3-Screen Display

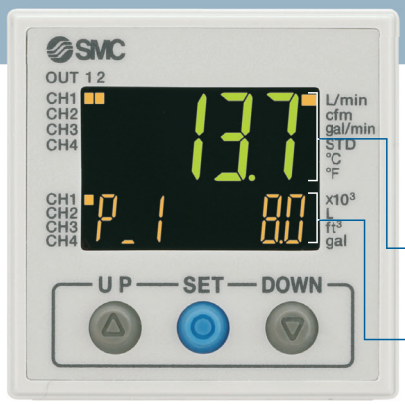
4-Channel Flow Monitor

New

CE UKCA RoHS

IO-Link

Up to 4 flow sensors can be connected!



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

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

● **Input Range Selection** p. 3

Visualisation of Settings

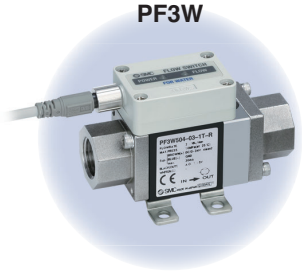
Set value (Threshold value)	P_1
Hysteresis value	H_1
Peak value	H_Hı
Bottom value	H_Lo
Channel display	CH_1

Applicable Flow Sensor Variations

Digital Flow Switch for Air
PF2A

3-Colour Display
Digital Flow Switch for Water
PF3W-Z

3-Colour Display
Digital Flow Switch for Water
PF3W



Digital Flow Switch for Deionised Water and Chemical Liquids
PF2D

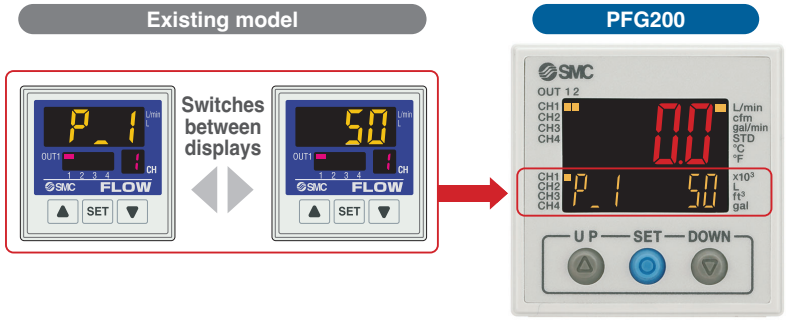
PFG200 Series

SMC

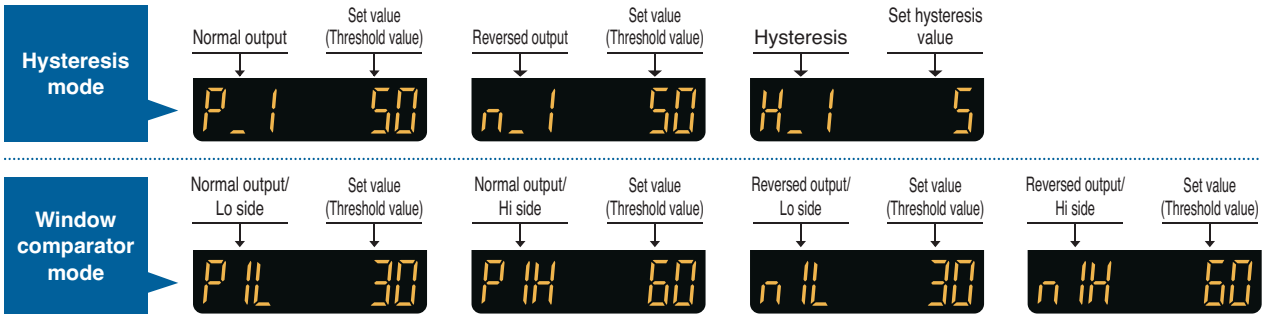
CAT.EUS100-157A-UK

Visualisation of Settings

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

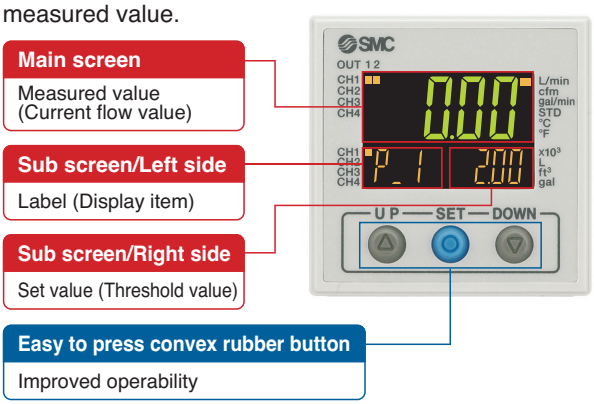


Mode Examples

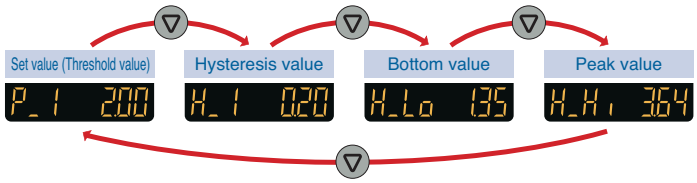


Easy Screen Switching

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



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



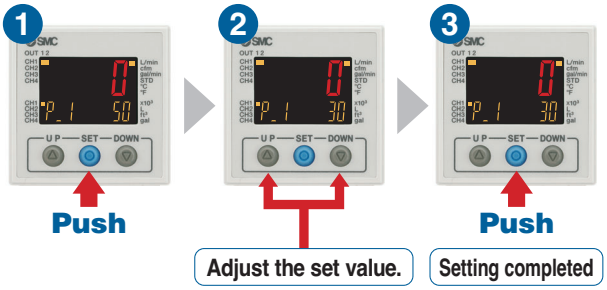
∗ One additional arbitrary display mode can be added via the function settings.

CH display	Other channel	Customer defined label	Display OFF

Simple 3-Step Setting

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

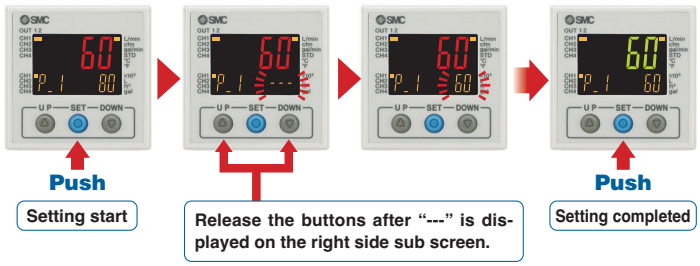
When the SET button is pressed and the hysteresis (H_1) is being displayed, the hysteresis value can be set.



