The temperature sensor output is fixed to 7 seconds.

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

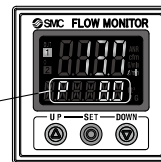
### Selection of display on sub screen

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



Integrated display

Sub screen



Remote monitor unit

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 power consumption.

In power-saving mode, only decimal points blink.

If any button is pressed during power-saving mode, the display is recovered for 30 seconds to check the flow, etc.

### Setting of security code

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

### External input function

This function can be used only when the optional external input is present. The accumulated flow, peak value, and bottom value can be reset remotely.

**Accumulated value external reset:** A function to reset the accumulated flow value when an external input signal is applied.

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

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

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

**Peak/Bottom value reset:** Peak and bottom value are reset.

### Forced output function

The output is turned on/off in a fixed state when starting the system or during maintenance. This enables the confirmation of wiring and prevents system errors due to unexpected output.

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

\* Also, an 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

The accumulated value is not cleared 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 life time of the memory device is 1 million access times. Take this into consideration before using this function.

### Peak/Bottom value display

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

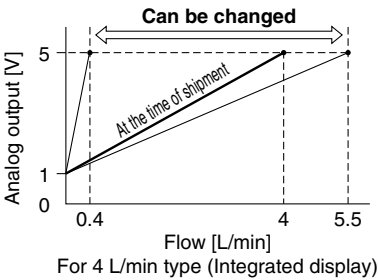
### Keylock function

Prevents operation errors such as accidentally changing setting values

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

■ Analog output free range function

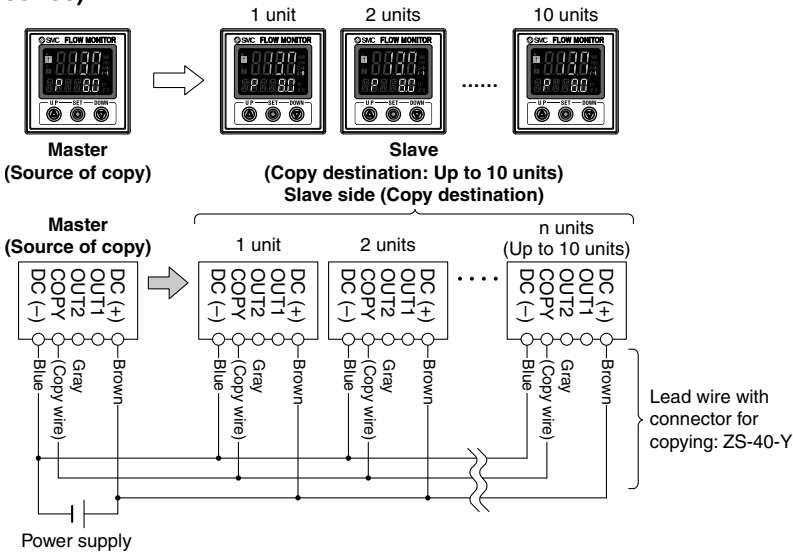
This function allows a flow that generates an output of 5 V or 20 mA to be changed. (This function is not available for the analog output to the temperature.) This function is available if the analog output type is used. The value can be changed between 10% of the maximum value of the rated flow and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



■ Copy function (Remote monitor unit/PF3W3 series)

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

The set value can be copied to up to 10 flow monitors simultaneously.  
(Maximum transmission distance: 4 m)



■ Error display function

When an error or abnormality arises, the location and contents are displayed.

