IO-Link Compatible*1

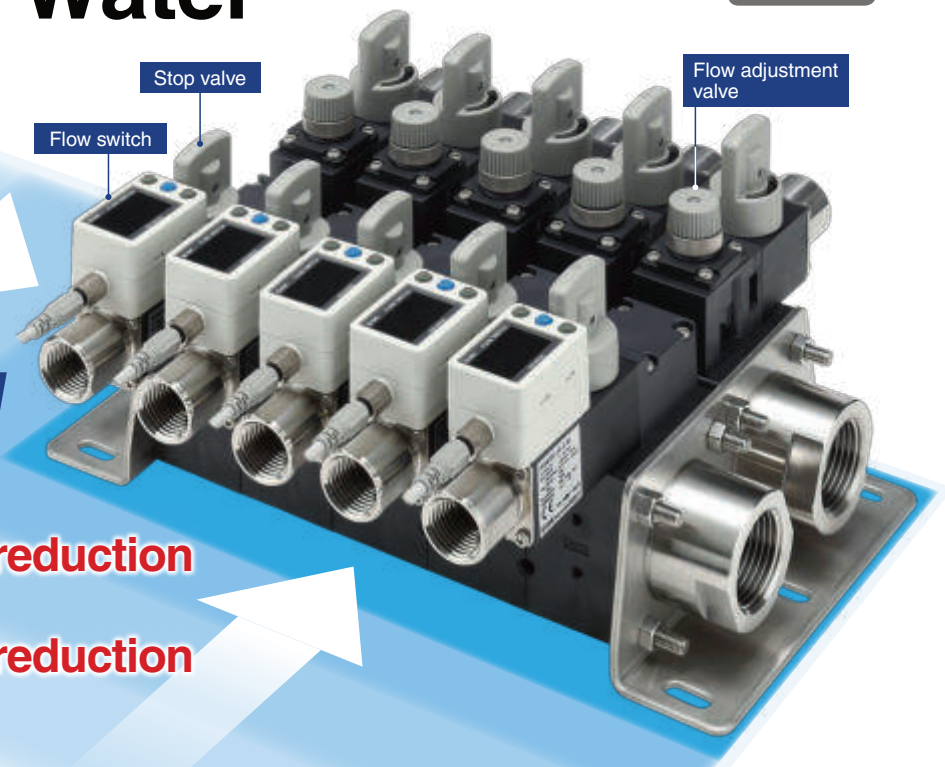
Digital Flow Switch Manifold for Water

New

RoHS

IP65

*1 Only compatible with the integrated display type



Space saving

* Comparison based on integrated type with existing piping material

Footprint Max. 85% reduction

Weight Max. 65% reduction

Needs no piping

* Comparison based on integrated type with existing piping work

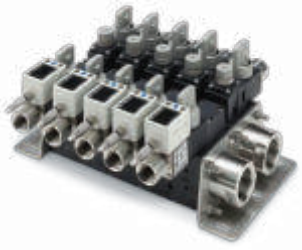
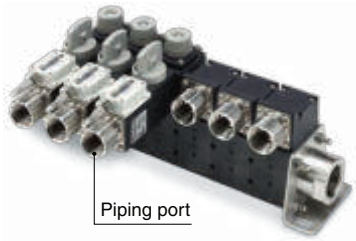
Work-hour for installation Max. 45% reduction

Flow range (Single unit)

0.5 to 4 L/min, 2 to 16 L/min, 5 to 40 L/min

Number of stations

1 to 10 stations * Max. 5 stations for flow range symbol 40 (5 to 40 L/min)

Series		Integrated Type		Remote Type	
		Basic type **PF3WB** Series	Straight type **PF3WC** Series	Supply type **PF3WS** Series	Return type **PF3WR** Series
					
Rated flow range [L/min]		0.5 to 4, 2 to 16, 5 to 40			
Port size		3/8 (Up to 4 L/min), 1/2 (Up to 16 L/min), 3/4 (Up to 40 L/min)			
Unit components	Flow switch	●	●	—	●
	Stop valve	●	●	●	●
	Flow adjustment valve	●	●	●	●

PF3WB/C/S/R Series

SMC

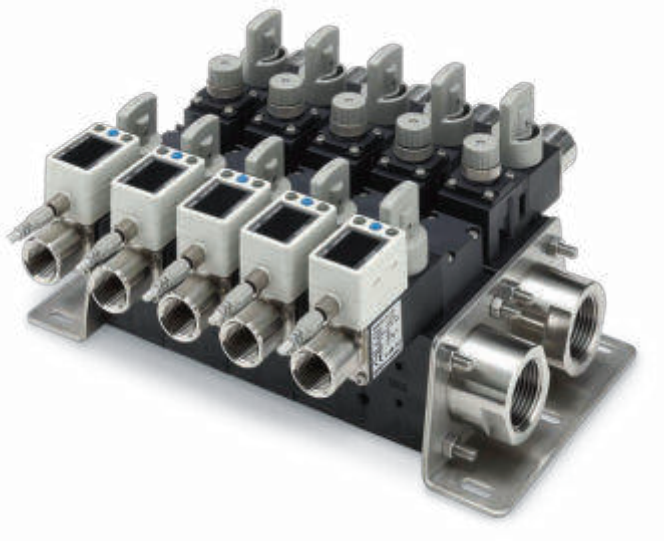
CAT.ES100-130A

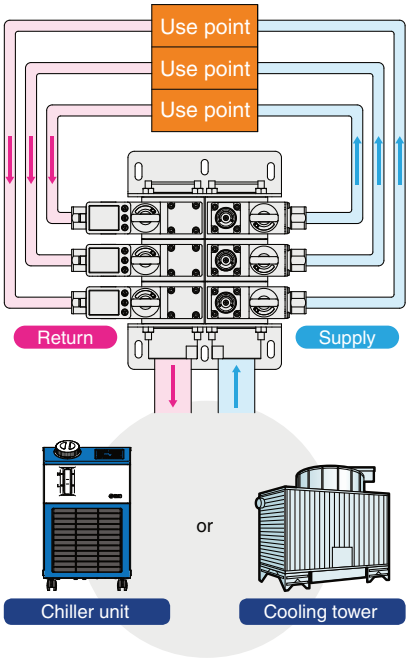
Integrated type and Remote type. Select the flow switch according

Integrated Type

Basic type PF3WB

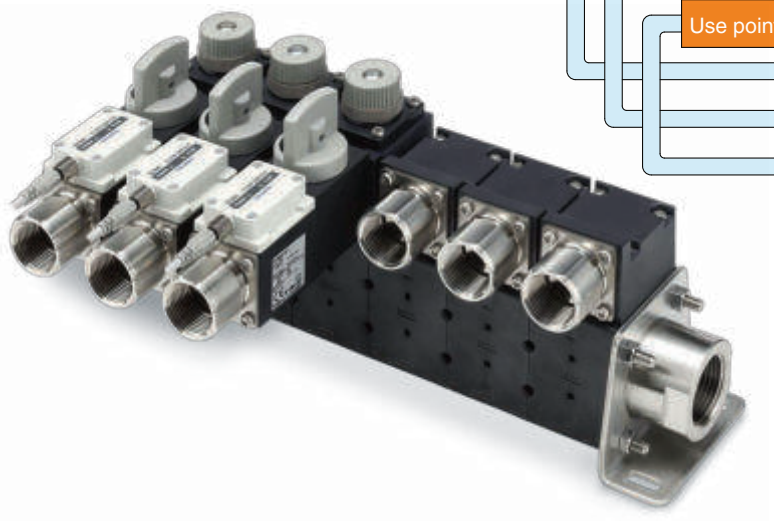
Space can be saved by integrating the supply and return in one unit.

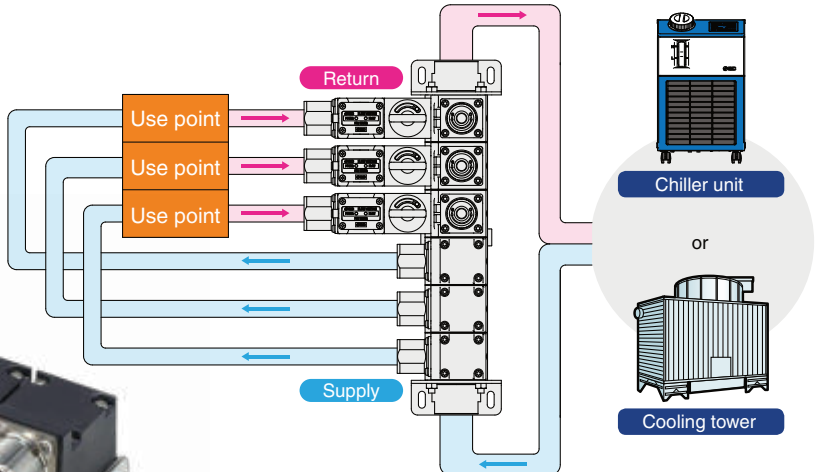




Straight type PF3WC

Space can be saved by integrating the supply and return in one unit.
The piping for the supply and return can be arranged in the same direction.

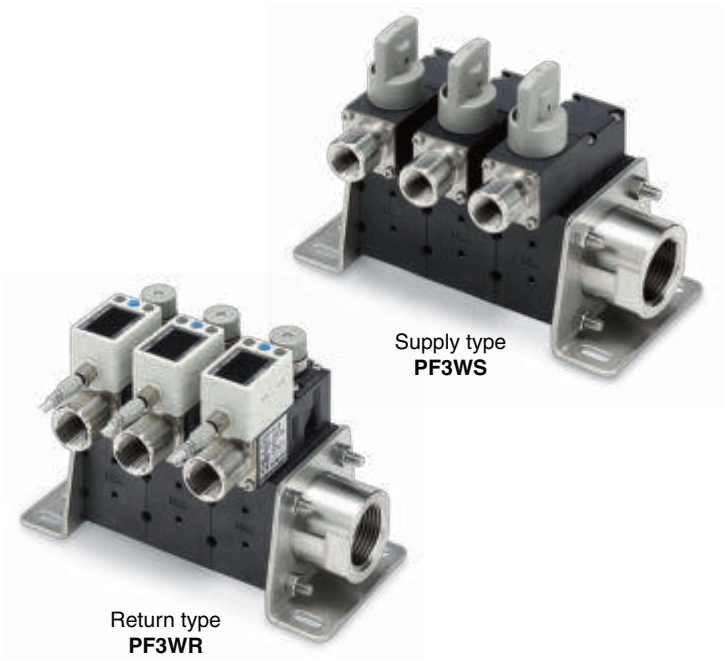


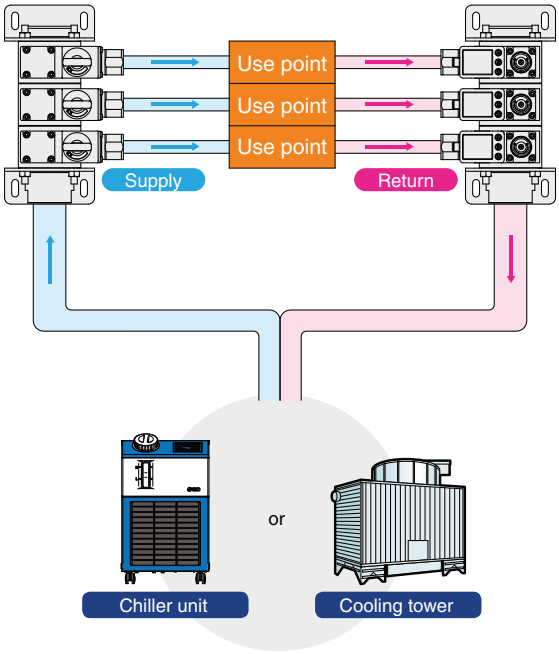


to your requirements.

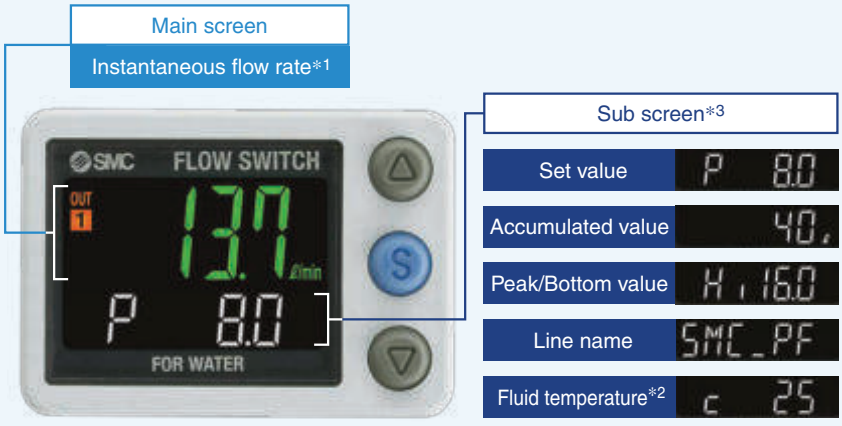
Remote Type

Free layout is possible by separating the supply and return unit.





3-color/2-screen display

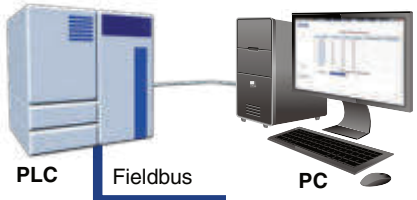


*1 Main screen shows the instantaneous flow rate only.
*2 Fluid temperature can be displayed only when the digital flow switch with a temperature sensor is selected.
*3 Sub screen can be turned off.
Mode display can be selected for IO-Link compatible type.