Now with a snap shot function for set value reading

Snap shot function

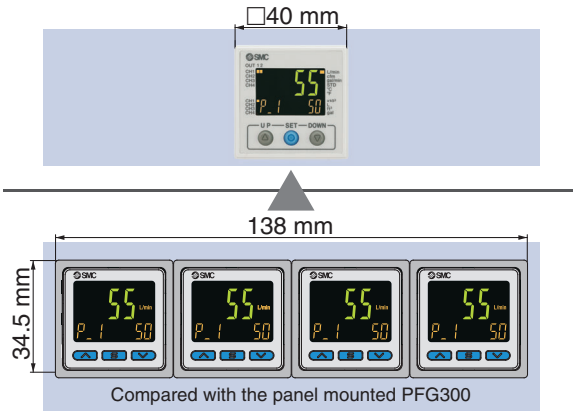
Pressing the △ and ▽ buttons simultaneously for a minimum of 1 second will make the set value (threshold value) the same as the current pressure value.

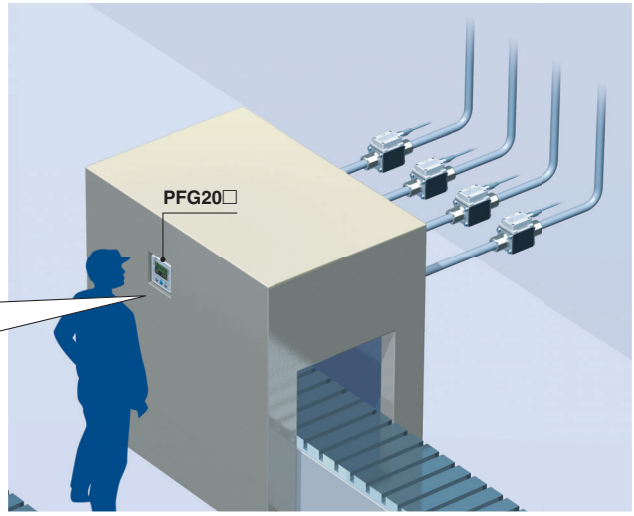


Centralised Control Saves Installation Space.

66 % reduction in installation space

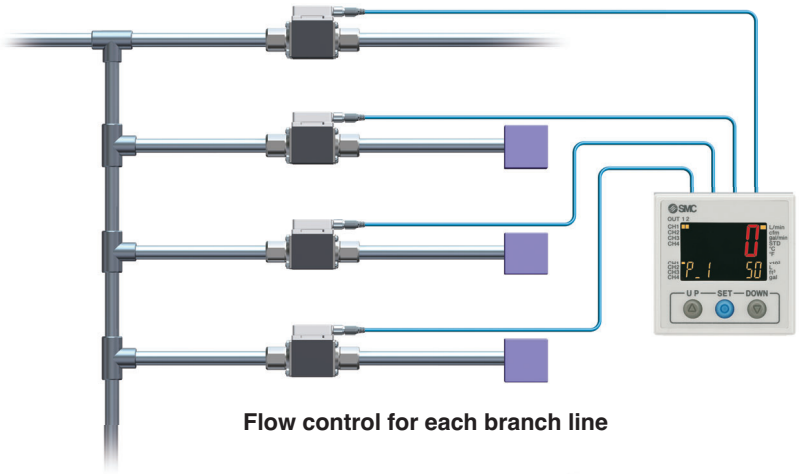
(Compared with the panel mounted PFG20□)





Accumulated Flow Measurement

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



Flow control for each branch line

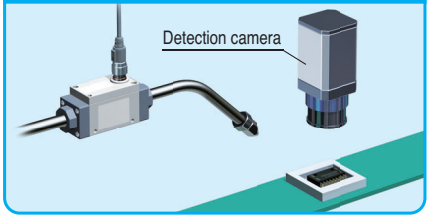
A Single Monitor Various Applications

3 channels are displayed simultaneously.

(Customer defined channel can be set.)

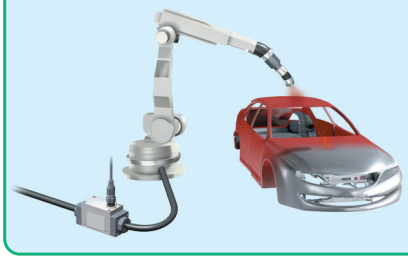
1ch

- Flow control of N_2 gas to prevent lead frame oxidation
- N_2 blow prevents distortion of camera image due to air turbulence.



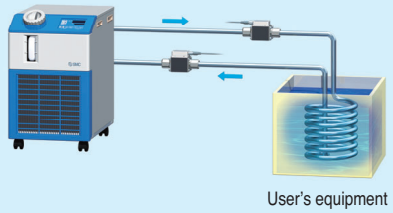
2ch

- Flow control of the air for spray painting



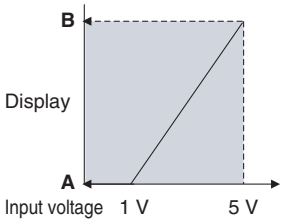
3ch 4ch

- Flow control of the circulating fluid in a chiller



* The product is not designed to be explosion proof.

