3-Colour Display

Digital Flow Switch for Large Flow

Applicable fluid Air, N_2, Ar, CO_2

IP65

IO-Link*1

*1 For the PF3A□□H-L

A wide range of flow measurement is possible with 1 product.

Flow ratio*2 **100:1**

*2 Max. rated flow value : Min. rated flow value

	Series	Output type	Rated flow range [l/min] / New Display range [l/min]
Body Ported Type	**3-Colour Display** PF3A7□H(-L) Series 	Switch output Analogue output IO-Link	3000 L type: 0 – 30 – 3000 – 4500 6000 L type: 0 – 60 – 6000 – 9000 12000 L type: 0 – 120 – 12000 – 18000
Modular Type	**3-Colour Display** PF3A7□H(-L) Series 	Switch output Analogue output IO-Link	New 500 L type: 0 – 5 – 500 – 750 1000 L type: 0 – 10 – 1000 – 1500 2000 L type: 0 – 20 – 2000 – 3000 New 4000 L type: 0 – 40 – 4000 – 6000 New 8000 L type: 0 – 80 – 8000 – 12000
	4-Screen Display With pressure/ temperature sensor PF3A8□H-L Series 	Switch output IO-Link	

New

- 500 L/4000 L/8000 L types have been added to the modular type.
- The display range has been expanded. (1.5 times the rated flow range)

Modular type

500 L | 1000 L | 2000 L | 4000 L | 8000 L

Can be connected to the air combination

500 L

4000 L 8000 L

4-Screen Display
With pressure/ temperature sensor

Added applicable air combination sizes (●: Model)

Flow range	Air combination model				
	AC20-D	AC30-D	AC40-D	AC50-D	AC60-D
500 l/min	●				
1000 l/min		●			
2000 l/min			●		
4000 l/min				●	●
8000 l/min				●	●

Body ported type

3000 L | 6000 L | 12000 L

3-Screen Display Digital Flow Monitor

Allows for the monitoring of remote lines

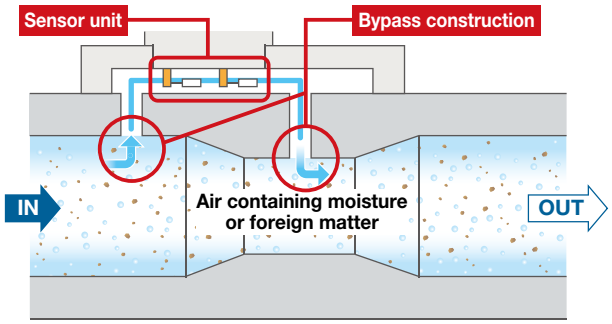
PF3A□H(-L) Series

SMC

CAT.EUS100-117E-UK

Improved resistance to moisture and foreign matter

The bypass construction reduces the moist air or foreign matter in contact with the sensor, reducing sensor accuracy deterioration and damage.



∗ The figure shows the PF3A703/6/12H(-L).

Through bore construction *1

- **Pressure loss: 75 % reduction** *2 (20 kPa → 5 kPa)
- **Maintenance-free fluid passage**

∗1 Excludes the modular type
∗2 Compared with the existing model (PF2A7□H/ Large flow type)

New Can be used with carbon dioxide and argon, in addition to air and nitrogen

∗ It is possible to select the gas in settings.

∗ For the modular type, check the fluid in use with the AC-D connected component.

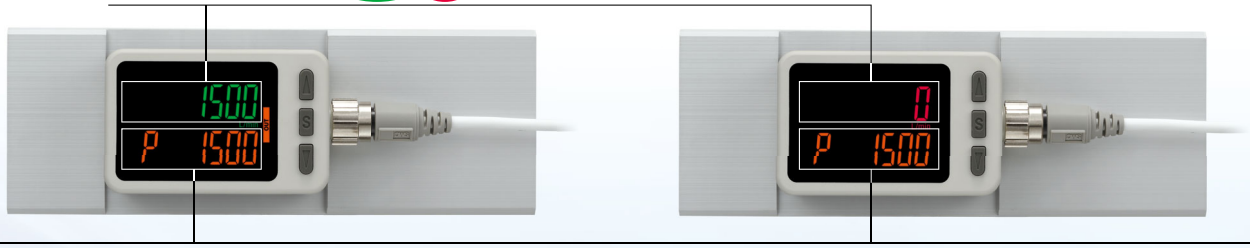
3-colour/2-screen display

∗ 2-screen display: 2-row display of main screen and sub screen

Upper Main display: Green At set point

Upper Main display: Red At set point

Instantaneous flow rate Green Red (Upper Main display)



Set value Orange (Lower Sub display)

The lower/sub display can be changed by pressing the up/down buttons.

∗ Either "Input of line name" or "Display OFF" can be added via the function settings.

Accumulated value

Peak/Bottom value

Line name

New Expanded the set point range/display range

It is possible to display/set a range of up to **150 %** of the rated flow range.

∗ Existing model: 105 %
∗ For a list of setting ranges for each series, refer to the "Flow Range" table on page 24.

Grease-free

Smallest settable increment

1 l/min ∗ For the PF3A7/8R5H, PF3A7/801H

2 l/min ∗ For the PF3A703H

∗ 5 l/min for the existing model (PF2A703H/Large flow type)

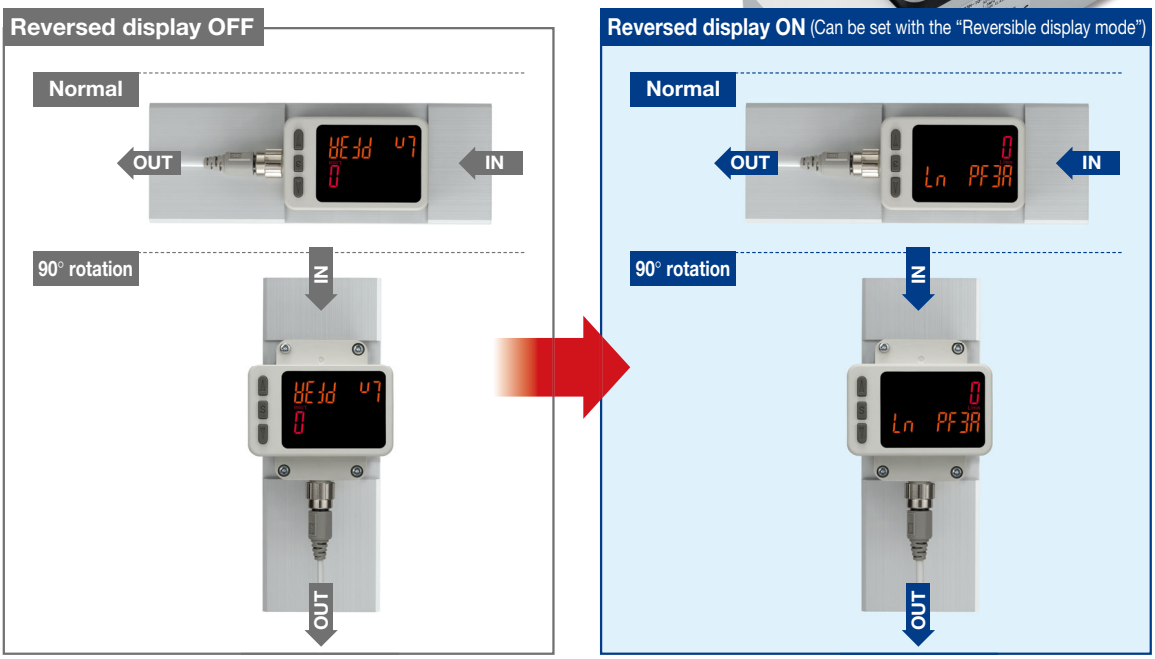
Display rotates 90° and can be reversed.

Clockwise **90°** **Easy operation, improved visibility**

The display can be rotated in increments of 90° according to the installation. The display can be reversed for easy operation.

* Excludes the PF3A7/8R5H, 7/804H, and 7/808H

Installation Example



Select a digital flow switch to increase energy savings

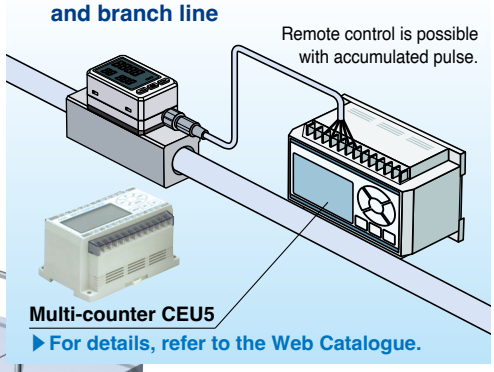
Flow control is necessary for promoting energy saving in any application. Saving energy starts from numerical control of the flow consumption of equipment and lines and clarification of the purpose and effect.

- **Digital display allows visualization.**
- **3-colour, 2-screen/4-screen display, Improved visibility**
- **Remote control of the consumption flow rate is possible with accumulated pulse.**

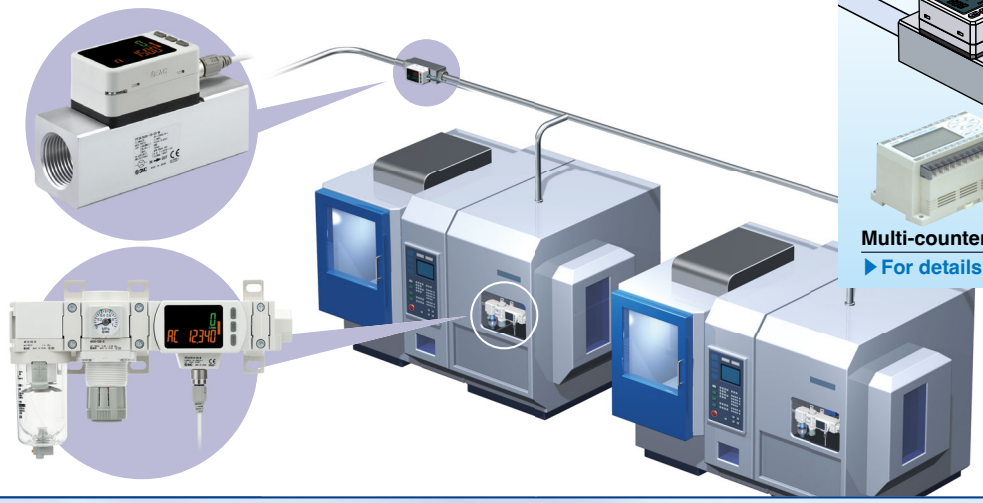
Energy Saving Program

For details, refer to the SMC website.
www.smc.eu

■Flow control of equipment, main line, and branch line



▶ For details, refer to the Web Catalogue.



New Accumulated pulse conversion value: Select from **4 types** based on the flow range

Accumulated pulse width: Select a setting between **50 to 100 ms**

3-Colour Display Modular Type Digital Flow Switch
PF3A7R5H/701H/702H/704H/708H(-L) Series

Can be connected to the air combination

Series	AC20-D	AC30-D	AC40-D	AC50-D	AC60-D	Flow range
PF3A7R5H(-L)	●					500 l/min
PF3A701H(-L)		●				1000 l/min
PF3A702H(-L)			●			2000 l/min
PF3A704H(-L)				●	●	4000 l/min
PF3A708H(-L)				●	●	8000 l/min

500 l/min (PF3A7R5H)

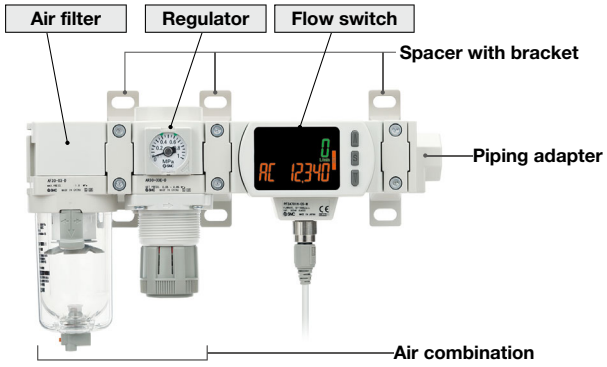
1000 l/min (PF3A701H)
2000 l/min (PF3A702H)

4000 l/min (PF3A704H)
8000 l/min (PF3A708H)

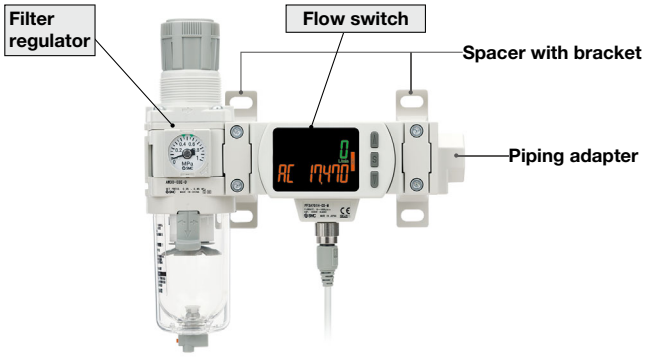
Air Combination Connection Examples

Products do not come assembled.
They should be ordered separately and assembled by the customer.

For the AC30B-D + PF3A701H



For the AW30-D + PF3A701H



Simple Specials System

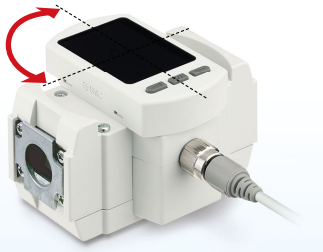
Unit with F.R.L is available with the simple special ordering system.
The lead time is almost the same as the standard product.

Please contact your local sales representative for more details.

A right to left (-R) flow direction is also available.

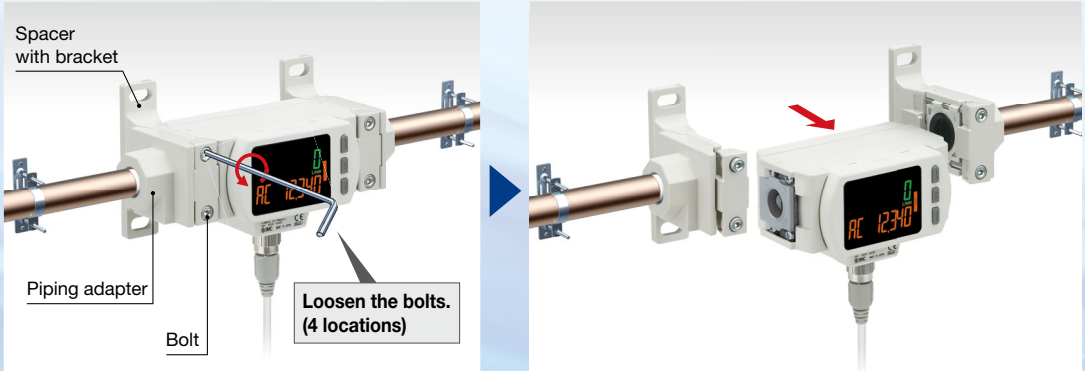
90° rotation

* Excludes the PF3A7/8R5H, 7/804H, and 7/808H

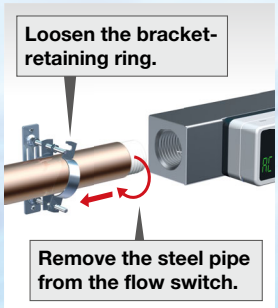


The flow switch can be installed/removed without removing the piping.

Reduced maintenance time for inspection, cleaning, replacement, etc.



When the PF3A703H is used with steel pipes



4-Screen Display Modular Type Digital Flow Switch with Pressure/Temperature Sensor
PF3A8R5H/801H/802H/804H/808H-L Series

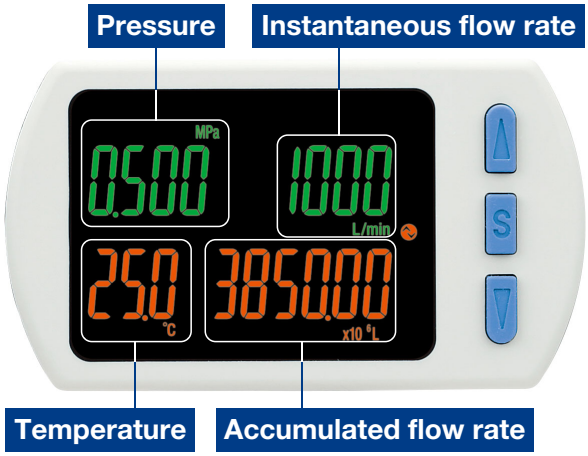
Can be connected to the air combination

Series	AC20-D	AC30-D	AC40-D	AC50-D	AC60-D	Flow range	Pressure	Temperature
PF3A8R5H-L	●					500 l/min	1 MPa	50 °C
PF3A801H-L		●				1000 l/min		
PF3A802H-L			●			2000 l/min		
PF3A804H-L				●	●	4000 l/min		
PF3A808H-L				●	●	8000 l/min		

500 l/min (PF3A8R5H)
1000 l/min (PF3A801H)
2000 l/min (PF3A802H)
4000 l/min (PF3A804H)
8000 l/min (PF3A808H)

3-colour/4-screen display

Simultaneous measurement of the instantaneous flow rate, accumulated flow rate, pressure, and temperature



Pressure sensor

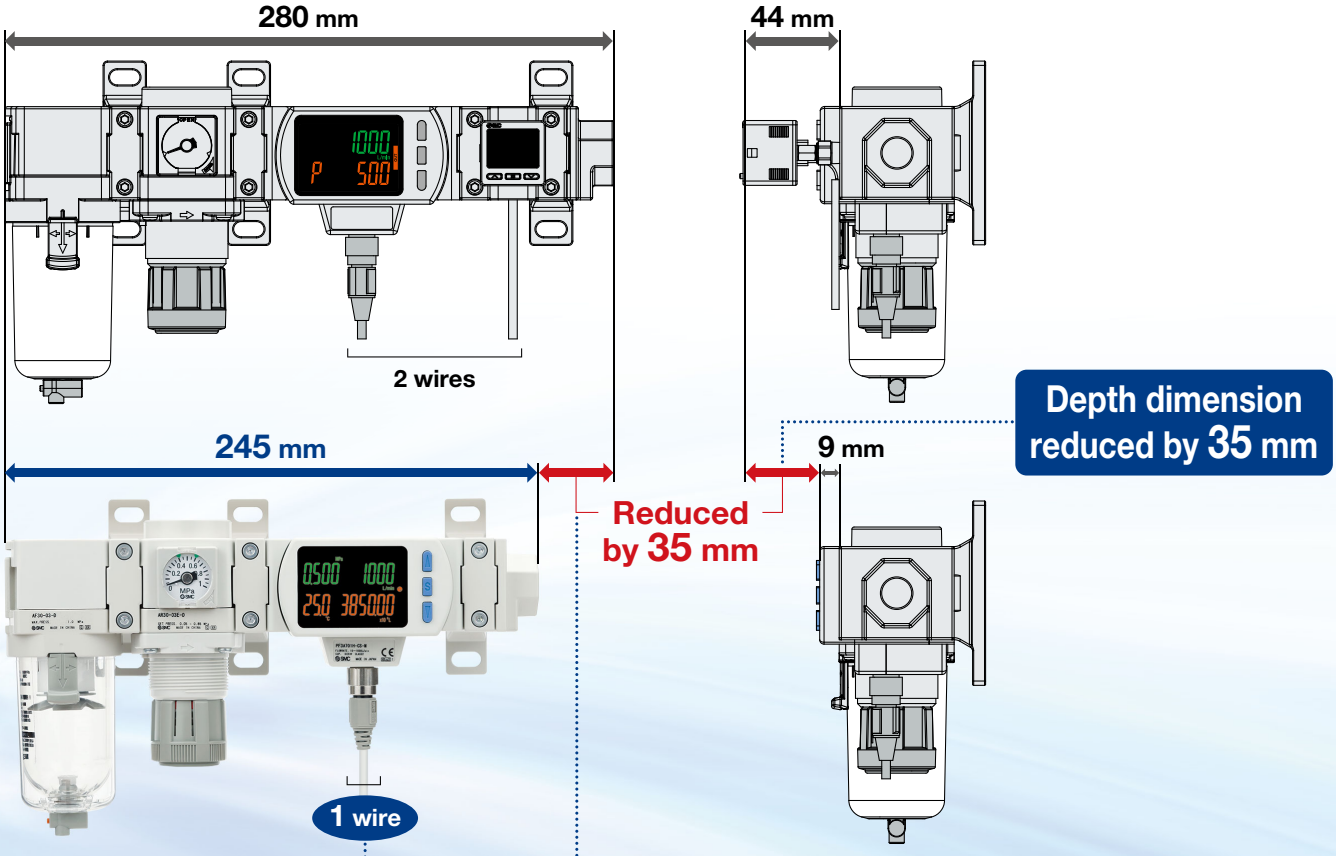
Rated pressure range: 0 to 1 MPa

Temperature sensor

Rated temperature range: 0 to 50 °C

Space-saving design, Reduced labour

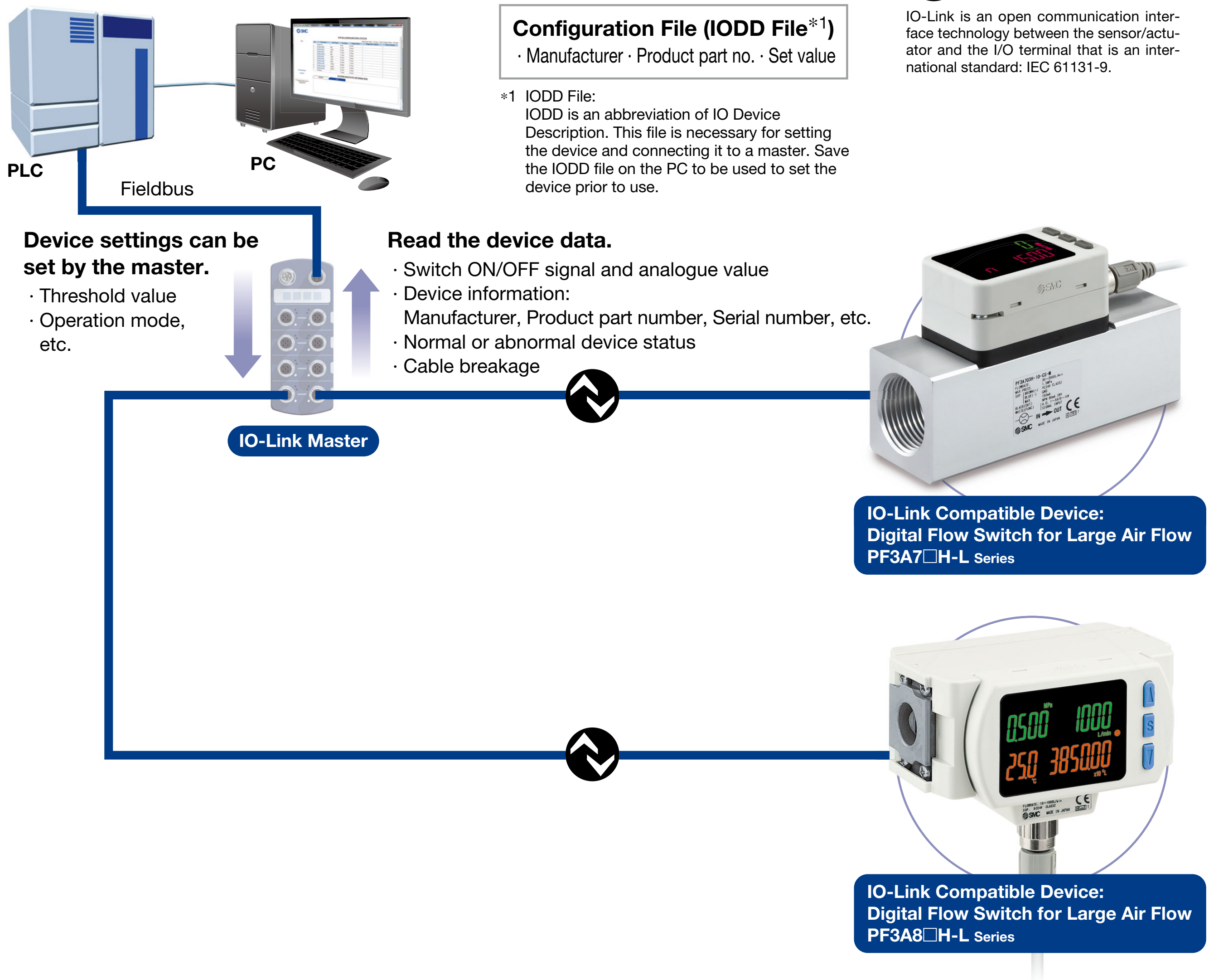
Both the flow rate and pressure can be measured with 1 product.
The installation of a digital pressure switch and a cross spacer is not necessary, thus reducing the face-to-face and depth dimensions. In addition, only 1 cable is required for wiring. This reduces the required installation space, piping, and wiring work.