- **Fluid temperature: 0 to 90°C**
- **Ethylene glycol aqueous solution can be used.**
- **Non-grease**

IO-Link Compatible

Supports the IO-Link communication protocol



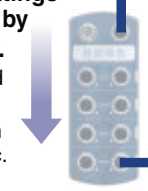
Configuration File (IODD File*1)
- Manufacturer
- Product part no.
- Set value

*1 **IODD File:** IODD is an abbreviation of IO Device Description. This file is necessary for setting the device and connecting it to a master. Save the IODD file on the PC to be used to set the device prior to use.

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

Device settings can be set by the master.
- Threshold value
- Operation mode, etc.

Read the device data.
- Switch ON/OFF signal and analog value
- Device information: Manufacturer, Product part number, Serial number, etc.
- Normal or abnormal device status
- Cable breakage



IO-Link Master

IO-Link Compatible Device: Digital Flow Switch for Water

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

Bit offset	Item	Note
0	OUT1 output	0: OFF 1: ON
1	OUT2 output	0: OFF 1: ON
8	Diagnosis (flow rate)	0: OFF 1: ON
9	Diagnosis (temperature)	0: OFF 1: ON
15	Diagnosis (error)	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)															

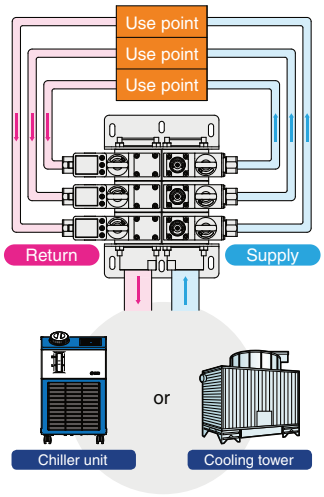
Bit offset	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Item	Measured temperature value (PD) ∗ The area is not used when the product without temperature sensor is selected.															

Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Item	Error	Reservation					Temperature	Flow rate	Reservation						OUT2	OUT1
	Diagnosis						Diagnosis								Switch output	

Application Example

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

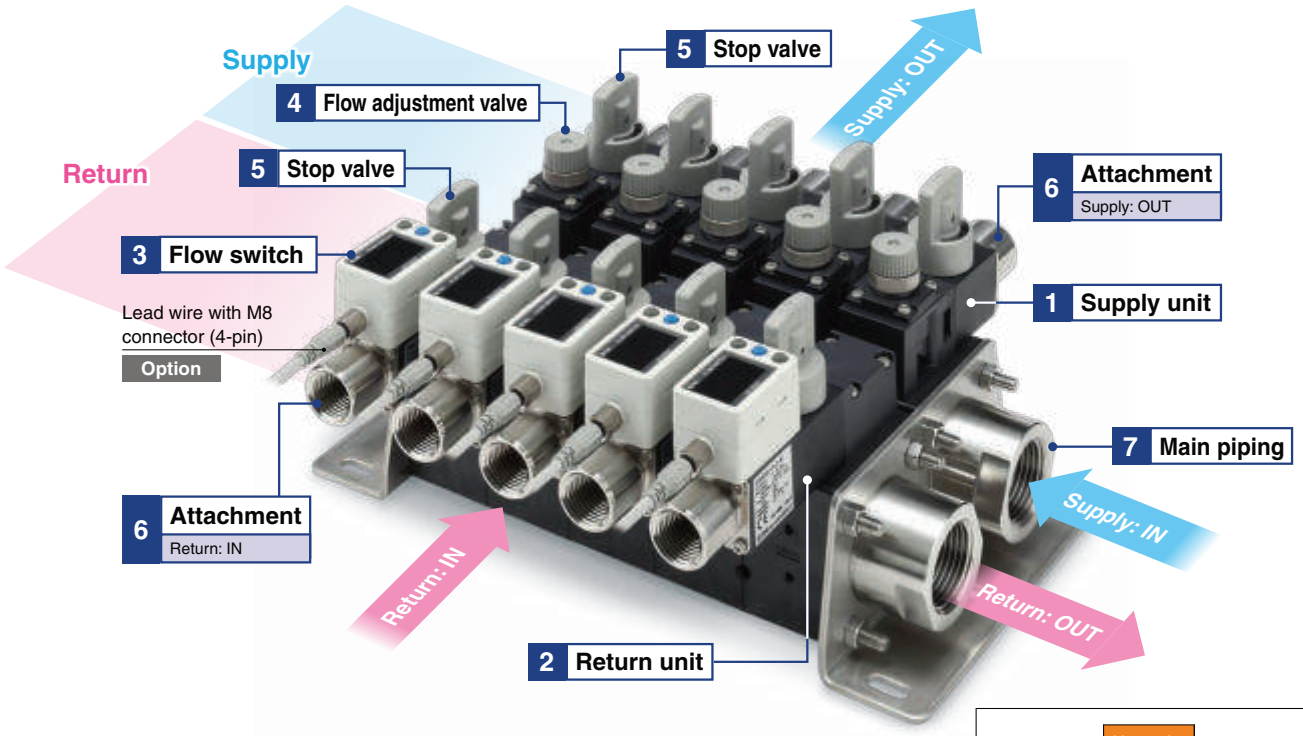
Displays the output communication status and indicates the presence of communication data

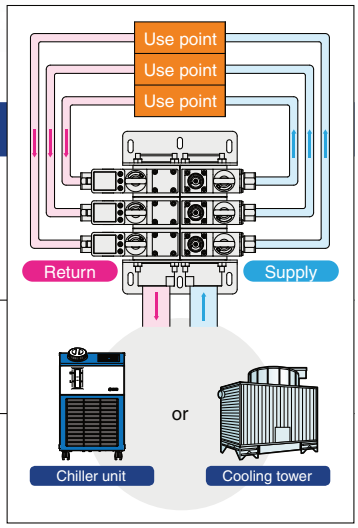
Operation and Display

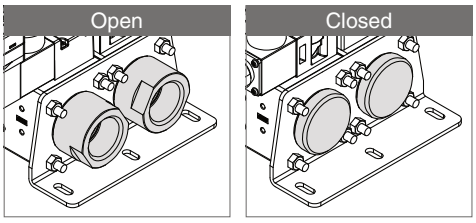
Communication with master	IO-Link status indicator light	Status			Screen display*2	Description
Yes	*1	IO-Link mode	Normal	Operate	MODE OPE	Normal communication status (readout of measured value)
				Start up	MODE STRT	At the start of communication
				Preoperate	MODE PRE	
	(Flashing) *1		Abnormal	Version does not match	Er 15	The IO-Link version does not match that of the master. The master uses version 1.0.
				Lock	MODE LOC	Backup and restore required due to data storage lock.
No				Communication disconnection	MODE OPE / MODE STRT / MODE PRE	Normal communication was not received for 1 second or longer.
	OFF	SIO mode			MODE SIO	General switch output

∗1 In IO-Link mode, the IO-Link indicator will be ON or flashing. ∗2 When the lower line (sub screen) is set to mode display

Parts Descriptions and Functions (Integrated Type / Basic Type Construction)





Description	Function
1 Supply unit (Supply)	Supply the fluid from the main piping of the supply side to the customer/cooling part. Flow adjustment valve and stop valve can be freely combined. ＊ Flow switch is not applicable for use on the supply unit.
2 Return unit (Return)	Returns the fluid discharged from the use point. Flow switch, flow adjustment valve and stop valve can be freely combined.
3 Flow switch	Displays/outputs the flow rate Integrated display type (**PF3W7**) or remote sensor type (**PF3W5**) can be selected. Temperature sensor can be selected (with or without the temperature sensor). Available for IO-Link type (integrated display type only) ＊ Not applicable for supply unit
4 Flow adjustment valve	Orifice mechanism to adjust the flow rate ＊ The flow adjustment valve of this product is not suitable for applications which require constant adjustment of flow rate. ＊ Not suitable for stopping flow ＊ For supply/return unit type
5 Stop valve	Mechanical part for stopping flow ＊ Not suitable for applications which require adjustment of flow rate ＊ For supply/return unit type
6 Attachment	Connects the piping for supply and return unit
7 Main piping	 Connects piping for the manifold body Can be set to open or close ＊ PF3WC series is not applicable for “Closed.” ＊ Main piping cannot be changed after order is placed.

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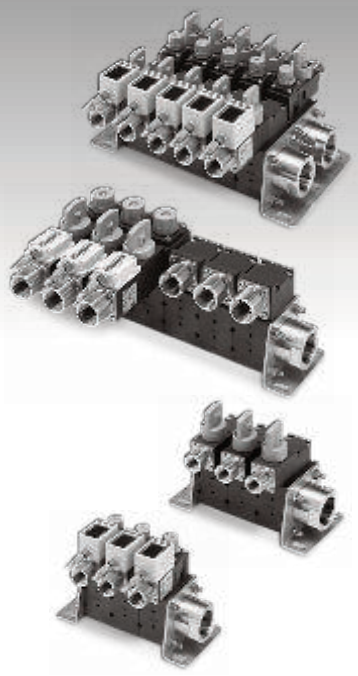
Digital Flow Switch Manifold for Water
PF3WB/C/S/R Series



Integrated Type **Digital Flow Switch Manifold for Water** **Basic Type**
PF3WB Series
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Integrated Type **Digital Flow Switch Manifold for Water** **Straight Type**
PF3WC Series
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Remote Type **Digital Flow Switch Manifold for Water** **Supply Type**
PF3WS Series
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Remote Type **Digital Flow Switch Manifold for Water** **Return Type**
PF3WR Series
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Integrated Type **Digital Flow Switch Manifold for Water** Basic Type

PF3WB Series

RoHS

How to Order

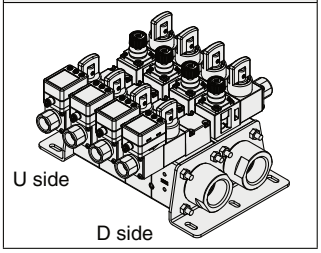
Integrated type (Basic type)

PF3W B 04 D □ – W 7 04 P – 03 – A □ – M

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬

❶ Manifold type

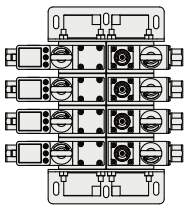
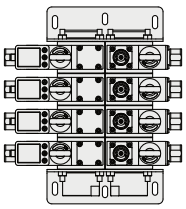
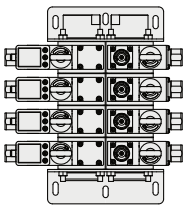
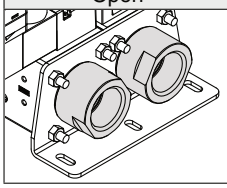
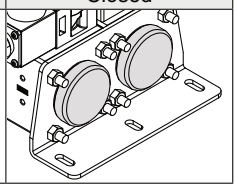
B
Integrated type (Basic type)



❷ System

	Symbol		Stations	Flow range 04	20	40
Manifold type	B	01	1 station	●	●	●
		02	2 stations	●	●	●
		03	3 stations	●	●	●
		04	4 stations	●	●	●
		05	5 stations	●	●	●
		06	6 stations	●	●	—
		07	7 stations	●	●	—
		08	8 stations	●	●	—
		09	9 stations	●	●	—
		10	10stations	●	●	—

❸ Main piping

B	D	U
U side: Open	U side: Closed	U side: Open
		
D side: Open	D side: Open	D side: Closed
Open	Closed	
		

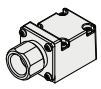
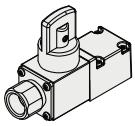
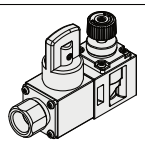
∗ When "Open," the port size of the main piping is 1 inch.

❹ Main piping/Attachment thread type

Nil	Rc
N	NPT
F	G∗1

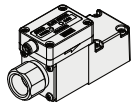
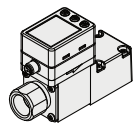
∗1 ISO 228 compliant

❺ Supply unit components

Symbol	Nil	S	P	W
Flow adjustment valve	—	●	—	●
Stop valve	—	—	●	●
				

∗ The flow switch is not applicable for the supply unit.
∗ This flow adjustment valve is not suitable for applications which require constant adjustment or stopping of flow.
∗ The stop valve of this product is not suitable for applications which require adjustment of flow rate.

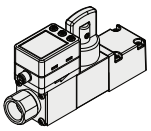
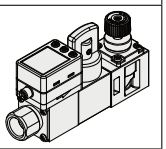
❻ Return unit Flow switch type

5	7
Remote sensor unit	Integrated display
	

❼ Return unit Rated flow range (Flow range)

Symbol	Rated flow range (Flow range)
04	0.5 to 4 L/min
20	2 to 16 L/min
40	5 to 40 L/min

❽ Return unit components

Symbol	Nil	S	P	W
Flow adjustment valve	—	●	—	●
Stop valve	—	—	●	●
				

∗ Flow switch is installed on the return unit. (Example shows the integrated display type.)
∗ This flow adjustment valve is not suitable for applications which require constant adjustment or stopping of flow.
∗ The stop valve of this product is not suitable for applications which require adjustment of flow rate.

