Digital Flow Switch for Deionized Water and Chemical Liquids

PF2D Series

A single controller can monitor the flow rate of 4 different sensors.

Body and Sensor

New PFA

Tube

Super PFA

Three types of flow range

0.4 to 4 L/min (PF2D504)
1.8 to 20 L/min (PF2D520)
4.0 to 40 L/min (PF2D540)

3-Screen Display

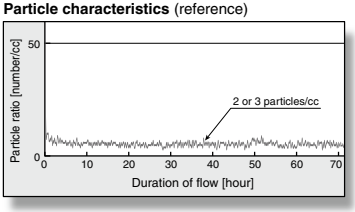
4-channel Flow Monitor

PFG200 series p. 381-1

Dust generation of 3 particles/cc or less (average number)

Karman vortex eliminates moving parts and allows low dust generation.

Particle characteristics (reference)

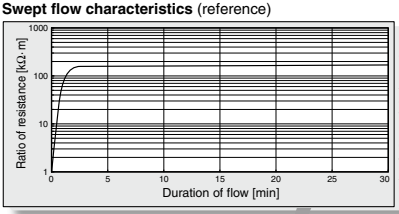


The data was obtained by performing an actual 10 minutes' supersonic cleaning using an average 16 MΩ·cm of deionized water at class 10000 clean room (1 L/min flow rate).
The diameter of the measured particles ranges from 0.1 to 0.5 μm. The flow rate used during measuring is 100 cc/min.

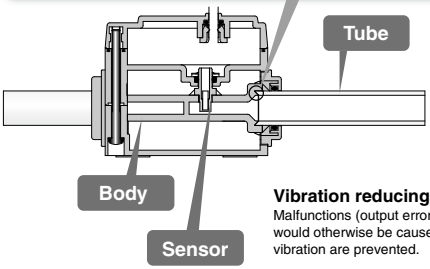
Swept flow characteristics

Tapered side seal minimizes dead volume to reduce accumulation of liquid pool.

Swept flow characteristics (reference)

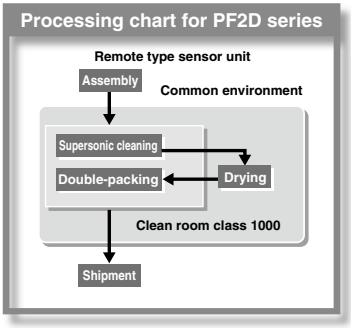


Fill the flow path with sulfuric acid and leave it for 30 minutes.
After disposing the sulfuric acid, flush the flow path out with deionized water and measure the resistance rate of the fluid that is discharged from the downstream side.
A quick recovery time indicates little liquid pool.



Vibration reducing seals
Malfunctions (output errors) that would otherwise be caused by vibration are prevented.

Processing chart for PF2D series



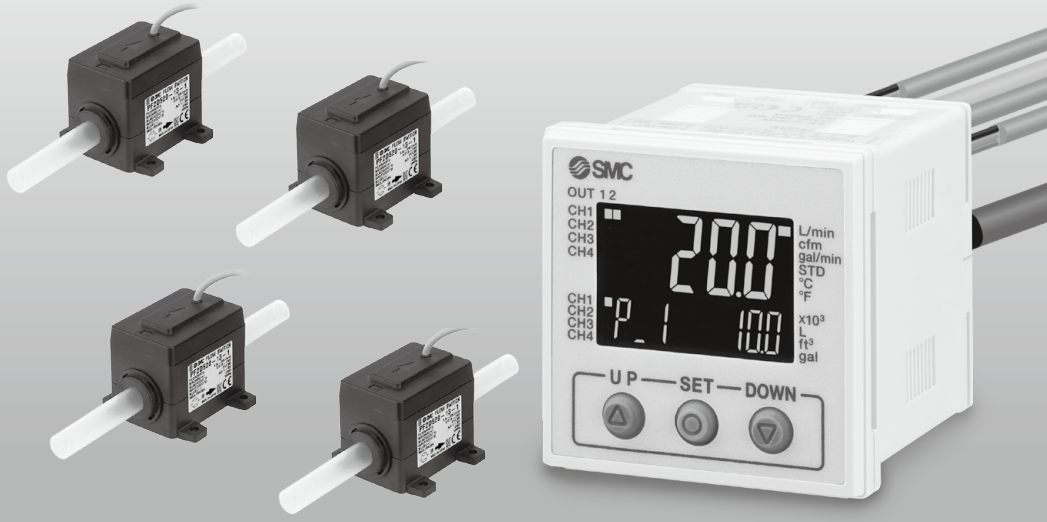
3-Screen Display

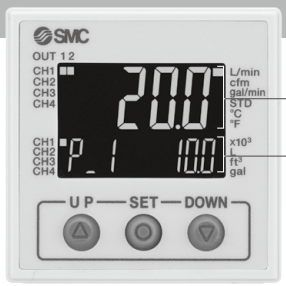
4-Channel Flow Monitor

Up to 4 flow sensors can be connected!

CE UKCA RoHS

IO-Link





It is possible to change the settings while checking the measured value.

Main screen	Measured value (Current flow value)	
Sub screen	Left side	Right side
	Label (Display item), Set value (Threshold value)	

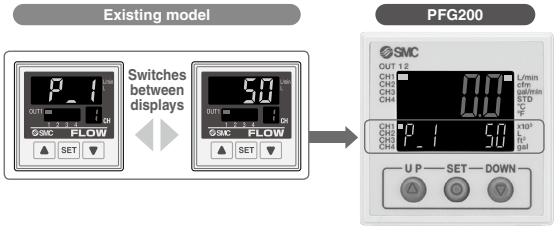
- **Input Range Selection**

Visualization of Settings

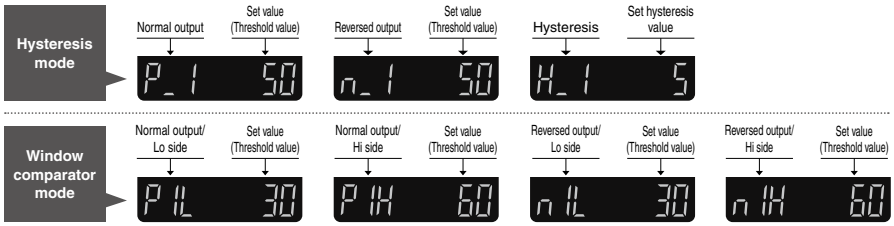
Set value (Threshold value)	P_1	**Hysteresis value**	H_1	**Peak value**	H_H₁
Bottom value	H_Lo	**Channel display**	CH_1		

Visualization of Settings

Item and set value are displayed together.
Easy to confirm the displayed item

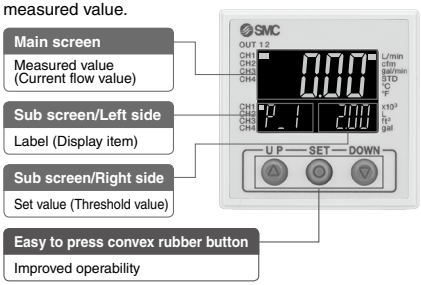


Mode Examples

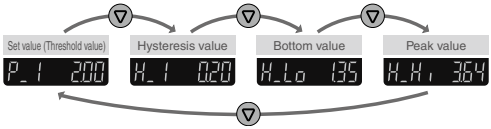


Easy Screen Switching

It is possible to change the settings while checking the measured value.



The sub screen can be switched by pressing the down buttons.



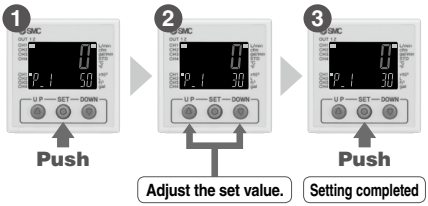
∗ One additional arbitrary display mode can be added via the function settings.