IO-Link Compatible PF3A□□H-□□-L□-□□

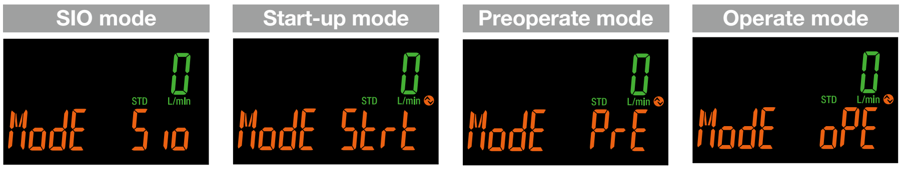
Supports the IO-Link communication protocol

IO-Link is an open communication interface technology between the sensor/actuator and the I/O terminal that is an international standard: IEC 61131-9.



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	(ON) *1	IO-Link mode	Normal	Operate	ModE oPE	Normal communication status (readout of measured value)
	(Flashing) *1			Start up	ModE Strt	At the start of communication
				Preoperate	ModE PrE	
			Abnormal	Version does not match	Er 15 / 1.0	The IO-Link version does not match that of the master. * The applicable IO-Link version is 1.1.
No				Communication disconnection	ModE oPE / ModE Strt / ModE PrE	Normal communication was not received for 1 s or longer.
	OFF	SIO mode			ModE S io	General switch output

*1 In IO-Link mode, the IO-Link indicator is ON or flashing. *2 When the lower line (sub screen) is set to mode display (Upper line for the PF3A8□H-L)
* "ModE LoC" is displayed when the data storage lock is enabled. (Except for when the version does not match or when in SIO mode)

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 (periodic) data and to monitor such problems in detail with the noncyclic (aperiodic) data.

For the PF3A7□H-L

Process Data

Bit offset	Item	Note
0	OUT1 output	0: OFF 1: ON
1	OUT2 output	0: OFF 1: ON
8	Flow rate diagnosis	0: OFF 1: ON
14	Fixed output	0: OFF 1: ON
15	Error (Failure)	0: OFF 1: ON
16 to 31	Measured flow rate value	Signed 16 bit

Diagnosis items
· Over current error
· Rated flow error
· Accumulated flow error
· Flow sensor failure
· Temperature sensor failure
· Internal product malfunction

Bit offset	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Item	Measured flow rate value (PD)															

Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Item	Error (Failure)	Fixed output	Reservation					Flow rate diagnosis	Reservation						OUT2	OUT1
															Switch output	

For the PF3A8□H-L

Process Data

Bit offset	Item	Note
0	Accumulated flow SW1	0: OFF 1: ON
1	Accumulated flow SW2	0: OFF 1: ON
2	Flow rate SW1	0: OFF 1: ON
3	Flow rate SW2	0: OFF 1: ON
4	Temperature SW1	0: OFF 1: ON
5	Temperature SW2	0: OFF 1: ON
6	Pressure SW1	0: OFF 1: ON
7	Pressure SW2	0: OFF 1: ON
8	Flow rate unit	0: L 1: ft3
9	Flow rate criteria	0: STD 1: nor
10	Flow rate diagnosis	0: Normal 1: HHH

Bit offset	Item	Note
11	Temperature diagnosis	0: Normal 1: HHH/LLL
12	Pressure diagnosis	0: Normal 1: HHH/LLL
13	Fixed output	0: Normal output 1: Fixed output
14	Error	0: Normal 1: Abnormal
15	System error	0: Normal 1: Abnormal
16 to 31	Measured pressure value	Signed 16 bit
32 to 47	Measured temperature value	Signed 16 bit
48 to 63	Measured flow rate value	Signed 16 bit
64 to 79	Accumulated flow rate lower limit	Unsigned 32 bit
80 to 95	Accumulated flow rate upper limit	

Diagnosis items
· Rated flow error
· Above/Below the rated pressure range
· Above/Below the rated temperature range
· Error (Over current, Outside of zero-clear range, Version does not match)
· System error (Flow/Temperature sensor failure, Internal malfunction)

Bit offset	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
Item	Accumulated flow rate upper limit (PD)															

Bit offset	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
Item	Accumulated flow rate lower limit (PD)															

Bit offset	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
Item	Measured flow rate value (PD)															

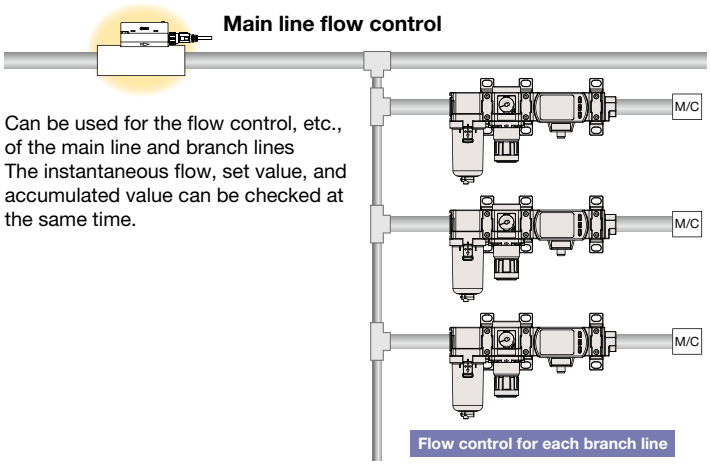
Bit offset	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
Item	Measured temperature value (PD)															

Bit offset	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Item	Measured pressure value (PD)															

Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Item	System error	Error	Fixed output	Pressure diagnosis	Temperature diagnosis	Flow rate diagnosis	Flow rate criteria	Flow rate unit	Pressure 2	Pressure 1	Temperature 2	Temperature 1	Flow rate 2	Flow rate 1	Accumulated flow 2	Accumulated flow 1

Application Example

Main line flow control

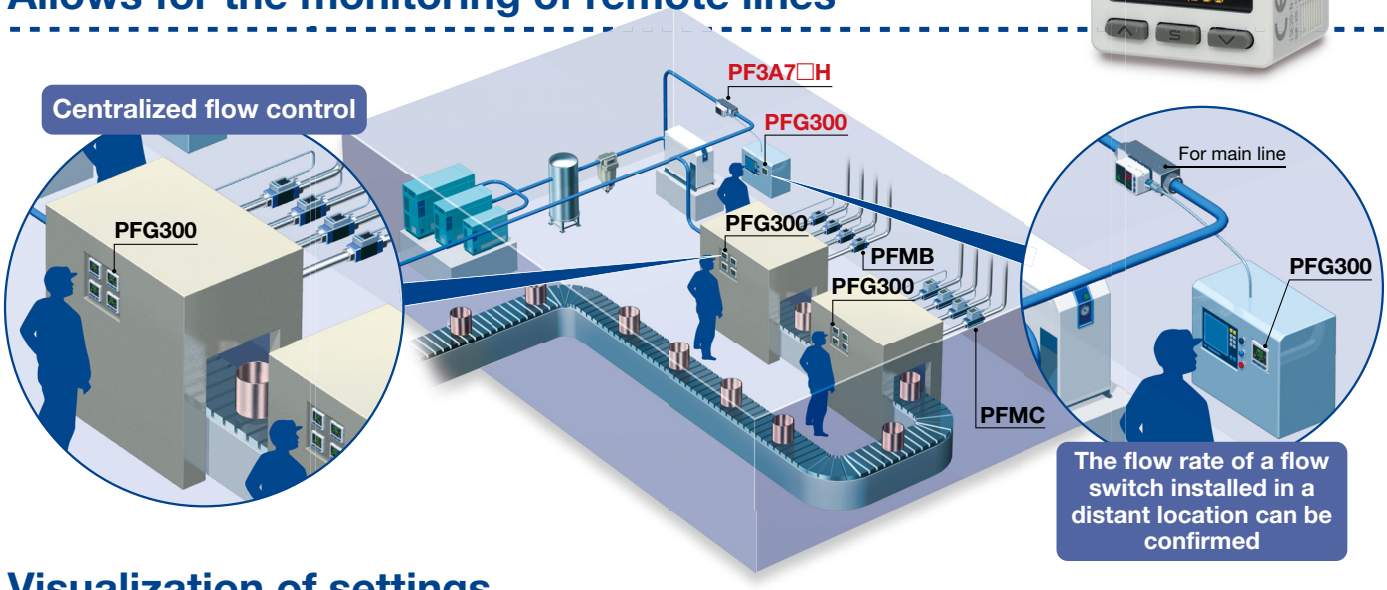


Can be used for the flow control, etc., of the main line and branch lines
The instantaneous flow, set value, and accumulated value can be checked at the same time.

Flow control for each branch line

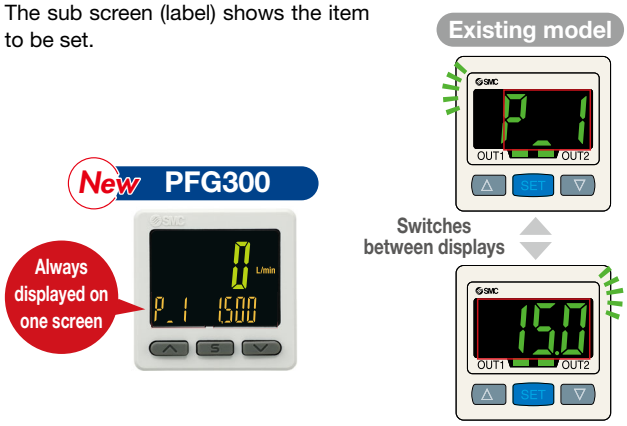
3-Screen Display Digital Flow Monitor
PFG300 Series

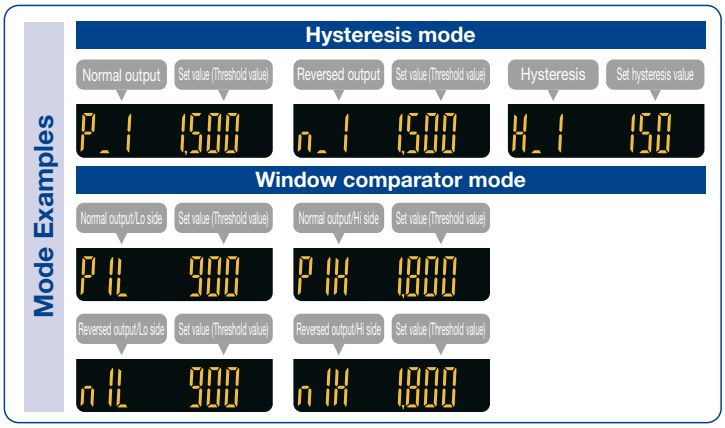
Allows for the monitoring of remote lines



Visualization of settings

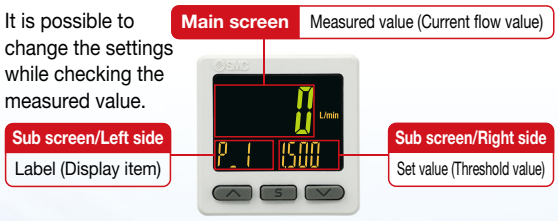
The sub screen (label) shows the item to be set.



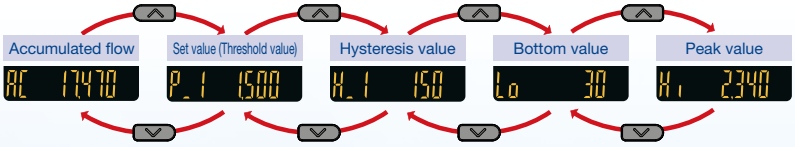


Easy screen switching

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



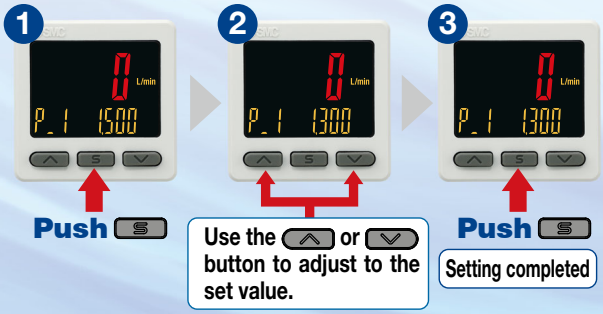
The sub screen can be switched by pressing the up/down buttons.



* Either “Input of line name” or “Display OFF” can be added via the function settings.

Simple 3-step setting

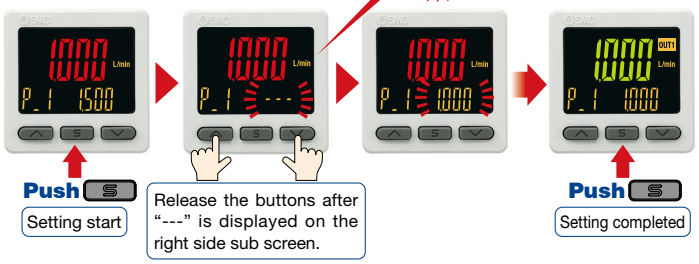
When the S button is pressed and the set value (P_1) is being displayed, the set value (threshold value) can be set. When the S button is pressed and the hysteresis (H_1) is being displayed, the hysteresis value can be set.



With a snap shot function for set value reading

Pressing the and buttons simultaneously for a minimum of 1 second will make the set value (threshold value) the same as the current flow value.

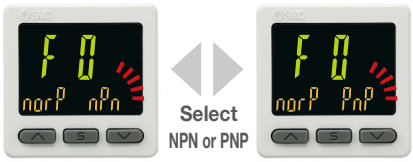
Snap shot function



SMC

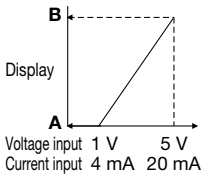
NPN/PNP switch function

The number of stock items can be reduced.



NPN PNP

Input range selection (for Pressure/Flow rate)



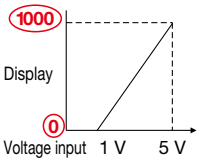
The displayed value to the sensor input can be set as required.
(Voltage input: 1 to 5 V/Current input: 4 to 20 mA)
Pressure switch/Flow switch can be displayed.

A is displayed for 1 V (or 4 mA). B is displayed for 5 V (or 20 mA). The range can be set as required.

Analogue output of 0 to 10 V is also available.

Voltage output	1 to 5 V	Switchable
	0 to 10 V	
Current output	4 to 20 mA	Fixed

■ Pressure Sensor for General Fluids/PSE570



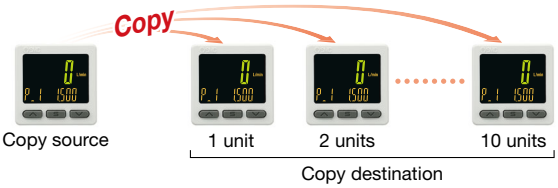
	A	B
PSE570	0	1000
PSE573	−100	100
PSE574	0	500

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

Convenient functions

Copy function

The set values of the monitor can be copied.



Security code

The key locking function keeps unauthorized persons from tampering with the settings.

Power saving mode

Power consumption is reduced by turning off the monitor.

Current consumption*1	Reduction rate*2
25 mA or less	Approx. 50 % reduction

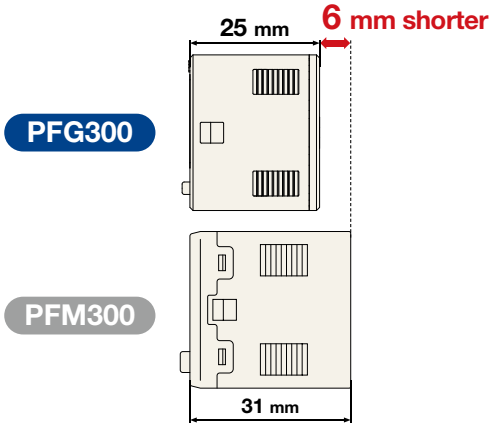
*1 During normal operation *2 In power saving mode

External input function

The accumulated value, peak value, and bottom value can be reset remotely.

Compact & Lightweight

- **Compact: Max. 6 mm shorter**
- **Lightweight: Max. 5 g lighter (30 g → 25 g)**



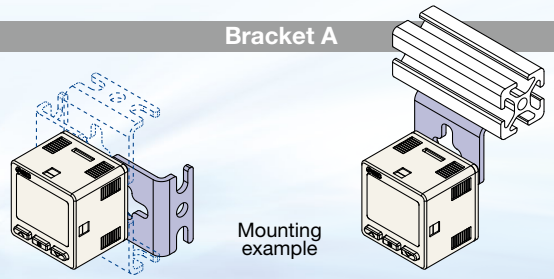
Functions

- Output operation
- Simple setting mode
- Display colour
- Delay time setting
- Digital filter setting
- FUNC output switching function
- Selectable analogue output function
- External input function
- Forced output function
- Accumulated value hold
- Peak/Bottom value display
- Setting of a security code
- Key-lock function
- Reset to the default settings
- Display with zero cut-off setting
- Selection of the display on the sub screen
- Analogue output free range function
- Error display function
- Copy function
- Selection of power saving mode

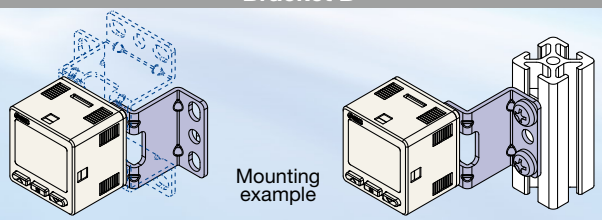
Mounting

The bracket configuration allows for mounting in four orientations.