❾ Supply/Return unit Port size

Symbol	Port size	Rated flow range (Flow range) 04	20	40
03	3/8	●	△∗1	—
04	1/2	—	●	△∗1
06	3/4	—	—	●

∗1 Made to order

❿ Return unit Flow switch output specifications

Refer to Table 1 on page 11.

⓫ Return unit: Lead wire for flow switch (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. For details, refer to the **Web Catalog**.
∗ Lead wires for the flow switch will be included with the product.

⓬ Return unit Flow switch unit specifications

Refer to Table 2 on page 11.

SMC

Integrated Type **Digital Flow Switch Manifold for Water** Straight Type

PF3WC Series

CE RoHS

How to Order

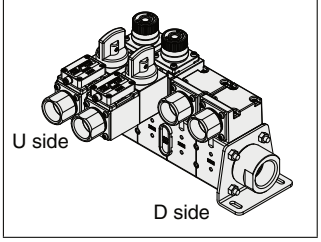
Integrated type (Straight type)

PF3W C 04 D □ – W 7 04 P – 03 – A □ – M

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬

❶ Manifold type

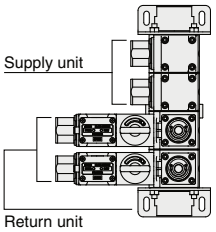
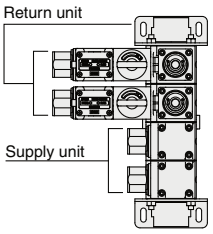
C
Integrated type (Straight type)

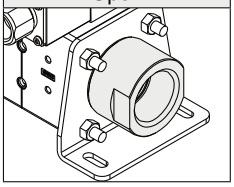


❷ System

	Symbol	Stations	Flow range 04	20	40
Manifold type C	01	1 station	●	●	●
	02	2 stations	●	●	●
	03	3 stations	●	●	●
	04	4 stations	●	●	●
	05	5 stations	●	●	●

❸ Supply/Return unit layout

D	U
U side: Open	U side: Open
	
D side: Open	D side: Open

Open


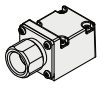
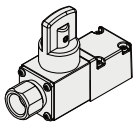
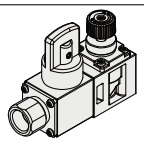
∗ Not applicable for "Closed" of the main piping
∗ Main piping port is 1 inch.

❹ Main piping/ Attachment thread type

Nil	Rc
N	NPT
F	G∗1

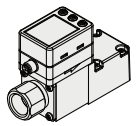
∗1 ISO 228 compliant

❺ Supply unit components

Symbol	Nil	S	P	W
Flow adjustment valve	—	●	—	●
Stop valve	—	—	●	●
				

∗ The flow switch is not applicable for the supply unit.
∗ This flow adjustment valve is not suitable for applications which require constant adjustment or stopping of flow.
∗ The stop valve of this product is not suitable for applications which require adjustment of flow rate.

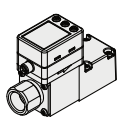
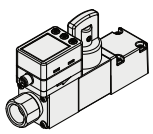
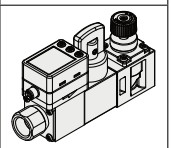
❻ Return unit Flow switch type

5	7
Remote sensor unit	Integrated display
	

❼ Return unit Rated flow range (Flow range)

Symbol	Rated flow range (Flow range)
04	0.5 to 4 L/min
20	2 to 16 L/min
40	5 to 40 L/min

❽ Return unit components

Symbol	Nil	S	P	W
Flow adjustment valve	—	●	—	●
Stop valve	—	—	●	●
				

∗ Flow switch is installed on the return unit. (Example shows the integrated display type.)
∗ This flow adjustment valve is not suitable for applications which require constant adjustment or stopping of flow.
∗ The stop valve of this product is not suitable for applications which require adjustment of flow rate.

❾ Supply/Return unit Port size

Symbol	Port size	Rated flow range (Flow range) 04	20	40
03	3/8	●	△∗1	—
04	1/2	—	●	△∗1
06	3/4	—	—	●

∗1 Made to order

❿ Return unit Flow switch output specifications

Refer to Table 1 on page 11.

⓫ Return unit: Lead wire for flow switch (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. For details, refer to the **Web Catalog**.
∗ Lead wires for the flow switch will be included with the product.

⓬ Return unit Flow switch unit specifications

Refer to Table 2 on page 11.

Remote Type Digital Flow Switch Manifold for Water Supply Type

PF3WS Series

CE RoHS

How to Order

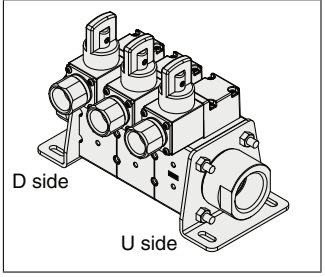
Remote type (Supply type)

PF3W S 03 D □ – P 20 – 04

❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Manifold type

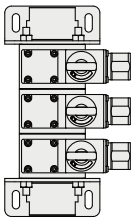
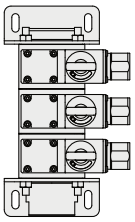
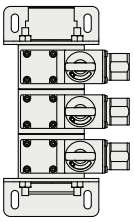
S
Remote type (Supply type)

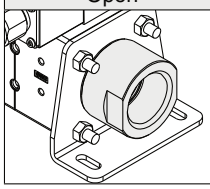
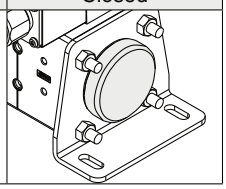


❷ System

Symbol	Stations	Flow range		
		04	20	40
01	1 station	●	●	●
02	2 stations	●	●	●
03	3 stations	●	●	●
04	4 stations	●	●	●
05	5 stations	●	●	●
06	6 stations	●	●	—
07	7 stations	●	●	—
08	8 stations	●	●	—
09	9 stations	●	●	—
10	10 stations	●	●	—

❸ Main piping

B	D	U
U side: Open	U side: Closed	U side: Open
		
D side: Open	D side: Open	D side: Closed

Open	Closed
	

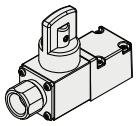
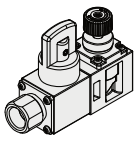
∗ When "Open," the port size of the main piping is 1 inch.

❹ Main piping thread type

Nil	Rc
N	NPT
F	G∗1

∗1 ISO 228 compliant

❺ Supply unit components

Symbol	Nil	S	P	W
Flow adjustment valve	—	●	—	●
Stop valve	—	—	●	●
				

∗ The flow switch is not applicable for the supply unit.
∗ This flow adjustment valve is not suitable for applications which require constant adjustment or stopping of flow.
∗ The stop valve of this product is not suitable for applications which require adjustment of flow rate.

❻ Rated flow range (Flow range)

Symbol	Rated flow range (Flow range)
04	0.5 to 4 L/min
20	2 to 16 L/min
40	5 to 40 L/min

❼ Supply unit port size

Symbol	Port size	Rated flow range (Flow range)		
		04	20	40
03	3/8	●	△∗1	—
04	1/2	—	●	△∗1
06	3/4	—	—	●

∗1 Made to order

Remote Type Digital Flow Switch Manifold for Water Return Type

PF3WR Series

CE RoHS

How to Order

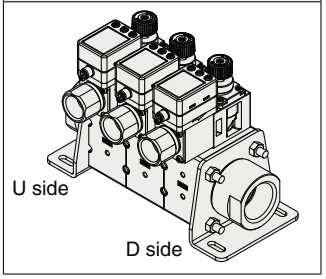
Remote type (Return type)

PF3W R 03 U □ – 7 20 S – 04 – C □ – M

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫

❶ Manifold type

R
Remote type (Return type)

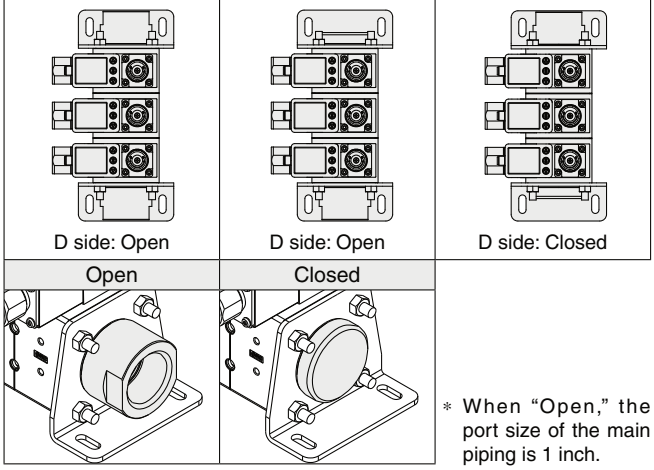


❷ System

Symbol	Stations	Flow range		
		04	20	40
01	1 station	●	●	●
02	2 stations	●	●	●
03	3 stations	●	●	●
04	4 stations	●	●	●
05	5 stations	●	●	●
06	6 stations	●	●	—
07	7 stations	●	●	—
08	8 stations	●	●	—
09	9 stations	●	●	—
10	10 stations	●	●	—

❸ Main piping

B	D	U
U side: Open	U side: Closed	U side: Open
D side: Open	D side: Open	D side: Closed



Open	Closed

* When "Open," the port size of the main piping is 1 inch.

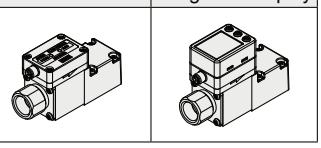
❹ Main piping thread type

Nil	Rc
N	NPT
F	G*1

*1 ISO 228 compliant

❺ Flow switch type

5	7
Remote sensor unit	Integrated display

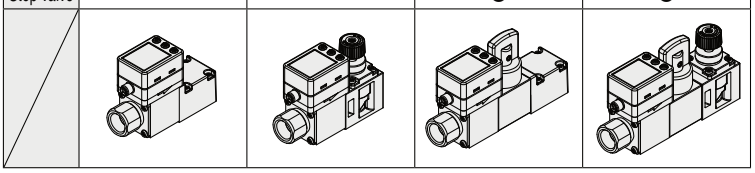


❻ Rated flow range (Flow range)

Symbol	Rated flow range (Flow range)
04	0.5 to 4 L/min
20	2 to 16 L/min
40	5 to 40 L/min

❼ Return unit components

Symbol	Nil	S	P	W
Flow adjustment valve	—	●	—	●
Stop valve	—	—	●	●



* Flow switch is installed on the return unit. (Example shows the integrated display type.)
* This flow adjustment valve is not suitable for applications which require constant adjustment or stopping of flow.
* The stop valve of this product is not suitable for applications which require adjustment of flow rate.

❽ Return unit port size

Symbol	Port size	Rated flow range (Flow range)		
		04	20	40
03	3/8	●	△*1	—
04	1/2	—	●	△*1
06	3/4	—	—	●

*1 Made to order

❾ Flow switch output specifications

Refer to Table 1 on page 11.

❿ Lead wire for flow switch (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.
For details, refer to the **Web Catalog**.
* Lead wires for the flow switch will be included with the product.

⓫ Flow switch unit specifications

Refer to Table 2 on page 11.

Table 1 Return Unit: Flow Switch Output Specifications

Type	Symbol	OUT1	OUT2		Temperature sensor
		Flow rate/ Temperature*5	Flow rate	Temperature	
Remote sensor unit	1	Analog 1 to 5 V	—	—	None
	2	Analog 4 to 20 mA	—	—	
	1T	Analog 1 to 5 V	—	Analog 1 to 5 V	Yes
	2T*1	Analog 4 to 20 mA	—	Analog 4 to 20 mA	
Integrated display	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*1	NPN	External input*2	—	
	H*1	PNP	External input*2	—	
	AT	NPN	(NPN) ⇔*3 NPN		Yes
	BT	PNP	(PNP) ⇔*3 NPN		
	CT	NPN	(Analog 1 to 5 V) ⇔*3 Analog 1 to 5 V		
	DT	NPN	(Analog 4 to 20 mA) ⇔*3 Analog 4 to 20 mA		
	ET	PNP	(Analog 1 to 5 V) ⇔*3 Analog 1 to 5 V		
	FT	PNP	(Analog 4 to 20 mA) ⇔*3 Analog 4 to 20 mA		
Integrated display (IO-Link compatible*4)	L*1	IO-Link/ Switch output (N/P)	—		None
	L2*1	IO-Link/ Switch output (N/P)	Switch output (N/P)		
	LT	IO-Link/ Switch output (N/P)	—		Yes
	L2T*1	IO-Link/ Switch output (N/P)	Switch output (N/P)		

*1 Made to order
*2 External input: The accumulated value, peak value, and bottom value can be reset.
*3 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.
*4 Only integrated display type is suitable for IO-Link.
*5 OUT1 is applicable for temperature only for LT or L2T (IO-link compatible with temperature sensor).