Input Range Selection (for Pressure/Flow rate)



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

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

For Digital Flow Switch for Air / PF2MC7

	A	B
PF2MC7501	0	500
PF2MC7102	0	1000
PF2MC7202	0	2000

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

For Flow Sensor / PFMV5

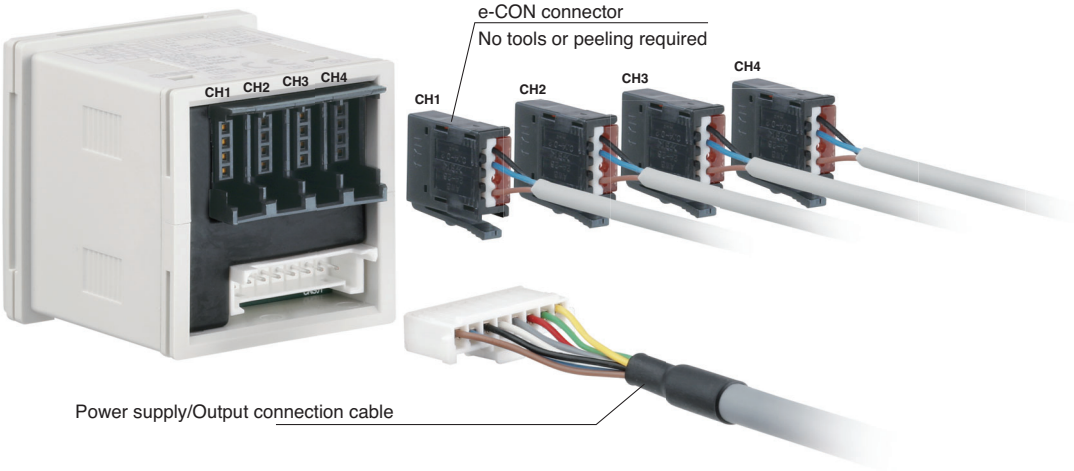
Setting of the display for analogue voltage

	A	B
PFMV5 Series	1.00	5.00

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

Connectors

Connection and removal of wiring is easy.



Functions pp. 16 to 18

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

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

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

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

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

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

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

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

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

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

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

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

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

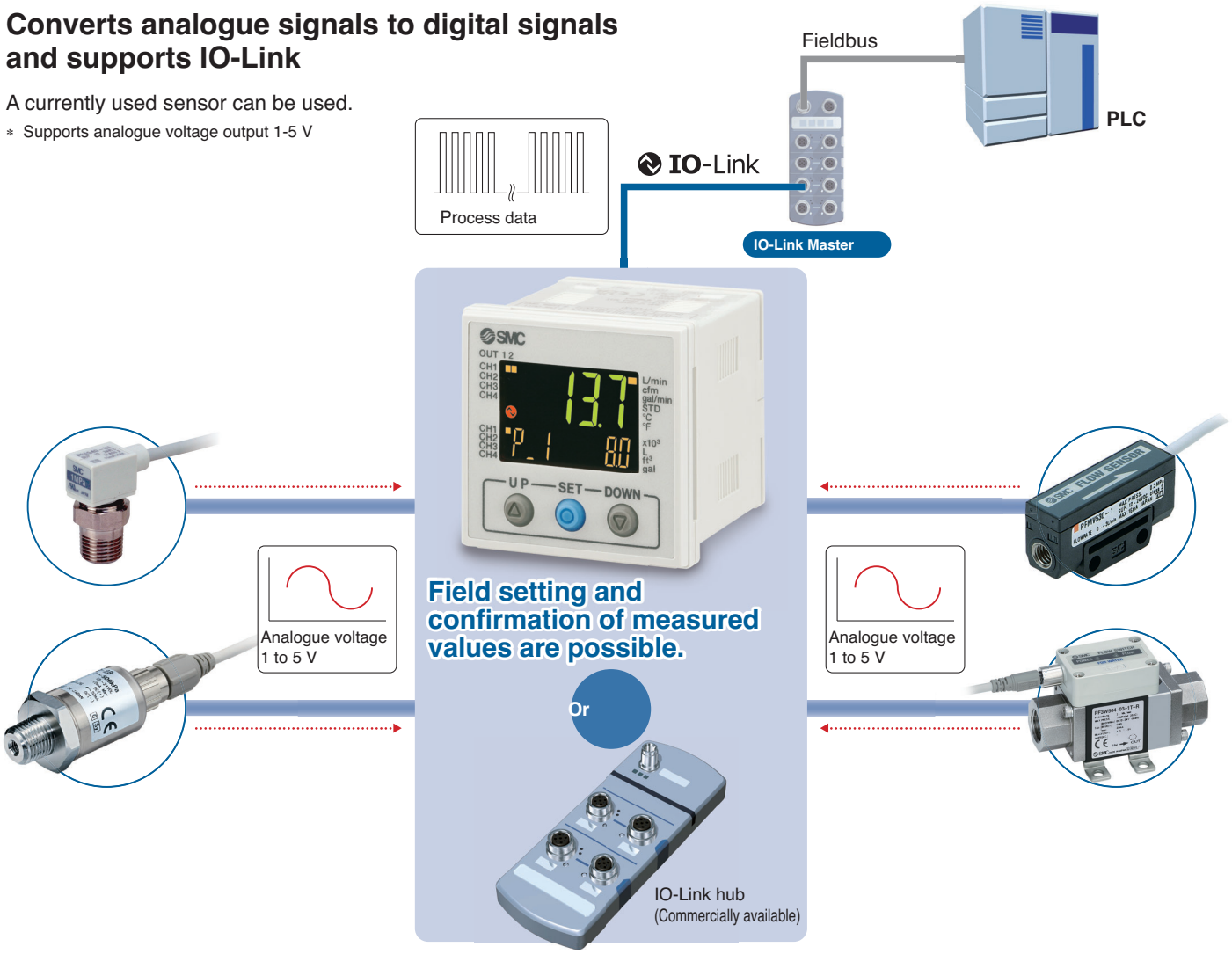
Channel scan function
Flow values for each channel are displayed in turn every 2 seconds.

Hub Function

Converts analogue signals to digital signals and supports IO-Link

A currently used sensor can be used.

∗ Supports analogue voltage output 1-5 V



Process Data

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

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

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

Each channel has 2 outputs∗1.