Display	Description	Contents	Action	Applicable model	
				Integrated display PF3W7 series	Remote monitor unit PF3W3 series
Er1	OUT1 over current error	A 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 turning it on again.	●	●
Er2	OUT2 over current error	A load current of 80 mA or more is applied to the switch output (OUT2).		●	●
HHH	Instantaneous flow error	The flow rate has exceeded the display flow range (rated flow x approx. 1.4).	Decrease the flow rate.	●	●
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])	Accumulated flow error	The flow rate exceeds the accumulated flow rate range. (Decimal points start blinking due to the flow range.)	Clear the accumulated flow rate. (This error is irrelevant when accumulated flow is not being 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. Temperature sensor is not connected to the remote sensor unit.	Connect the temperature output wire. Check if or not the remote sensor unit is connected to a temperature sensor.	—	●
	Temperature sensor failure	If the above actions to correct the lower limit of fluid temperature and unconnected sensor are taken and error message still appears, the temperature sensor of the remote sensor unit may be damaged.	Please contact SMC for investigation.	—	●
Er0	System error	Internal data error	Turn the power off and then on again. If the error cannot be rectified, please contact SMC for investigation.	●	●
Er4				●	●
Er6				●	●
Er8				●	●
Er12	Temperature sensor failure	Temperature sensor may be damaged.		●	—

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



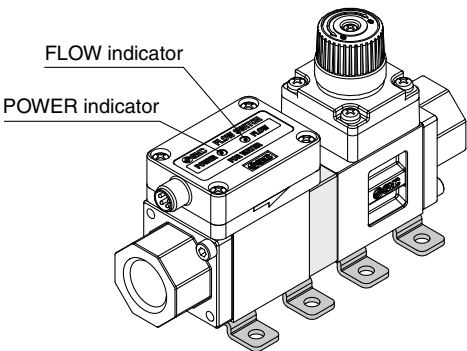
Remote Sensor Unit (PF3W5 series)

■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 display function

When an error or abnormality arises, the location and contents are displayed.

LED display	Description	Contents	Action
<div>POWER <span>Green</span> <span>Red</span> FLOW</div> <div>FLOW indicator: Red ON</div>	Over upper limit of flow rate	Flow is approximately 110% or more of the rated flow.	Decrease the flow rate.
<div>POWER <span>Red</span></div> <div>POWER indicator: Blinking red</div>	Temperature measurement range error	Fluid temperature is either under -10°C or over 110°C.	Adjust the fluid temperature within the measurable temperature range.
<div>POWER <span>Red</span> <span>Red</span> FLOW</div> <div>POWER indicator: Blinking red FLOW indicator: Red ON</div>	Over upper limit of flow rate and temperature measurement range error	Refer to above.	Refer to above.
LED display	Description	Contents	Action
<div>POWER <span>Red</span> <span>Red</span> FLOW</div> <div>POWER indicator: Red ON FLOW indicator: Red ON</div>	System error	Internal data error or other errors occur.	Turn the power off and then on again. If the error cannot be rectified, please contact SMC for investigation.
<div>POWER <span>Red</span> <span>Red</span> FLOW</div> <div>POWER indicator: Red ON FLOW indicator: Blinking red</div>			
<div>POWER <span>Red</span> <span>Red</span> FLOW</div> <div>POWER indicator: Red ON FLOW indicator: OFF</div>		Temperature sensor may be damaged.	

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

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  
PF3W/3

Function  
Details



# Applicable Fluids

## Material and Fluid Compatibility Check List (Guide)

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

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


- \*1 Since static electricity may be generated, implement suitable countermeasures.
- \*2 Fluid may pass through. Fluid that has passed through may have an impact on components made of different materials.
- \*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

#### 1. 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.

#### 2. 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.

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

1. 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.
2. 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.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

#### 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. 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.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. 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

#### 1. 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

1. 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.
2. 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.
3. 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

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. 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.

### Caution

#### SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

### Revision History

**Edition B** \* The remote type has been added.  
\* Units with a flow adjustment valve have been added.  
\* The 100 L/min type has been added.  
\* The PVC piping type has been added.  
\* Number of pages has been increased from 16 to 32.

PR

**Edition C** \* The 250 L/min type has been added.  
\* The analog 4 to 20 mA 2-output type (-X128) has been added to made to order options.  
\* The brass piping material specification (-X143) has been added to made to order options.  
\* Number of pages has been decreased from 32 to 28.

QW

**Edition D** \* The PF3W7□-X445 has been added.  
\* Number of pages has been increased from 28 to 36.

WU

## Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.