CH display	Other channel	Customer defined label	Display OFF

Simple 3-Step Setting

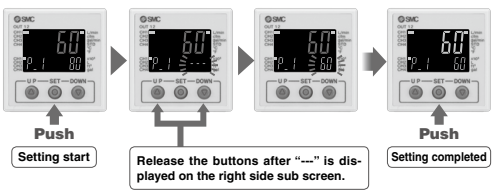
After selecting the channel, when the SET button is pressed and the set value (P_1) is displayed, the set value (threshold value) can be set.

When the SET button is pressed and the hysteresis (H_1) is being displayed, the hysteresis value can be set.



Now with a snap shot function for set value reading

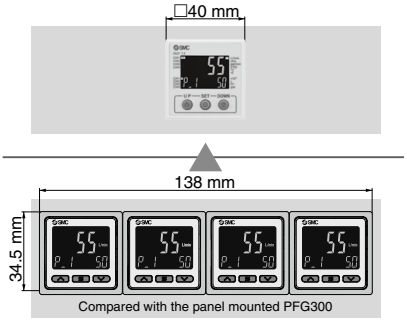
Snap shot function Pressing the ▲ and ▼ buttons simultaneously for a minimum of 1 second will make the set value (threshold value) the same as the current pressure value.

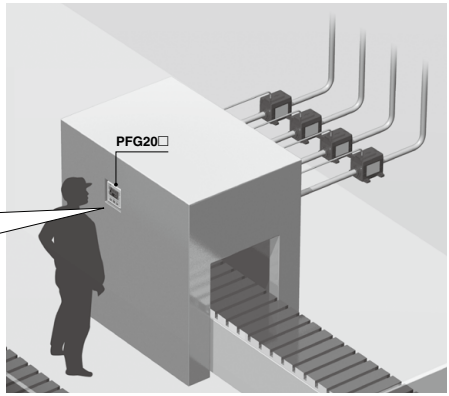


Centralized Control Saves Installation Space.

66% reduction in installation space

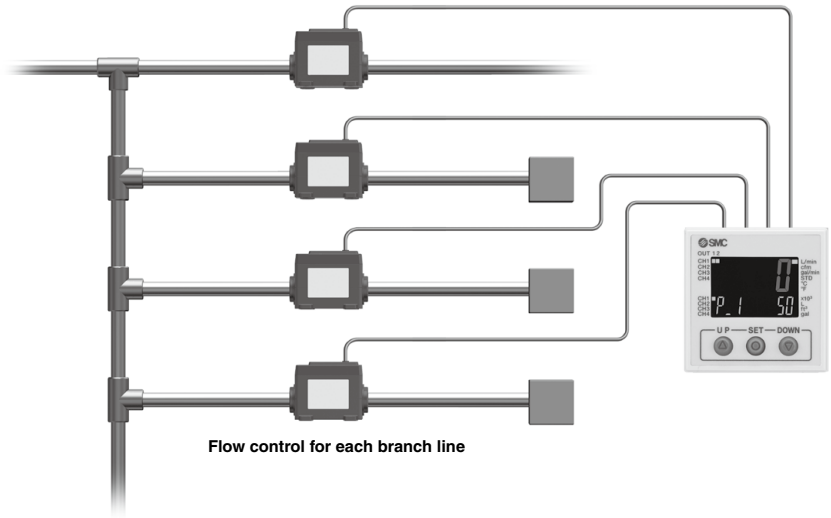
(Compared with the panel mounted PFG20□)





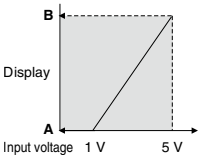
Accumulated Flow Measurement

A single product can manage the accumulated flow in four lines.



Flow control for each branch line

Input Range Selection (for Pressure/Flow rate)



The sensor input range can be set to the required value and displayed. (Voltage input: 1 to 5 V)
Pressure switch/Flow switch can be displayed.

A is displayed for 1 V. B is displayed for 5 V.
The range can be set as required.
Refer to pages 9 and 10 for the specification of the sensors which can be connected.
For the individual specifications of each connectable sensor, refer to the **Web Catalog**.

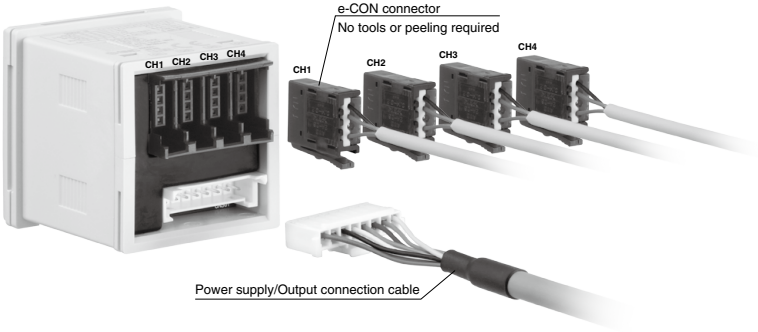
■ Pressure Sensor for General Fluids PSE56□

	A	B
PSE560	0.000	1.000
PSE561	0	–101
PSE562	0	101
PSE563	–101	101

Set A and B to the values shown in the table.

Connectors

Connection and removal of wiring is easy.



Functions p. 309

■ Peak/Bottom value indication function
This function constantly detects and updates the maximum (minimum) flow when the power is supplied, and allows to hold the maximum (minimum) flow value.

■ Key-lock function
This function prevents operation errors such as accidentally changing setting values.

■ External input function
The accumulated value, peak value, and bottom value can be reset remotely.

■ Error display function
This function displays error location and content when a problem or error has occurred.

■ Delay time setting
The time from when the instantaneous flow reaches the set value to when the switch output operates can be set.

■ Zero-cut setting
When the flow display value is close to zero, this function forces the display to zero.

■ Selection of power-saving mode
Power-saving mode can be selected.
It shifts to power-saving mode automatically when there is no button operation for 30 seconds.

■ Setting of security code
Users can select whether a security code must be entered to release the key lock.

■ Accumulated value hold
The accumulated value is not cleared even when the power supply is turned OFF.

■ Snap shot function
The current flow rate value can be stored to the switch output ON/OFF set point.

■ Output check function
It is possible to check the switch output operation and process data value.

■ Channel to channel copy function
The set values can be copied to other channel.

■ Channel select function
Flow value for the selected channel is displayed.