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

Diagnosis item	· Output overcurrent

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

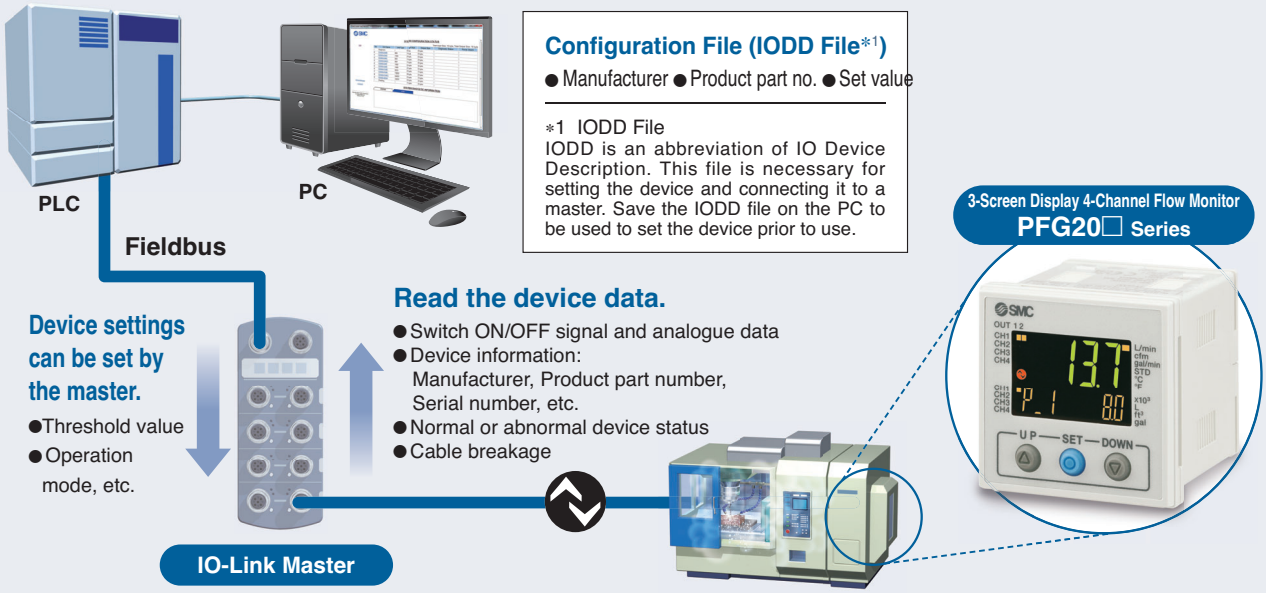
Implement diagnostic bits in the process data.

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

IO-Link

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

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



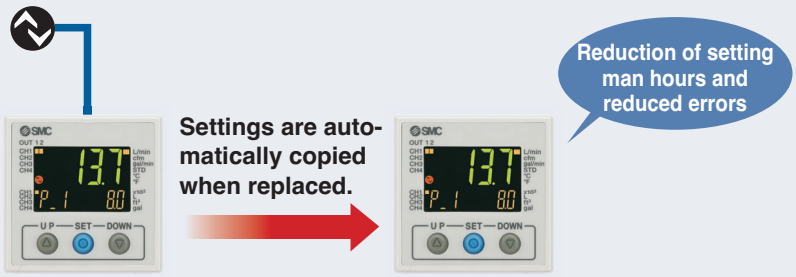
Configuration File (IODD File*1)

● Manufacturer ● Product part no. ● Set value

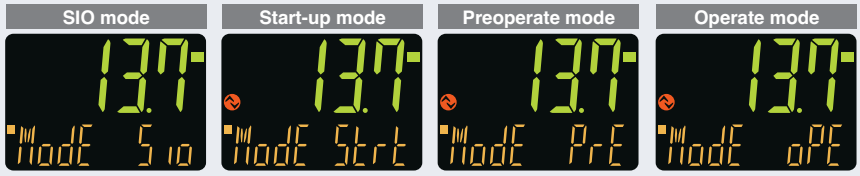
*1 IODD File
IODD is an abbreviation of IO Device Description. This file is necessary for setting the device and connecting it to a master. Save the IODD file on the PC to be used to set the device prior to use.

Automatic setting function [Data storage function]

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



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

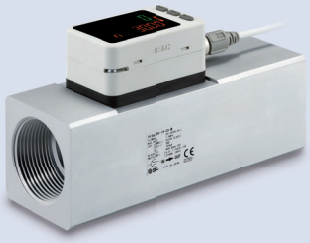


Operation and Display

Communication with master	IO-Link status indicator light	Status			Screen display *2	Description
Yes	*1	IO-Link mode	Normal	Operate	ModE oPE	Normal communication status (readout of measured value)
				Start up	ModE Strt	At the start of communication
				Preoperate	ModE PrE	
	(Flashing) *1		Abnormal	Version does not match	Er 15 V 10	IO-Link version does not match that of the master. The master uses version 1.0. * The applicable IO-Link version is 1.1.
No				Communication disconnection	ModE oPE / ModE Strt / ModE PrE	Normal communication was not received for 1 second or longer.
	OFF	SIO mode			ModE SIO	General switch output

*1 In IO-Link mode, the IO-Link indicator is ON or flashes. *2 When the sub screen is set to Mode
* "ModE LoC" is displayed when the data storage lock is enabled. (Except for version mismatch or when in SIO mode)

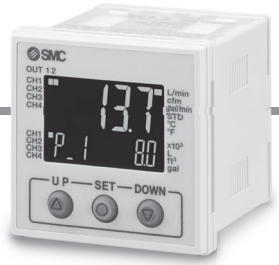
Series Variations

		Digital Sensor Monitor	
		PFG300  Catalogue PDF on www.smc.eu	**PFG200** 
Basic Specifications	Repeatability	±0.1 % (F.S.)	±0.1 % (F.S.)
	Voltage	12 to 24 VDC	12 to 24 VDC
	No. of outputs for switch	2 outputs	5 outputs
	Analogue output	1 to 5 V	—
	Operating temperature	0 to 50 °C	0 to 50 °C
Functions	Number of screens	3	3
	Enclosure	IP40	Front face: IP65 Others: IP40
	3 Step	Yes	Yes
	Wiring	Connector	Connector
Applicable Flow Sensors	Catalogue PDF on www.smc.eu	For Air PFMB  PF2MC7  PF3A7 	For Air PF2A5  For Water PF3W5-Z  PF3W5  For Deionised Water and Chemical Liquids PF3W5  PF2D5 

CONTENTS

3-Screen Display 4-Channel Flow Monitor *PFG200 Series*

3-Screen Display
4-Channel Flow Monitor
PFG200 Series



How to Order

PFG20 1 – □ □ □ □

Input/Output specification

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

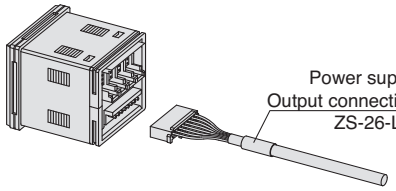
∗1 When the flow monitor is used as an IO-Link device, the total power supply current of the connected sensors should be 200 mA or less.