Bracket A



Bracket B

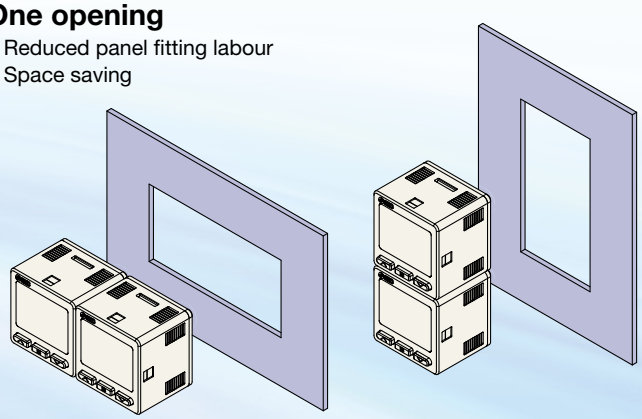


Panel mounting

Mountable side by side both vertically and horizontally

One opening

· Reduced panel fitting labour
· Space saving



Flow Switch Flow Rate Variations

Series	Compatibility with the PFG300 digital flow monitor	Applicable fluid	Detection method	Smallest settable increment	Rated flow range [l/min]
PF2A 	**PFG200** 	Air N_2	Thermal type (Thermistor)	0.1 l/min	1 – 10
				0.5 l/min	5 – 50
				1 l/min	10 – 100
				2 l/min	20 – 200
				5 l/min	50 – 500
PF3A□H(-L)  Body ported type  Modular type	**PFG300** 	Air N_2 Ar CO_2	Thermal type (Platinum sensor) Bypass flow type	2 l/min	30 – Body ported type – 3000
				5 l/min	60 – Body ported type – 6000
				10 l/min	120 – Body ported type – 12000
				1 l/min	5 – Modular type – 500
				1 l/min	10 – Modular type – 1000
				2 l/min	20 – Modular type – 2000
				2 l/min	40 – Modular type – 4000
				5 l/min	80 – Modular type – 8000
PF2M7(-L) 	**PFGM302** 	Dry air N_2 Ar CO_2	Thermal type (MEMS)	0.001 l/min	0.01 – 1
				0.01 l/min	0.02 – 2
					0.05 – 5
					0.1 – 10
				0.1 l/min	0.3 – 25
					0.5 – 50
					1 – 100
				1 l/min	2 – 200
PFMB 	**PFG300** 	Dry air N_2	Thermal type (MEMS) Bypass flow type	1 l/min	5 – 500
					10 – 1000
					20 – 2000
PF2MC7(-L) 	**PFG300** 	Dry air N_2	Thermal type (MEMS) Bypass flow type	1 l/min	5 – 500
					10 – 1000
					20 – 2000

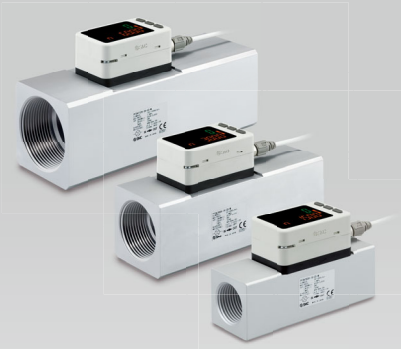
Series	Compatibility with the PFG300 digital flow monitor	Applicable fluid	Detection method	Rated flow range [l/min]
PFMV5 	**PFGV301** 	Dry air N_2	Thermal type (MEMS)	0 – 0.1
				0 – 0.5
				0 – 1
				0 – 3
				−0.5 – 0.5
				−1 – 1
				−3 – 3

Flow Switch Variations / Basic Performance Table

Series	PFMV5	PF2M7(-L)	PFMB	PF2MC7(-L)	PF2A	PF3A□H(-L)
	 PFGV301	 PFGM302	 PFG300	 PFG300	 PFG200	 PFG300
Enclosure	IP40	IP40	IP40	IP65 [**Monitor unit:** IP40]	IP65	**IP65** [**Monitor unit:** IP40]
Fluid	Dry air, N_2	Dry air, N_2, Ar, CO_2	Dry air, N_2	Dry air, N_2	Air, N_2	**Air, N_2, Ar, CO_2**
Setting	Digital	Digital	Digital	Digital	Digital	**Digital**
Rated flow range [l/min]	0 to 0.1 0 to 0.5 0 to 1 0 to 3 −0.5 to 0.5 −1 to 1 −3 to 3	0.01 to 1 0.02 to 2 0.05 to 5 0.1 to 10 0.3 to 25 0.5 to 50 1 to 100 2 to 200	5 to 500 10 to 1000 20 to 2000	5 to 500 10 to 1000 20 to 2000	1 to 10 5 to 50 10 to 100 20 to 200 50 to 500	**30 to 3000 60 to 6000 120 to 12000** **5 to 500 10 to 1000 20 to 2000 40 to 4000 80 to 8000**
Power supply voltage	12 to 24 VDC ±10 %	PF2M7: 12 to 24 VDC ±10 % PF2M7-L: 18 to 30 VDC ±10 %	12 to 24 VDC ±10 %	PFMC: 12 to 24 VDC ±10 % PFMC-L: 18 to 30 VDC ±10 %	12 to 24 VDC ±10 %	**PF3A7□H: 24 VDC ±10 %** **PF3A7□H-L: 18 to 30 VDC ±10 %** **PF3A7□H-L (Modular type): 21.6 to 30 VDC** **PF3A8□H-L: 21.6 to 30 VDC**
Temperature characteristics (25 °C standard)	±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) [**Monitor unit:** ±0.5 % F.S. (0 to 50 °C)]	±3 % F.S. ±1 digit (15 to 35 °C) ±5 % F.S. ±1 digit (0 to 50 °C)	±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) [**Monitor unit:** ±0.5 % F.S. (0 to 50 °C)]	±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) [**Monitor unit:** ±0.5 % F.S. (0 to 50 °C)]	±3 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C)	**±5 % F.S. (0 to 50 °C)** [**Monitor unit:** ±0.5 % F.S. (0 to 50 °C)]
Repeatability	±2 % F.S. (Fluid: Dry air) Analogue output: ±5 % F.S. [**Monitor unit:** ±0.1 % F.S. Analogue output: ±0.3 % F.S.]	±1 % F.S. ±1 digit (Fluid: Dry air)	±1 % F.S. (Fluid: Dry air) [**Monitor unit:** ±0.1 % F.S.]	±1 % F.S. (Fluid: Dry air) [**Monitor unit:** ±0.1 % F.S.]	±1 % F.S. (PF2A7□0) ±2 % F.S. (PF2A7□1)	**±1 % F.S.** [**Monitor unit:** ±0.1 % F.S.]
Hysteresis	Hysteresis mode: Variable Window comparator mode: Variable	Hysteresis mode: Variable Window comparator mode: Variable	Hysteresis mode: Variable Window comparator mode: Variable	Hysteresis mode: Variable Window comparator mode: Variable	Hysteresis mode: Variable Window comparator mode: Fixed (3 digits)	**Hysteresis mode: Variable** **Window comparator mode: Variable**
Output	NPN/PNP open collector Analogue voltage output Analogue current output	NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output IO-Link	NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output	NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output IO-Link	NPN/PNP open collector Accumulated pulse output	**NPN/PNP open collector** **Accumulated pulse output** **Analogue voltage output** **Analogue current output** **IO-Link**
Display	[**Monitor unit:** 2-colour LCD display]	2-colour LCD display	2-colour LED display 2-colour LCD display [**Monitor unit:** 3-colour LCD display]	3-colour LCD display	LED display	**3-colour LCD display**

∗ The monitor unit values are for the PFG300 and PFMV3.

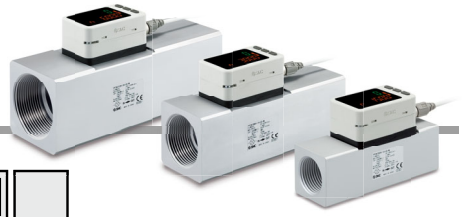
CONTENTS



Body Ported Type

3-Colour Display Digital Flow Switch

PF3A7□H Series



How to Order

PF3A 7 03 H – □ 10 – ES □ – M □

Type

7	Integrated display

Rated flow range

03	30 to 3000 l/min
06	60 to 6000 l/min
12	120 to 12000 l/min

Large flow type

Thread type

—	Rc
N	NPT
F∗1	G

∗1 ISO 1179-1 compliant

Port size

Symbol	Port size	Rated flow range		
		03	**06**	**12**
10	1	●	—	—
14	1 1/2	—	●	—
20	2	—	—	●

Output specification

Symbol	OUT	FUNC∗2	Applicable monitor unit model
CS	NPN	Analogue voltage output∗3 ⇔ External input∗4	PFG300 series
DS	NPN	Analogue current output ⇔ External input∗4	PFG310 series
ES	PNP	Analogue voltage output∗3 ⇔ External input∗4	PFG300 series
FS	PNP	Analogue current output ⇔ External input∗4	PFG310 series

∗2 Analogue output or external input can be selected by pressing the buttons. Analogue output is set as default setting.
∗3 1 to 5 V or 0 to 10 V can be selected by pressing the button. The default setting is 1 to 5 V.
∗4 The accumulated value, peak value, and bottom value can be reset.

Options

—	With lead wire with M12 connector (3 m)∗5
N	Without lead wire with M12 connector

∗5 Options are shipped together with the product but do not come assembled.

Unit specification

—	Units selection function
M	SI units only∗6

∗6 Fixed units: Instantaneous flow: l/min
Accumulated flow: L

Calibration certificate

—	None
A∗7	Yes

∗7 Made to order

Option/Part No.

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

Part no.	Option	Note
ZS-37-A	Lead wire with M12 connector	Length: 3 m

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

Specifications

Model			PF3A703H	PF3A706H	PF3A712H
Fluid	Applicable fluid*1		Air, Nitrogen, Ar, CO_2		
	Fluid temperature		0 to 50 °C		
Flow	Detection method		Thermal type		
	Rated flow range		30 to 3000 l/min	60 to 6000 l/min	120 to 12000 l/min
	Set point range*2	Instantaneous flow	30 to 4500 l/min	60 to 9000 l/min	120 to 18000 l/min
		Accumulated flow	0 to 999,999,999,990 L	0 to 999,999,999,900 L	
	Smallest settable increment	Instantaneous flow	2 l/min	5 l/min	10 l/min
		Accumulated flow	10 L	100 L	
	Accumulated pulse	Converted value	Select from 50 L/pulse, 100 L/pulse, 500L/pulse, or 1000 L/pulse.		
		Pulse width	Variable from 50 to 100 ms/10 ms increments		
	Accumulated value hold function*3		Intervals of 2 or 5 minutes can be selected.		
Pressure	Rated pressure range		0.1 to 1.5 MPa		
	Proof pressure		2.25 MPa		
	Pressure loss		Refer to the "Pressure Loss" graph on page 25.		
	Pressure characteristics*4		±2.5 % F.S. (0.1 to 1.0 MPa, 0.5 MPa standard)		
Electrical	Power supply voltage		24 VDC ±10 %		
	Current consumption		150 mA or less		
	Protection		Polarity protection		
Accuracy*5	Display accuracy		±3.0 % F.S.		
	Analogue output accuracy		±3.0 % F.S.		
	Repeatability		Switch output/Display: ±1.0 % F.S. Analogue output: ±1.0 % F.S.		
	Temperature characteristics		±5.0 % F.S. (Ambient temperature of 0 to 50 °C, 25 °C standard)		
Switch output	Output type		NPN open collector PNP open collector		
	Output mode		Select from Instantaneous output (Hysteresis mode or Window comparator mode), Accumulated output, or Accumulated pulse output.		
	Switch operation		Select from Normal or Reversed output.		
	Max. load current		60 mA		
	Max. applied voltage (NPN only)		28 VDC		
	Internal voltage drop (Residual voltage)		NPN output type: 1 V or less (at load current of 60 mA) PNP output type: 2 V or less (at load current of 60 mA)		
	Response time*6		Select from 1 s, 2 s, or 5 s.		
	Hysteresis*7		Variable from 0		
	Protection		Over current protection		
Analogue output*8	Output type		Voltage output: 1 to 5 V (0 to 10 V can be selected*9), Current output: 4 to 20 mA		
	Impedance	Voltage output	Output impedance: Approx. 1 kΩ		
		Current output	Maximum load impedance: Approx. 600 Ω		
	Response time*10		Linked to the response time of the switch output		
External input*11	Input type		No-voltage input: 0.4 V or less		
	Input mode		Select from Accumulated value external reset or Peak/Bottom value reset.		
	Input time		30 ms or longer		
Display	Reference condition*12		Select from Standard conditions or Normal conditions.		
	Unit*13	Instantaneous flow	l/min, CFM (ft^3/min)		
		Accumulated flow	L, ft^3		
	Display range*14	Instantaneous flow	0 to 4500 l/min (Flow under 30 l/min is displayed as "0")	0 to 9000 l/min (Flow under 60 l/min is displayed as "0")	0 to 18000 l/min (Flow under 120 l/min is displayed as "0")
		Accumulated flow*15	0 to 999,999,999,990 L	0 to 999,999,999,900 L	
	Minimum display unit	Instantaneous flow	2 l/min	5 l/min	10 l/min
		Accumulated flow	10 L	100 L	
	Display		LCD, 2-screen display (Main screen/Sub screen) Main screen: Red/Green, Sub screen: Orange Main screen: 5 digits, 7 segment, Sub screen: 6 digits, 7 segment		
	Indicator LED		OUT indicator: Red LED is ON when output is ON		
Environmental resistance	Enclosure		IP65		
	Withstand voltage		1000 VAC for 1 minute between terminals and housing		
	Insulation resistance		50 MΩ (500 VDC measured via megohmmeter) between terminals and housing		
	Operating temperature range		Operating: 0 to 50 °C, Stored: −10 to 60 °C (No freezing or condensation)		
	Operating humidity range		Operating/Stored: 35 to 85 % RH (No condensation)		
Standards			CE/UKCA marking, UL (CSA)		
Piping	Piping specification		Rc1, NPT1, G1	Rc1 1/2, NPT1 1/2, G1 1/2	Rc2, NPT2, G2
Main materials of parts in contact with fluid			Aluminium alloy, PPS, HNBR [Sensor: Pt, Au, Fe, Lead glass (exempted from the RoHS application), Al_2O_3]		
Length of lead wire with connector			3 m		
Weight	Piping specification	Rc	610 g	1190 g	1680 g
		NPT	610 g	1190 g	1680 g
		G	630 g	1220 g	1720 g
	Lead wire with connector		+90 g		

*1 The air quality class is according to JIS B 8392-1:2012 [6:6:4] and ISO8573-1:2010 [6:6:4]. Use an air filter with 5 μm or less filtration rating on the inlet side.
*2 Set point range will change according to the setting of the zero cut-off function.
*3 When using the accumulated value hold function, use the operating conditions to calculate the product life, and do not exceed it. The maximum update limit of the memory device is 1.5 million times. If the product is operated 24 hours per day, the product life will be as follows:
・5 min interval: life is calculated as 5 min x 1.5 million = 7.5 million min = 14.3 years
・2 min interval: life is calculated as 2 min x 1.5 million = 3 million min = 5.7 years
If the accumulated value external reset is repeatedly used, the product life will be shorter than the calculated life.
*4 When the pressure range is 1.0 to 1.5 MPa, the pressure characteristics will be ±5 % F.S. (standard pressure is 0.5 MPa). Do not release the OUT side piping port of the product to the atmosphere without connecting piping. If the product is used with the piping port released to atmosphere, accuracy may vary.
*5 The accuracy value is based on air as a fluid. For other fluids, it is a reference value.
*6 The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum value of the rated flow range instantaneously) until the switch output turns ON (or OFF) when set to be 90 % of the rated flow rate
*7 If the flow fluctuates around the set value, the width for setting more than the fluctuating width needs to be set. Otherwise, chattering will occur.
*8 Analogue output or external input can be selected by pressing the buttons. Refer to the graph for analogue output.
*9 When selecting 0 to 10 V, refer to the analogue output graph for the allowable load current.
*10 The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum value of the rated flow range instantaneously) until the analogue output reaches 90 % of the rated flow rate
*11 Analogue output or external input can be selected by pressing the buttons.
*12 The flow rate given in the specifications is the value under standard conditions.
*13 Setting is only possible for models with the units selection function.
*14 Display range will change according to the setting of the zero cut-off function.
*15 The accumulated flow display is the upper 6-digit and lower 6-digit (total of 12 digits) display. The upper 6 digits and the lower 6 digits are displayed alternately, with "x 10^6" lighting up when the upper digits are displayed.
* Products with tiny scratches, marks, or display colour or brightness variations which do not affect the performance of the product are verified as conforming products.

Body Ported Type **IO**-Link

3-Colour Display **Digital Flow Switch**

PF3A7□H-L Series

How to Order

PF3A 7 03 H – □ 10 – L Q – M □

Type

7	Integrated display

Rated flow range

03	30 to 3000 l/min
06	60 to 6000 l/min
12	120 to 12000 l/min

Large flow type

Thread type

—	Rc
N	NPT
F∗1	G

∗1 ISO 1179-1 compliant

Port size

Symbol	Port size	Rated flow range		
		03	**06**	**12**
10	1	●	—	—
14	1 1/2	—	●	—
20	2	—	—	●

Output specification

Symbol	OUT	FUNC∗2	Applicable monitor unit model
L	IO-Link: Switch output (N/P)	—	—
L3	IO-Link: Switch output (N/P)	Analogue voltage output∗3 ⇔ External input∗4	PFG300 series
L4	IO-Link: Switch output (N/P)	Analogue current output ⇔ External input∗4	PFG310 series

∗2 Analogue output or external input can be selected by pressing the buttons.
Analogue output is set as default setting.
Output symbol “L” cannot be used as the FUNC terminal is not connected.

∗3 1 to 5 V or 0 to 10 V can be selected by pressing the button.
The default setting is 1 to 5 V.

∗4 The accumulated value, peak value, and bottom value can be reset.

Options

—	With lead wire with M12 connector (3 m)∗5
N	Without lead wire with M12 connector
Q	Lead wire with M12-M12 connector (3 m)∗6

∗5 Options are shipped together with the product but do not come assembled.

∗6 The lead wire has an M12 (female) connector on one side and an M 1 2 (male) connector on the other side.

Unit specification

—	Units selection function
M	SI units only∗7

∗7 Fixed units: Instantaneous flow: l/min
Accumulated flow: L

Calibration certificate

—	None
A∗8	Yes

∗8 Made to order

Options/Part Nos.

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

Part no.	Option	Note
ZS-37-A	Lead wire with M12 connector	Length: 3 m
ZS-49-A	Lead wire with M12-M12 connector	Male/female conversion, Length: 3 m

Specifications

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

Model			PF3A703H-L	PF3A706H-L	PF3A712H-L
Electrical	Power supply voltage	When used as a switch output device	24 VDC ±10 %		
		When used as an IO-Link device	18 to 30 VDC ±10 %		
Switch output	Output type		Select from NPN or PNP open collector output.		
	Output mode		Select from Hysteresis, Window comparator, Accumulated output, Accumulated pulse output, Error output, or Switch output OFF modes.		
	Max. applied voltage		30 V (NPN output)		
	Internal voltage drop (Residual voltage)		1.5 V or less (at load current of 80 mA)		
	Delay time*1		3.3 ms or less, variable from 0 to 60 s/0.01 s increments		
Analogue output	Response time*2		Linked to the set value of the digital filter		
Display	Display		LCD, 2-screen display (Main screen/Sub screen) Main screen: Red/Green, Sub screen: Orange Main screen/Sub screen: 9 digits (7 segments 7 digits, 11 segments 2 digits)		
	Digital filter*3		Select from 1 s, 2 s, or 5 s.		
Standards			CE/UKCA marking, UL (CSA)		

∗1 The time from when the instantaneous flow reaches the set value to when the switch output operates can be set.
∗2 The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum value of the rated flow range instantaneously) until the analogue output reaches 90 % of the rated flow rate
∗3 The time for the digital filter can be set to the sensor input. The response time indicates when the set value is 90 % in relation to the step input.

Communication Specifications (IO-Link mode)

IO-Link type	Device
IO-Link version	V 1.1
Communication speed	COM2 (38.4 kbps)
Configuration file	IODD file*1
Minimum cycle time	3.3 ms
Process data length	Input data: 4 bytes, Output data: 0 bytes
On request data communication	Yes
Data storage function	Yes
Event function	Yes
Vendor ID	131 (0 x 0083)
Device ID*2	PF3A703H-□□-L□-□□ : 400 (0 x 0190)
	PF3A703H-□□-L3□-□□: 401 (0 x 0191)
	PF3A703H-□□-L4□-□□: 402 (0 x 0192)
	PF3A706H-□□-L□-□□ : 403 (0 x 0193)
	PF3A706H-□□-L3□-□□: 404 (0 x 0194)
	PF3A706H-□□-L4□-□□: 405 (0 x 0195)
	PF3A712H-□□-L□-□□ : 406 (0 x 0196)
	PF3A712H-□□-L3□-□□: 407 (0 x 0197)
	PF3A712H-□□-L4□-□□: 408 (0 x 0198)

∗1 The configuration file can be downloaded from the SMC website, https://www.smc.eu
∗2 The device ID differs according to each product type (output specification).

Other specifications that are not listed are the same as those of the standard product. For details, refer to page 14.

Modular Type

3-Colour Display Digital Flow Switch

PF3A7□H Series

How to Order

PF3A 7 01 H – ES □ – M □ – □

Type

7	Integrated display

Rated flow range

Symbol	Rated flow range	Applicable air combination model
R5	5 to 500 l/min	AC20-D
01	10 to 1000 l/min	AC30-D
02	20 to 2000 l/min	AC40-D
04	40 to 4000 l/min	AC50-D, AC60-D
08	80 to 8000 l/min	AC50-D, AC60-D

Large flow type

Output specification

Symbol	OUT	FUNC*1	Applicable monitor unit model
CS	NPN	Analogue voltage output*2 ⇔ External input*3	PFG300 series
DS	NPN	Analogue current output ⇔ External input*3	PFG310 series
ES	PNP	Analogue voltage output*2 ⇔ External input*3	PFG300 series
FS	PNP	Analogue current output ⇔ External input*3	PFG310 series

∗1 Analogue output or external input can be selected by pressing the buttons. Analogue output is set as default setting.
∗2 1 to 5 V or 0 to 1 0 V can be selected by pressing the button. The default setting is 1 to 5 V.
∗3 The accumulated value, peak value, and bottom value can be reset.

Options/Part Nos.

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

Part no.	Option	Note
ZS-37-A	Lead wire with M12 connector	Length: 3 m
ZS-49-A	Lead wire with M12-M12 connector	Male/female conversion, Length: 3 m

Option*4

–	With lead wire with connector (3 m)
N	Without lead wire with connector
Q	Lead wire with M12-M12 connector (3 m)*5

∗4 Options are shipped together with the product but do not come assembled.
∗5 The lead wire has an M12 (female) connector on one side and an M12 (male) connector on the other side.

Unit specification

–	Units selection function
M	SI units only*6

∗6 Fixed units: Instantaneous flow: l/min
Accumulated flow: L

Calibration certificate

–	None
A*7	Yes

∗7 Made to order

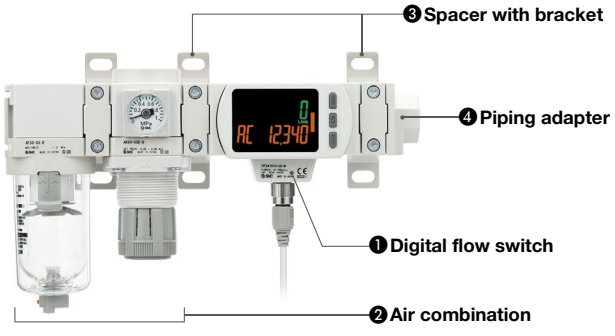
Flow direction

–	Left to right
R	Right to left

Caution on Mounting

Pipe threads are not provided for this product. If the product is to be used as a single unit, order a spacer (or spacer with bracket) and a piping adapter separately. Refer to page 35 for details on attachments.

Assembly Example



∗ Avoid mounting the lubricator on the inlet side.
∗ If a pressure relief 3-port valve is installed on the inlet side of the digital flow switch, causing a backflow of air, the measured value will change.

Assembly example

❶ Digital flow switch PF3A701H-CS-M ····· 1 pc.
❷ Air combination AC30B-03E-D ····· 1 pc.
❸ Spacer with bracket Y300T-D ····· 2 pcs.
❹ Piping adapter E300-03-D ····· 1 pc.

Products do not come assembled. They should be ordered separately and assembled by the customer.

Simple Specials System

A system designed to respond quickly and easily to your special ordering needs

Please contact your local sales representative for more details.