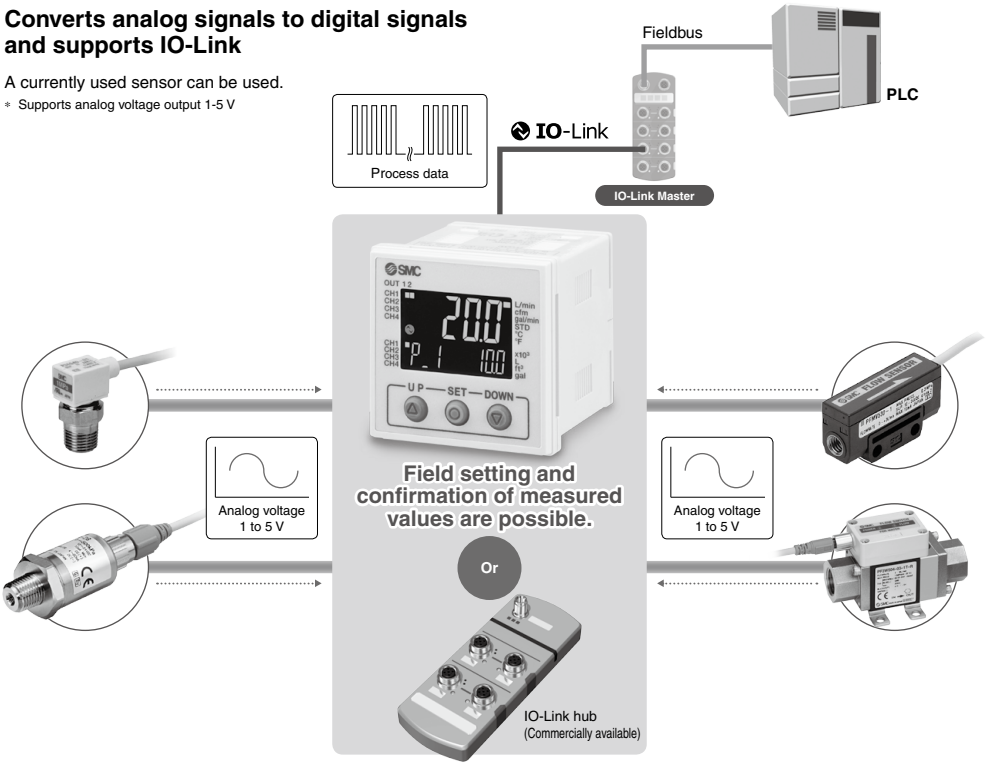
■ Channel scan function
Flow values for each channel are displayed in turn every 2 seconds.

Hub Function

Converts analog signals to digital signals and supports IO-Link

A currently used sensor can be used.

∗ Supports analog voltage output 1-5 V



Process Data

Bit offset	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
Item	CH1 measured value: 16-bit signed integer															
Bit offset	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
Item	CH2 measured value: 16-bit signed integer															
Bit offset	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
Item	CH3 measured value: 16-bit signed integer															
Bit offset	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Item	CH4 measured value: 16-bit signed integer															

Measurement data of sensors for 4 channels are combined and cyclically sent as a process data.

Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Item	Error	System error	Fixed output	Reservation	CH4 diagnosis	CH3 diagnosis	CH2 diagnosis	CH1 diagnosis	CH4 OUT2	CH4 OUT1	CH3 OUT2	CH3 OUT1	CH2 OUT2	CH2 OUT1	CH1 OUT2	CH1 OUT1

Each channel has 2 outputs∗1.

Diagnosis item	· Internal product malfunction · Outside of zero-clear range

Diagnosis item	· Output overcurrent

Diagnosis item	· Display upper and lower limits are exceeded. · The accumulated flow upper and lower limits are exceeded

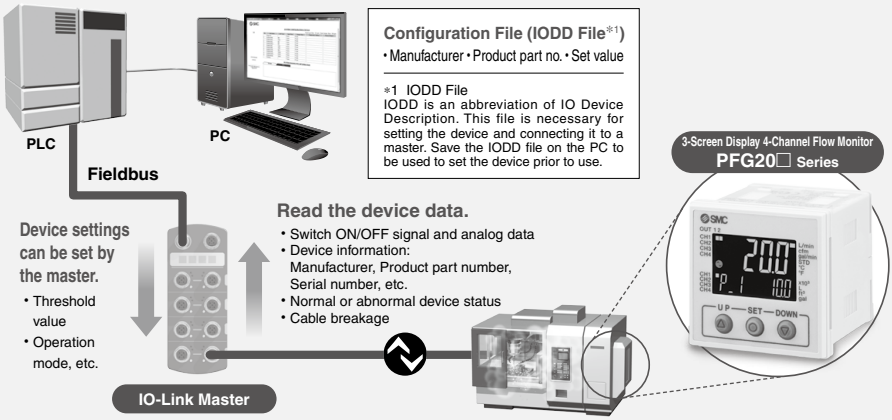
Implement diagnostic bits in the process data.

∗1 During SIO mode, only CH1 has 2 switch outputs. CH2-4 has one output each.

IO-Link

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

Visualization of operation/equipment status
Remote monitoring and control by communication



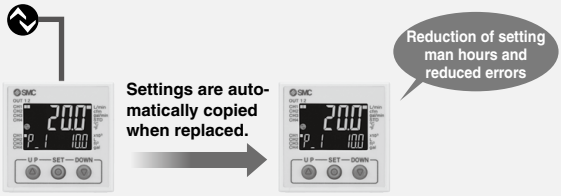
Configuration File (IODD File*1)

• Manufacturer • Product part no. • Set value

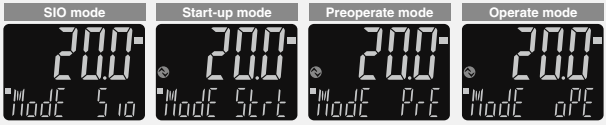
*1 IODD File
IODD is an abbreviation of IO Device Description. This file is necessary for setting the device and connecting it to a master. Save the IODD file on the PC to be used to set the device prior to use.

Automatic setting function [Data storage function]

When replacing the sensor monitor with the same type (the same device ID), the parameters (set values) stored in the IO-Link master are automatically copied (set) to the new sensor monitor.



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	
	*1 (Flashing)		Abnormal	Version does not match	Er 15 V 10	IO-Link version does not match that of the master. The master uses version 1.0. * The applicable IO-Link version is 1.1.
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 is ON or flashes. *2 When the sub screen is set to Mode
* "ModE LoC" is displayed when the data storage lock is enabled. (Except for version mismatch or when in SIO mode)

For Deionized Water and Chemical Liquids

Digital Flow Switch

PF2D Series

How to Order

Remote Type Sensor Unit

PF2D5 [20] – [13] – [1] – [C]

Flow rate range

04	0.4 to 4 L/min
20	1.8 to 20 L/min
40	4 to 40 L/min

Port size: (inch)

11	3/8	PF2D504
13	1/2	PF2D520
19	3/4	PF2D540

Output specification

Symbol	Specification	Applicable monitor unit (monitor) model
1	Output for monitor unit + analog output (1 to 5 V)	PFG200/PF2D300 series
2	Output for monitor unit + analog output (4 to 20 mA)	PF2D300 series

Option (Refer to page 391.)

Nil	None
C	e-con connector x 1 pc.

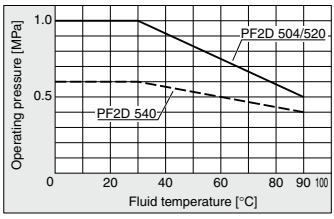
The cable and connector are shipped unassembled.

Specifications for Sensor Unit

Refer to pages 202 and 203 for Flow Switch Precautions. For details about the Specific Product Precautions, refer to the Operation Manual on the SMC website, http://www.smcworld.com Click here for details.