Unit specification

—	With unit selection function
M	SI units only∗2

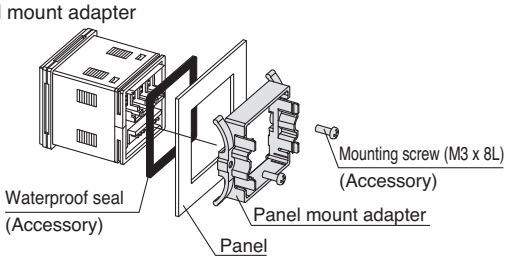
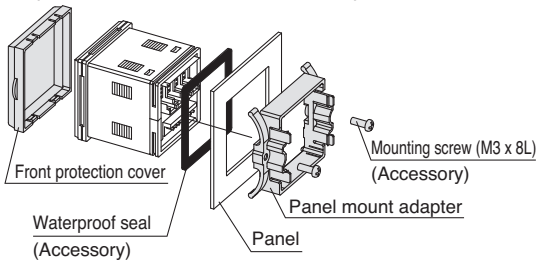
∗2 Fixed unit: Instantaneous flow : l/min
Accumulated flow : L

Option 3

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

∗ Cable is shipped together, but not connected.

Option 1

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

∗ Options are not assembled, but shipped together.

Option 2

—	None
4C	Sensor connector (4 pcs.) ∗ For PF2A5□, PF2/3W5□
4D	Sensor connector (4 pcs.) ∗ For PF2D5□

∗ Connector is not connected, but shipped together.

Options/Part Nos.

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

Description	Part no.	Note
Power supply/Output connection cable	ZS-26-L	Length: 2 m
For PF2A5□□, PF2W5□□, PF3W5□□ Sensor connector (e-CON)	ZS-28-CA-4	1 pc., Finished O.D.: Ø 1.15 to Ø 1.35, Cover colour: Blue
For PF2D5□□ Sensor connector (e-CON)	ZS-28-CA-2	1 pc., Finished O.D.: Ø 0.9 to Ø 1.0, Cover colour: Red
Panel mount adapter	ZS-26-B	Mounting screw (M3 x 8 L, 2 pcs.), With waterproof seal
Panel mount adapter + Front protection cover	ZS-26-C	Mounting screw (M3 x 8 L, 2 pcs.), With waterproof seal
Front protection cover	ZS-26-01	—
Power supply with M12 connector cable (Made to Order)	ZS-26-LM12	For use when using an M12 connector for IO-Link communication

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

Specifications

Series			PFG20□ Series					
Applicable SMC flow sensor			**PF2A510**	**PF2A550**	**PF2A511**	**PF2A521**	**PF2A551**	**PF2(3)W504**	**PF2(3)W520**
Rated flow range			1 to 10 l/min	5 to 50 l/min	10 to 100 l/min	20 to 200 l/min	50 to 500 l/min	0.5 to 4 l/min	2 to 16 l/min
Instantaneous flow rate display/Set flow rate range			0 to 11 l/min	0 to 55 l/min	0 to 110 l/min	0 to 220 l/min	0 to 550 l/min	0.35 to 4.50 l/min (Flow under 0.35 l/min is displayed as "0.00")	1.7 to 17.0 l/min (Flow under 1.7 l/min is displayed as "0.0")
Instantaneous flow rate display/Min. setting unit			0.1 l/min	0.5 l/min	1 l/min	2 l/min	5 l/min	0.05 l/min	0.1 l/min
Accumulated flow display/Set flow rate range			0 to 999,999,999 L				0 to 9,999,999.99 x 10^3 L	0 to 99,999,999.9 L	0 to 999,999,999 L
Accumulated flow display/Min. setting unit			1L				10 L	0.1 L	1 L
Accumulated pulse flow rate exchange value			0.1 l/pulse	0.5 l/pulse	1 l/pulse	2 l/pulse	5 l/pulse	0.05 L	0.1 L
Unit			l/min, cfm (depends on selected range)					l/min, gal/min (depends on selected range)	
Electrical	Power supply voltage	**When used as a switch output device**	12 to 24 VDC ±10 % with 10 % ripple (p-p) or less						
		When used as an IO-Link device	18 to 30 VDC, including ripple (p-p) 10 %*1						
	Current consumption		55 mA or less						
	Protection		Polarity protection						
	Power supply voltage for sensor*1		[Power supply voltage] –1.5 V						
	Power supply current for sensor*2		Max. 110 mA (However, the total power supply current for the four inputs is 440 mA or less, and the total power supply current when used as an IO-Link device is 200 mA or less).						
Accuracy	**Display accuracy (Linearity)**		±5.0 % F.S. Max.*4						
	Repeatability		±3.0 % F.S. Max.*4						
	Temperature characteristics		±0.5 % F.S. Max. (Reference: 25 °C)						
Switch output (SIO mode)	**Output type**		NPN or PNP open collector output: 5 outputs						
	Output mode		Hysteresis mode, Window comparator mode, Accumulated output, Accumulated pulse output, Error output, Output OFF						
	Switch operation		Normal output, Reversed output						
	Max. load current		80 mA						
	Max. applied voltage (NPN only)		30 VDC						
	Internal voltage drop (Residual voltage)		1.5 V or less (at load current of 80 mA)						
	Delay time*3		5 ms or less, variable from 0 to 60 s/0.01 s increments						
	Hysteresis		Variable from 0*5						
	Protection		Over current protection						
Analogue input	**Input type**		Voltage input: 1 to 5 VDC (Input impedance: 1 MΩ)						
	Number of inputs		4 inputs (Check the "Internal Circuits and Wiring Examples" on pages 11 to 14.)						
	Connection method		e-CON						
	Protection		Over voltage protection (up to a voltage of 26.4 VDC)						
External input*8			Voltage free input: 0.4 V or less (Reed or Solid state) for 30 ms or longer						
Display	**Display type**		LCD						
	Number of screens		3-screen display (Main screen, Sub screen x 2)						
	Display colour		Main screen: Red/Green, Sub screen: Orange						
	Number of display digits		Main screen: 4 digits (7 segments), Sub screen (Left): 4 digits (some digits are 11-segments, 7 segments for other), Sub screen (Right): 5 digits (some digits are 11-segments, 7 segments for other)						
	Indicator light		Lights up when switch output is turned ON. OUT1, OUT2: Orange						
Digital filter*6			Variable from 0 to 30 s/0.01 s increments						
Environment	**Enclosure**		Front face: IP65 (when panel-mounted), Others: IP40						
	Withstand voltage		1000 VAC for 1 minute between terminals and housing						
	Insulation resistance		50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing						
	Operating temperature range		Operating: 0 to 50 °C, Stored: –10 to 60 °C (No condensation)						
	Operating humidity range		Operating/Stored: 35 to 85 % RH (No condensation)						
Standards			CE/UKCA marking						
Weight	**Body**		51 g (Excludes power supply and output cable)						
	Power supply/Output cable		60 g						
	e-CON (1 pc.)		2 g						
Communication (IO-Link mode)	**IO-Link type**		Device						
	IO-Link version		V1.1						
	Communication speed		COM2 (38.4 kbps)						
	Configuration file		IODD file*7						
	Minimum cycle time		4.8 ms						
	Process data length		Input data: 10 bytes, Output data: 0 bytes						
	On request data communication		Yes						
	Data storage function		Yes						
	Event function		Yes						
	Vendor ID		131 (0 x 0083)						