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

Table 2 Return Unit: Flow Switch Unit Specifications

Type	Symbol	Instantaneous flow	Accumulated flow	Temperature
Remote sensor unit	Nil	L/min	—	°C
	G*1	L/min (gal/min)	—	°C (°F)
Integrated display	M	L/min	L	°C
	G*1	gal/min	gal	°C
	F*1	gal/min	gal	°F
	J*1	L/min	L	°F
Integrated display (IO-Link compatible)	Nil*1	gal/min	gal	°C
	M	L/min	L	°C

*1 Made to order

* Under the New Measurement Act, units other than SI cannot be used in Japan.
· Remote sensor unit: Nil
· Integrated display: M
· Integrated display (IO-Link compatible): M

Reference: 1 [L/min] ⇔ 0.2642 [gal/min]
1 [gal/min] ⇔ 3.785 [L/min]
°F = 9/5°C + 32

Manifold Common Specifications

Model		PF3WB	PF3WC	PF3WS	PF3WR
Manifold type		Integrated type		Remote type	
System		1 to 10 stations*1	Supply: 1 to 5 stations Return: 1 to 5 stations	1 to 10 stations*1	
Unit	Rated flow range	0.5 to 4 L/min, 2 to 16 L/min, 5 to 40 L/min			
	Supply unit components	Flow adjustment valve, Stop valve			—
	Return unit components	Flow switch, Flow adjustment valve, Stop valve		—	Flow switch, Flow adjustment valve, Stop valve
Fluid	Applicable fluid	Water and Ethylene glycol aqueous solution (with viscosity of 3 mPa·s [3 cP] or less)*2			
	Fluid temperature	0 to 90°C (No freezing or condensation)			
Pressure specifications	Operating pressure range*3	0 to 1 MPa			
	Proof pressure*3	1.5 MPa			
	Pressure loss	Refer to the "Pressure Loss" graph.			
Environmental resistance	Enclosure	IP65			
	Operating temperature range	0 to 50°C (No freezing or condensation)			
	Operating humidity range	Operation, Storage: 85% R.H. (No condensation)			
Standards		CE marking (EMC directive/RoHS directive)			
Wetted parts material*4		PPS, Stainless steel 304, FKM			
		Non-grease			
Port size*5	Main piping	1			
	Attachment	3/8, 1/2, 3/4			

*1 Max. 5 stations when the flow rate symbol for the supply/return unit is 40 (5 to 40 L/min)
*2 Refer to the graph of measurable range for ethylene glycol aqueous solution on page 14. 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.
*3 The operating pressure range and proof pressure may change according to the fluid temperature. Refer to the graphs on page 14.
*4 For details, refer to the "Wetted Parts Construction" on page 16.
*5 When the piping diameter or piping passage is restricted, the specifications may not be satisfied.
* Products with tiny scratches, marks, or flow switch display color or brightness variations which do not affect the performance of the product are verified as conforming products.

Integrated Display Specifications: PF3W7 Series

For detailed specifications of flow switches, refer to the PF3W series in the **Web Catalog** or the Operation Manual.

Model	PF3W704	PF3W720	PF3W740
Detection method	Karman vortex		
Rated flow range	0.5 to 4 L/min	2 to 16 L/min	5 to 40 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")
Set flow range	0.35 to 5.50 L/min	1.7 to 22.0 L/min	3.5 to 55.0 L/min
Smallest settable increment	0.01 L/min	0.1 L/min	
Accuracy	Display value: ±3% F.S., Analog output: ±3% F.S.		
Repeatability	±2% F.S.		
Temperature characteristics	±5% F.S. (25°C standard)		
Power supply voltage	12 to 24 VDC ±10%		
Current consumption	50 mA or less		
Standards and regulations	CE marking (EMC directive/RoHS directive)		

IO-Link Compatible

Model			PF3W704	PF3W720	PF3W740
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 housing		
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 (0 x 0083)

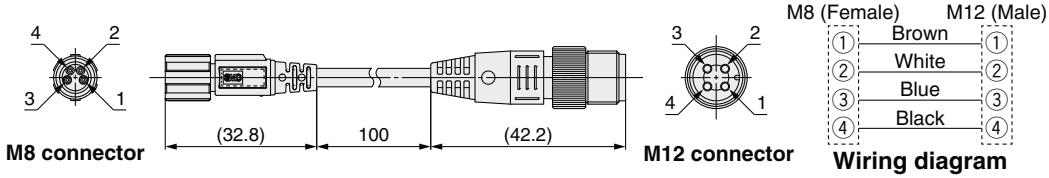
∗1 The configuration file can be downloaded from the SMC website, https://www.smcworld.com

Device ID∗1

Model		PF3W704	PF3W720	PF3W740
Output specification	**L**	352 (0 x 0160)	353 (0 x 0161)	354 (0 x 0162)
	L2			
	LT	357 (0 x 0165)	358 (0 x 0166)	359 (0 x 0167)
	L2T			

∗1 The device ID differs according to each product type (flow range, whether or not a temperature sensor is provided, etc.).

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



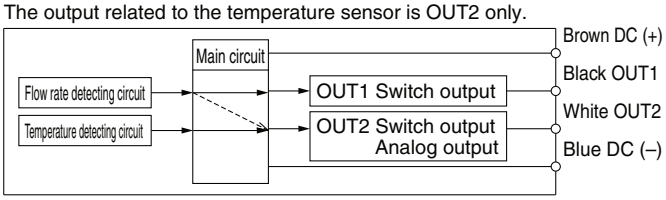
∗ For wiring, refer to the Operation Manual on the SMC website, https://www.smcworld.com

Integrated Display: 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
Display accuracy	±2°C
Analog output accuracy	±3% F.S.
Response time	7 s∗2
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.

Remote Sensor Unit Specifications: PF3W5 Series

For detailed specifications of flow switches, refer to the PF3W series in the **Web Catalog** or the Operation Manual.

Model	PF3W504	PF3W520	PF3W540
Detection method	Karman vortex		
Rated flow range	0.5 to 4 L/min	2 to 16 L/min	5 to 40 L/min
Accuracy	±3% F.S.		
Repeatability	±2% F.S.		
Temperature characteristics	±5% F.S. (25°C standard)		
Power supply voltage	12 to 24 VDC ±10%		
Current consumption	30 mA or less		
Standards and regulations	CE marking (EMC directive/RoHS directive)		

Remote Sensor Unit: Temperature Sensor Specifications

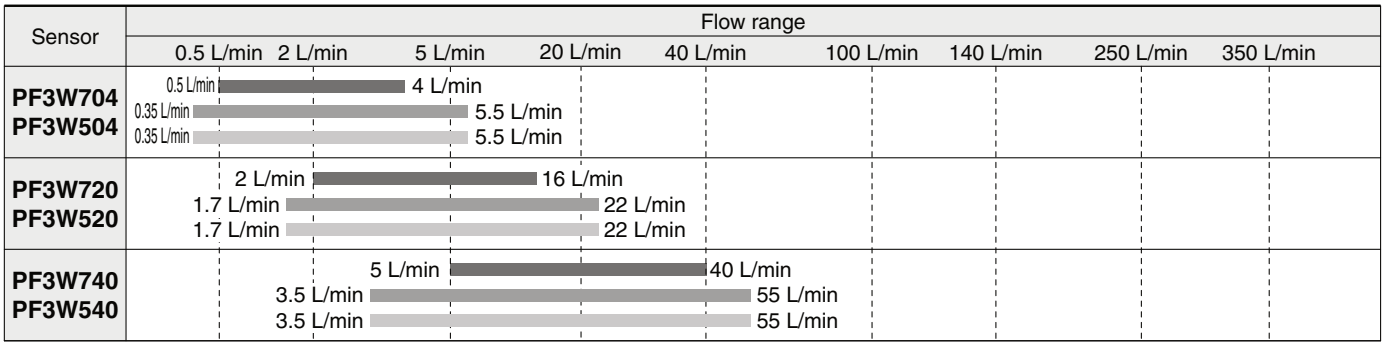
Rated temperature range	0 to 100°C*1
Analog output accuracy	±3% F.S.
Response time	7 s*2
Ambient temperature characteristics	±5% F.S.

*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.

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.



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

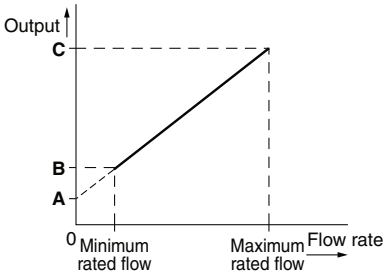
Rated flow range Display flow range Set flow range

Analog Output

Flow rate/Analog output

	A	B	C
Voltage output	1 V	1.5 V	5 V
Current output	4 mA	6 mA	20 mA

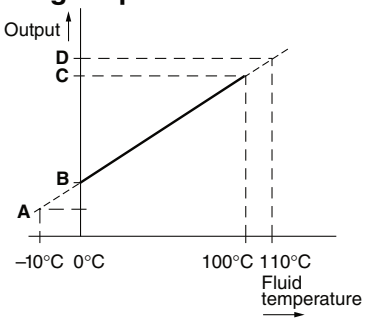
Model	Rated flow [L/min]	
	Minimum	Maximum
PF3W704/504	0.5	4
PF3W720/520	2	16
PF3W740/540	5	40



Fluid temperature/Analog output

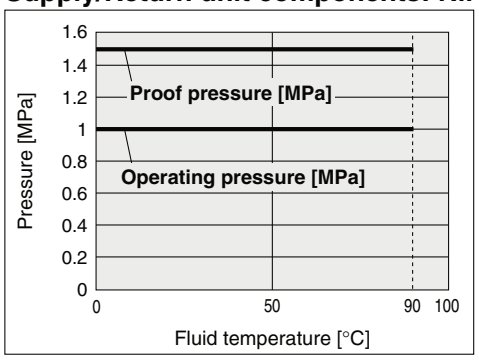
	A	B
Voltage output	0.6 V	1 V
Current output	2.4 mA	4 mA

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

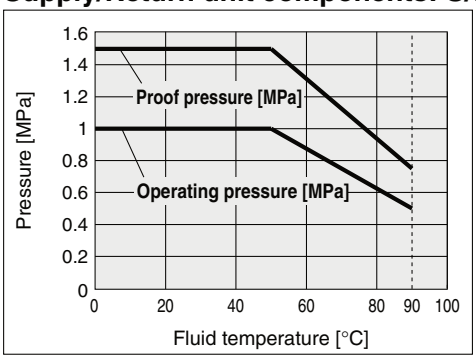


Operating Pressure and Proof Pressure

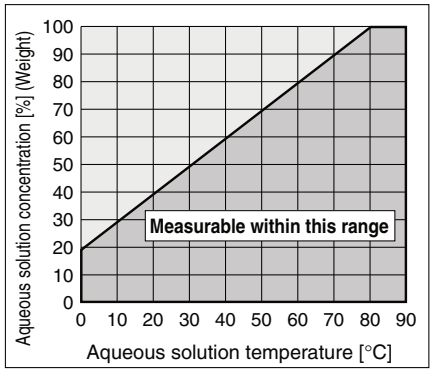
Supply/Return unit components: Nil



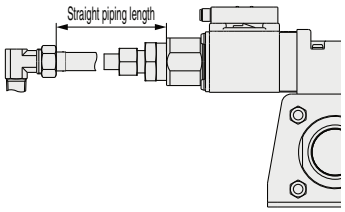
Supply/Return unit components: S/P/W



Measurable Range for Ethylene Glycol Aqueous Solution (Reference Value)



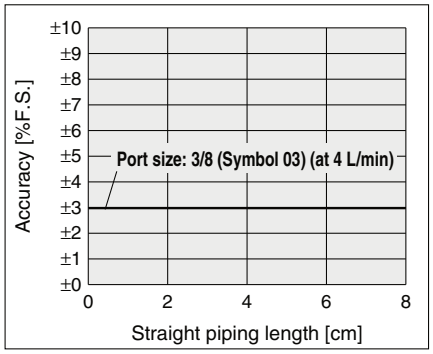
Straight Piping Length and Accuracy (Reference Value)



- 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 ±3% F.S. specification.