Model		PF2D504	PF2D520	PF2D540
Measured fluid		Liquid not to corrode nor erode deionized water and/or fluoropolymer. Viscosity: 3mPa·s (3cP) or less		
Detection style		Karman vortex		
Rated flow range		0.4 to 4 L/min	1.8 to 20 L/min Note 1)	4 to 40 L/min
Operating pressure range Note 2)		0 to 1 MPa		0 to 0.6 MPa
Proof pressure Note 3)		1.5 MPa		0.9 MPa
Operating fluid temperature		0 to 90°C		
Accuracy Note 4)		±2.5% F.S. (at 25°C water)		
Repeatability		±1% F.S. (at 25°C water)		
Temperature characteristics		±5% F.S. (0 to 50°C, based on 25°C)		
Output specifications	Pulse output	Pulse output, N channel, open drain, output for monitor unit PF2D 300/301 (Specifications: Maximum load current of 10 mA; Maximum applied voltage of 30 V)		
	Analog output	Voltage output Note 5) 1 to 5 V Accuracy: ±2% F.S., Min. load impedance: 100 kΩ (Output impedance: 1 kΩ)		
		Current output Note 6) 4 to 20 mA Accuracy: ±2% F.S.or less, Max. load impedance: 300 Ω or less with 12 VDC, 600 Ω or less with 24 VDC		
Power supply voltage		12 to 24 VDC ±10%		
Current consumption		20 mA or less (without load)		
Environmental resistance	Enclosure	IP65		
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C in stock (with no condensation and freezing)		
	Voltage resistance	1000 VAC for 1 min. between external terminals and case		
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between external terminals and case		
Standards		CE/UKCA marking		
Lead wire		Cabtire cord, 4 cores ø3.5, 3 m		
Weight		140 g (without lead wire)		225 g (without lead wire)
Port size		3/8 inch tube	1/2 inch tube	3/4 inch tube
Wetted material		Body: New PFA, Sensor: New PFA, Tube: Super PFA		

Note 1) 1.6 to 20 L/min (0.1 MPa) with viscosity of 1 mPa·s (1 cP) or less
Note 2) The operating pressure range drops according to the fluid temperature. See attached graph.
Note 3) 1.5 times of the maximum operating pressure and varying with fluid temperature.
Note 4) The system accuracy when combined with PF2D30□.
Note 5) When the voltage output is selected.
Note 6) When the current output is selected.
Note 7) The sensor unit conforms to the CE/UKCA marking.
Note 8) For details about wiring, refer to the Operation Manual that can be downloaded from SMC website (http://www.smcworld.com).



Made to Order

LQ1 series fluoropolymer fittings mounting type is also available. Refer to page 392.

SMC

How to Order

Remote Type Monitor Unit

PF2D30 [0] – [A] – [M]

Output specification

0	NPN open collector 2 outputs
1	PNP open collector 2 outputs

Mounting

A	Panel mounting

Unit specification

Nil	With unit switching function
M	Fixed SI unit Note)

Note) Fixed units: Real-time flow rate: L/min
Accumulated flow: L

Specifications for Monitor Unit

Refer to pages 202 and 203 for Flow Switch Precautions. For details about the Specific Product Precautions, refer to the Operation Manual on the SMC website, http://www.smcworld.com Click here for details.

Model		PF2D300/301		
Flow rate measurement range Note 1)		0.25 to 4.5 L/min	1.3 to 21.0 L/min	2.5 to 45 L/min
Set flow rate range Note 1)		0.25 to 4.5 L/min	1.3 to 21.0 L/min	2.5 to 45 L/min
Minimum set unit Note 1)		0.05 L/min	0.1 L/min	0.5 L/min
Accumulated pulse flow rate exchange value (Pulse width: 50ms) Note 1)		0.05 L/pulse	0.1 L/pulse	0.5 L/pulse
Display units Note 2)	Real-time flow rate	L/min, gal (US)/min		
	Accumulated flow	L, gal (US)		
Accumulated flow range Note 1)		0 to 999999 L		
Accuracy Note 3)		±2.5% F.S.		
Repeatability		±0.5% F.S.		
Temperature characteristics		±1% F.S. (15 to 35°C, based on 25°C) ±2% F.S. (0 to 50°C, based on 25°C)		
Current consumption (No load)		60 mA or less		
Weight		45 g		
Output specifications Note 4)	Switch output	NPN open collector (PF2D300)	Maximum load current: 80 mA Internal voltage drop: 1 V or less (with load current of 80 mA) Maximum applied voltage: 30 V 2 outputs	
		PNP open collector (PF2D301)	Maximum load current: 80 mA Internal voltage drop: 1.5 V or less (with load current of 80 mA) 2 outputs	
	Accumulated pulse output	NPN open collector or PNP open collector (same as switch output)		
Environmental resistance	Enclosure	IP40		
	Operating temperature range	Operating: 0 to 50°C, Stored: –25 to 85°C (with no condensation and freezing)		
	Voltage resistance	1000 VAC for 1 min. between external terminal and case		
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between external terminal and case		
Standards		CE/UKCA marking		
Indicator light		3-digits 7-segment LED		
Status LED's		ON: when light is on, OUT1: Green; OUT2: Red		
Power supply voltage		12 to 24 VDC ±10%		
Response time		1sec. or less		
Hysteresis		Hysteresis mode: adjustable (can be set from 0) Window comparator mode Note 5): fixed (3 digits)		

Note 1) The value varies depending on set flow range
Note 2) For digital flow switch with unit switching function. (Fixed SI unit [L/min or L] will be set for switch types without the unit switching function.)
Note 3) The system accuracy when combined with PF2D5□□.
Note 4) Switch output and accumulated pulse output can be selected using the control button operation during initial setting.

	1	2	3	4
Output 1	Switch output	Switch output	Accumulated pulse output	Accumulated pulse output
Output 2	Switch output	Accumulated pulse output	Switch output	Accumulated pulse output

Note 5) Window comparator mode: Since hysteresis (H) will reach 3 digits, keep P_1 and P_2 or n_1 and n_2 apart by 7 digits more. (In case of output OUT2, n_1, 2 to be n_3, 4 and P_1, 2 to be P_3, 4.)
Note 6) The monitor unit conforms to the CE/UKCA marking.
Note 7) Accumulated flow rate is reset when the power supply turns OFF.
Note 8) For details about wiring, refer to the Operation Manual that can be downloaded from SMC website (http://www.smcworld.com).

3-Screen Display
4-Channel Flow Monitor
PFG200 Series

How to Order

PFG20 0 – M □ □ □

Input/Output specification

Symbol	Description
0	NPN 5 outputs + External input
1	PNP 5 outputs + External input
2∗1	IO-Link + NPN 4 outputs or NPN 5 outputs (SIO mode)
3∗1	IO-Link + PNP 4 outputs or PNP 5 outputs (SIO mode)

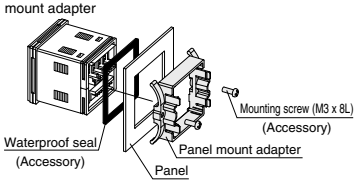
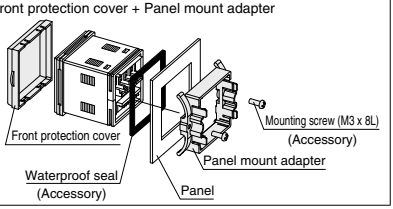
∗1 When the flow monitor is used as an IO-Link device, the total power supply current of the connected sensors should be 200 mA or less.

Unit specification

Nil	With unit selection function∗2
M	SI units only∗3

∗2 Under the New Measurement Act, switches with the unit selection function are no longer allowed for use in Japan.
∗3 Fixed unit: Instantaneous flow: L/min
Accumulated flow: L

Option 1

Nil	None
A	Panel mount adapter 
B	Front protection cover + Panel mount adapter 

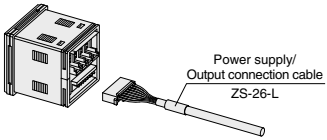
∗ Options are not assembled, but shipped together.

Option 2

Nil	None
4D	Sensor connector (4 pcs.) ∗ For PF2D5□

∗ Connector is not connected, but shipped together.

Option 3

Nil	Power supply/Output connection cable (2 m) 
N	None

∗ Cable is shipped together, but not connected.

Options/Part Nos.