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

Specifications

Model			PF3A7R5H	PF3A701H	PF3A702H	PF3A704H	PF3A708H
Fluid	**Applicable fluid**∗1		Air, Nitrogen, Ar, CO_2				
	Fluid temperature		0 to 50 °C				
Flow	**Detection method**		Thermal type (Bypass flow type)				
	Rated flow range		5 to 500 l/min	10 to 1000 l/min	20 to 2000 l/min	40 to 4000 l/min	80 to 8000 l/min
	Set point range∗2	**Instantaneous flow**	5 to 750 l/min	10 to 1500 l/min	20 to 3000 l/min	40 to 6000 l/min	80 to 12000 l/min
		Accumulated flow	0 to 999,999,999,990 L				0 to 999,999,999,900 L
	Smallest settable increment	**Instantaneous flow**	1 l/min		2 l/min		5 l/min
		Accumulated flow	10 L				100 L
	Accumulated pulse	**Converted value**	Select from 1 L/pulse, 10 L/pulse, 50 L/pulse, or 100 L/pulse.	Select from 10 L/pulse, 50 L/pulse, 100 L/pulse, or 500 L/pulse.		Select from 50 L/pulse, 100 L/pulse, 500 L/pulse, or 1000 L/pulse.	
		Pulse width	Variable from 50 to 100 ms/10 ms increments				
	Accumulated value hold function∗3		Intervals of 2 or 5 minutes can be selected.				
Pressure	**Rated pressure range**		0 to 1.0 MPa				
	Proof pressure		1.5 MPa				
	Pressure loss		Refer to the "Pressure Loss" graph on page 25.				
	Pressure characteristics∗4		±5.0 % F.S. (0 to 1.0 MPa, 0.5 MPa standard)				
Electrical	**Power supply voltage**		24 VDC ±10 %				
	Current consumption		150 mA or less				
	Protection		Polarity protection				
Accuracy∗5	**Display accuracy**∗6		±3.0 % F.S.				
	Analogue output accuracy∗6		±3.0 % F.S.				
	Repeatability		±1.0 % F.S.				
	Temperature characteristics		±5.0 % F.S. (Ambient temperature of 0 to 50 °C, 25 °C standard)				
	Effects of connecting modular products∗7		±5.0 % F.S.				
Switch output	**Output type**		NPN open collector, PNP open collector				
	Output mode		Select from Instantaneous output (Hysteresis mode or Window comparator mode), Accumulated output, or Accumulated pulse output.				
	Switch operation		Select from Normal or Reversed output.				
	Max. load current		60 mA				
	Max. applied voltage (NPN only)		28 VDC				
	Internal voltage drop (Residual voltage)		NPN output type: 1 V or less (at load current of 60 mA), PNP output type: 2 V or less (at load current of 60 mA)				
	Response time∗8		Select from 1 s, 2 s, or 5 s.				
	Hysteresis∗9		Variable from 0				
	Protection		Over current protection				
Analogue output∗10	**Output type**		Voltage output: 1 to 5 V (0 to 10 V can be selected∗11), Current output: 4 to 20 mA				
	Impedance	**Voltage output**	Output impedance: Approx. 1 kΩ				
		Current output	Maximum load impedance: 600 Ω, Minimum load impedance: 50 Ω				
	Response time∗12		Linked to the response time of the switch output				
External input∗13	**Input type**		No-voltage input: 0.4 V or less				
	Input mode		Select from Accumulated value external reset or Peak/Bottom value reset.				
	Input time		30 ms or longer				
Display	**Reference condition**∗14		Select from Standard conditions or Normal conditions.				
	Unit∗15	**Instantaneous flow**	l/min, CFM (ft^3/min)				
		Accumulated flow	L, ft^3				
	Display range∗16	**Instantaneous flow**	0 to 750 l/min	0 to 1500 l/min	0 to 3000 l/min	0 to 6000 l/min	0 to 12000 l/min
		Accumulated flow∗17	0 to 999,999,999,990 L				0 to 999,999,999,900 L
	Minimum display unit	**Instantaneous flow**	1 l/min		2 l/min		5 l/min
		Accumulated flow	10 L				100 L
	Display		LCD, 2-screen display (Main screen/Sub screen) Main screen: Red/Green, Sub screen: Orange Main screen: 4 digits, 7 segment, Sub screen: 6 digits, 7 segment				
	Indicator LED		OUT indicator: Red LED is ON when output is ON				
Environmental resistance	**Enclosure**		IP65				
	Withstand voltage		1000 VAC for 1 minute between terminals and housing				
	Insulation resistance		50 MΩ (500 VDC measured via megohmmeter) between terminals and housing				
	Operating temperature range		Operating: 0 to 50 °C, Stored: –10 to 60 °C (No freezing or condensation)				
	Operating humidity range		Operating/Stored: 35 to 85 % RH (No condensation)				
Standards			CE/UKCA marking, UL (CSA)				
Piping	**Piping specification**		Modular (Body size: 20)	Modular (Body size: 30)	Modular (Body size: 40)	Modular (Body size: 50, 60)	Modular (Body size: 50, 60)
Main materials of parts in contact with fluid			Stainless steel 304, Aluminium alloy, PPS, HNBR [Sensor: Pt, Au, Ni, Fe, Lead glass (exempted from the RoHS application), Al_2O_3]				
Length of lead wire with connector			3 m				
Weight	**Body**		350 g	350 g	400 g	720 g	720 g
	Lead wire with connector		+90 g				

∗1 The air quality class is according to JIS B 8392-1:2012 [6:6:4] and ISO8573-1:2010 [6:6:4]. Use an air filter with 5 μm or less filtration rating on the inlet side.

∗2 Set point range will change according to the setting of the zero cut-off function.

∗3 When using the accumulated value hold function, use the operating conditions to calculate the product life, and do not exceed it. The maximum update limit of the memory device is 1.5 million times. If the product is operated 24 hours per day, the product life will be as follows:
- 5 min interval: life is calculated as 5 min x 1.5 million = 7.5 million min = 14.3 years
- 2 min interval: life is calculated as 2 min x 1.5 million = 3 million min = 5.7 years

If the accumulated value external reset is repeatedly used, the product life will be shorter than the calculated life.

∗4 Do not release the OUT side piping port of the product to the atmosphere without connecting piping. If the product is used with the piping port released to atmosphere, accuracy may vary.

∗5 The accuracy value is based on air as a fluid. For other fluids, it is a reference value.

∗6 The value when connecting a product with a port size of 1/4 (PF3A7R5H), 3/8 (PF3A701H), 1/2 (PF3A702H), or 1 (PF3A704H, PF3A708H)

∗7 The value when the port size of the modular product is 1 / 4 (PF 3 A 7 R 5 H), 3 / 8 (PF 3 A 7 0 1 H), 1 / 2 (PF3A702H), or 1 (PF3A704H, PF3A708H) and the product is operated at a supply pressure of 0.5 MPa

∗8 The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum value of the rated flow range instantaneously) until the switch output turns ON (or OFF) when set to be 90 % of the rated flow rate

∗9 If the flow fluctuates around the set value, the width for setting more than the fluctuating width needs to be set. Otherwise, chattering will occur.

∗10 Analogue output or external input can be selected by pressing the buttons. Refer to the graph for analogue output.

∗11 When selecting 0 to 10 V, refer to the analogue output graph for the allowable load current.

∗12 The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum value of the rated flow range instantaneously) until the analogue output reaches 90 % of the rated flow rate

∗13 Analogue output or external input can be selected by pressing the buttons.

∗14 The flow rate given in the specifications is the value under standard conditions.

∗15 Setting is only possible for models with the units selection function.

∗16 Display range will change according to the setting of the zero cut-off function.

∗17 The accumulated flow display is the upper 6 -digit and lower 6 -digit (total of 12 digits) display. The upper 6 digits and the lower 6 digits are displayed alternately, with "x 10^6" lighting up when the upper digits are displayed.

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

Modular Type IO-Link

3-Colour Display Digital Flow Switch

PF3A7□H-L Series

How to Order

PF3A 7 01 H – L Q – M □ – □

Type

7	Integrated display

Rated flow range

Symbol	Rated flow range	Applicable air combination model
R5	5 to 500 l/min	AC20-D
01	10 to 1000 l/min	AC30-D
02	20 to 2000 l/min	AC40-D
04	40 to 4000 l/min	AC50-D, AC60-D
08	80 to 8000 l/min	AC50-D, AC60-D

Large flow type

Output specification

Symbol	OUT	FUNC*1	Applicable monitor unit model
L	IO-Link/Switch output (N/P)	—	—
L3	IO-Link/Switch output (N/P)	Analogue voltage output*2 ⇔ External input*3	PFG300 series
L4	IO-Link/Switch output (N/P)	Analogue current output ⇔ External input*3	PFG310 series

∗1 Analogue output or external input can be selected by pressing the buttons. Analogue output is set as default setting.
∗2 1 to 5 V or 0 to 1 0 V can be selected by pressing the button. The default setting is 1 to 5 V.
∗3 The accumulated value, peak value, and bottom value can be reset.

Option*4

—	With lead wire with M12 connector (3 m)
N	Without lead wire with M12 connector
Q	Lead wire with M12-M12 connector (3 m)*5

∗4 Options are shipped together with the product but do not come assembled.
∗5 The lead wire has an M12 (female) connector on one side and an M 1 2 (male) connector on the other side.

Unit specification

—	Units selection function
M	SI units only*6

∗6 Fixed units: Instantaneous flow: l/min
Accumulated flow: L

Calibration certificate

—	None
A*7	Yes

∗7 Made to order

Flow direction

—	Left to right
R	Right to left

Options/Part Nos.

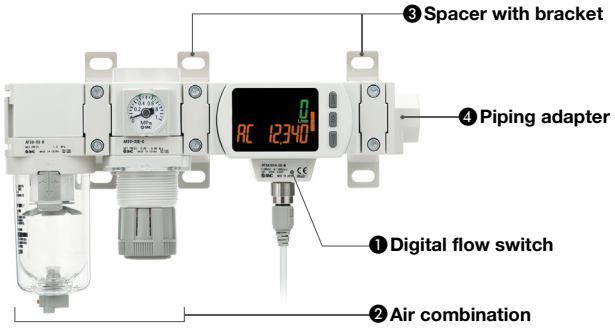
When only optional parts are required, order with the part numbers listed below.

Part no.	Option	Note
ZS-37-A	Lead wire with M12 connector	Length: 3 m
ZS-49-A	Lead wire with M12-M12 connector	Male/female conversion, Length: 3 m

Caution on Mounting

Pipe threads are not provided for this product. If the product is to be used as a single unit, order a spacer (or spacer with bracket) and a piping adapter separately. Refer to page 35 for details on attachments.

Assembly Example



∗ Avoid mounting the lubricator on the inlet side.
∗ If a pressure relief 3-port valve is installed on the inlet side of the digital flow switch, causing a backflow of air, the measured value will change.

Assembly example

- ❶ Digital flow switch PF3A701H-L-M ····· 1 pc.
- ❷ Air combination AC30B-03E-D ····· 1 pc.
- ❸ Spacer with bracket Y300T-D ····· 2 pcs.
- ❹ Piping adapter E300-03-D ····· 1 pc.

Products do not come assembled. They should be ordered separately and assembled by the customer.

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Specifications

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

Model			PF3A7R5H	PF3A701H	PF3A702H	PF3A704H	PF3A708H
Electrical	Power supply voltage	When used as a switch output device	24 VDC ±10 %				
		When used as an IO-Link device	21.6 to 30 VDC				
Switch output	Output type		Select from NPN or PNP open collector output.				
	Output mode		Select from Hysteresis, Window comparator, Accumulated output, Accumulated pulse output, Error output, or Switch output OFF modes.				
	Max. applied voltage		30 V (NPN output)				
	Internal voltage drop (Residual voltage)		1.5 V or less (at load current of 80 mA)				
	Delay time*1		3.3 ms or less, variable from 0 to 60 s/0.01 s increments				
Analogue output	Response time*2		Linked to the set value of the digital filter				
Display	Display		LCD, 2-screen display (Main screen/Sub screen) Main screen: Red/Green, Sub screen: Orange Main screen/Sub screen: 9 digits (7 segments 7 digits, 11 segments 2 digits)				
	Digital filter*3		Select from 1 s, 2 s, or 5 s.				
Standards			CE/UKCA marking, UL (CSA)				

*1 The time from when the instantaneous flow reaches the set value to when the switch output operates can be set.
*2 The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum value of the rated flow range instantaneously) until the analogue output reaches 90 % of the rated flow rate
*3 The time for the digital filter can be set to the sensor input. The response time indicates when the set value is 90 % in relation to the step input.

Communication Specifications (IO-Link mode)

IO-Link type	Device
IO-Link version	V 1.1
Communication speed	COM2 (38.4 kbps)
Configuration file	IODD file*1
Minimum cycle time	3.3 ms
Process data length	Input data: 4 bytes, Output data: 0 bytes
On request data communication	Yes
Data storage function	Yes
Event function	Yes
Vendor ID	131 (0 x 0083)
Device ID*2	PF3A7R5H-□□-L□-□□ : 738 (0 x 02E2)
	PF3A7R5H-□□-L3□-□□: 739 (0 x 02E3)
	PF3A7R5H-□□-L4□-□□: 740 (0 x 02E4)
	PF3A701H-□□-L□-□□ : 394 (0 x 018A)
	PF3A701H-□□-L3□-□□: 395 (0 x 018B)
	PF3A701H-□□-L4□-□□: 396 (0 x 018C)
	PF3A702H-□□-L□-□□ : 397 (0 x 018D)
	PF3A702H-□□-L3□-□□: 398 (0 x 018E)
	PF3A702H-□□-L4□-□□: 399 (0 x 018F)
	PF3A704H-□□-L□-□□ : 741 (0 x 02E5)
	PF3A704H-□□-L3□-□□: 742 (0 x 02E6)
	PF3A704H-□□-L4□-□□: 743 (0 x 02E7)
	PF3A708H-□□-L□-□□ : 744 (0 x 02E8)
	PF3A708H-□□-L3□-□□: 745 (0 x 02E9)
	PF3A708H-□□-L4□-□□: 746 (0 x 02EA)

*1 The configuration file can be downloaded from the SMC website, https://www.smc.eu
*2 The device ID differs according to each product type (output specification).

Other specifications that are not listed are the same as those of the standard product. For details, refer to page 18.

Modular Type | IO-Link | RoHS

4-Screen Display **Digital Flow Switch with Pressure/Temperature Sensor**

PF3A8□H-L Series

How to Order

PF3A 8 01 H – L2 Q – M □ – □

Type

8	With pressure/temperature sensor

Rated flow range

Symbol	Rated flow range	Applicable air combination model
R5	5 to 500 l/min	AC20-D
01	10 to 1000 l/min	AC30-D
02	20 to 2000 l/min	AC40-D
04	40 to 4000 l/min	AC50-D, AC60-D
08	80 to 8000 l/min	AC50-D, AC60-D

Output specification

Symbol	OUT1	OUT2
L2	IO-Link/Switch output (N/P)	Switch output (N/P)

Option[*1]

—	With lead wire with M12 connector (3 m)
N	Without lead wire with M12 connector
Q	Lead wire with M12-M12 connector (3 m)[*2]

∗1 Options are shipped together with the product but do not come assembled.

∗2 The lead wire has an M 1 2 (female) connector on one side and an M 1 2 (male) connector on the other side.

Unit specification

—	Units selection function
M	SI units only[*3]

∗3 Fixed units: Instantaneous flow: l/min
Accumulated flow : L
Pressure : kPa, MPa
Temperature : °C

Calibration certificate (For flow/pressure sensors only)

—	None
A[*4]	Yes

∗4 Made to order

Flow direction

—	Left to right
R	Right to left

Options/Part Nos.

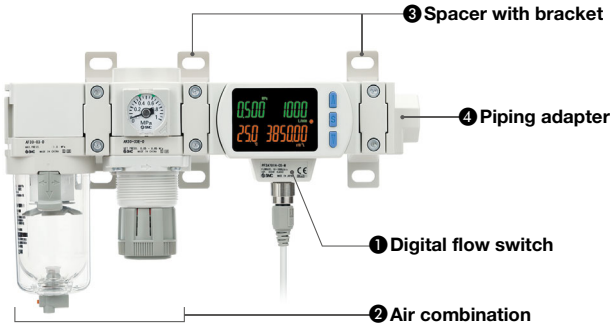
When only optional parts are required, order with the part numbers listed below.

Part no.	Option	Note
ZS-37-A	Lead wire with M12 connector	Length: 3 m
ZS-49-A	Lead wire with M12-M12 connector	Male/female conversion, Length: 3 m

Caution on Mounting

Pipe threads are not provided for this product. If the product is to be used as a single unit, order a spacer (or spacer with bracket) and a piping adapter separately. Refer to page 35 for details on attachments.

Assembly Example



∗ Avoid mounting the lubricator on the inlet side.
∗ If a pressure relief 3-port valve is installed on the inlet side of the digital flow switch, causing a backflow of air, the measured value will change.

Assembly example

- ❶ **Digital flow switch PF3A801H-L2-M** ····· **1 pc.**
- ❷ **Air combination AC30B-03E-D** ····· **1 pc.**
- ❸ **Spacer with bracket Y300T-D** ····· **2 pcs.**
- ❹ **Piping adapter E300-03-D** ····· **1 pc.**

Products do not come assembled. They should be ordered separately and assembled by the customer.

Simple Specials System

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Specifications

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

Model			PF3A8R5H	PF3A801H	PF3A802H	PF3A804H	PF3A808H
Fluid	Applicable fluid*1		Air, Nitrogen, Ar, CO_2				
	Fluid temperature		0 to 50 °C				
Flow	Detection method		Thermal type (Bypass flow type)				
	Rated flow range		5 to 500 l/min	10 to 1000 l/min	20 to 2000 l/min	40 to 4000 l/min	80 to 8000 l/min
	Set point range*2	Instantaneous flow	5 to 750 l/min	10 to 1500 l/min	20 to 3000 l/min	40 to 6000 l/min	80 to 12000 l/min
		Accumulated flow	0 to 9,999,999,990 L				0 to 99,999,999,900 L
	Smallest settable increment	Instantaneous flow	1 l/min		2 l/min		5 l/min
		Accumulated flow	10 L				100 L
	Accumulated pulse	Converted value	Select from 1 L/pulse, 10 L/pulse, 50 L/pulse, or 100 L/pulse.	Select from 10 L/pulse, 50 L/pulse, 100 L/pulse, or 500 L/pulse.		Select from 50 L/pulse, 100 L/pulse, 500 L/pulse, or 1000 L/pulse.	
		Pulse width	Variable from 50 to 100 ms/10 ms increments				
	Accumulated value hold function*3		Intervals of 2 or 5 minutes can be selected.				
Pressure	Rated pressure range		0.000 to 1.000 MPa				
	Set pressure range*2		−0.050 to 1.050 MPa				
	Smallest settable increment		0.001 MPa				
	Proof pressure		1.5 MPa				
	Pressure loss		Refer to the "Pressure Loss" graph on page 25.				
Temperature	Rated temperature range		0.0 to 50.0 °C				
	Set temperature range		−10.0 to 60.0 °C				
	Smallest settable increment		0.1°C				
Electrical	Power supply voltage		21.6 to 30 VDC				
	Current consumption		150 mA or less				
	Protection		Polarity protection				
Accuracy*4	Accuracy	Flow rate*5	±3.0 % F.S.				
		Pressure	±3.0 % F.S.				
		Temperature*6	±2.5 °C (Flow range: 10 to 100 % F.S.)				
	Repeatability (Flow rate/Pressure)		±1.0 % F.S.				
	Temperature characteristics (Flow rate/Pressure)		±5.0 % F.S. (Ambient temperature of 0 to 50 °C, 25 °C standard)				
	Pressure characteristics (Flow rate)*7		±5.0 % F.S. (0 to 1.0 MPa, 0.5 MPa standard)				
	Effects of connecting modular products (Flow rate)*8		±5.0 % F.S.				
Switch output	Output type		Select from NPN or PNP open collector. (2 outputs)				
	Output mode		Hysteresis mode, Window comparator mode, Error output, Output OFF, Accumulated output, Accumulated pulse output (Only flow rate)				
	Switch operation		Select from Normal or Reversed output.				
	Max. load current		60 mA				
	Max. applied voltage (NPN only)		30 VDC				
	Internal voltage drop (Residual voltage)		1.5 V or less (at load current of 60 mA)				
	Response time		5 ms or less				
	Delay time*9		Variable from 0 to 60 s/0.01 s increments				
	Hysteresis*10		Variable from 0				
	Protection		Over current protection				
Display	Reference condition*11		Select from Standard conditions or Normal conditions.				
	Unit*12	Instantaneous flow	l/min, CFM (ft^3/min)				
		Accumulated flow	L, ft^3				
		Pressure	MPa, KPa, kgf/cm^2, bar, psi				
		Temperature	°C, °F				
	Display range	Instantaneous flow*13	0 to 750 l/min	0 to 1500 l/min	0 to 3000 l/min	0 to 6000 l/min	0 to 12000 l/min
		Accumulated flow	0 to 9,999,999,990 L				0 to 99,999,999,900 L
		Pressure*13	−0.050 to 1.050 MPa				
		Temperature	−10.0 to 60.0 °C				
	Min. display unit	Instantaneous flow	1 l/min		2 l/min		5 l/min
		Accumulated flow	10 L				100 L
		Pressure	0.001 MPa				
		Temperature	0.1°C				
	Display		LCD, 4-screen display Upper line: Red/Green, Lower line: Orange Upper/Lower line: 10 digits (7 segments 5 digits, 11 segments 5 digits)				
	Indicator LED		OUT indicator: Orange LED is ON when output is ON				
Digital filter*14	Flow rate		1 s (2 s or 5 s can be selected.)				
	Pressure		0.1 s (Variable from 0 to 30 s/0.01 s increments)				
	Temperature		1 s				
Environmental resistance	Enclosure		IP65				
	Withstand voltage		1000 VAC for 1 minute between terminals and housing				
	Insulation resistance		50 MΩ (500 VDC measured via megohmmeter) between terminals and housing				
	Operating temperature range		Operating: 0 to 50 °C, Stored: −10 to 60 °C (No freezing or condensation)				
	Operating humidity range		Operating/Stored: 35 to 85 % RH (No condensation)				
Standards			CE/UKCA marking, UL (CSA)				
Piping	Piping specification		Modular (Body size: 20)	Modular (Body size: 30)	Modular (Body size: 40)	Modular (Body size: 50, 60)	Modular (Body size: 50, 60)
Main materials of parts in contact with fluid			Stainless steel 304, Aluminium alloy, PPS, HNBR [Sensor: Pt, Au, Ni, Fe, Lead glass (exempted from the RoHS application), Al_2O_3]				
Length of lead wire with connector			3 m				
Weight	Body		350 g	350 g	400 g	720 g	720 g
	Lead wire with connector		+90 g				

*1 The air quality class is according to JIS B 8392-1:2012 [6:6:4] and ISO 8573-1:2010 [6:6:4]. Use an air filter with 5 µm or less filtration rating on the inlet side.

*2 Set point range will change according to the setting of the zero cut-off function.

*3 When using the accumulated value hold function, use the operating conditions to calculate the product life, and do not exceed it. The maximum update limit of the memory device is 1.5 million times. If the product is operated 24 hours per day, the product life will be as follows:
- 5 min interval: life is calculated as 5 min x 1.5 million = 7.5 million min = 14.3 years
- 2 min interval: life is calculated as 2 min x 1.5 million = 3 million min = 5.7 years

If the accumulated value external reset is repeatedly used, the product life will be shorter than the calculated life.

*4 The accuracy value is based on air as a fluid. For other fluids, it is a reference value.

*5 The value when connecting a product with a port size of 1/4 (PF3A8R5H), 3/8 (PF3A801H), 1/2 (PF3A802H), or 1 (PF3A804H, PF3A808H)

*6 In the low flow rate range, the temperature value fluctuates (rises). Refer to the "Temperature Accuracy" graph on page 28.

*7 Do not release the OUT side piping port of the product to the atmosphere without connecting piping. If the product is used with the piping port released to atmosphere, accuracy may vary.