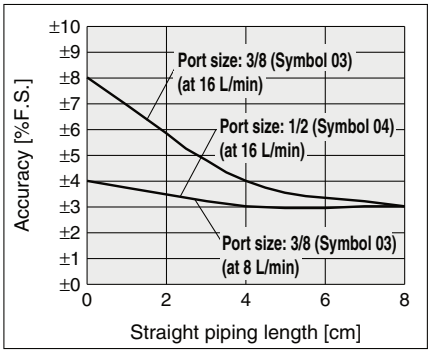
Flow range: 0.5 to 4 L/min (Symbol 04)

Pressure: 0.3 MPa Piping diameter: ø12



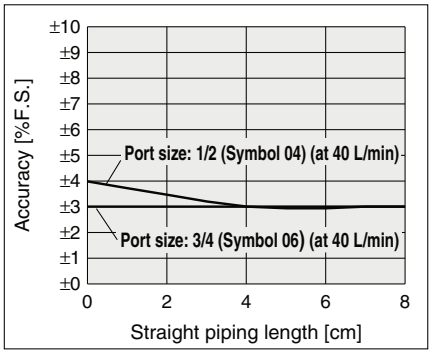
Flow range: 2 to 16 L/min (Symbol 20)

Pressure: 0.3 MPa Piping diameter: ø12



Flow range: 5 to 40 L/min (Symbol 40)

Pressure: 0.3 MPa Piping diameter: ø16

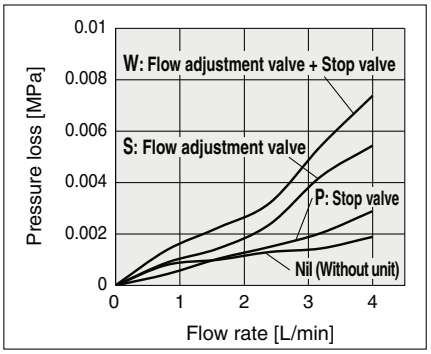


Flow Characteristics Per Station (Reference Value)

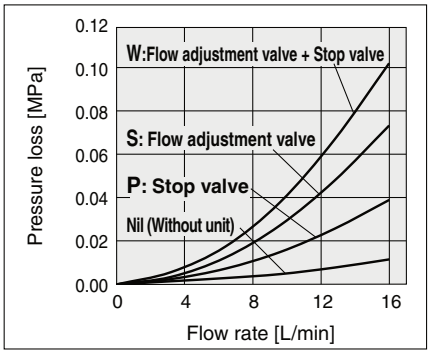
■ Supply Unit (Without flow switch)

Rated flow range (Flow range)	Unit components			Cv factor
	Symbol	Flow adjustment valve	Stop valve	
0.5 to 4 L/min (Symbol **04**)	**Nil**	—	—	2.04
	S	●	—	1.20
	P	—	●	1.65
	W	●	●	1.03
2 to 16 L/min (Symbol **20**)	**Nil**	—	—	3.31
	S	●	—	1.31
	P	—	●	1.80
	W	●	●	1.11
5 to 40 L/min (Symbol **40**)	**Nil**	—	—	6.36
	S	●	—	3.57
	P	—	●	2.49
	W	●	●	2.17

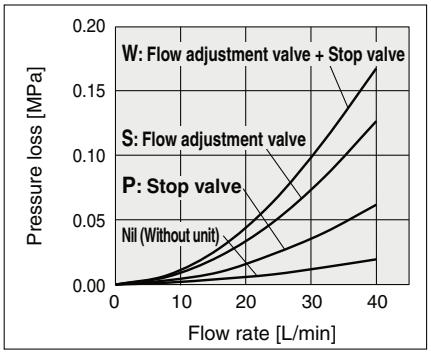
Flow range: 0.5 to 4 L/min (Symbol 04) (Reference value)



Flow range: 2 to 16 L/min (Symbol 20) (Reference value)



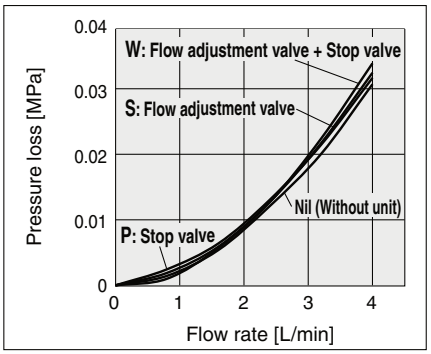
Flow range: 5 to 40 L/min (Symbol 40) (Reference value)



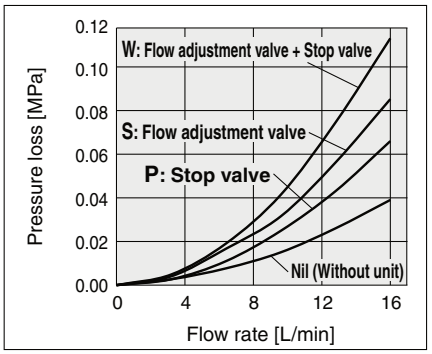
■ Return Unit (With flow switch) ∗ The flow path of the integrated display type and remote sensor type is common.

Rated flow range (Flow range)	Unit components			Cv factor
	Symbol	Flow adjustment valve	Stop valve	
0.5 to 4 L/min (Symbol **04**)	**Nil**	—	—	0.50
	S	●	—	0.49
	P	—	●	0.50
	W	●	●	0.48
2 to 16 L/min (Symbol **20**)	**Nil**	—	—	1.79
	S	●	—	1.21
	P	—	●	1.38
	W	●	●	1.05
5 to 40 L/min (Symbol **40**)	**Nil**	—	—	4.57
	S	●	—	3.11
	P	—	●	2.42
	W	●	●	2.04

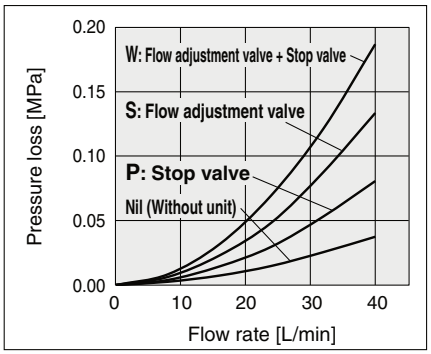
Flow range: 0.5 to 4 L/min (Symbol 04) (Reference value)



Flow range: 2 to 16 L/min (Symbol 20) (Reference value)

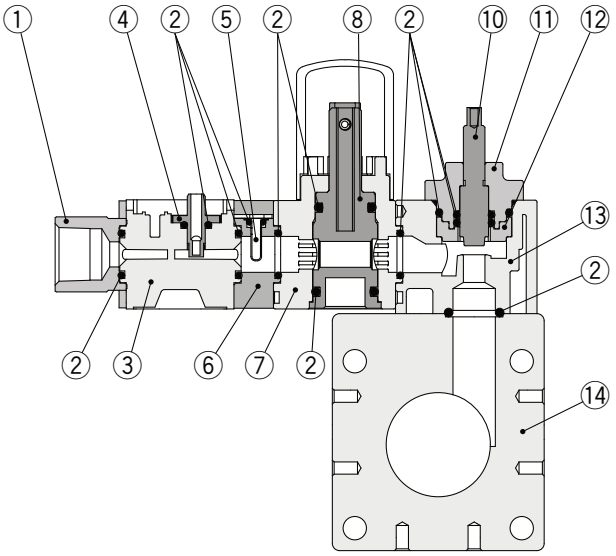


Flow range: 5 to 40 L/min (Symbol 40) (Reference value)

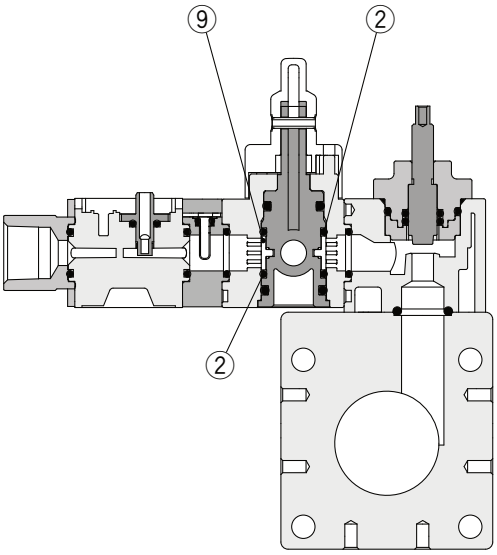


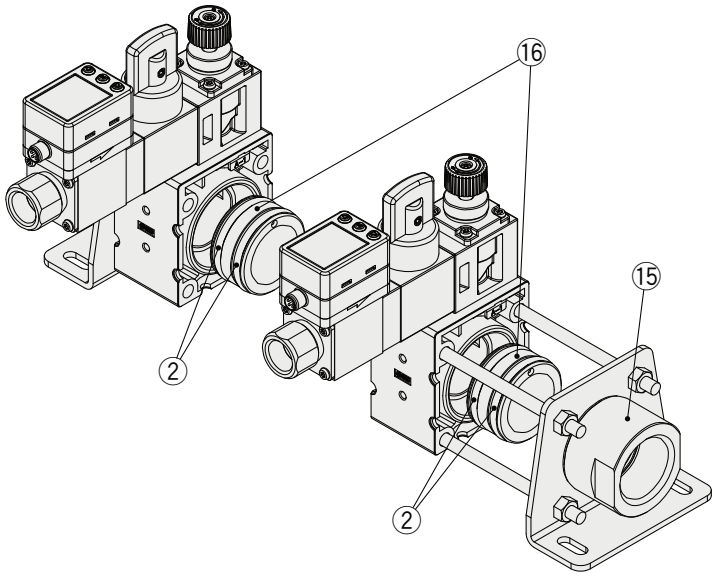
Wetted Parts Construction

Stop valve fully open



Stop valve fully closed





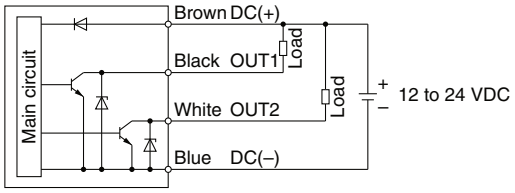
Component Parts

No.	Description	Material	Note
1	**Attachment**	Stainless steel 304	
2	**Seal**	FKM	
3	**Sensor body**	PPS	
4	**Flow sensor**	PPS	
5	**Temperature sensor**	Stainless steel 304	
6	**Temperature sensor body**	PPS	
7	**Stop valve body**	PPS	
8	**Stop valve shaft**	PPS	
9	**Guide**	PPS	
10	**Flow adjustment valve shaft**	Stainless steel 304	
11	**Flow adjustment valve cover**	PPS	
12	**Shaft support**	PPS	
13	**Flow adjustment valve body**	PPS	
14	**Main body**	PPS	
15	**Main piping**	Stainless steel 304	
16	**Connecting part**	PPS	Through-hole type
		Stainless steel 304	No through-hole between the supply/return unit of manifold type C (Supply unit and return unit are separate.)

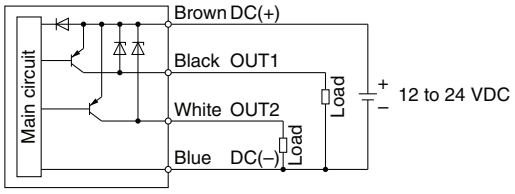
Internal Circuits and Wiring Examples

Integrated display

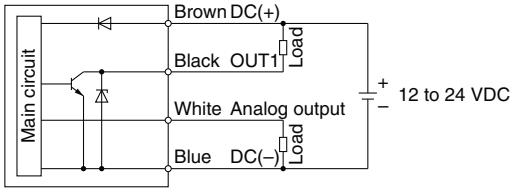
-A(T)
NPN (2 outputs)



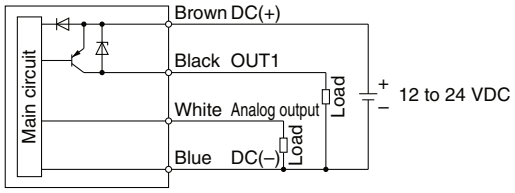
-B(T)
PNP (2 outputs)



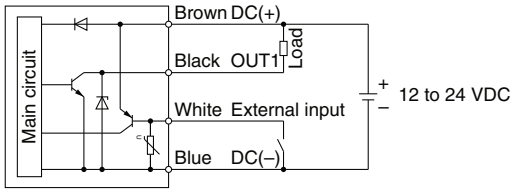
-C(T)/D(T)
C(T): NPN + Analog voltage output
D(T): NPN + Analog current output



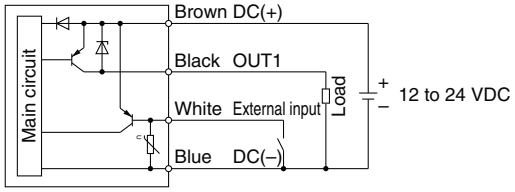
-E(T)/F(T)
E(T): PNP + Analog voltage output
F(T): PNP + Analog current output



-G
NPN + External input



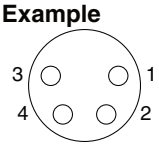
-H
PNP + External input



Lead wire (Option)

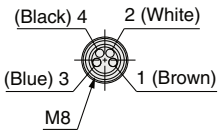
Connector pin number

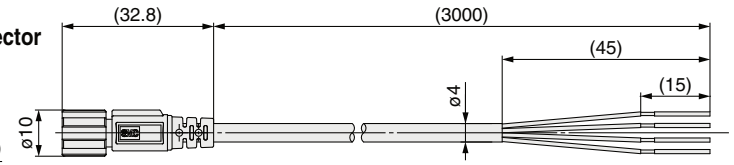
Example



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

ZS-40-A
Lead wire with M8 connector





Pin no.	Pin name	Wire color
1	DC (+)	Brown
2	OUT2	White
3	DC (–)	Blue
4	OUT1	Black

* 4-wire type lead wire with M8 connector used for the PF3W□ series
* For wiring, refer to the Operation Manual on the SMC website, https://www.smcworld.com

Lead Wire Specifications

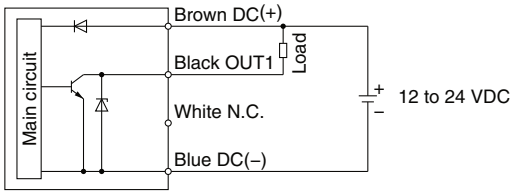
Conductor	Nominal cross section	AWG 23
	O.D.	Approx. 0.7 mm
Insulator	Material	Heat-resistant PVC
	O.D.	Approx. 1.1 mm
	Color	Brown, White, Black, Blue
Sheath	Material	Heat- and oil-resistant PVC
Finished O.D.		ø4

Internal Circuits and Wiring Examples

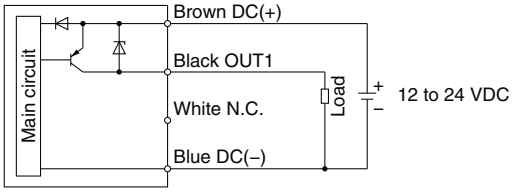
Integrated display (IO-Link)

-L(T)
When used as a switch output device (When not used as an IO-Link device = When in SIO mode)