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

Description	Part no.	Note
Power supply/Output connection cable	ZS-26-L	Length: 2 m
For PF2D5□□ Sensor connector (e-CON)	ZS-28-CA-2	1 pc., Finished O.D.: ø0.9 to ø1.0, Cover color: Red
Panel mount adapter	ZS-26-B	Mounting screw (M3 x 8 L, 2 pcs.), With waterproof seal
Panel mount adapter + Front protection cover	ZS-26-C	Mounting screw (M3 x 8 L, 2 pcs.), With waterproof seal
Front protection cover	ZS-26-01	—
Power supply with M12 connector cable (Made to Order)	ZS-26-LM12	For use when using an M12 connector for IO-Link communication

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

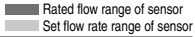
Specifications

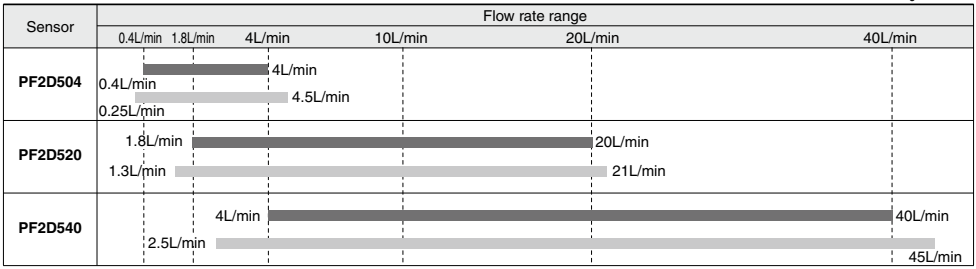
Series			PFG20□ Series		
Applicable SMC flow sensor			**PF2D504**	**PF2D520**	**PF2D540**
Rated flow range			0.4 to 4 L/min	1.8 to 20 L/min	4 to 40 L/min
Instantaneous flow rate display/Set flow rate range			0.25 to 4.50 L/min (Flow under 0.25 L/min is displayed as "0.00")	1.3 to 21.0 L/min (Flow under 1.3 L/min is displayed as "0.0")	2.5 to 45.0 L/min (Flow under 2.5 L/min is displayed as "0.0")
Instantaneous flow rate display/Min. setting unit			0.05 L/min	0.1 L/min	0.5 L/min
Accumulated flow display/Set flow rate range			0 to 99,999,999.9 L	0 to 999,999,999 L	
Accumulated flow display/Min. setting unit			0.1 L	1 L	
Accumulated pulse flow rate exchange value			0.05 L	0.1 L	0.5 L
Unit			L/min, gal/min (depends on selected range)		
Electrical	Power supply voltage	**When used as a switch output device**	12 to 24 VDC ±10% with 10% ripple (p-p) or less		
		When used as an IO-Link device	18 to 30 VDC, including ripple (p-p) 10%*1		
	Current consumption		55 mA or less		
	Protection		Polarity protection		
	Power supply voltage for sensor*1		[Power supply voltage] −1.5 V		
	Power supply current for sensor*2		Max. 110 mA (However, the total power supply current for the four inputs is 440 mA or less, and the total power supply current when used as an IO-Link device is 200 mA or less).		
Accuracy	**Display accuracy (Linearity)**		±5.0% F.S. Max.*4		
	Repeatability		±3.0% F.S. Max.*4		
	Temperature characteristics		±0.5% F.S. Max. (Reference: 25°C)		
Switch output (SIO mode)	**Output type**		NPN or PNP open collector output: 5 outputs		
	Output mode		Hysteresis mode, Window comparator mode, Accumulated output, Accumulated pulse output, Error output, Output OFF		
	Switch operation		Normal output, Reversed output		
	Max. load current		80 mA		
	Max. applied voltage (NPN only)		30 VDC		
	Internal voltage drop (Residual voltage)		1.5 V or less (at load current of 80 mA)		
	Delay time*3		5 ms or less, variable from 0 to 60 s/0.01 s increments		
	Hysteresis		Variable from 0*5		
	Protection		Over current protection		
Analog input	**Input type**		Voltage input: 1 to 5 VDC (Input impedance: 1 MΩ)		
	Number of inputs		4 inputs (Check the "Internal Circuits and Wiring Examples" on pages 11 to 14.)		
	Connection method		e-CON		
	Protection		Over voltage protection (up to a voltage of 26.4 VDC)		
External input*8			Voltage free input: 0.4 V or less (Reed or Solid state) for 30 ms or longer		
Display	**Display type**		LCD		
	Number of screens		3-screen display (Main screen, Sub screen x 2)		
	Display color		Main screen: Red/Green, Sub screen: Orange		
	Number of display digits		Main screen: 4 digits (7 segments), Sub screen (Left): 4 digits (some digits are 11-segments, 7 segments for other), Sub screen (Right): 5 digits (some digits are 11-segments, 7 segments for other)		
	Indicator light		Lights up when switch output is turned ON. OUT1, OUT2: Orange		
Digital filter*6			Variable from 0 to 30 s/0.01 s increments		
Environment	**Enclosure**		Front face: IP65 (when panel-mounted), Others: IP40		
	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		
	Operating temperature range		Operating: 0 to 50°C, Stored: −10 to 60°C (No condensation)		
	Operating humidity range		Operating/Stored: 35 to 85% RH (No condensation)		
Standards			CE/UKCA marking		
Weight	**Body**		51 g (Excludes power supply and output cable)		
	Power supply/Output cable		60 g		
	e-CON (1 pc.)		2 g		
Communication (IO-Link mode)	**IO-Link type**		Device		
	IO-Link version		V1.1		
	Communication speed		COM2 (38.4 kbps)		
	Configuration file		IODD file*7		
	Minimum cycle time		4.8 ms		
	Process data length		Input data: 10 bytes, Output data: 0 bytes		
	On request data communication		Yes		
	Data storage function		Yes		
	Event function		Yes		
	Vendor ID		131 (0 x 0083)		

∗1 Check the power supply voltage range of the connected sensor.
∗2 Over current on DC (+) side and DC (−) side of the sensor input connector results in breakage of the product.
∗3 Value without digital filter (at 0 ms)
∗4 The system accuracy when combined with an applicable flow sensor.
∗5 If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the amount of fluctuation, or chattering will occur.
∗6 The response time indicates when the set value is 90% in relation to the step input.
∗7 The configuration file can be downloaded from the SMC website, https://www.smcworld.com
∗8 This setting is only possible for the PFG200/PFG201.
∗9 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.

Set Flow Rate Range and Rated Flow Range

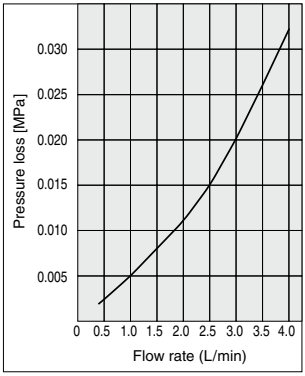
Set the flow rate within the rated flow range.
The set flow rate range is the range of flow rate that can be set on the controller
The rated flow range is the range that satisfies the sensor's specifications (accuracy, linearity etc.).
It is possible to set a value outside off the rated flow range, however, the specification is not be guaranteed.