*8 The value when the port size of the modular product is 1/4 (PF3A8R5H), 3/8 (PF3A801H), 1/2 (PF3A802H), or 1 (PF3A804H, PF3A808H) and the product is operated at a supply pressure of 0.5 MPa

*9 The time from when the measured value reaches the set value to when the switch output operates can be set.

*10 If the measured value fluctuates around the set value, the width for setting more than the fluctuating width needs to be set. Otherwise, chattering will occur.

*11 The flow rate given in the specifications is the value under standard conditions.

*12 Setting is only possible for models with the units selection function.

*13 Display range will change according to the setting of the zero cut-off function.

*14 The time for the digital filter can be set to the sensor input. The response time indicates when the set value is 90 % in relation to the step input.

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

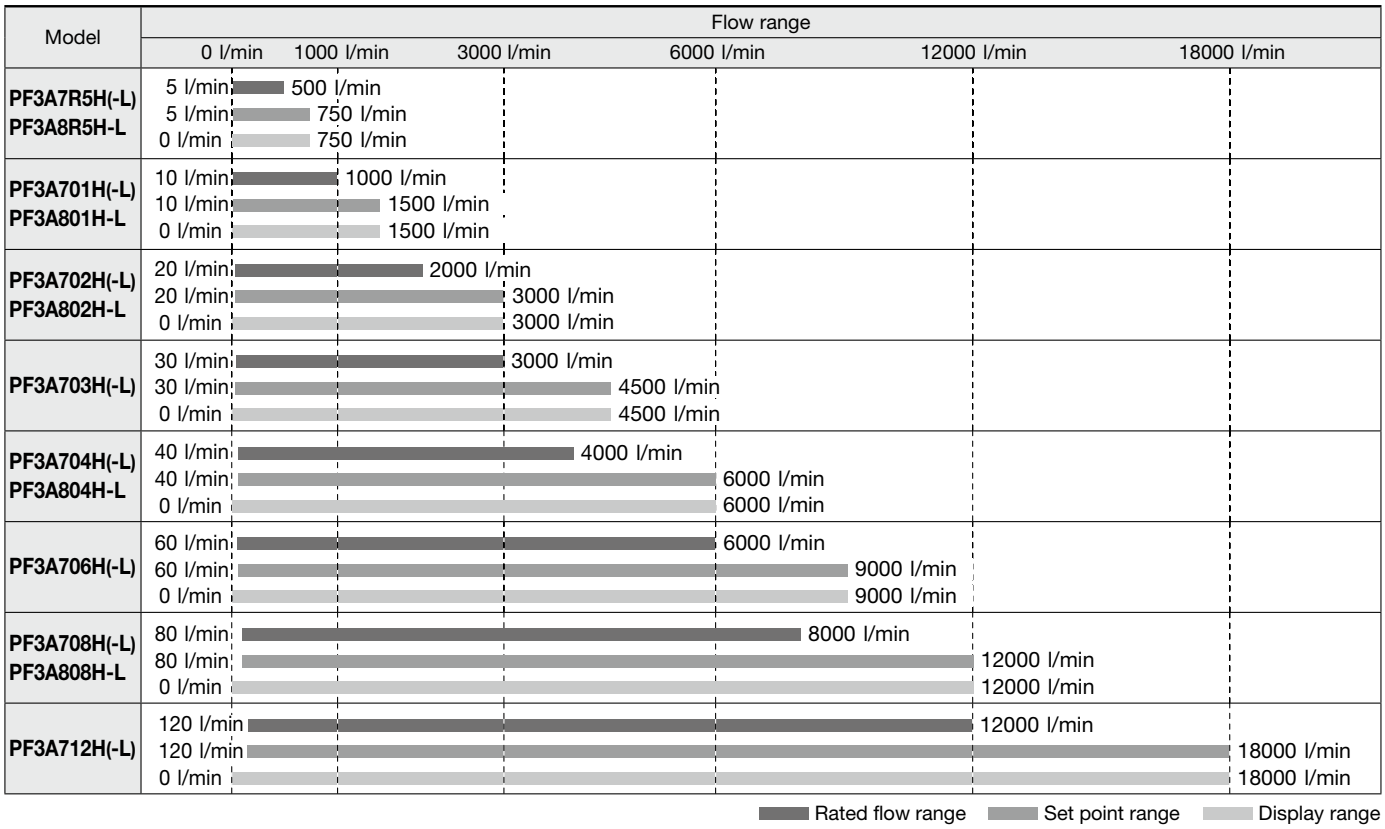
Specifications

Communication Specifications (IO-Link mode)

IO-Link type	Device
IO-Link version	V 1.1
Communication speed	COM2 (38.4 kbps)
Configuration file	IODD file*1
Minimum cycle time	5.8 ms
Process data length	Input data:12 bytes, Output data: 0 bytes
On request data communication	Yes
Data storage function	Yes
Event function	Yes
Vendor ID	131 (0 x 0083)
Device ID*2	PF3A8R5H-L2□-□□□: 747 (0 x 02EB)
	PF3A801H-L2□-□□□: 562 (0 x 0232)
	PF3A802H-L2□-□□□: 563 (0 x 0233)
	PF3A804H-L2□-□□□: 748 (0 x 02EC)
	PF3A808H-L2□-□□□: 731 (0 x 02DB)

*1 The configuration file can be downloaded from the SMC website, https://www.smc.eu
*2 The device ID differs according to each product type (output specification).

Flow Range



Analogue Output

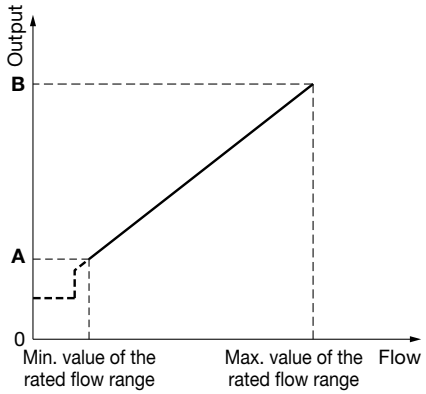
Flow/Analogue Output

	0 l/min	A*2	B
Voltage output (1 to 5 V)*1	1 V	1.04 V	5 V
Current output*1	4 mA	4.16 mA	20 mA

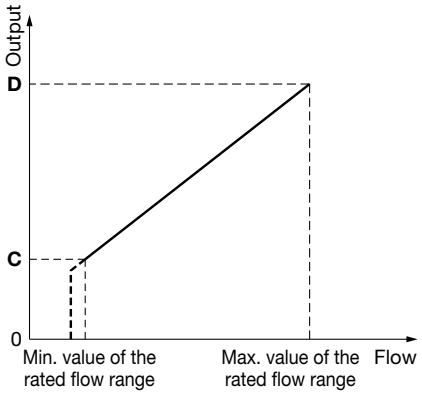
	0 l/min	C*2	D
Voltage output (0 to 10 V)*1*3	0 V	0.1 V	10 V

∗1 Analogue output accuracy is within ±3 % F.S.
∗2 A and C will change according to the setting of the zero cut-off function.
∗3 The analogue output current from the connected equipment should be 20 μA or less when selecting 0 to 10 V. When more than 20 μA current flows, it is possible that the accuracy is not satisfied below 0.5 V.
∗4 The minimum value of the rated flow range will change according to the setting of the zero cut-off function.

Model	Min. value of the rated flow range*4	Max. value of the rated flow range
PF3A7R5H(-L)	5 l/min	500 l/min
PF3A701H(-L)	10 l/min	1000 l/min
PF3A702H(-L)	20 l/min	2000 l/min
PF3A703H(-L)	30 l/min	3000 l/min
PF3A704H(-L)	40 l/min	4000 l/min
PF3A706H(-L)	60 l/min	6000 l/min
PF3A708H(-L)	80 l/min	8000 l/min
PF3A712H(-L)	120 l/min	12000 l/min



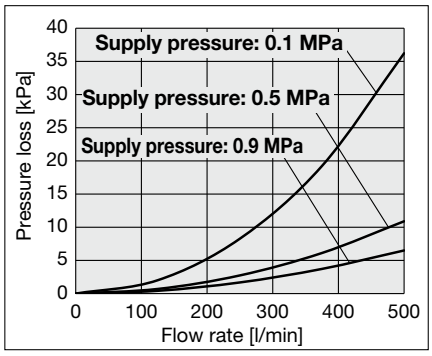
Voltage output (1 to 5 V)/ Current output (4 to 20 mA)



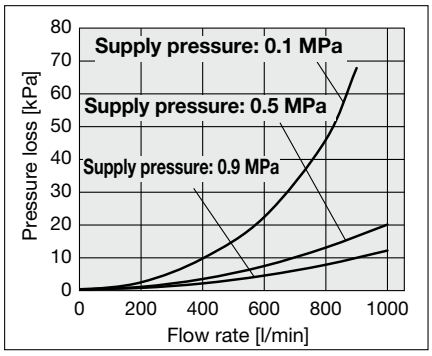
Voltage output (0 to 10 V)

Pressure Loss (Reference Data)

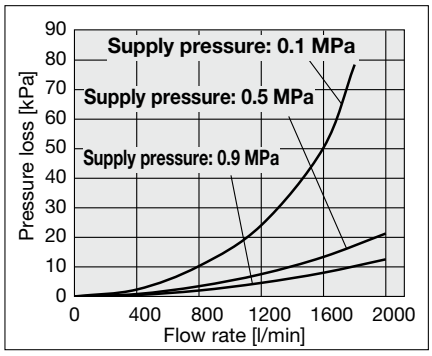
PF3A7R5H(-L) PF3A8R5H-L (for 500 l/min)



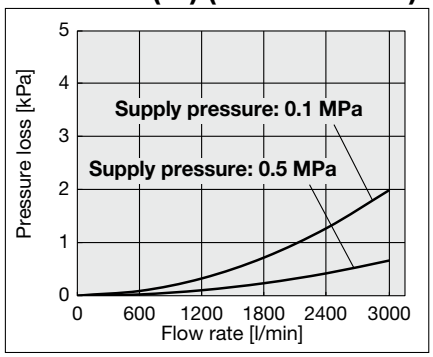
PF3A701H(-L) PF3A801H-L (for 1000 l/min)



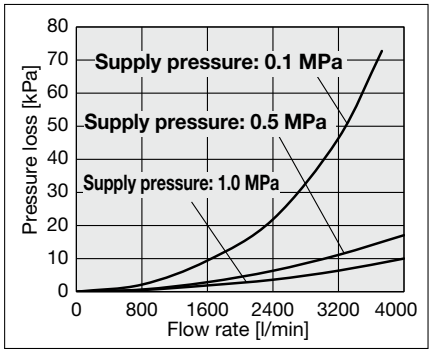
PF3A702H(-L) PF3A802H-L (for 2000 l/min)



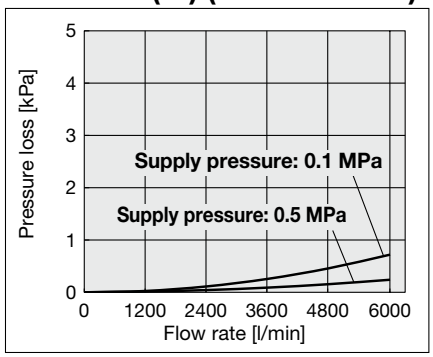
PF3A703H(-L) (for 3000 l/min)



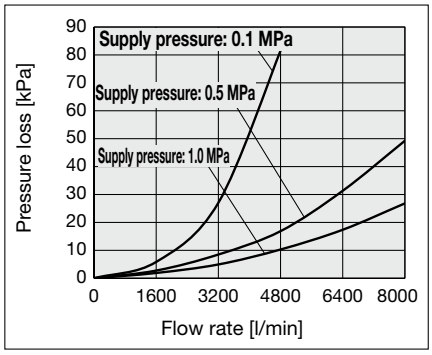
PF3A704H(-L) PF3A804H-L (for 4000 l/min)



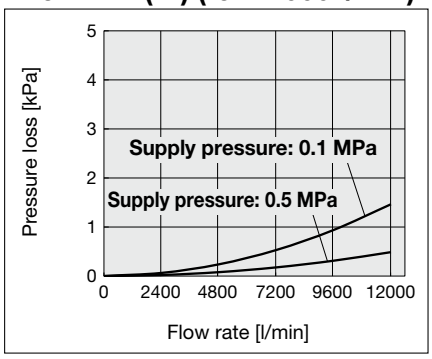
PF3A706H(-L) (for 6000 l/min)



PF3A708H(-L) PF3A808H-L (for 8000 l/min)



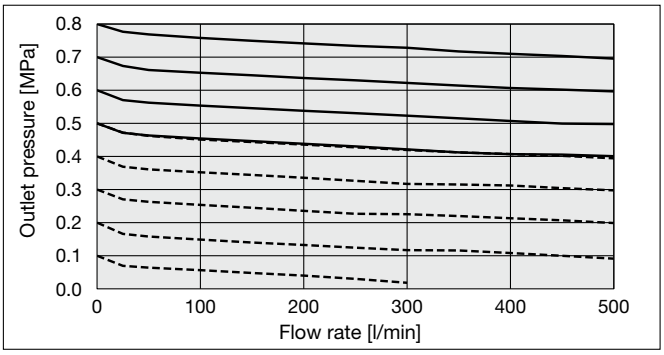
PF3A712H(-L) (for 12000 l/min)



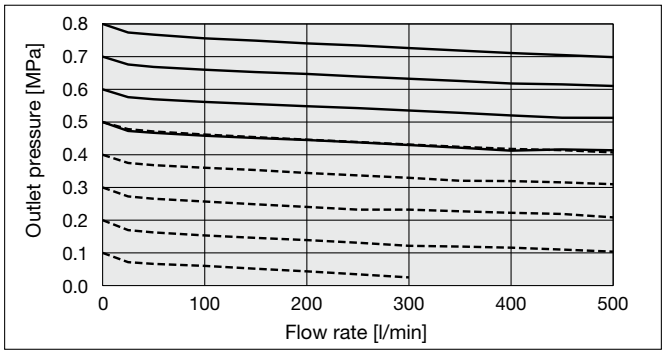
Flow Rate Characteristics (Reference Data)

—— Inlet pressure: 1.0 MPa
---- Inlet pressure: 0.7 MPa

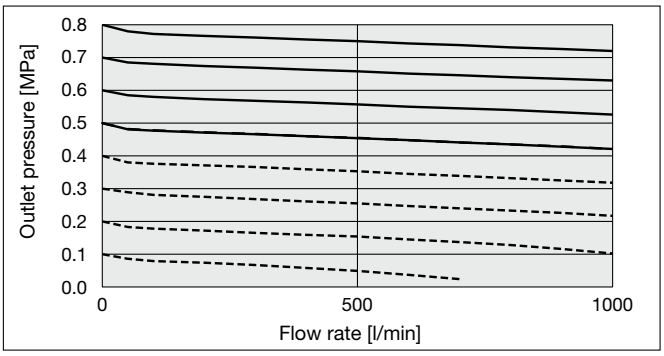
AC20B-D + PF3A7R5H/PF3A8R5H-L Rc1/4



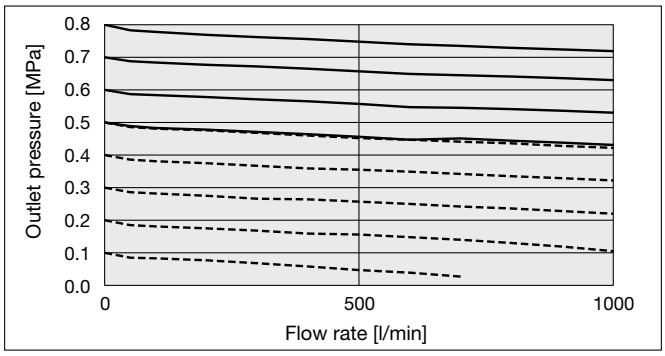
AW20-D + PF3A7R5H/PF3A8R5H-L Rc1/4



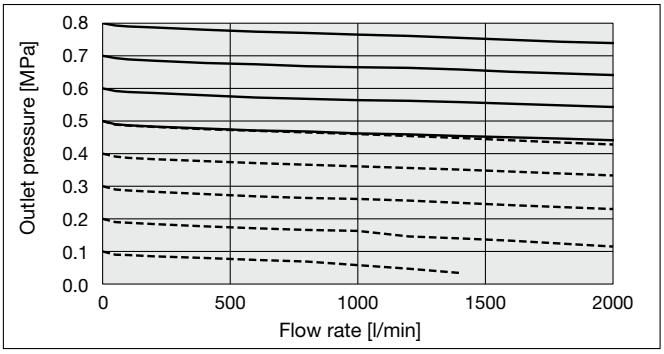
AC30B-D + PF3A701H/PF3A801H-L Rc3/8



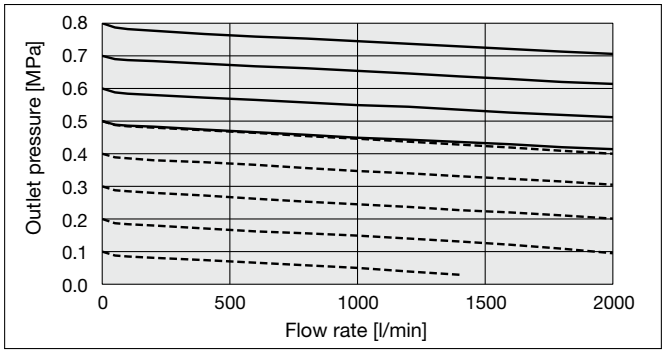
AW30-D + PF3A701H/PF3A801H-L Rc3/8



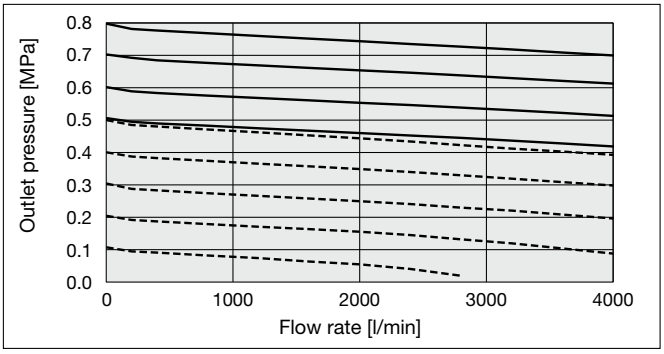
AC40B-D + PF3A702H/PF3A802H-L Rc1/2



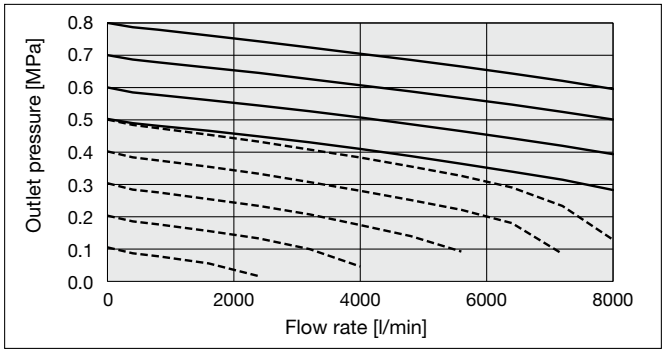
AW40-D + PF3A702H/PF3A802H-L Rc1/2



AC50B-D + PF3A708H/PF3A804H-L Rc1



AC50B-D + PF3A708H/PF3A808H-L Rc1



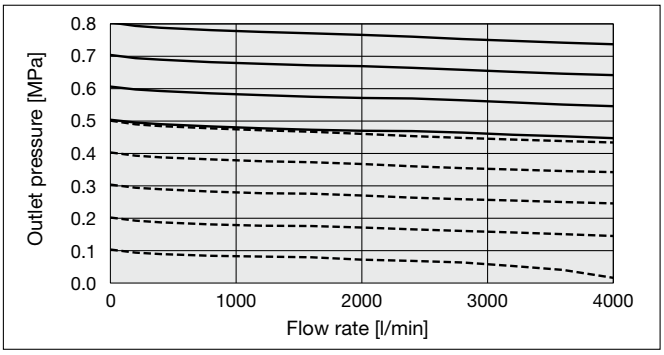
∗ This product cannot be used for applications in which the flow exceeds the rated flow range. Use caution when selecting a product.

Flow Rate Characteristics (Reference Data)

—— Inlet pressure: 1.0 MPa
---- Inlet pressure: 0.7 MPa

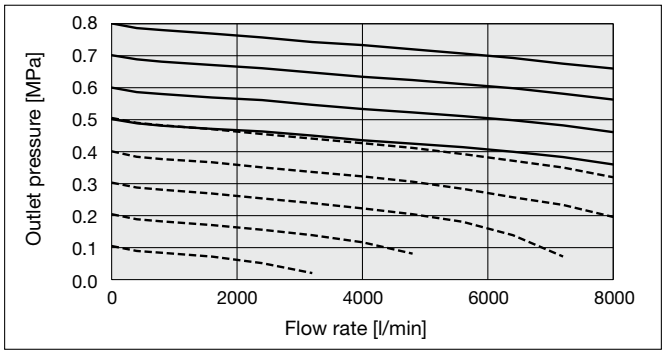
AC60B-D + PF3A704H/PF3A804H-L

Rc1



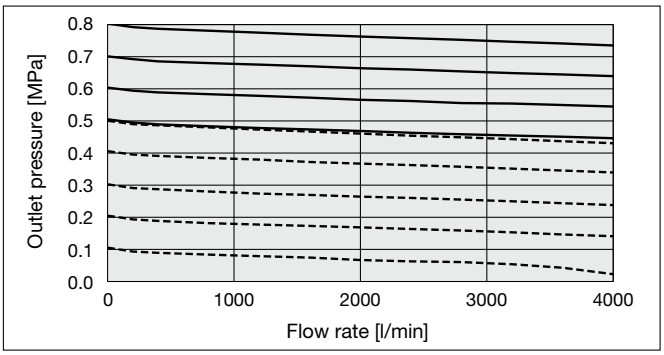
AC60B-D + PF3A708H/PF3A808H-L

Rc1



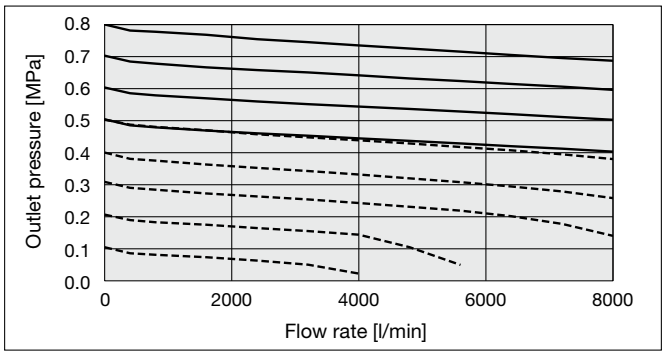
AW60-D + PF3A704H/PF3A804H-L

Rc1



AW60-D + PF3A708H/PF3A808H-L

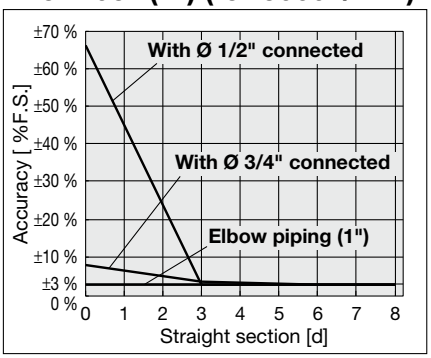
Rc1



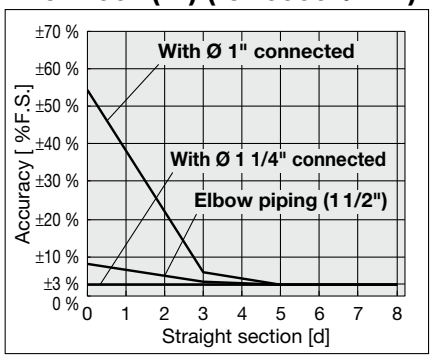
∗ This product cannot be used for applications in which the flow exceeds the rated flow range. Use caution when selecting a product.