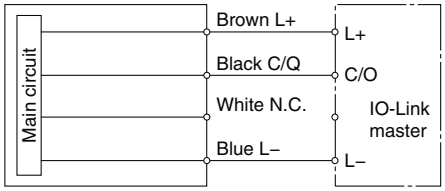
NPN setting



PNP setting

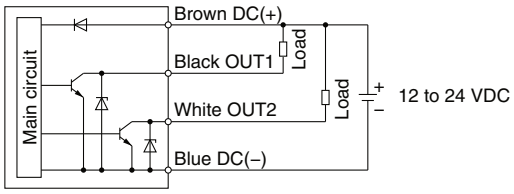


When used as an IO-Link device

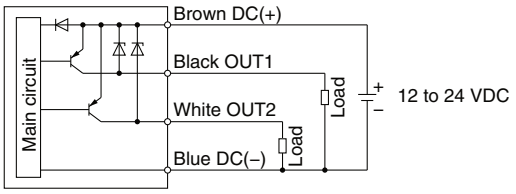


-L2(T)
When used as a switch output device (When not used as an IO-Link device = When in SIO mode)

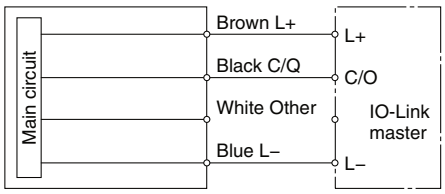
NPN setting



PNP setting

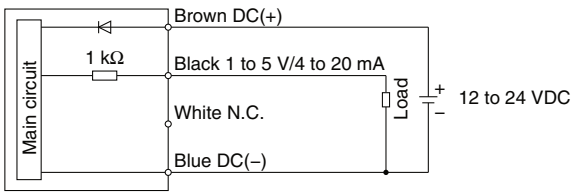


When used as an IO-Link device

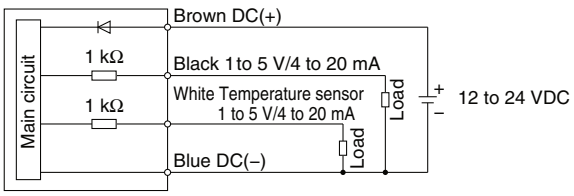


Remote sensor unit

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

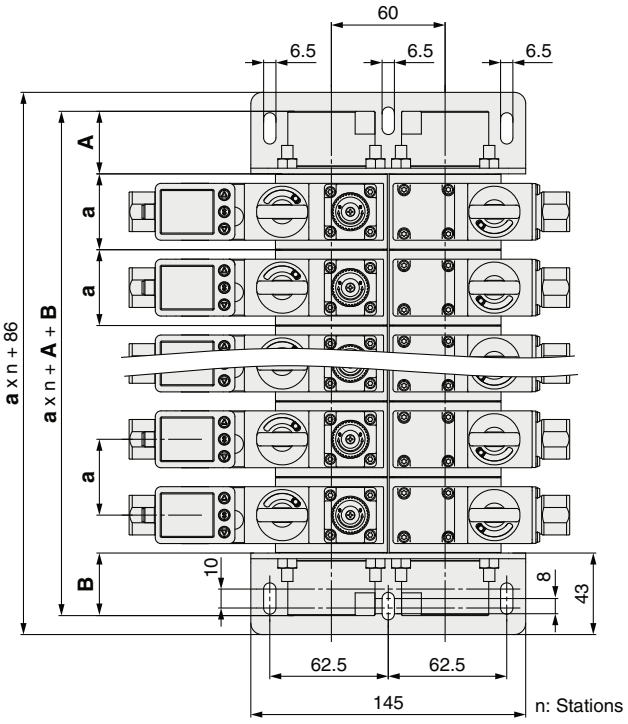


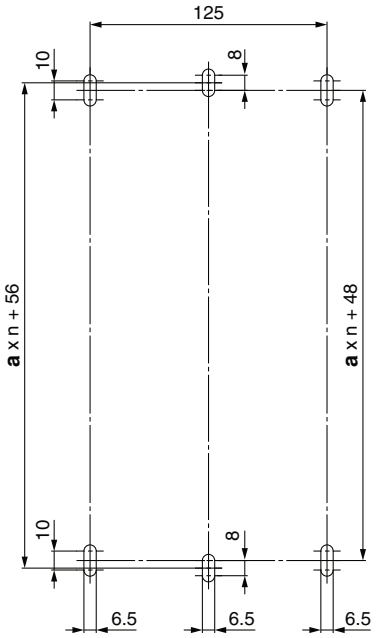
-1T/2T
1T: Analog voltage output (With temperature sensor output)
2T: Analog current output (With temperature sensor output)



Dimensions (Front View/Mounting Hole Position)

Integrated type (Basic type): PF3WB□□□-□□□□-□-□□-□



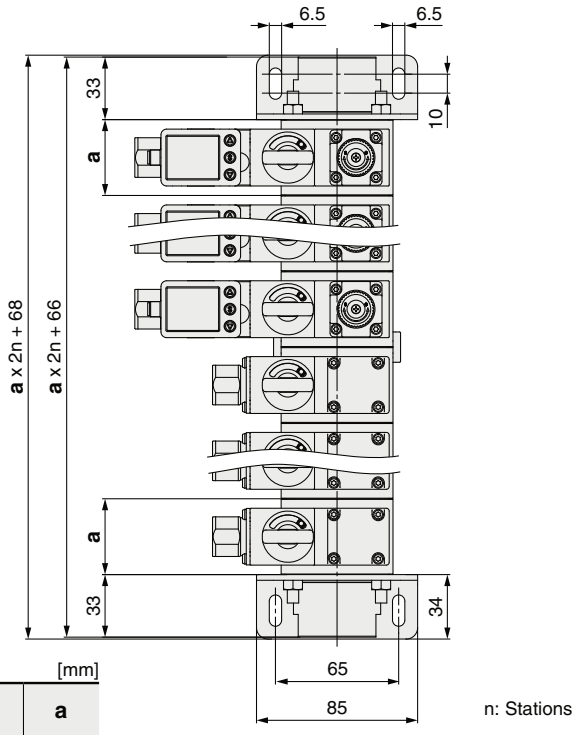


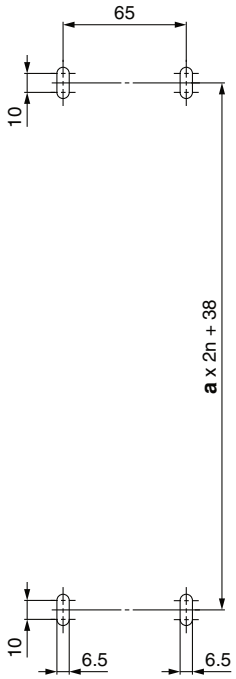
Mounting hole position

[mm]

Flow range [L/min]	A		B		a
	Open	Closed	Open	Closed	
0.5 to 4 (Symbol **04**)	33	14	33	14	40
2 to 16 (Symbol **20**)	33	14	33	14	40
5 to 40 (Symbol **40**)	33	14	33	14	45

Integrated type (Straight type): PF3WC□□□-□□□□-□-□□-□





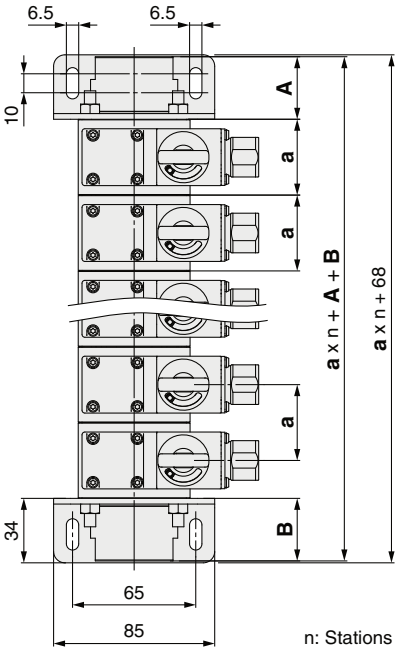
Mounting hole position

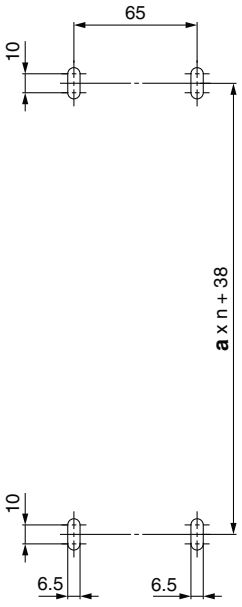
[mm]

Flow range [L/min]	a
0.5 to 4 (Symbol **04**)	40
2 to 16 (Symbol **20**)	40
5 to 40 (Symbol **40**)	45

Dimensions (Front View/Mounting Hole Position)

Remote type (Supply type): PF3WS□□□-□□-□



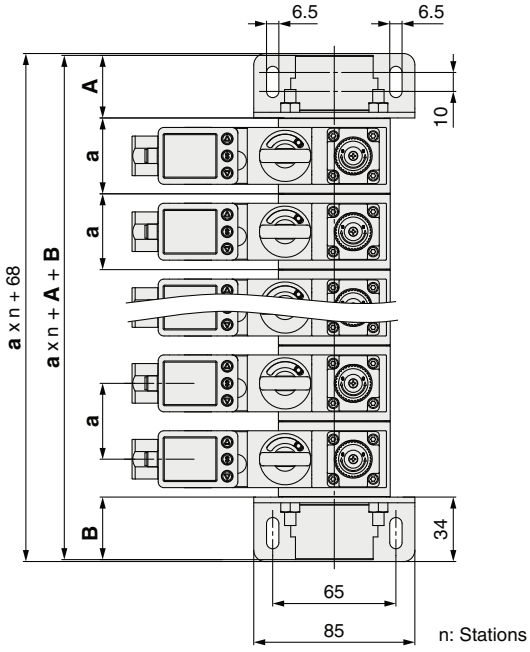


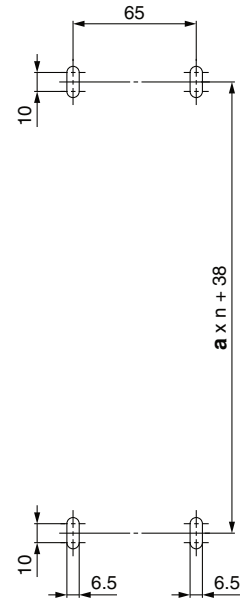
Mounting hole position

[mm]

Flow range [L/min]	A		B		a
	Open	Closed	Open	Closed	
0.5 to 4 (Symbol **04**)	33	14	33	14	40
2 to 16 (Symbol **20**)	33	14	33	14	40
5 to 40 (Symbol **40**)	33	14	33	14	45

Remote type (Return type): PF3WR□□□-□□□-□-□□-□





Mounting hole position

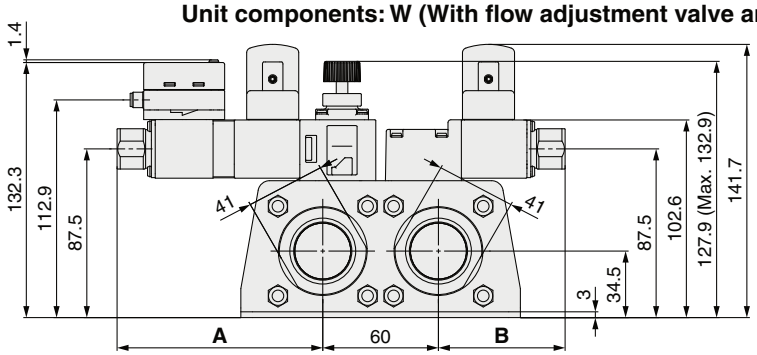
[mm]

Flow range [L/min]	A		B		a
	Open	Closed	Open	Closed	
0.5 to 4 (Symbol **04**)	33	14	33	14	40
2 to 16 (Symbol **20**)	33	14	33	14	40
5 to 40 (Symbol **40**)	33	14	33	14	45

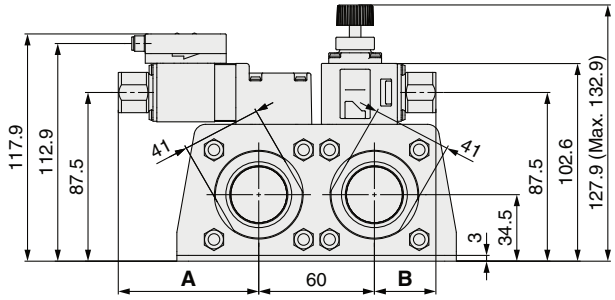
Dimensions (Side View)

Integrated type (Basic type); PF3WB
Flow range: 0.5 to 4 L/min (Symbol 04) / 2 to 16 L/min (Symbol 20)

Supply unit **Unit components: P (With stop valve)**
Return unit **Flow switch: Integrated display (With temperature sensor)**
Unit components: W (With flow adjustment valve and stop valve)



Supply unit **Unit components: S (With flow adjustment valve)**
Return unit **Flow switch: Remote sensor unit (With temperature sensor)**
Unit components: None