*1 Check the power supply voltage range of the connected sensor.
*2 Over current on DC (+) side and DC (–) side of the sensor input connector results in breakage of the product.
*3 Value without digital filter (at 0 ms)
*4 The system accuracy when combined with an applicable flow sensor.
*5 If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the amount of fluctuation, or chattering will occur.

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

Series			PFG20□ Series					
Applicable SMC flow sensor			**PF2(3)W540**	**PF2(3)W511**	**PF3W521**	**PF2D504**	**PF2D520**	**PF2D540**
Rated flow range			5 to 40 l/min	10 to 100 l/min	50 to 250 l/min	0.4 to 4 l/min	1.8 to 20 l/min	4 to 40 l/min
Instantaneous flow rate display/Set flow rate range			3.5 to 45.0 l/min (Flow under 0.35 l/min is displayed as "0.00")	7 to 110 l/min (Flow under 7 l/min is displayed as "0")	20 to 280 l/min (Flow under 20 l/min is displayed as "0")	0.25 to 4.50 l/min (Flow under 0.25 l/min is displayed as "0.00")	1.3 to 21.0 l/min (Flow under 1.3 l/min is displayed as "0.0")	2.5 to 45.0 l/min (Flow under 2.5 l/min is displayed as "0.0")
Instantaneous flow rate display/Min. setting unit			0.5 l/min	1 l/min	2 l/min	0.05 l/min	0.1 l/min	0.5 l/min
Accumulated flow display/Set flow rate range			0 to 999,999,999L			0 to 99,999,999.9 L	0 to 999,999,999 L	
Accumulated flow display/Min. setting unit			1 L			0.1 L	1 L	
Accumulated pulse flow rate exchange value			0.5 L	1 L	2 L	0.05 L	0.1 L	0.5 L
Unit			l/min, gal/min (depends on selected range)			l/min, gal/min (depends on selected range)		
Electrical	Power supply voltage	**When used as a switch output device**	12 to 24 VDC ±10 % with 10 % ripple (p-p) or less					
		When used as an IO-Link device	18 to 30 VDC, including ripple (p-p) 10 %*1					
	Current consumption		55 mA or less					
	Protection		Polarity protection					
	Power supply voltage for sensor*1		[Power supply voltage] –1.5 V					
	Power supply current for sensor*2		Max. 110 mA (However, the total power supply current for the four inputs is 440 mA or less, and the total power supply current when used as an IO-Link device is 200 mA or less).					
Accuracy	**Display accuracy (Linearity)**		±5.0 % F.S. Max.*4					
	Repeatability		±3.0 % F.S. Max.*4					
	Temperature characteristics		±0.5 % F.S. Max. (Reference: 25 °C)					
Switch output (SIO mode)	**Output type**		NPN or PNP open collector output: 5 outputs					
	Output mode		Hysteresis mode, Window comparator mode, Accumulated output, Accumulated pulse output, Error output, Output OFF					
	Switch operation		Normal output, Reversed output					
	Max. load current		80 mA					
	Max. applied voltage (NPN only)		30 VDC					
	Internal voltage drop (Residual voltage)		1.5 V or less (at load current of 80 mA)					
	Delay time*3		5 ms or less, variable from 0 to 60 s/0.01 s increments					
	Hysteresis		Variable from 0*5					
	Protection		Over current protection					
Analogue input	**Input type**		Voltage input: 1 to 5 VDC (Input impedance: 1 MΩ)					
	Number of inputs		4 inputs (Check the "Internal Circuits and Wiring Examples" on pages 11 to 14.)					
	Connection method		e-CON					
	Protection		Over voltage protection (up to a voltage of 26.4 VDC)					
External input*8			Voltage free input: 0.4 V or less (Reed or Solid state) for 30 ms or longer					
Display	**Display type**		LCD					
	Number of screens		3-screen display (Main screen, Sub screen x 2)					
	Display colour		Main screen: Red/Green, Sub screen: Orange					
	Number of display digits		Main screen: 4 digits (7 segments), Sub screen (Left): 4 digits (some digits are 11-segments, 7 segments for other), Sub screen (Right): 5 digits (some digits are 11-segments, 7 segments for other)					
	Indicator light		Lights up when switch output is turned ON. OUT1, OUT2: Orange					
Digital filter*6			Variable from 0 to 30 s/0.01 s increments					
Environment	**Enclosure**		Front face: IP65 (when panel-mounted), Others: IP40					
	Withstand voltage		1000 VAC for 1 minute between terminals and housing					
	Insulation resistance		50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing					
	Operating temperature range		Operating: 0 to 50 °C, Stored: –10 to 60 °C (No condensation)					
	Operating humidity range		Operating/Stored: 35 to 85 % RH (No condensation)					
Standards			CE/UKCA marking					
Weight	**Body**		51 g (Excludes power supply and output cable)					
	Power supply/Output cable		60 g					
	e-CON (1 pc.)		2 g					
Communication (IO-Link mode)	**IO-Link type**		Device					
	IO-Link version		V1.1					
	Communication speed		COM2 (38.4 kbps)					
	Configuration file		IODD file*7					
	Minimum cycle time		4.8 ms					
	Process data length		Input data: 10 bytes, Output data: 0 bytes					
	On request data communication		Yes					
	Data storage function		Yes					
	Event function		Yes					
	Vendor ID		131 (0 x 0083)					

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

*7 The configuration file can be downloaded from the SMC website, https://www.smc.eu

*8 This setting is only possible for the PFG200/PFG201.