IN Side Straight Section and Accuracy (Reference Data)

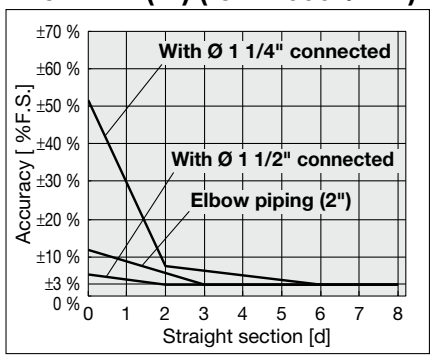
PF3A703H(-L) (for 3000 l/min)



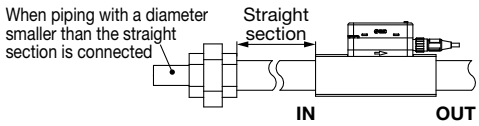
PF3A706H(-L) (for 6000 l/min)



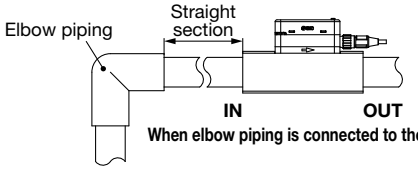
PF3A712H(-L) (for 12000 l/min)



· Do not connect equipment or piping which may generate fluctuations in the flow or drift on the IN side of the product. When installing a regulator on the IN side of the product, make sure that chatter is not generated.
· The piping on the IN side must have a straight section of piping whose length is more than 8 times the piping I.D.
If a straight section of piping is not installed, the accuracy may vary by ±3 % F.S. or more.
∗ The "straight section" refers to a section of piping without any bends or rapid changes in the cross sectional area.



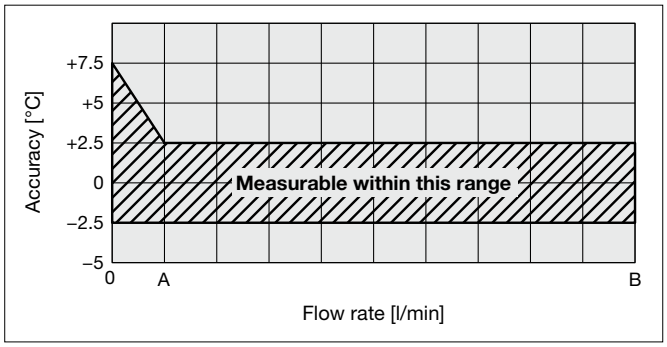
When piping of a different diameter is connected to the IN port



When elbow piping is connected to the IN port

Temperature Accuracy (Reference Data)

PF3A801H/802H-L



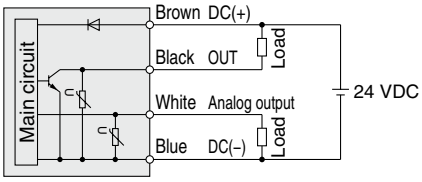
Model	A	B
PF3A8R5H-L	50 l/min	500 l/min
PF3A801H-L	100 l/min	1000 l/min
PF3A802H-L	200 l/min	2000 l/min
PF3A804H-L	400 l/min	4000 l/min
PF3A808H-L	800 l/min	8000 l/min

< Temperature Measurement >
When there is no (low) fluid flow, the heat of the platinum sensor heated for flow detection is transmitted to the temperature sensor, so the temperature measurement value in the low flow range (less than 10 % of the rated flow rate) tends to increase in relation to the fluid temperature.

< Detection Principle (Flow) >
When a heated platinum sensor is installed in the branch passage, and fluid flows through it, the fluid removes heat from the platinum sensor. The resistance value of the platinum sensor decreases as it loses heat. As the resistance value decrease ratio has a uniform relationship to the fluid flow, the flow rate can be detected by measuring the resistance value.

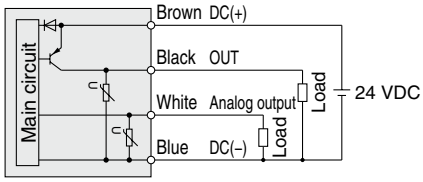
Internal Circuits and Wiring Examples

NPN + Analogue output selected
PF3A7□□H-□□-CS/DS□-□□



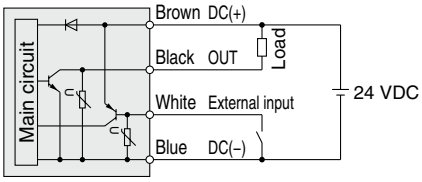
Max. applied voltage: 28 V, Max. load current: 60 mA, Internal voltage drop: 1 V or less
CS: Analogue output: 1 to 5 V or 0 to 10 V
Output impedance: 1 kΩ
DS: Analogue output: 4 to 20 mA
Max. load impedance: 600 Ω
Min. load impedance: 50 Ω

PNP + Analogue output selected
PF3A7□□H-□□-ES/FS□-□□



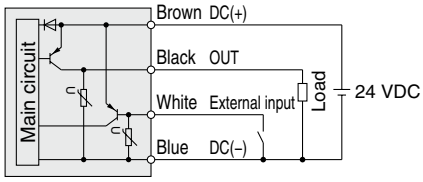
Max. load current: 60 mA, Internal voltage drop: 2 V or less
ES: Analogue output: 1 to 5 V or 0 to 10 V
Output impedance: 1 kΩ
FS: Analogue output: 4 to 20 mA
Max. load impedance: 600 Ω
Min. load impedance: 50 Ω

NPN + External input selected
PF3A7□□H-□□-CS/DS□-□□



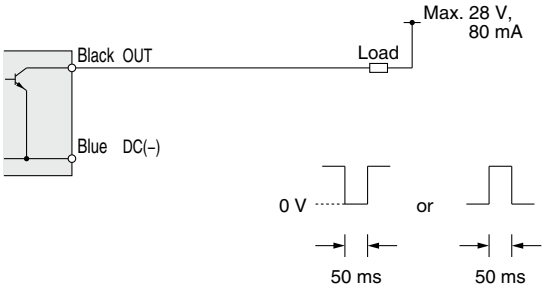
Max. applied voltage: 28 V, Max. load current: 60 mA, Internal voltage drop: 1 V or less
External input: Input voltage 0.4 V or less (Reed or Solid state input) for 30 ms or longer

PNP + External input selected
PF3A7□□H-□□-ES/FS□-□□

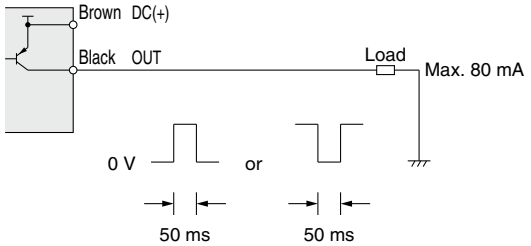


Max. load current: 60 mA, Internal voltage drop: 2 V or less
External input: Input voltage 0.4 V or less (Reed or Solid state input) for 30 ms or longer

Accumulated pulse output wiring examples
PF3A7□□H-□□-CS/DS□-□□



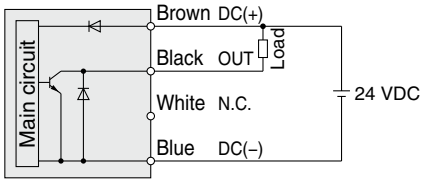
PF3A7□□H-□□-ES/FS□-□□



Internal Circuits and Wiring Examples

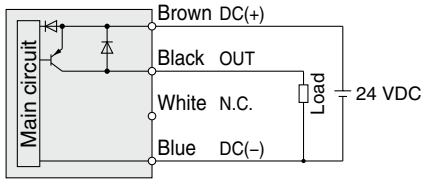
PF3A7□□H-□□-L□-□□

NPN output type



Max. applied voltage: 30 V, Max. load current: 60 mA, Internal voltage drop: 1.5 V or less

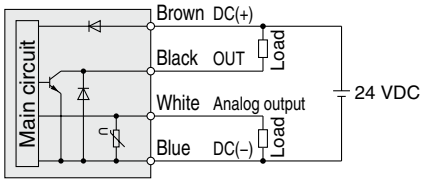
PNP output type



Max. load current: 60 mA, Internal voltage drop: 1.5 V or less

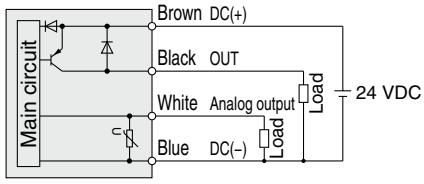
PF3A7□□H-□□-L3/L4□-□□

NPN + Analogue output selected



Max. applied voltage: 30 V, Max. load current: 60 mA, Internal voltage drop: 1.5 V or less
L3: Analogue output: 1 to 5 V or 0 to 10 V
Output impedance: 1 kΩ
L4: Analogue output: 4 to 20 mA
Max. load impedance: 600 Ω
Min. load impedance: 50 Ω

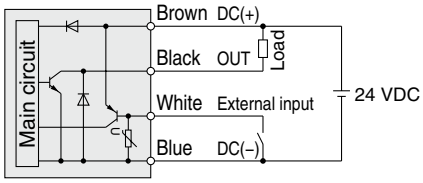
PNP + Analogue output selected



Max. load current: 60 mA, Internal voltage drop: 1.5 V or less
L3: Analogue output: 1 to 5 V or 0 to 10 V
Output impedance: 1 kΩ
L4: Analogue output: 4 to 20 mA
Max. load impedance: 600 Ω
Min. load impedance: 50 Ω

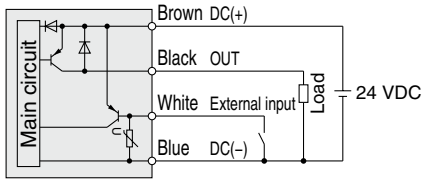
PF3A7□□H-□□-L3/L4□-□□

NPN + External input selected



Max. applied voltage: 30 V, Max. load current: 60 mA, Internal voltage drop: 1.5 V or less
External input voltage: 0.4 V or less (Reed or Solid state input) for 30 ms or longer

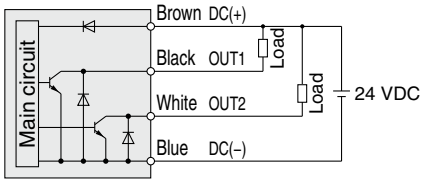
PNP + External input selected



Max. load current: 60 mA, Internal voltage drop: 1.5 V or less
External input voltage: 0.4 V or less (Reed or Solid state input) for 30 ms or longer

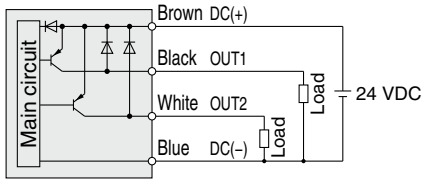
PF3A8□-L2□-□□

NPN 2 output type



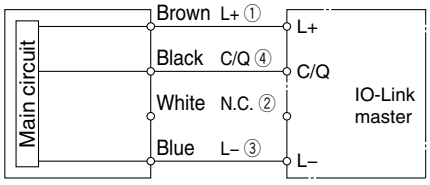
Max. applied voltage: 30 V, Max. load current: 60 mA, Internal voltage drop: 1.5 V or less

PNP 2 output type



Max. load current: 60 mA, Internal voltage drop: 1.5 V or less

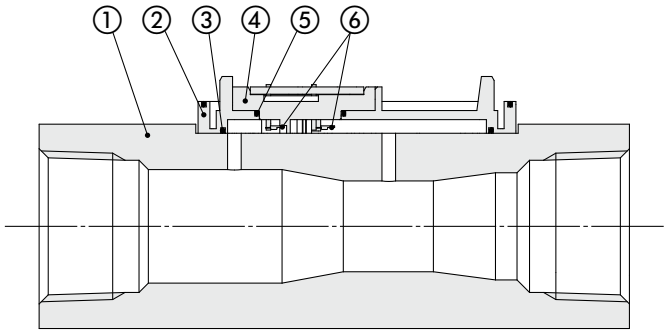
When used as an IO-Link device



∗ The numbers in the diagram show the connector pin layout.

Construction: Parts in Contact with Fluid

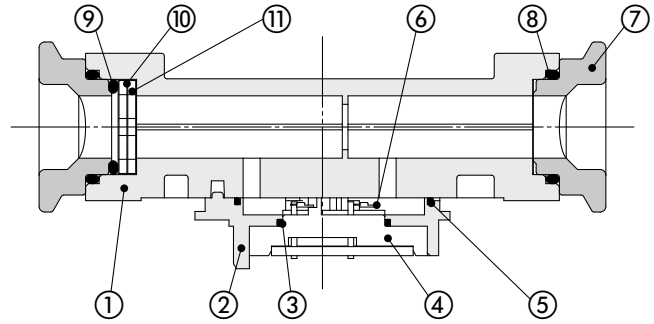
PF3A703H(-L)/706H(-L)/712H(-L)



Component Parts

No.	Description	Material	Note
1	**Body**	Aluminium alloy	Anodised
2	**Branch passage**	PPS	—
3	**Gasket**	HNBR	—
4	**Sensor base**	PPS	—
5	**Gasket**	HNBR	—
6	**Sensor**	Au, Pt, Al_2O_3	—

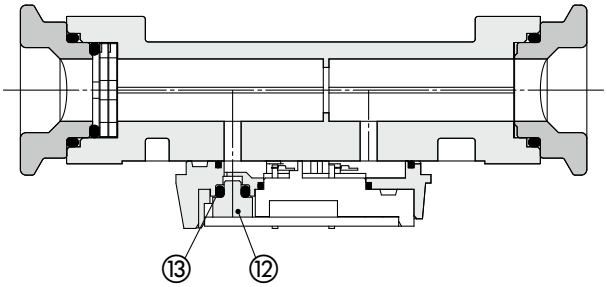
PF3A7R5H(-L)/PF3A701H(-L)/702H(-L)



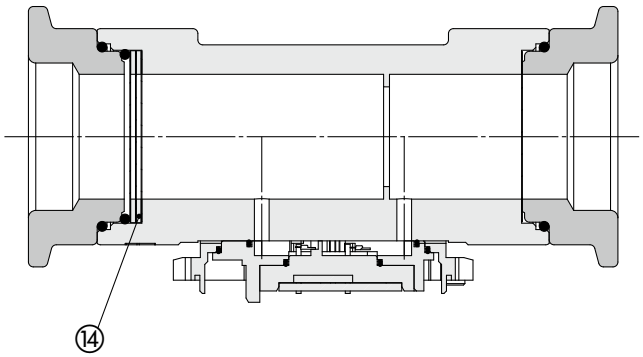
Component Parts

No.	Description	Material	Note
1	**Body**	ADC	
2	**Branch passage**	PPS	
3	**Gasket**	HNBR	
4	**Sensor base**	PPS	
5	**Gasket**	HNBR	
6	**Sensor**	Au, Pt, Al_2O_3	
7	**Attachment**	ADC	
8	**O-ring**	HNBR	
9	**O-ring**	HNBR	
10	**Mesh**	Stainless steel 304	
11	**Spacer**	PPS	
12	**Pressure sensor**	Silicon, PPS	
13	**O-ring**	HNBR	
14	**Spacer**	Stainless steel 304	

PF3A8R5H-L/PF3A801H-L/802H-L

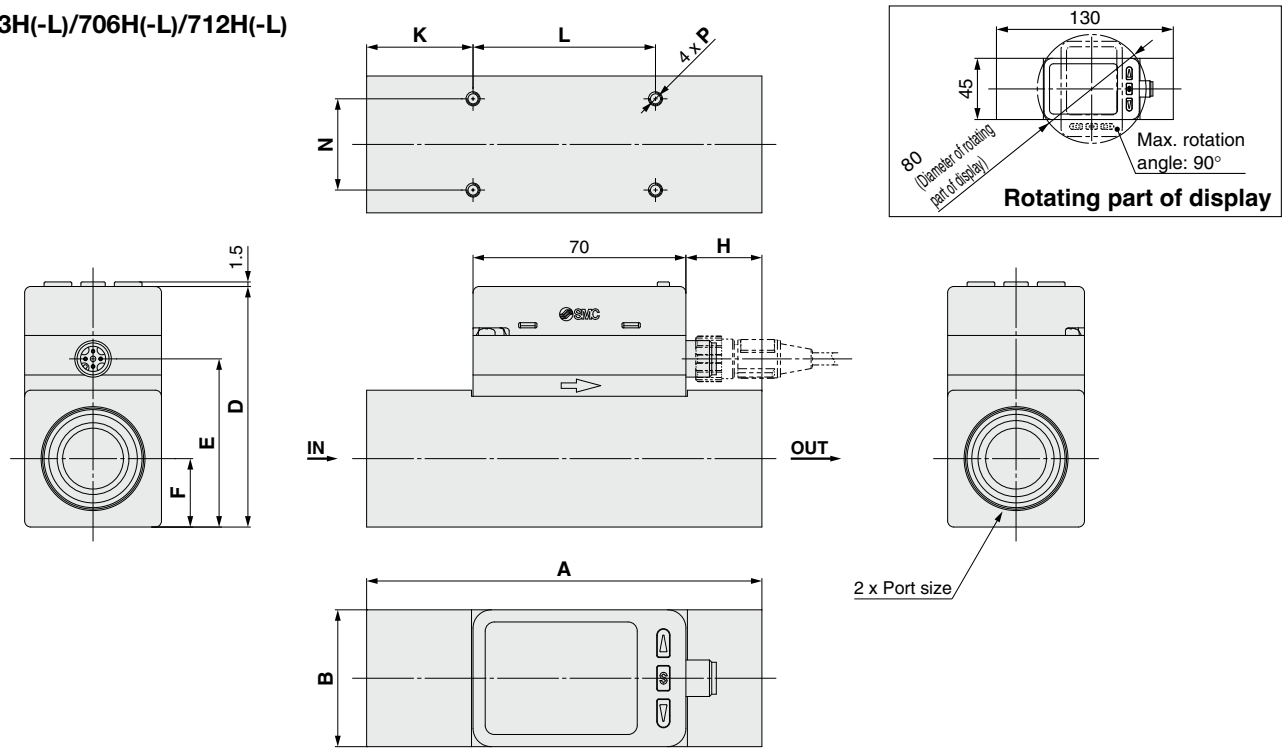


PF3A704H(-L)/PF3A708H(-L)/PF3A804H-L/PF3A808H-L



Dimensions: Body Ported Type

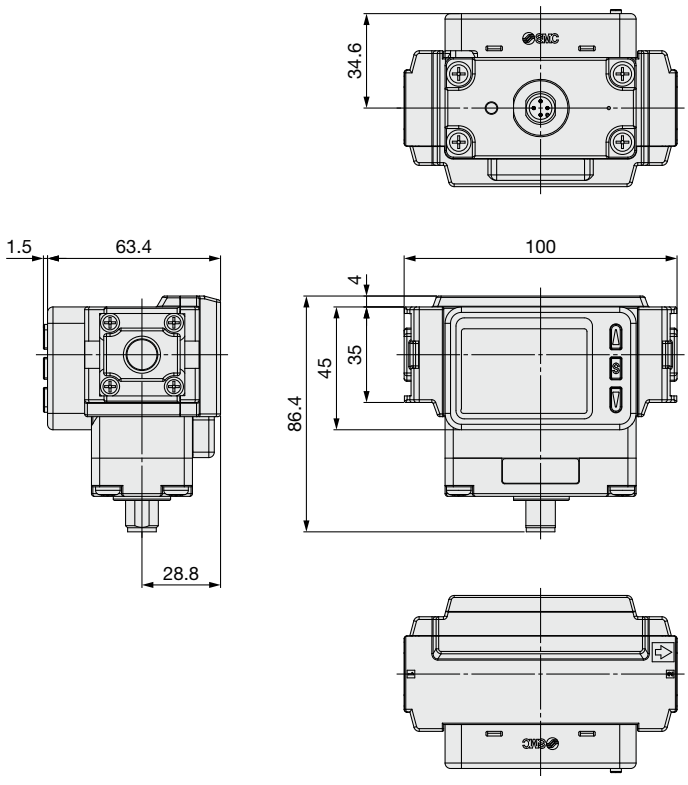
PF3A703H(-L)/706H(-L)/712H(-L)



Model \ Symbol	Port size	A	B	D	E	F	H	K	L	N	P
PF3A703H	Rc1, NPT1, G1	130	45	79.1	55.3	22.5	25	35	60	30	M4 x 0.7 depth 7
PF3A706H	Rc11/2, NPT11/2, G11/2	170	60	94.1	70.3	30	68	45	80	40	M5 x 0.8 depth 8
PF3A712H	Rc2, NPT2, G2	200	70	104.1	80.3	35	85	50	100	50	M6 x 1.0 depth 9