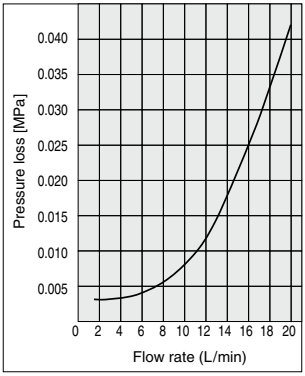


Flow Rate Characteristics (Pressure Characteristics)

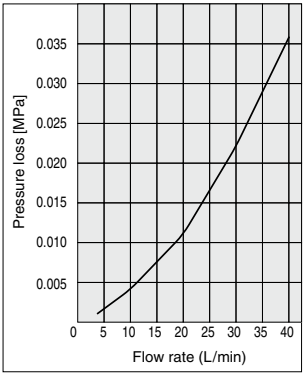
PF2D504



PF2D520

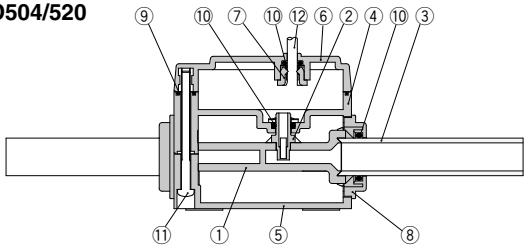


PF2D540

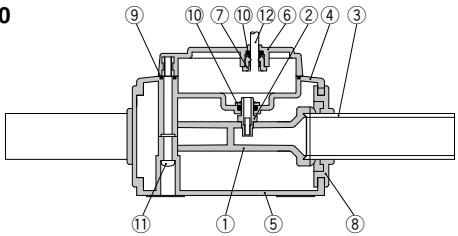


Construction

PF2D504/520



PF2D540

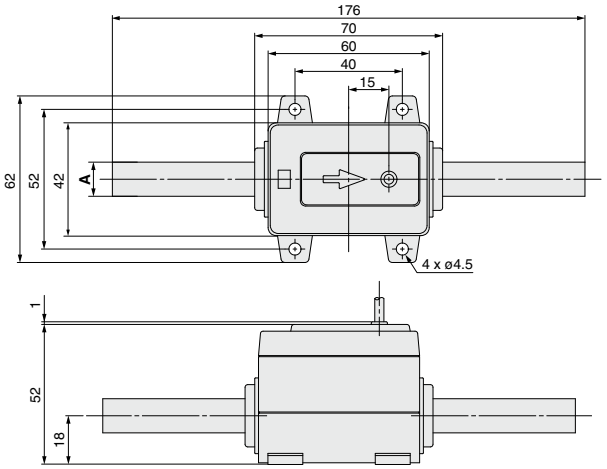


Parts list

Number	Parts	Material
1	**Body**	New PFA
2	**Sensor**	New PFA
3	**Tube**	Super PFA
4	**Housing A**	PPS
5	**Housing B**	PPS
6	**Housing C**	PPS
7	**Bushing**	POM
8	**Cap**	PPS
9	**Gasket**	FKM
10	**O-ring**	FKM
11	**Thread**	Stainless steel 304
12	**Lead wire**	PVC

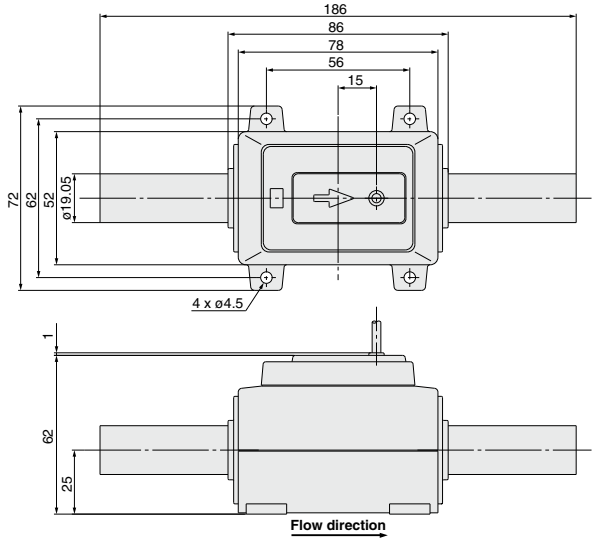
Dimensions: Remote Type Sensor Unit

PF2D504-11/520-13



Model	A
PF2D504	ø9.52
PF2D520	ø12.7

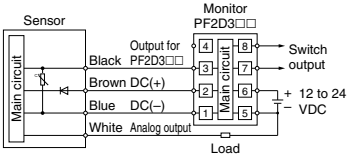
PF2D540-19



Internal Circuits and Wiring Examples

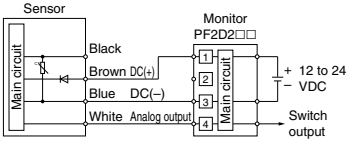
-1/2

Analog voltage output
Analog current output

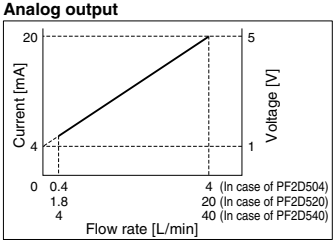


-1

Analog voltage output



Analog output

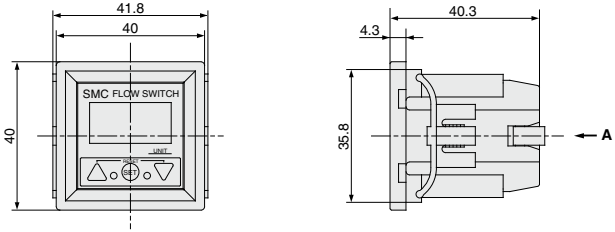


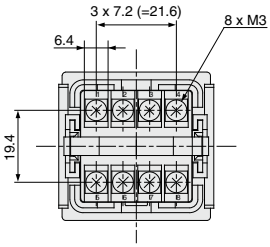
Cable Specifications

No. of cable wire		4
Conductor	**Nominal cross-sectional area**	0.15 mm^2
	Dimension	Approx. 0.5 mm
Insulator	**Dimension**	Approx. 0.9 mm Brown, White, Blue, Black
Sheath	**Material**	Oil-resistant PVC
	O.D.	3.5 mm

Dimensions: Remote Type Monitor Unit

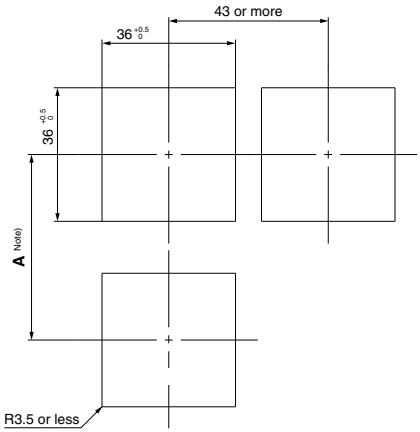
PF2D30⁰₁-A
Panel mounting type





View A

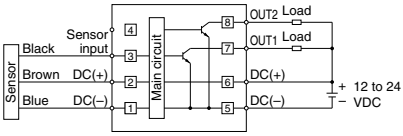
Panel fitting dimensions



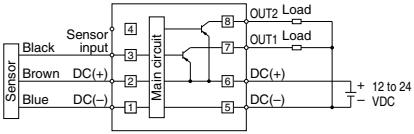
Note) Decide the length of A taking into account the size of terminal you use.
∗ The applicable panel thickness is 1 to 3.2 mm.
Corner: R3.5 or less

Internal Circuits and Wiring Examples

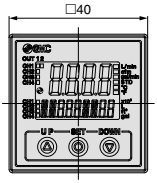
-0
NPN (2 outputs)

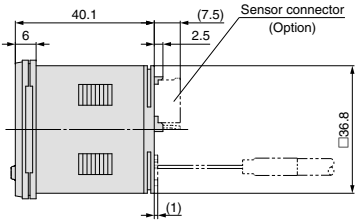


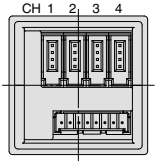
-1
PNP (2 outputs)



Dimensions



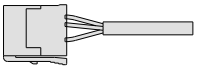




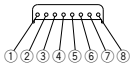
Sensor connector (4P x 4)

Pin no.	Terminal
①	DC (+)
②	N.C
③	DC (–)
④	IN (1 to 5 V)

Connector (Option)

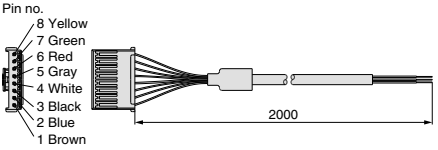


Power supply/Output connector (8P)



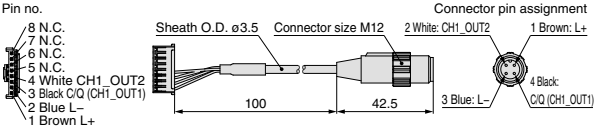
Pin no.	Terminal	
	PFG200/PFG201	PFG202/PFG203
①	DC (+)	L+
②	DC (–)	L–
③	CH1_OUT1	C/Q (CH1_OUT1)
④	CH1_OUT2	
⑤	CH2_OUT1	
⑥	CH3_OUT1	
⑦	CH4_OUT1	
⑧	Auto-shift input	N.C.