A: Return Unit Overall Length

Flow switch type	Temperature sensor	Flow range	Port size	Unit components			A
				Symbol	Flow adjustment valve	Stop valve	[mm]
Remote sensor unit Integrated display	None	0.5 to 4 L/min (Symbol **04**)	3/8 (Symbol **03**)	**Nil**	—	—	61.9
				S	●	—	61.9
				P	—	●	95.9
				W	●	●	95.9
	Yes			**Nil**	—	—	72.9
				S	●	—	72.9
				P	—	●	106.9
				W	●	●	106.9
	None	2 to 16 L/min (Symbol **20**)	3/8 (Symbol **03**) 1/2 (Symbol **04**)	**Nil**	—	—	65.9
				S	●	—	65.9
				P	—	●	99.9
				W	●	●	99.9
	Yes			**Nil**	—	—	76.9
				S	●	—	76.9
				P	—	●	110.9
				W	●	●	110.9

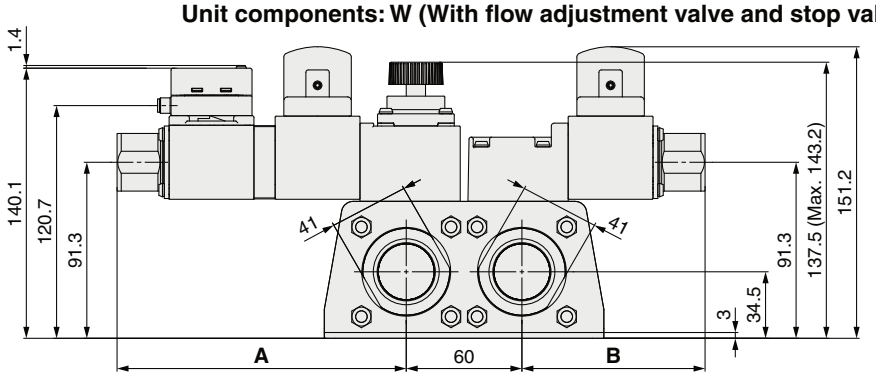
B: Supply Unit Overall Length

Flow range	Port size	Unit components			B
		Symbol	Flow adjustment valve	Stop valve	[mm]
0.5 to 4 L/min (Symbol **04**)	3/8 (Symbol **03**)	**Nil**	—	—	31.9
		S	●	—	31.9
		P	—	●	65.9
		W	●	●	65.9
2 to 16 L/min (Symbol **20**)	3/8 (Symbol **03**) 1/2 (Symbol **04**)	**Nil**	—	—	35.9
		S	●	—	35.9
		P	—	●	69.9
		W	●	●	69.9

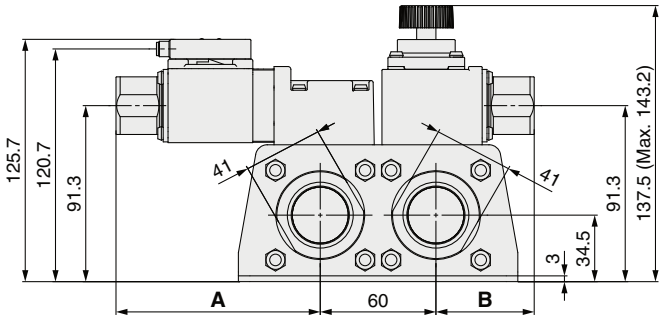
Dimensions (Side View)

Integrated type (Basic type): PF3WB
Flow range: 5 to 40 L/min (Symbol 40)

Supply unit **Unit components: P (With stop valve)**
Return unit **Flow switch: Integrated display (With temperature sensor)**
Unit components: W (With flow adjustment valve and stop valve)



Supply unit **Unit components: S (With flow adjustment valve)**
Return unit **Flow switch: Remote sensor unit (With temperature sensor)**
Unit components: None



A: Return Unit Overall Length

Flow switch type	Temperature sensor	Flow range	Port size	Unit components			A [mm]
				Symbol	Flow adjustment valve	Stop valve	
Remote sensor unit Integrated display	None	5 to 40 L/min (Symbol **40**)	1/2 (Symbol **04**) 3/4 (Symbol **06**)	**Nil**	—	—	95
				S	●	—	95
				P	—	●	139
				W	●	●	139
	Yes			**Nil**	—	—	106
				S	●	—	106
				P	—	●	150
				W	●	●	150

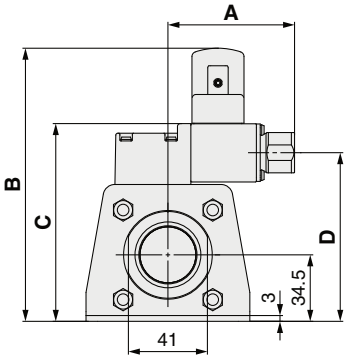
B: Supply Unit Overall Length

Flow range	Port size	Unit components			B [mm]
		Symbol	Flow adjustment valve	Stop valve	
5 to 40 L/min (Symbol **40**)	1/2 (Symbol **04**) 3/4 (Symbol **06**)	**Nil**	—	—	51
		S	●	—	51
		P	—	●	95
		W	●	●	95

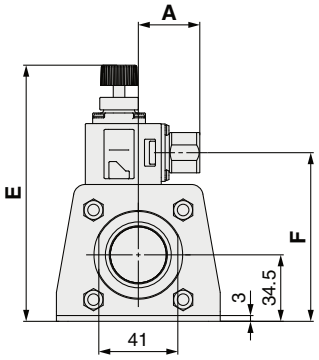
Dimensions (Side View)

Remote type (Supply type): PF3WS / Integrated type (Straight type): PF3WC Supply side

Unit components: P (With stop valve)



Unit components: S (With flow adjustment valve)



A: Supply Unit Overall Length

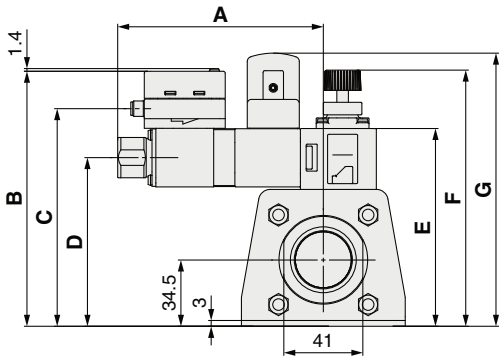
[mm]

Flow range	Port size	Unit components			A	B	C	D	E	F
		Symbol	Flow adjustment valve	Stop valve						
0.5 to 4 L/min (Symbol **04**)	3/8 (Symbol **03**)	**Nil**	—	—	31.9	141.7	102.6	87.5	127.9 (Max. 132.9)	87.5
		S	●	—	31.9					
		P	—	●	65.9					
		W	●	●	65.9					
2 to 16 L/min (Symbol **20**)	3/8 (Symbol **03**) 1/2 (Symbol **04**)	**Nil**	—	—	35.9	141.7	102.6	87.5	127.9 (Max. 132.9)	87.5
		S	●	—	35.9					
		P	—	●	69.9					
		W	●	●	69.9					
5 to 40 L/min (Symbol **40**)	1/2 (Symbol **04**) 3/4 (Symbol **06**)	**Nil**	—	—	51	151.2	111.5	91.3	137.5 (Max. 143.2)	91.3
		S	●	—	51					
		P	—	●	95					
		W	●	●	95					

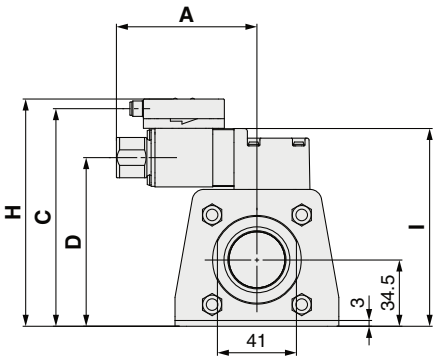
Dimensions (Side View)

Remote type (Return type): PF3WR / Integrated type (Straight type): PF3WC Return side

Flow switch: Integrated display (With temperature sensor)
Unit components: W (With flow adjustment valve and stop valve)



Flow switch: Remote sensor unit (With temperature sensor)
Unit components: None



A: Return Unit Overall Length

[mm]

Flow switch type	Temperature sensor	Flow range	Port size	Unit components			A	B	C	D	E	F	G	H	I
				Symbol	Flow adjustment valve	Stop valve									
Remote sensor unit Integrated display	None	0.5 to 4 L/min (Symbol **04**)	3/8 (Symbol **03**)	**Nil**	—	—	61.9	132.3	112.9	87.5	102.6	127.9 (Max. 132.9)	141.7	117.9	102.6
				S	●	—	61.9								
				P	—	●	95.9								
				W	●	●	95.9								
	Yes			**Nil**	—	—	72.9								
				S	●	—	72.9								
				P	—	●	106.9								
				W	●	●	106.9								
	None	2 to 16 L/min (Symbol **20**)	3/8 (Symbol **03**) 1/2 (Symbol **04**)	**Nil**	—	—	65.9	132.3	112.9	87.5	102.6	127.9 (Max. 132.9)	141.7	117.9	102.6
				S	●	—	65.9								
				P	—	●	99.9								
				W	●	●	99.9								
	Yes			**Nil**	—	—	76.9								
				S	●	—	76.9								
				P	—	●	110.9								
				W	●	●	110.9								
	None	5 to 40 L/min (Symbol **40**)	1/2 (Symbol **04**) 3/4 (Symbol **06**)	**Nil**	—	—	95	140.1	120.7	91.3	110.1	137.5 (Max. 143.2)	151.2	125.7	111.5
				S	●	—	95								
				P	—	●	139								
				W	●	●	139								
	Yes			**Nil**	—	—	106								
				S	●	—	106								
				P	—	●	150								
				W	●	●	150								

PF3W□ Series
Function Details

Integrated Display: PF3W7 Series

■ Delay time setting (IO-Link compatible type only)

The time from when the instantaneous flow reaches the set value to when the switch output operates can be set. Setting the delay time can prevent the switch output from chattering.
The total switching time is the switch operation time and the set delay time.
(Default setting: 0 s)

0.00 s
0.05 to 0.1 s (increment of 0.01 s)
0.1 to 1.0 s (increment of 0.1 s)
1 to 10 s (increment of 1 s)
20 s
30 s
40 s
50 s
60 s

■ 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.

■ Display color

The display color can be selected for each output condition. The selection of the display color provides visual identification of abnormal values.

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

■ Response time (Digital filter)

The response time (digital filter) can be set to suit the application. Setting the response time (digital filter) can reduce chattering of the switch output and flickering of the analog output and the display. The response time indicates when the set value is 90% in relation to the step input.

∗ The temperature sensor output is fixed to 7 s.

Response time (Digital filter)	Applicable model	
	IO-Link non-compatible	**IO-Link compatible**
0.5	●	●
1.0 (Default)	●	●
2.0	●	●
5.0	—	●
10.0	—	●
15.0	—	●
20.0	—	●
30.0	—	●

■ External input function (IO-Link non-compatible type only)

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 the life time of the memory device into consideration before using this function.

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.
For IO-Link compatible series, diagnostic bit (error, flow rate and temperature), process data (PD) flow and temperature measurement can be checked.

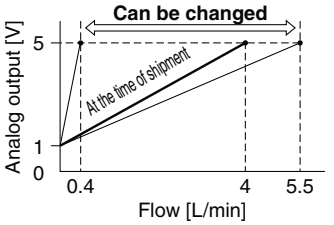
∗ Also, an increase or decrease of the flow and temperature will not change the on/off status of the output while the forced output function is activated.

■ 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 (3.7 million access times for the IO-Link compatible type). Take this into consideration before using this function.

■ Analog output free range function (IO-Link non-compatible type only)

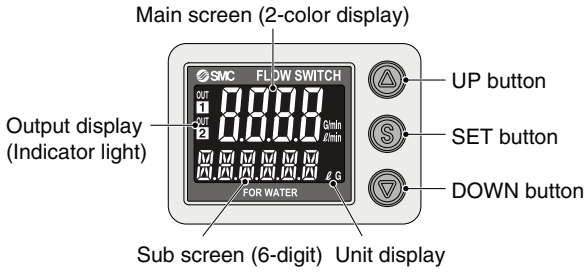
This function allows a flow that generates an output of 5 V or 20 mA to be changed. (This function is not available for the analog output to the temperature.) This function is available if the analog output type is used. The value can be changed between 10% of the maximum value of the rated flow and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



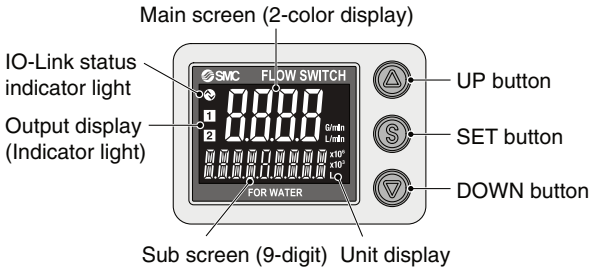
For 4 L/min type (Integrated display)

■ Display

Display is different for IO-Link compatible type.



IO-Link non-compatible



IO-Link compatible

■ 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.

■ 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.