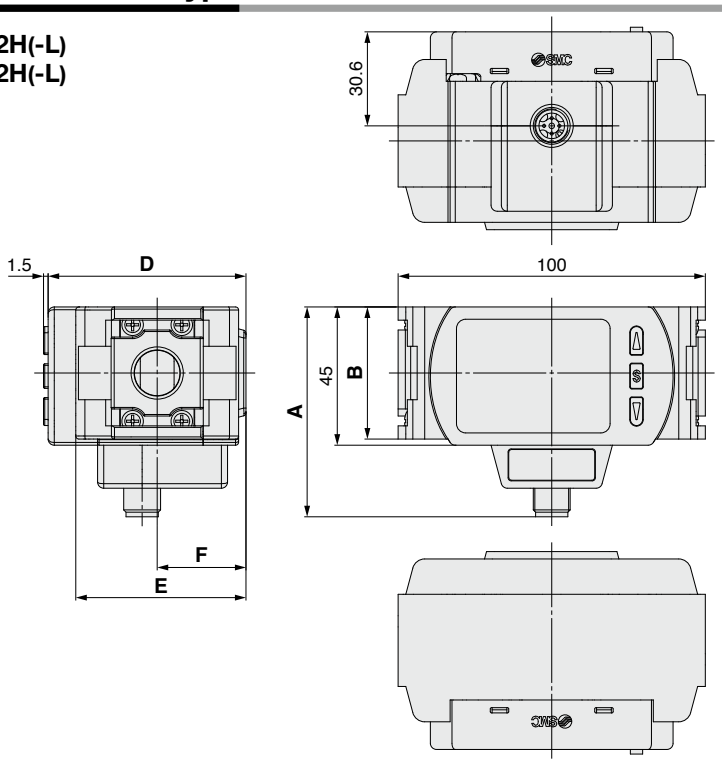
Dimensions: Modular Type

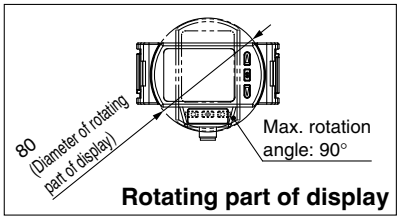
PF3A7R5H(-L)
PF3A8R5H(-L)



Dimensions: Modular Type

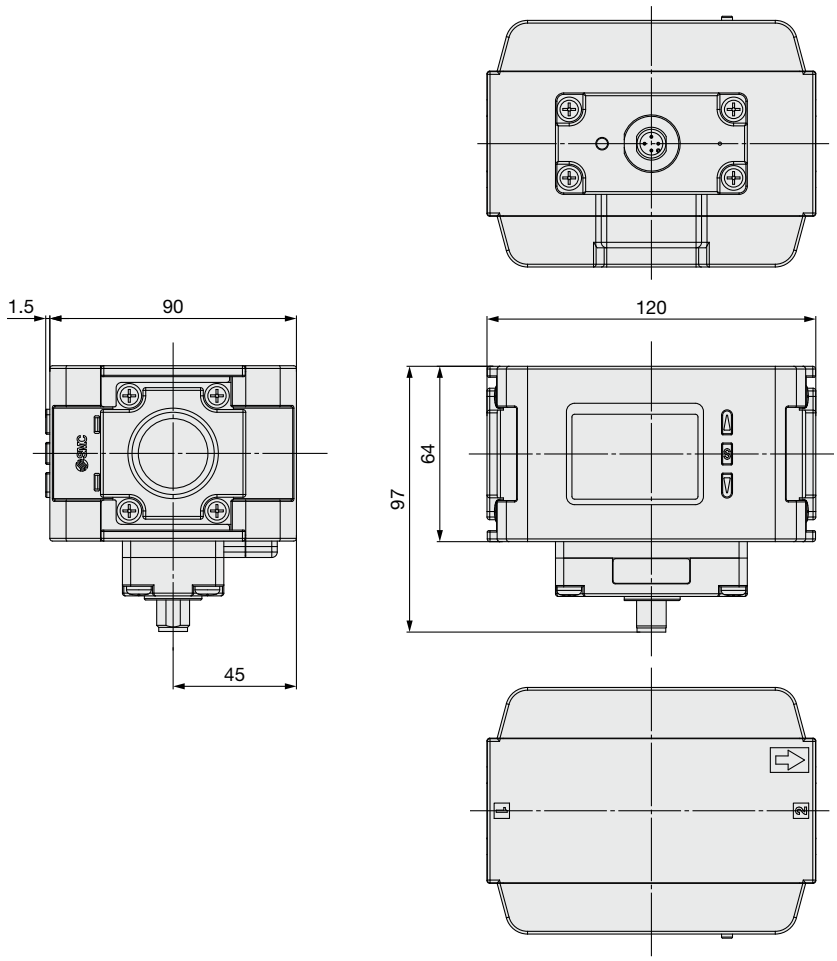
PF3A701H/702H(-L)
PF3A801H/802H(-L)





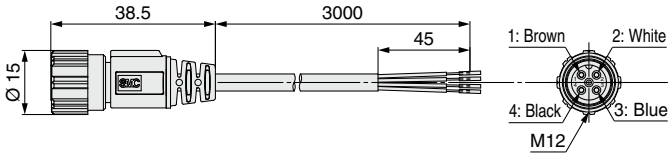
Model \ Symbol	A	B	D	E	F
PF3A701H/PF3A801H	68.3	43	64.4	55.4	28.9
PF3A702H/PF3A802H	72.3	51	73	71	35.5

PF3A704H/708H(-L)
PF3A804H/808H(-L)



Dimensions

Lead wire with M12 connector (Part no.: ZS-37-A)



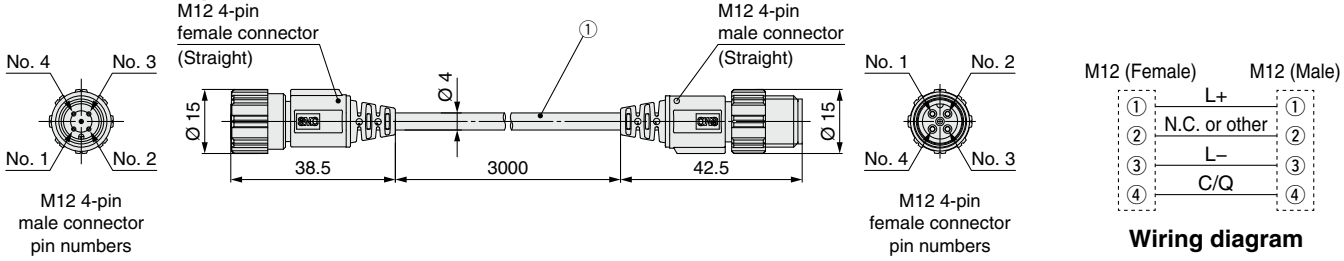
Cable Specifications

Conductor	**Nominal cross section**	AWG23
Insulator	**Outside diameter**	Approx. 1.1 mm
	Colour	Brown, Blue, Black, White
Sheath	**Finished outside diameter**	ø4

Pin no.	Pin name	Wire colour
1	DC(+)	Brown
2	FUNC	White
3	DC(–)	Blue
4	OUT(C/Q)	Black

* 4-wire type lead wire with M12 connector used for the PF3A series

Lead wire with M12-M12 connector (Part no.: ZS-49-A)



Wiring diagram

* For wiring, refer to the “Operation Manual” on the SMC website, https://www.smc.eu

Accessories

Unlike other options that can be provided with the shipped product, this option must be ordered separately.

Lead Wire with M12 Connector (Loose wires on 1 side)

EX500-AP 050 - S

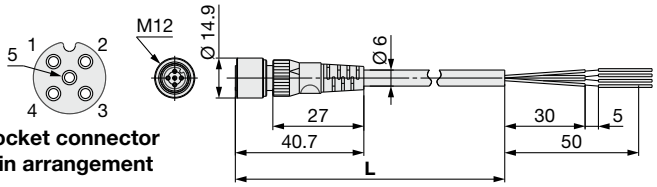
Cable length (L)

010	1000 mm
050	5000 mm

Connector specification

S	Straight
A	Angled

Straight connector type

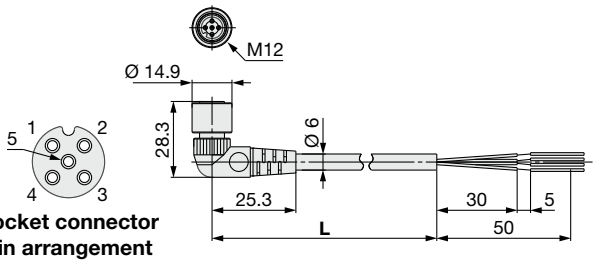


Socket connector pin arrangement

A-coded (Normal key)

Item	Specifications
Cable O.D.	ø6 mm
Nominal cross section	0.3 mm²/AWG22
Wire diameter (Including insulator)	1.5 mm
Min. bending radius	40 mm (Fixed)

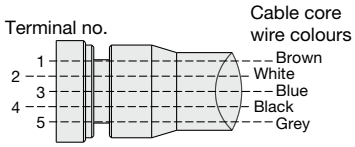
Angled connector type



Socket connector pin arrangement

A-coded (Normal key)

Item	Specifications
Cable O.D.	ø6 mm
Nominal cross section	0.3 mm²/AWG22
Wire diameter (Including insulator)	1.5 mm
Min. bending radius	40 mm (Fixed)



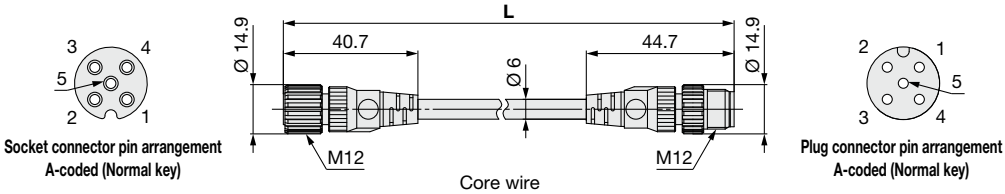
Connections

Lead Wire with M12 Connector (Connectors on Both Sides)

EX9-AC 005 -SSPS (With connectors on both sides (Socket/Plug))

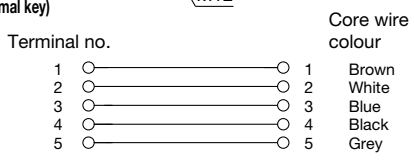
Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



Socket connector pin arrangement
A-coded (Normal key)

Plug connector pin arrangement
A-coded (Normal key)



Connections

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including conductor)	1.5 mm
Min. bending radius (Fixed)	40 mm

Modular Type
PF3A□H(-L) Series
Optional Accessories

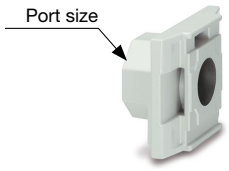
Piping Adapter: 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2

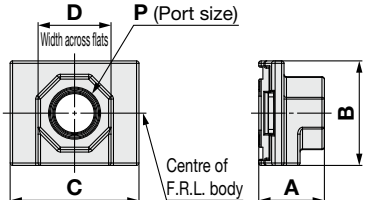
A piping adapter allows for the installation/removal of the component without removing the piping and thus makes maintenance easier.

E 300 – □ 03 – D

❶ ❷ ❸

		Symbol	Description	❶ Body size [Applicable AC size] 200 [AC20]	300 [AC30]	400 [AC40]	600 [AC50, AC60]
❷	Pipe thread type	–	Rc	●	●	●	●
		N	NPT	●	●	●	●
		F	G	●	●	●	●
		+					
❸	Port size	01	1/8	●	–	–	–
		02	1/4	●	●	●	–
		03	3/8	●	●	●	–
		04	1/2	–	●	●	–
		06	3/4	–	–	●	●
		10	1	–	–	–	●
		12	1 1/4	–	–	–	●
		14	1 1/2	–	–	–	●





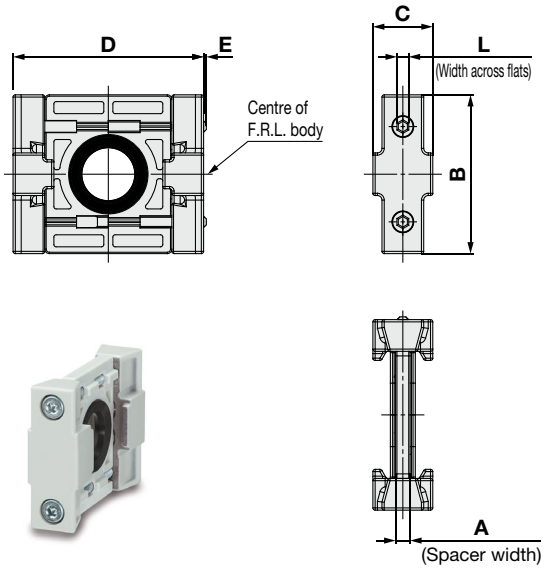
Model	P	A	B	C	D	Applicable AC size
E200-D	1/8, 1/4, 3/8	24	35	42	24	**AC20-D**
E300-D	1/4, 3/8, 1/2	27	43	53	30	**AC30-D**
E400-D	1/4, 3/8, 1/2, 3/4	30	51	71	36	**AC40-D**
E600-D	3/4, 1	39	64	90	46	**AC50-D** **AC60-D**
	1 1/4, 1 1/2	42			63	

Caution on Mounting

Pipe threads are not provided on the face which connects with the other components. For use, a separate spacer (or spacer with bracket) is required.

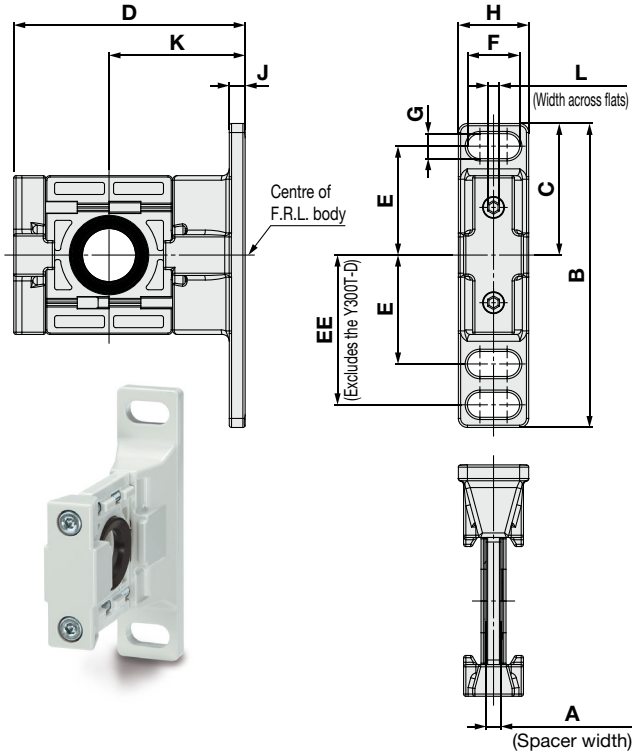
Spacer/Spacer with Bracket

Spacer



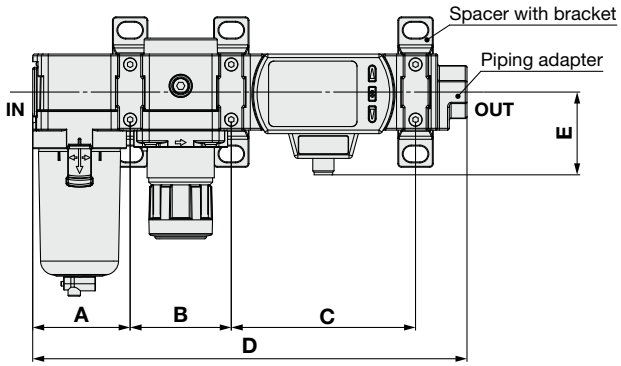
Model	A	B	C	D	E	L	Applicable size
Y200-D	3.2	35	13.2	42	0.6	2	**AC20-D**
Y300-D	4.2	43	16.2	53	–	3	**AC30-D**
Y400-D	5.2	51	19.2	71	–	3	**AC40-D**
Y600-D	6.2	64	27.2	90	–	4	**AC50-D** **AC60-D**

Spacer with bracket



Model	A	B	C	D	E	EE	F	G	H	J	K	L	Applicable size
Y200T-D	3.2	67	29	51	24	33	11.5	5.5	15.5	3.5	30	2	**AC20-D**
Y300T-D	4.2	85	42.5	67.5	35	–	14	7	20	6	41	3	**AC30-D**
Y400T-D	5.2	115	50	85.5	40	55	18	9	26	7	50	3	**AC40-D**
Y600T-D	6.2	140	60	115	50	70	20	11	31.2	8	70	4	**AC50-D** **AC60-D**

Mounting Position Example



Applicable air combination model	A	B	C	D	E
AC20-D	41.6	43.2	103.2	213.6	64.9
AC30-D	55.1	57.2	104.2	245.6	46.8
AC40-D	72.6	75.2	105.2	285.6	46.8
AC50-D	93.1	96.2	126.2	357.6	65
AC60-D	98.1	101.2	126.2	367.6	65

3-Screen Display

Digital Flow Monitor
PFG300 Series

How to Order

PFG 3 0 0 – RT – M – L

3	Remote type monitor unit

Input specification

Symbol	Description	Applicable flow switch model
0	Voltage input	PF3A7□H-CS/ES/L3 series
1	Current input	PF3A7□H-DS/FS/L4 series

∗ The PFG3 (monitor unit) cannot be used as an IO-Link communication device.

Output specification

RT	2 outputs (NPN/PNP switching type) + Analogue voltage output∗1, 2
SV	2 outputs (NPN/PNP switching type) + Analogue current output∗2
XY	2 outputs (NPN/PNP switching type) + Copy function

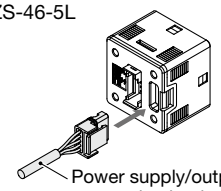
∗1 Can switch between 1 to 5 V and 0 to 10 V
∗2 Can be switched to external input or copy function

Unit specification

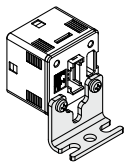
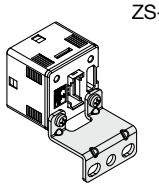
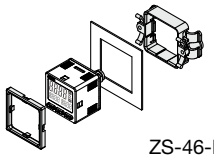
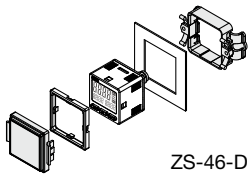
–	Units selection function
M	SI units only∗3

∗3 Fixed units: Instantaneous flow: l/min
Accumulated flow: L

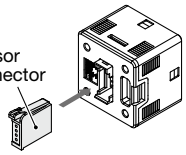
Option 1

Symbol	Description	
–	Without lead wire	
L	Power supply/output connection lead wire (Lead wire length: 2 m)	ZS-46-5L  Power supply/output connection lead wire

Option 2

Symbol	Description	
–	None	
A1	Bracket A (Vertical mounting)	ZS-46-A1 
A2	Bracket B (Horizontal mounting)	ZS-46-A2 
B	Panel mount adapter	 ZS-46-B
D	Panel mount adapter + Front protection cover	 ZS-46-D

Option 3

–	None
C	ZS-28-CA-4  Sensor connector

Option 4

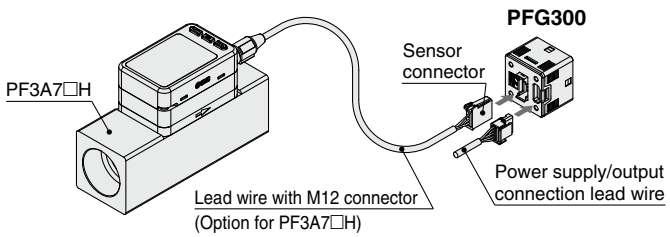
	Operation manual	Calibration certificate
–	○	–
Y	–	–
K	○	○
T	–	○

Options/Part Nos.

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

Part no.	Option	Note
ZS-28-CA-4	Sensor connector	For PF3A7□H
ZS-46-A1	Bracket A	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
ZS-46-A2	Bracket B	Tapping screw: Nominal size 3 x 8 L (2 pcs.)
ZS-46-B	Panel mount adapter	
ZS-46-D	Panel mount adapter + Front protection cover	
ZS-46-5L	Power supply/output connection lead wire	5-core, 2 m
ZS-27-01	Front protection cover	

Connection Example



Specifications

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

Model			**PFG300** series					
Applicable SMC flow switch	**Model**		PF3A7R5H	PF3A701H	PF3A702H	PF3A703H	PF3A706H	PF3A712H
	Rated flow range∗1		5 to 500 l/min	10 to 1000 l/min	20 to 2000 l/min	30 to 3000 l/min	60 to 6000 l/min	120 to 12000 l/min
Flow	**Set point range**	Instantaneous flow	–25 to 525 l/min	–50 to 1050 l/min	–100 to 2100 l/min	–150 to 3150 l/min	–300 to 6300 l/min	–600 to 12600 l/min
		Accumulated flow	0 to 999,999,999,990 L			0 to 999,999,999,990 L	0 to 999,999,999,900 L	
	Smallest settable increment	Instantaneous flow	1 l/min			2 l/min	5 l/min	10 l/min
		Accumulated flow	10 L			10 L	100 L	
	Accumulated volume per pulse (Pulse width = 50 ms)		1 L/pulse	10 L/pulse		10 L/pulse	100 L/pulse	
	Accumulated value hold function∗3		Intervals of 2 or 5 minutes can be selected. The stored accumulated flow is held even when the power supply is OFF.					
Electrical	**Power supply voltage**		12 to 24 VDC ±10 % (24 VDC when the PF3A7□H is connected)					
	Current consumption		25 mA or less					
	Protection		Polarity protection					
Accuracy	**Display accuracy**		±0.5 % F.S. ± Minimum display unit (Ambient temperature of 25 °C)					
	Analogue output accuracy		±0.5 % F.S. (Ambient temperature of 25 °C)					
	Repeatability		±0.1 % F.S. ± Minimum display unit					
	Temperature characteristics		±0.5 % F.S. (Ambient temperature: 0 to 50 °C, 25 °C standard)					
Switch output	**Output type**		Select from NPN or PNP open collector output.					
	Output mode		Select from Hysteresis, Window comparator, Accumulated output, Accumulated pulse output, Error output, or Switch output OFF modes.					
	Switch operation		Select from Normal or Reversed output.					
	Max. load current		80 mA					
	Max. applied voltage (NPN only)		30 VDC					
	Internal voltage drop (Residual voltage)		NPN output: 1 V or less (at load current of 80 mA), PNP output: 1.5 V or less (at load current of 80 mA)					
	Response time∗2		3 ms or less					
	Delay time∗2		Select from 0.00, 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, or 60 s.					
	Hysteresis∗4		Variable from 0					
	Protection		Short circuit protection					
Analogue output∗5	**Output type**		Voltage output: 1 to 5 V, 0 to 10 V (only when the power supply voltage is 24 VDC) Current output: 4 to 20 mA (0 l/min to maximum value of the rated flow)					
	Impedance	Voltage output	Output impedance: 1 kΩ					
		Current output	Maximum load impedance: 300 Ω (at power supply voltage of 12 V), 600 Ω (at power supply voltage of 24 VDC)					
	Response time∗2		50 ms or less					
External input∗6	**External input**		Input voltage: 0.4 V or less (Reed or Solid state) for 30 ms or longer					
	Input mode		Select from Accumulated value external reset or Peak/Bottom value reset.					
Sensor input	**Input type**		Voltage input: 1 to 5 VDC (Input impedance: 1 MΩ), Current input: 4 to 20 mA DC (Input impedance: 51 Ω) (0 l/min to maximum value of the rated flow)					
	Connection method		Connector (e-CON)					
	Protection		Over voltage protection (Up to 26.4 VDC)					
Display	**Display mode**		Select from Instantaneous flow or Accumulated flow.					
	Unit∗7	Instantaneous flow	l/min, cfm (ft³/min)					
		Accumulated flow	L, ft³, L x 10⁶, ft³ x 10⁶					
	Display range	Instantaneous flow	–25 to 525 l/min	–50 to 1050 l/min	–100 to 2100 l/min	–150 to 3150 l/min	–300 to 6300 l/min	–600 to 12600 l/min
		Accumulated flow∗9	0 to 999,999,999,990 L			0 to 999,999,999,990 L	0 to 999,999,999,900 L	
	Minimum display unit	Instantaneous flow	1 l/min			2 l/min	5 l/min	10 l/min
		Accumulated flow	10 L			10 L	100 L	
	Display type		LCD					
	Number of displays		3-screen display (Main screen, Sub screen)					
	Display colour		1) Main screen: Red/Green, 2) Sub screen: Orange					
	Number of display digits		1) Main screen: 5 digits (7 segments), 2) Sub screen: 9 digits (7 segments)					
	Indicator LED		LED ON when switch output is ON. OUT1/2: Orange					
Digital filter∗8			Select from 0.00, 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, or 30 s.					
Environmental resistance	**Enclosure**		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 or freezing)					
	Operating humidity range		Operating/Stored: 35 to 85 % RH (No condensation or freezing)					
Standards			CE/UKCA marking, UL (CSA)					
Weight	**Body**		25 g (Excluding the power supply/output connection lead wire)					
	Lead wire with connector		+39 g					

∗1 Rated flow range of the applicable flow switch

∗2 Value without digital filter (at 0.00 s)

∗3 When using the accumulated value hold function, use the operating conditions to calculate the product life, and do not exceed it. The maximum access limit of the memory device is 1.5 million times. If the product is operated 24 hours per day, the product life will be as follows:
- 5 min interval: life is calculated as 5 min x 1.5 million = 7.5 million min = 14.3 years
- 2 min interval: life is calculated as 2 min x 1.5 million = 3 million min = 5.7 years

If the accumulated value external reset is repeatedly used, the product life will be shorter than the calculated life.