Power supply/Output connection cable (Accessory)

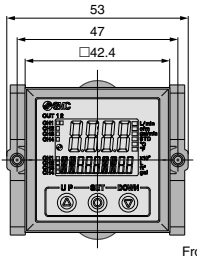


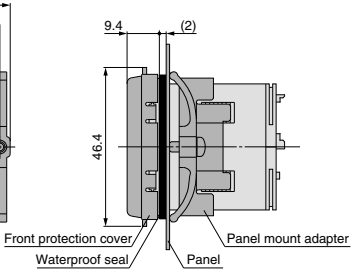
Power supply with M12 connector/Output cable (Made to Order)

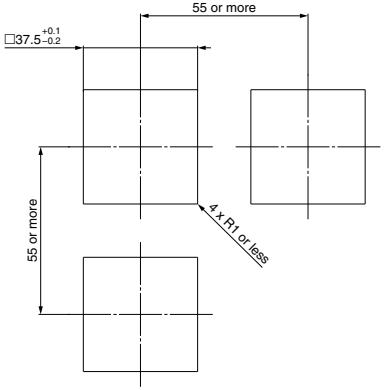
∗ For use when using an M12 connector for IO-Link communication



Front protection cover + Panel mount adapter







Panel fitting dimensions
Applicable panel thickness:
0.5 to 8 mm

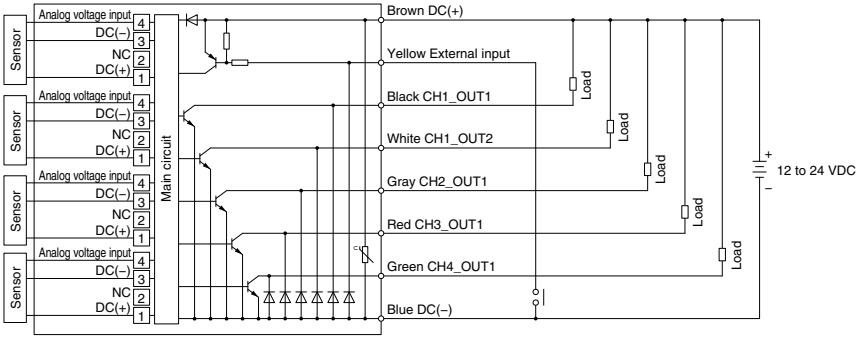
Internal Circuits and Wiring Examples

PFG20□–□□□□

•Input/Output specifications

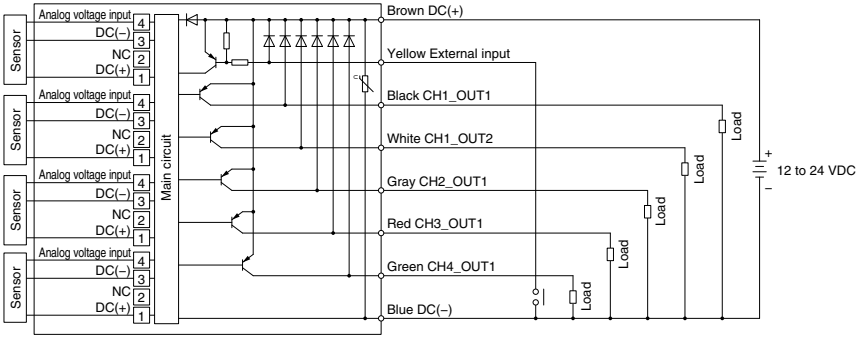
0

· NPN open collector 5 outputs + External input



1

· PNP open collector 5 outputs + External input



Internal Circuits and Wiring Examples

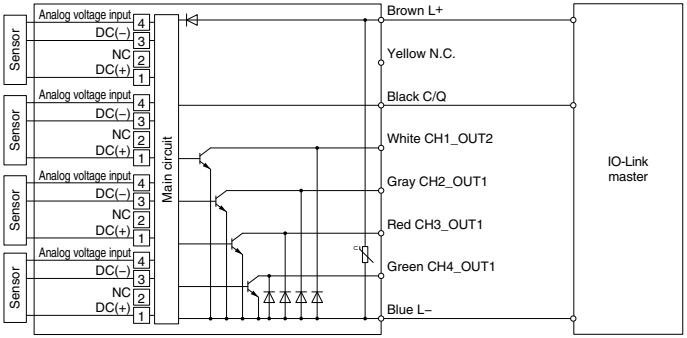
PFG20□–□□□□

Input/Output specifications

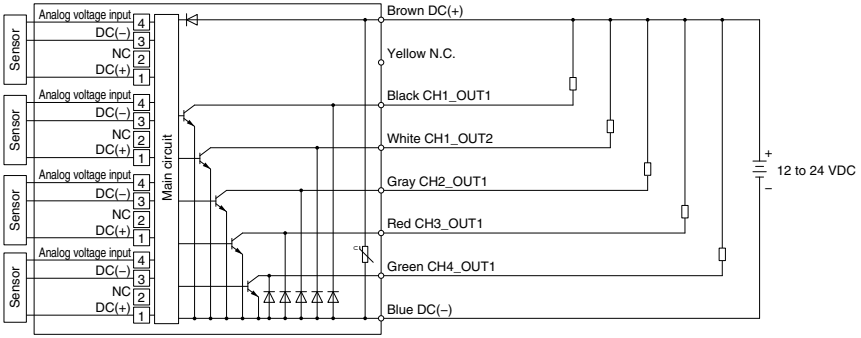
2

· IO-Link/NPN open collector 1 output + NPN open collector 4 outputs

When used as an IO-Link device



When used as a switch output device



Internal Circuits and Wiring Examples

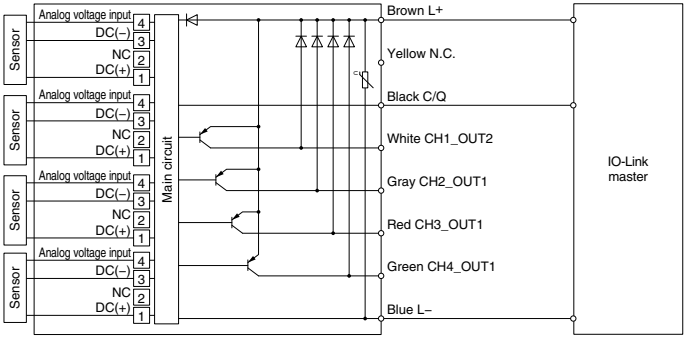
PFG20□–□□□□

Input/Output specifications

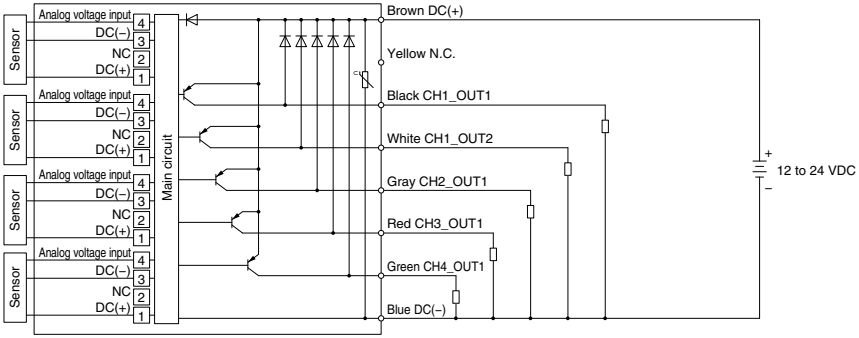
3

· IO-Link/PNP open collector 1 output + PNP open collector 4 outputs

When used as an IO-Link device



When used as a switch output device

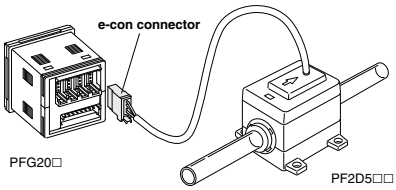


PF2D Series
Option

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

e-con connector

Part no.	Qty.
ZS-28-CA-2	1



In addition to the connector shown above, those listed below (female contact) can be connected.

Manufacturer	Model
3M Japan Limited	37104-3101-000FL
Tyco Electronics Japan G.K.	1-1473562-4
OMRON Corp.	XN2A-1430

PF2D5 Series
Made to Order

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

Made to Order

1 Fluoropolymer fittings mounting type (Space saving type)

Attached insert bushings and nuts for LQ1 series fluoropolymer fittings on double end piping.

How to Order

Refer to page 382 for details about How to Order.

PF2D504 S – 11 – □ – □ – 1S □

With LQ1 fitting

Size

Model	IN side	OUT side
11	3	3
1113	3	4 (With reducer)
1311	4 (With reducer)	3
13	4 (With reducer)	4 (With reducer)

PF2D520 S – 13 – □ – □ – 1S □

With LQ1 fitting

Size

Model	IN side	OUT side
13	4	4
1319	4	5 (With reducer)
1913	5 (With reducer)	4
19	5 (With reducer)	5 (With reducer)

PF2D540 S – 19 – □ – □ – 1S □

With LQ1 fitting

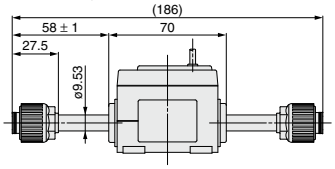
Size

Model	IN side	OUT side
19	5	5
1925	5	6 (With reducer)
2519	6 (With reducer)	5
25	6 (With reducer)	6 (With reducer)

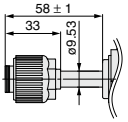
Dimensions

External dimensions of the body are the same as those of standard products. Refer to page 386.

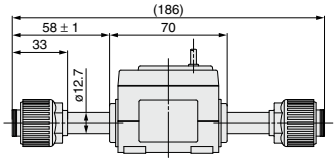
LQ1 fitting size: 3



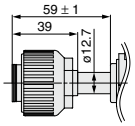
LQ1 fitting size: 4



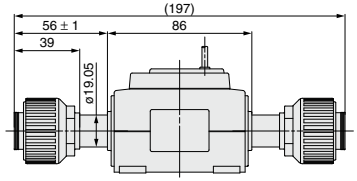
LQ1 fitting size: 4



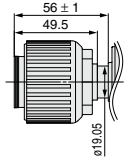
LQ1 fitting size: 5



LQ1 fitting size: 5



LQ1 fitting size: 6



SMC

Made to Order Related Products

Made to Order

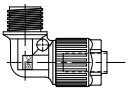
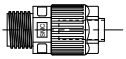
How to Order Fittings for a Product with Nuts