*9 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.

Applicable Flow Sensors

Applicable SMC flow sensor	Rated flow range [l/min] (0.4 0.5 1 2 4 5 10 20 40 50 100 200 250 500)
PF2A510	1 – 10
PF2A550	5 – 50
PF2A511	10 – 100
PF2A521	20 – 200
PF2A551	50 – 500
PF2(3)W504	0.5 – 4
PF2(3)W520	2 – 16
PF2(3)W540	5 – 40
PF2(3)W511	10 – 100
PF3W521	50 – 250
PF2D504	0.4 – 4
PF2D520	1.8 – 20
PF2D540	4 – 40

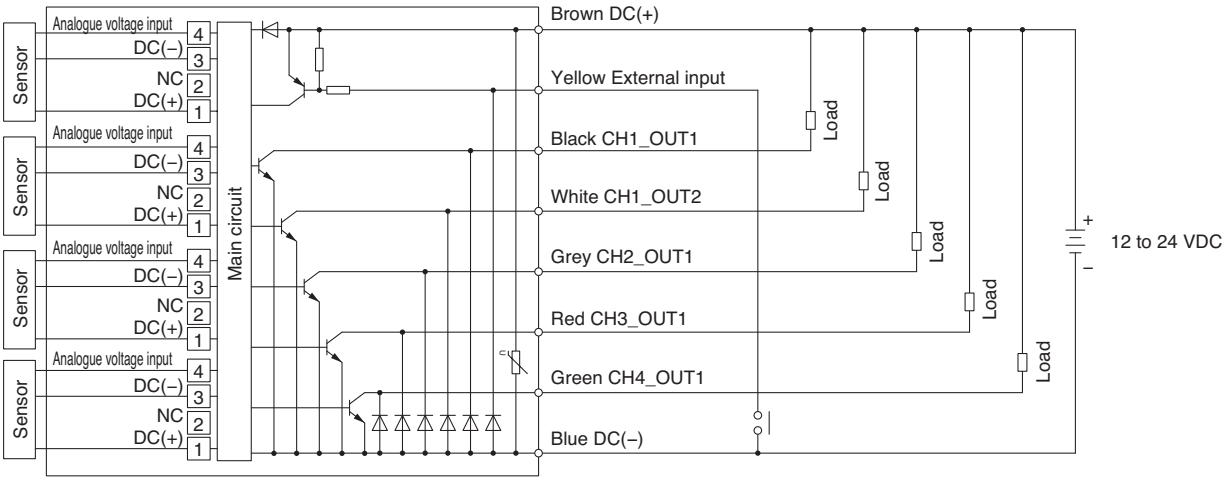
Internal Circuits and Wiring Examples

PFG20□–□□□□

• Input/Output specifications

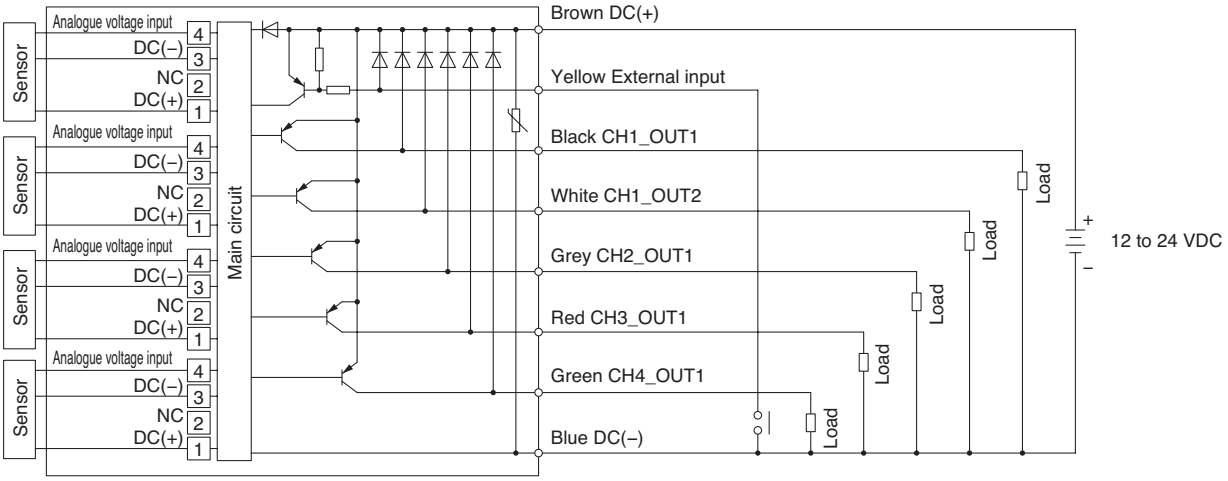
0

· NPN open collector 5 outputs + External input