∗4 If the flow fluctuates around the set value, the width for setting more than the fluctuating width needs to be set. Otherwise, chattering will occur.

∗5 Setting is only possible for models with analogue output.

∗6 Setting is only possible for models with external input.

∗7 Setting is only possible for models with the units selection function.

∗8 The response time indicates when the set value is 90 % in relation to the step input.

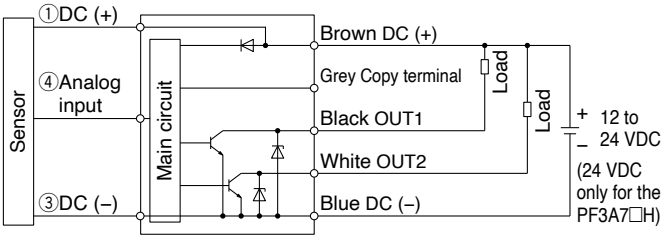
∗9 The accumulated flow display is the upper 6-digit and lower 6-digit (total of 12 digits) display. When the upper digits are displayed, x 10^6 lights up.

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

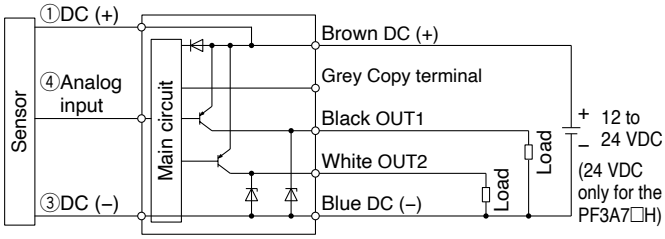
∗ For PF3A704H and PF3A708H, make a setting through input range selection.

Internal Circuits and Wiring Examples

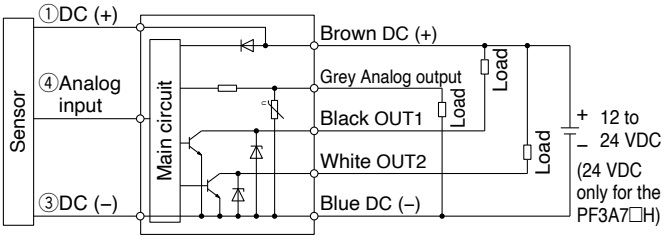
-XY
-RT
-SV
NPN (2 outputs) + Copy function



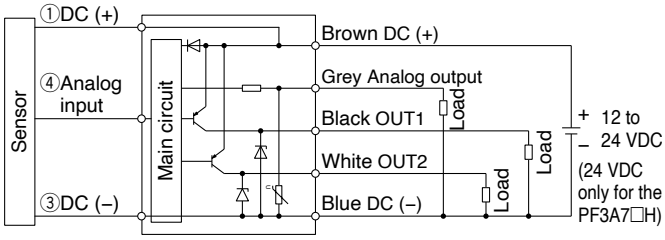
-XY
-RT
-SV
PNP (2 outputs) + Copy function



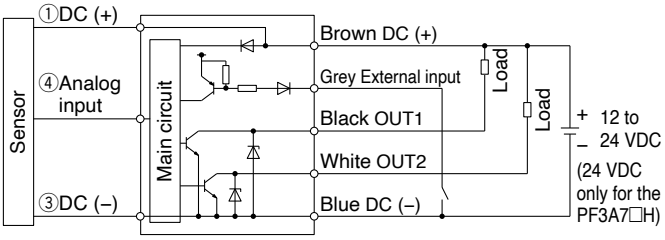
-RT: NPN (2 outputs) + Analogue voltage output
-SV: NPN (2 outputs) + Analogue current output



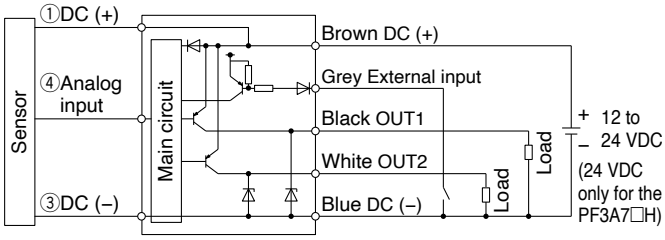
-RT: PNP (2 outputs) + Analogue voltage output
-SV: PNP (2 outputs) + Analogue current output



-RT: NPN (2 outputs) + External input
-SV: NPN (2 outputs) + External input

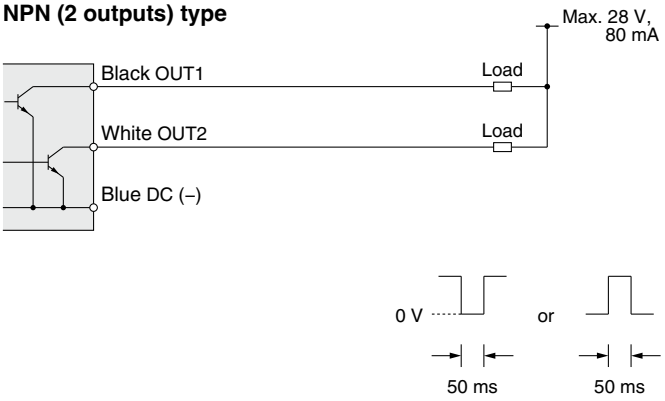


-RT: PNP (2 outputs) + External input
-SV: PNP (2 outputs) + External input

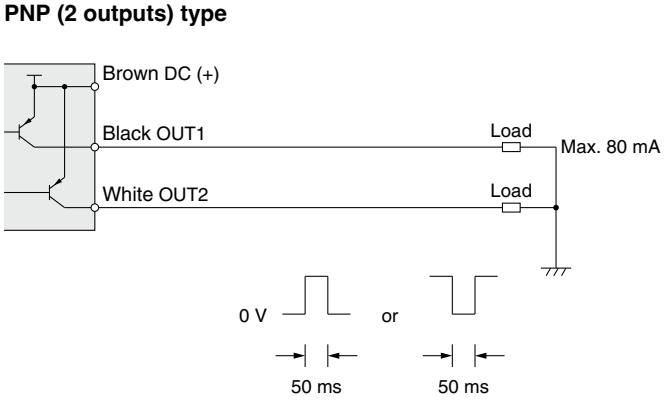


Accumulated pulse output wiring examples

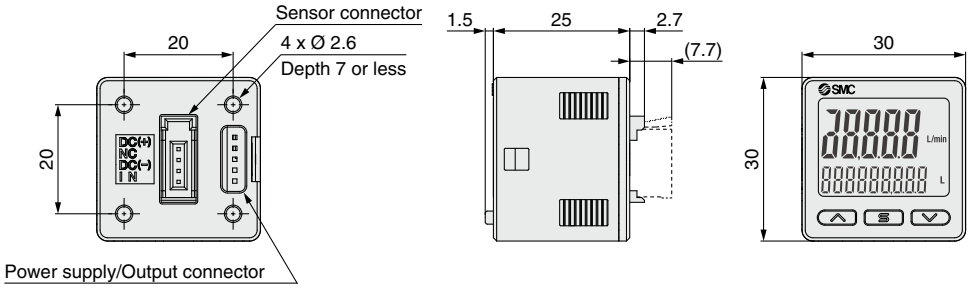
NPN (2 outputs) type



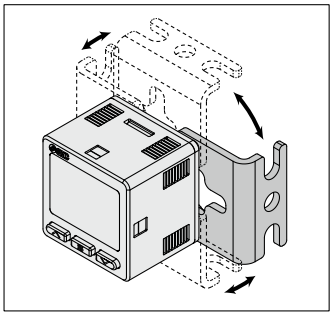
PNP (2 outputs) type



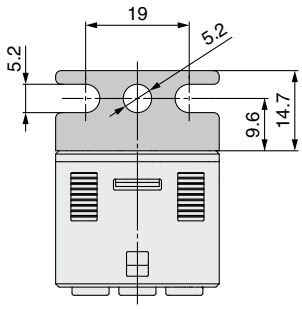
Dimensions

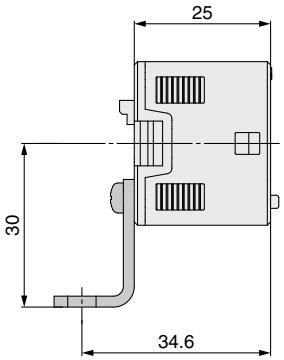


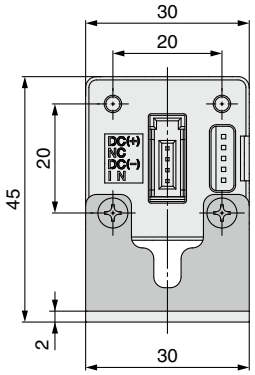
Bracket A
(Part no.: ZS-46-A1)



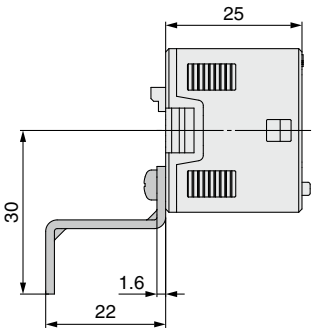
∗ Bracket configuration allows for mounting in four orientations.

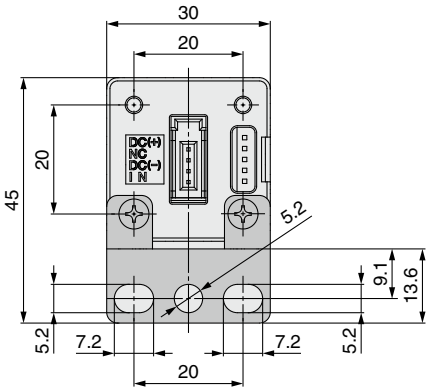


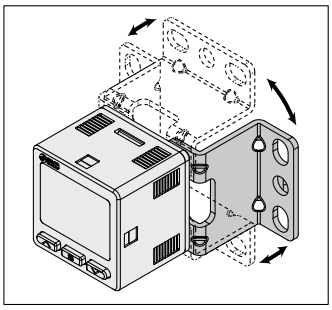




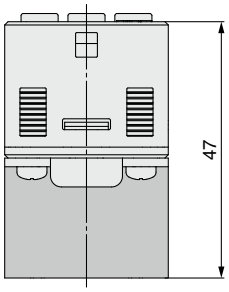
Bracket B
(Part no.: ZS-46-A2)





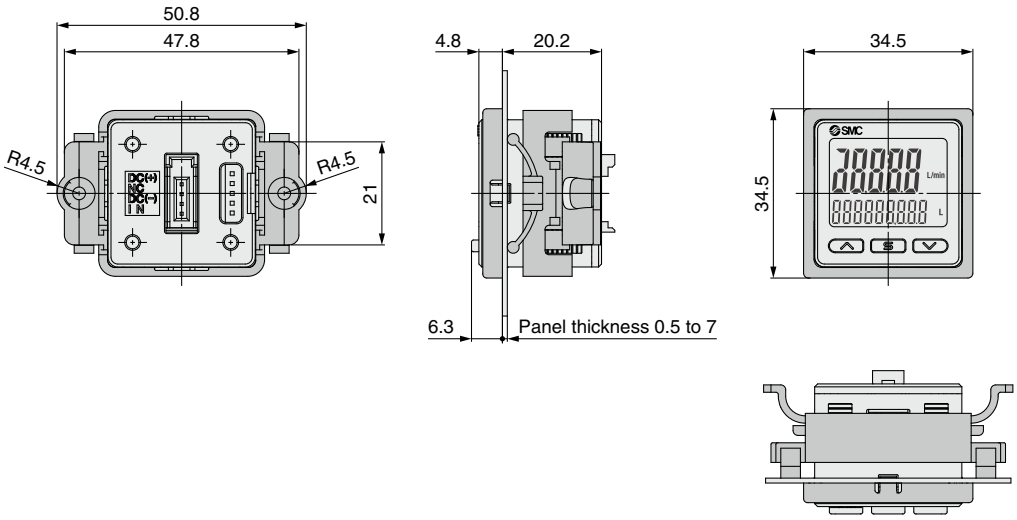


∗ Bracket configuration allows for mounting in four orientations.

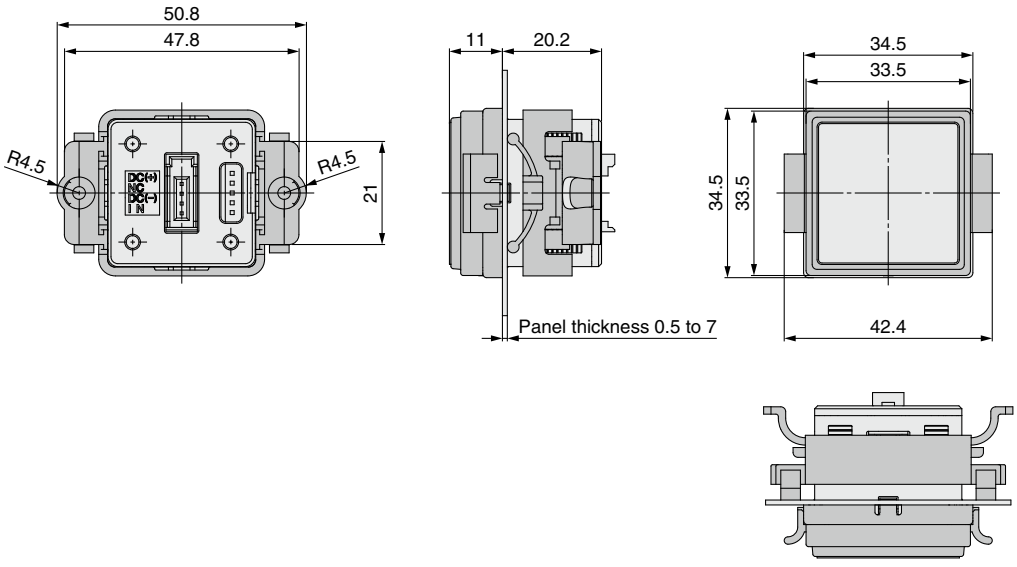


Dimensions

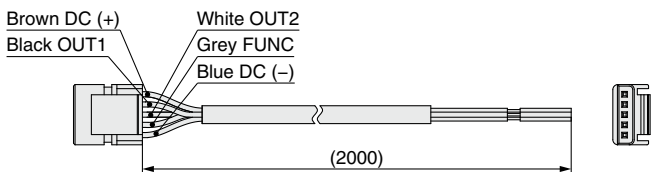
Panel mount adapter (Part no.: ZS-46-B)



Panel mount adapter + Front protection cover (Part no.: ZS-46-D)



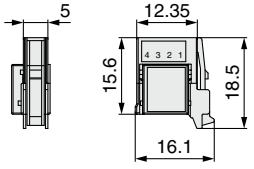
Power supply/output connection lead wire (Part no.: ZS-46-5L)



Sensor connector (Part no.: ZS-28-CA-4)

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

*1 1 to 5 V or 4 to 20 mA



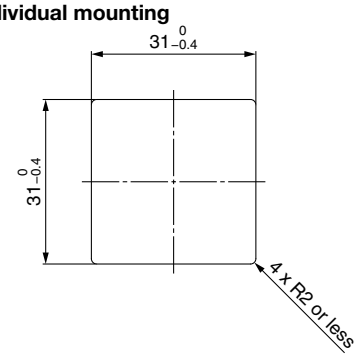
Cable Specifications

Conductor cross section		0.15 mm² (AWG26)
Insulator	**Outside diameter**	1.0 mm
	Colour	Brown, Blue, Black, White, Gray (5-core)
Sheath	**Finished outside diameter**	ø3.5

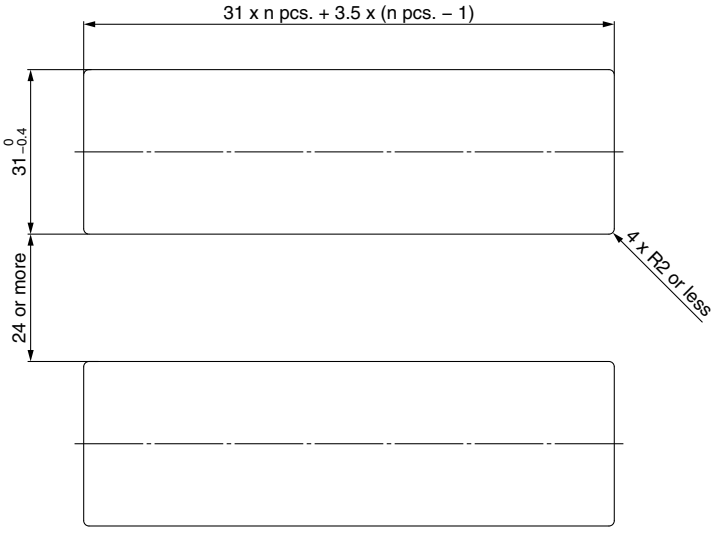
Dimensions

Panel fitting dimensions

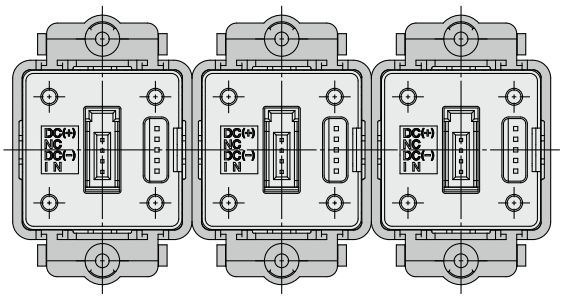
Individual mounting



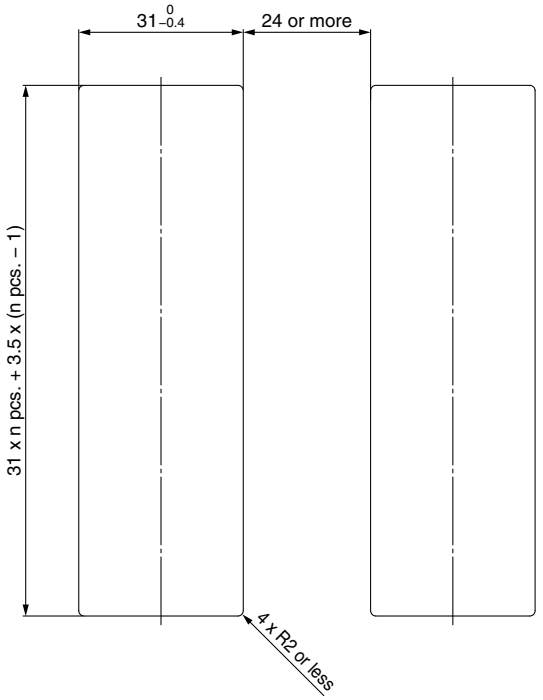
Multiple (2 pcs. or more) secure mounting
<Horizontal>



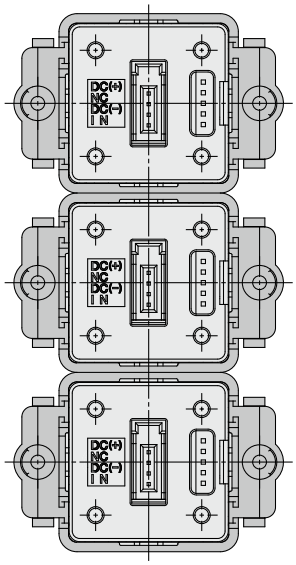
Panel mount example
<Horizontal>



<Vertical>



Panel mount example
<Vertical>



⚠ 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.

⚠ **Danger:**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ **Warning:**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Caution:**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
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 catalogue 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. Our products cannot be used beyond their specifications.
Our products are not developed, designed, and manufactured to be used under the following conditions or environments.
Use under such conditions or environments is not covered.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

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 catalogue 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.

SMC Corporation (Europe)

Austria	+43 (0)2262622800	www.smc.at	office.at@smc.com
Belgium	+32 (0)33551464	www.smc.be	info@smc.be
Bulgaria	+359 (0)2807670	www.smc.bg	sales.bg@smc.com
Croatia	+385 (0)13707288	www.smc.hr	sales.hr@smc.com
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Finland	+358 207513513	www.smc.fi	smc.fi@smc.com
France	+33 (0)164761000	www.smc-france.fr	supportclient.fr@smc.com
Germany	+49 (0)61034020	www.smc.de	info.de@smc.com
Greece	+30 210 2717265	www.smchellas.gr	sales@smchellas.gr
Hungary	+36 23513000	www.smc.hu	office.hu@smc.com
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Lithuania	+370 5 2308118	www.smclt.lt	info.lt@smc.com
Netherlands	+31 (0)205318888	www.smc.nl	info@smc.nl
Norway	+47 67129020	www.smc-norge.no	post.no@smc.com
Poland	+48 22 344 40 00	www.smc.pl	office.pl@smc.com
Portugal	+351 214724500	www.smc.eu	apoiocliente.pt@smc.com
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