■ Key-lock function

Prevents operation errors such as accidentally changing setting values

Integrated Display: PF3W7 Series

■ Error display function

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

Display	Description	Contents	Action	Applicable model	
				IO-Link non-compatible	IO-Link compatible
Er 1	OUT1 over current error	The switch output (OUT1) load current of 80 mA or more flows.	Turn the power OFF and remove the cause of the over current. Then turn the power ON again.	●	●
Er 2	OUT2 over current error	The switch output (OUT2) load current of 80 mA or more flows.		●	●
HHH	Instantaneous flow error	The flow has exceeded the upper limit of the display flow range.	Decrease the flow rate.	●	●
999999999 (Alternately displays [999] and [999999])	Accumulated flow error	The accumulated flow has exceeded the accumulated flow range.	Reset the accumulated flow.	●	—
999999 (Flashing)	Accumulated flow error	The accumulated flow has exceeded the accumulated flow range.	Reset the accumulated flow.	—	●
c HHH	Over upper limit of temperature	Fluid temperature exceeds 110°C.	Lower the fluid temperature.	●	●
c LLL	Under lower limit of temperature	Fluid temperature is under –10°C.	Raise the fluid temperature.	●	●
Er 0	System error	An internal data error has occurred.	Turn the power OFF and turn it ON again.	●	●
Er 4					
Er 6					
Er 8					
Er 7	System error	An internal data error has occurred.	Turn the power OFF and turn it ON again.	—	●
Er40					
Er 12	Temperature sensor failure	Temperature sensor may be damaged.	Turn the power OFF and turn it ON again.	●	●
Er 15	Version does not match	The IO-Link version does not match that of the master. The master uses version 1.0.	Ensure that the master IO-Link version matches the device version.	—	●

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

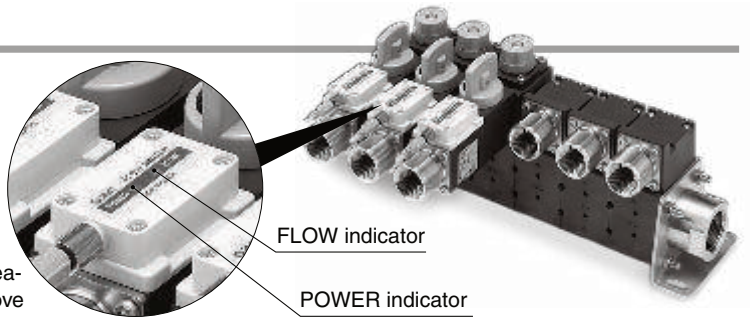
Remote Sensor Unit: PF3W5 Series

■ 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 indicator light blinks faster. When below the measurable lower limit of flow rate, the indicator light turns off, when above the measurable upper limit of flow rate, red indicator light turns on.



■ Error display function

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

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

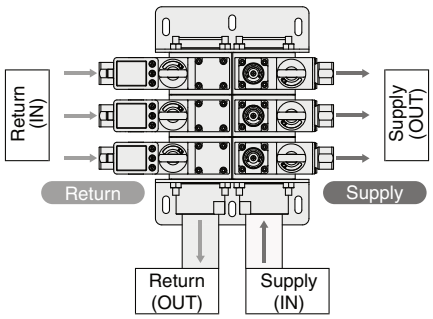
LED display	Description	Contents	Action
POWER Red Red FLOW — POWER indicator: Red ON, FLOW indicator: Red ON	System error	Internal data error or other errors occur.	Turn the power off and then on again. If the error cannot be rectified, please contact SMC for investigation.
POWER Red Red FLOW (blinking)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

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

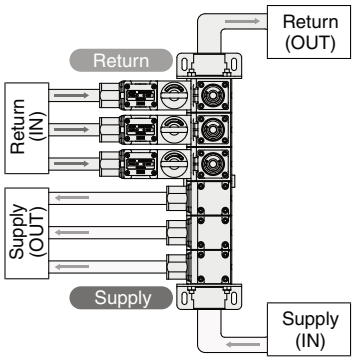
PF3WB/C/S/R Series
Reference Data

[Reference] Flow Characteristics of the Entire System

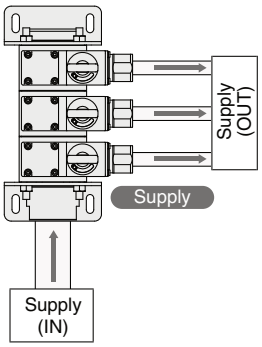
PF3WB



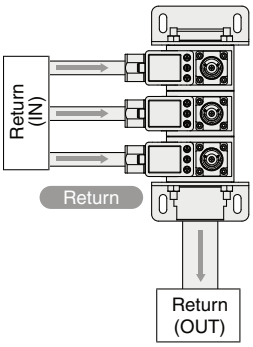
PF3WC



PF3WS



PF3WR

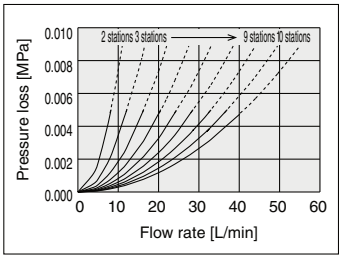


* Flow characteristics when the unit consists of sensors of the same structure
* When the unit includes the flow adjustment valve and stop valve, they are fully open.
* The flow characteristics for multiple supply units is based on the flow coming from the main piping (supply (IN)) to each supply unit (supply (OUT)).
* The flow characteristics for multiple return units is based on the flow coming from each return unit (return (IN)) to the main piping (return (OUT)).
* Assuming constant flow to each unit

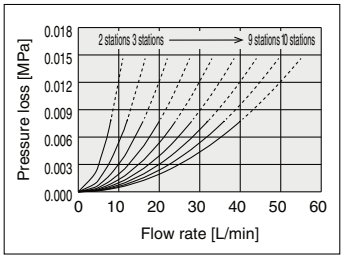
■ Flow characteristics for multiple supply units

Flow range: 0.5 to 4 L/min (Symbol **04**) (Reference value)

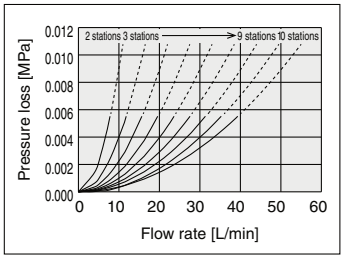
Unit components: Nil



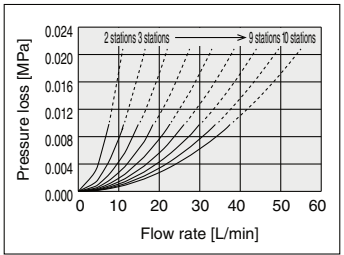
Unit components: S



Unit components: P

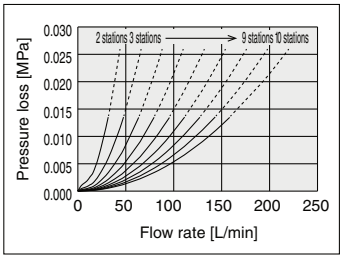


Unit components: W

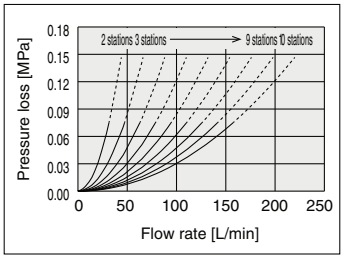


Flow range: 2 to 16 L/min (Symbol **20**) (Reference value)

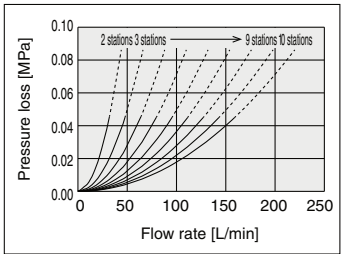
Unit components: Nil



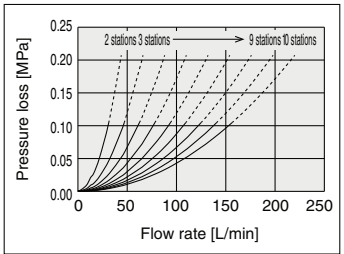
Unit components: S



Unit components: P

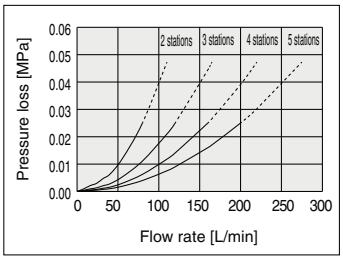


Unit components: W

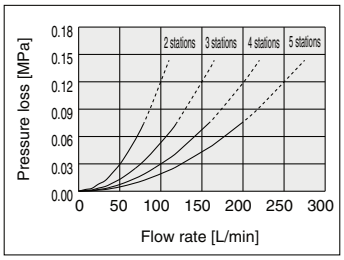


Flow range: 5 to 40 L/min (Symbol **40**) (Reference value)

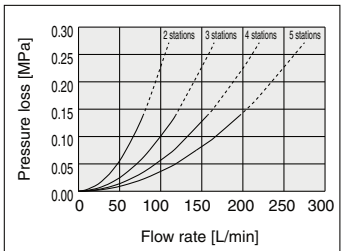
Unit components: Nil



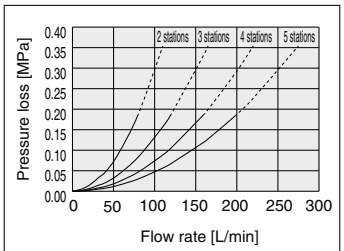
Unit components: S



Unit components: P



Unit components: W

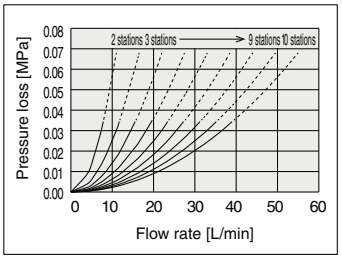


[Reference] Flow Characteristics of the Entire System

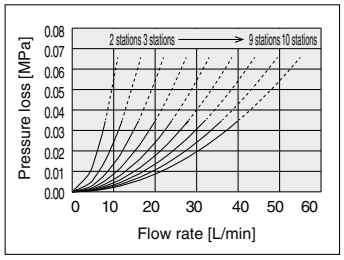
■ Characteristics of total flow for multiple return units

Flow range: 0.5 to 4 L/min (Symbol **04**) (Reference value)

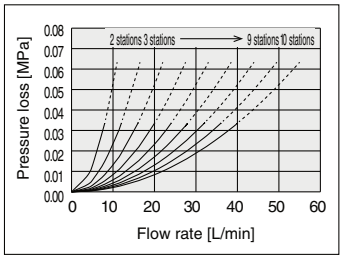
Unit components: Nil



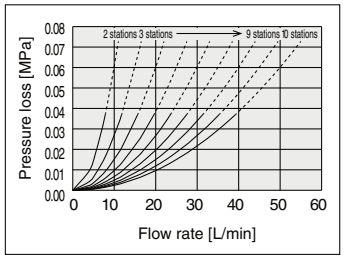
Unit components: S



Unit components: P

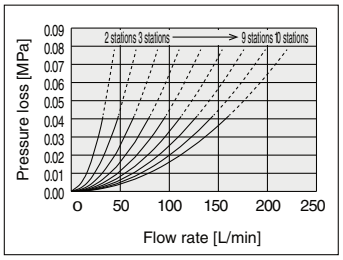


Unit components: W

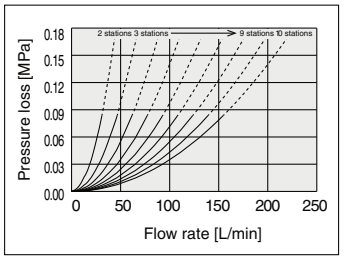


Flow range: 2 to 16 L/min (Symbol **20**) (Reference value)

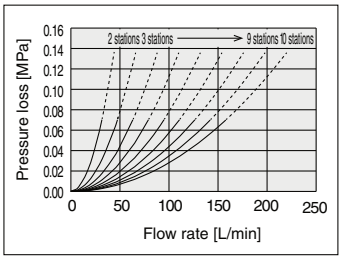
Unit components: Nil



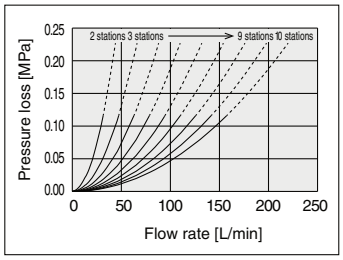
Unit components: S



Unit components: P

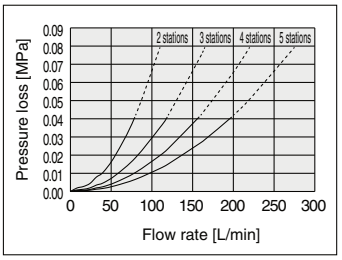


Unit components: W

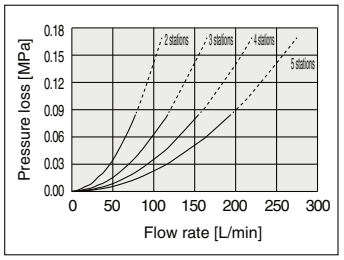


Flow range: 5 to 40 L/min (Symbol **40**) (Reference value)

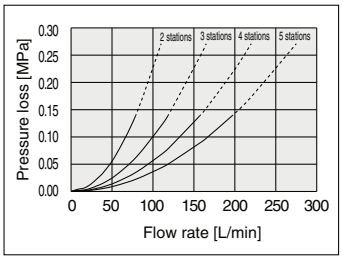
Unit components: Nil



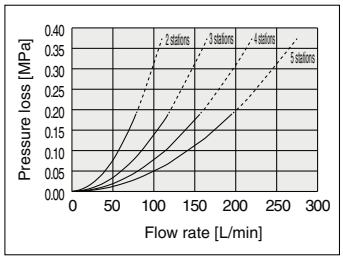
Unit components: S



Unit components: P



Unit components: W



⚠ 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.