How to order a flow sensor, **PF2D5□S** series, etc. nut type fittings without a nut (including insert bushings) in one place.

LQ1 E 21 – SN

Fitting type

Nut type fittings without a nut (including insert bushings) in one place

E	T
Union elbow	Union tee
	
P	**U**
Panel mount union	Union
	

Applicable tubing size

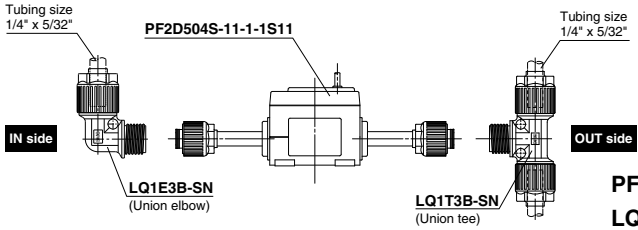
Class	No.	Applicable tubing size (mm)	Reducing
3	1	10 x 8	○
3	2	8 x 6	●
3	3	6 x 4	●
4	1	12 x 10	○
4	2	10 x 8	●
5	1	19 x 16	○
5	2	12 x 10	●
6	1	25 x 22	○
6	2	19 x 16	●

Class	No.	Applicable tubing size (inch)	Reducing
3	A	3/8" x 1/4"	○
3	B	1/4" x 5/32"	●
4	A	1/2" x 3/8"	○
4	B	3/8" x 1/4"	●
5	A	3/4" x 5/8"	○
5	B	1/2" x 3/8"	●
6	A	1" x 7/8"	○
6	B	3/4" x 5/8"	●

○: Basic size ●: With reducer

Note) Please select an isometric fitting with the same size as the fitting at the flow sensor.

Order example



PF2D504S-11-1-1S11 1
LQ1E3B-SN (Union elbow) 1
LQ1T3B-SN (Union tee) 1

Note) Flow sensors and fittings are shipped packed separately.

PF2D Series
Applicable Fluid

Compatibility checklist: Between the digital flow switch sensor material for deionized water and chemicals and the fluid selected.

Fluid		Compatibility
Acetone		○
Ammonium hydroxide	Concentration 30% or less	○
Isobutyl alcohol		×
Isopropyl alcohol		○
Hydrochloric acid	Concentration 38% or less	○
Ozone		×
Hydrogen peroxide	Concentration 50% or less 50°C or less	○
Ethyl acetate		○
Butyl acetate		○
Nitric acid (except fuming nitric acid)	Concentration 10% or less	○
Deionized water		○
Sodium hydroxide		×
Ultra deionized water		○
Toluene		○
Hydrofluoric acid	Concentration 50% or less	○
Sulfuric acid (except fuming sulfuric acid)	Concentration 20% or less	○
Phosphoric acid	Concentration 30% or less	○

Note 1) The material and fluid compatibility check list provides reference values as a guide only.
Note 2) It is possible that some fluids are permeable depending on the type of fluid, its density and temperature. Any permeated fluid may affect the products life.
Thus, when using these fluid types, verify the fluid in advance by testing it, prior to making a decision to use it.

Table symbols ○ : Can be used
: Can be used under certain conditions
× : Cannot be used

· Compatibility is indicated for fluid temperatures at 90°C or less.
· The product does not have an explosion proof construction. Be sure to take measures to prevent the area around the product from becoming filled with an explosive gas, when using an explosive fluid.

PF2D Series
Specific Product Precautions

Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions.

Return of Product

⚠Warning

If the product to be returned is contaminated or is possibly contaminated with substances that are harmful to humans, for safety reasons, please contact SMC beforehand and then employ a specialist cleaning company to decontaminate the product. After the decontamination prescribed above has been carried out, submit a Product Return Request Sheet or the Detoxification/Decontamination Certificate to SMC and await SMC's approval and further instructions before attempting to return the item.
Please refer to the International Chemical Safety Cards (ICSC) for a list of harmful substances.
If you have any further questions, please don't hesitate to contact your SMC sales representative.