1

· PNP open collector 5 outputs + External input



Internal Circuits and Wiring Examples

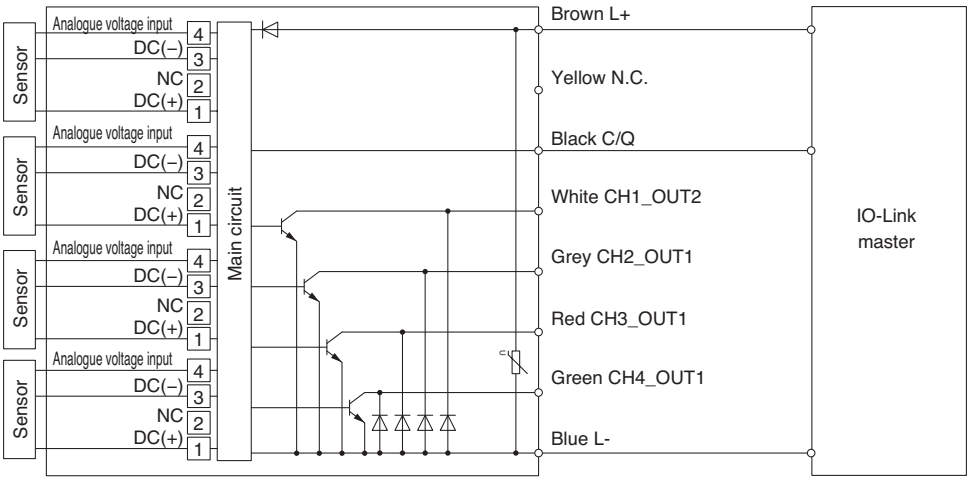
PFG20□–□□□□

Input/Output specifications

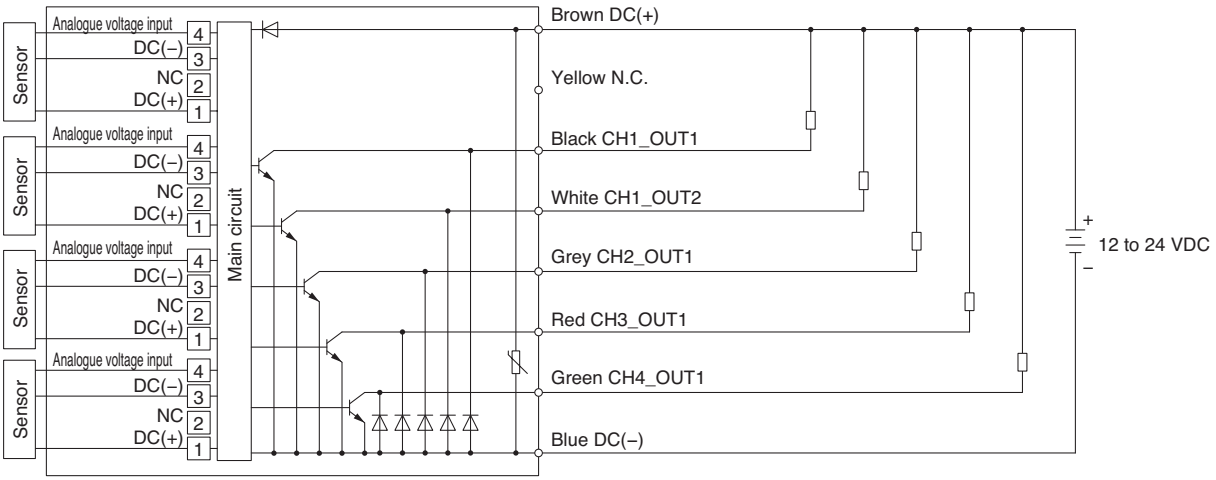
2

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

When used as an IO-Link device



When used as a switch output device



Internal Circuits and Wiring Examples

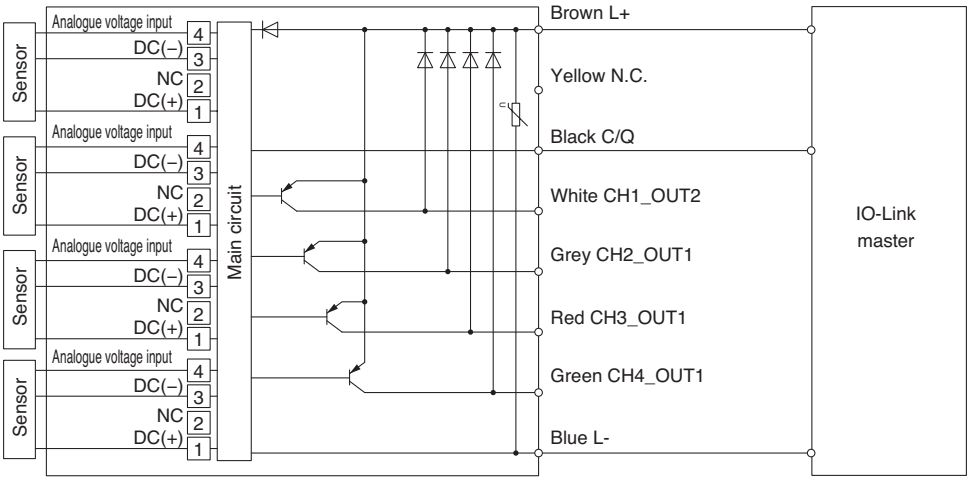
PFG20□–□□□□

Input/Output specifications

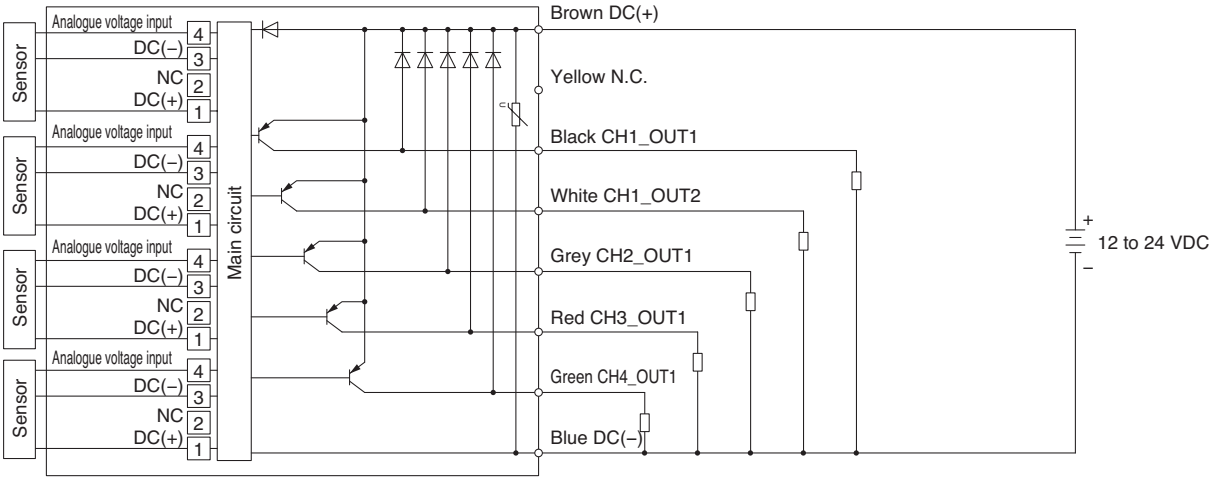
3

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

When used as an IO-Link device



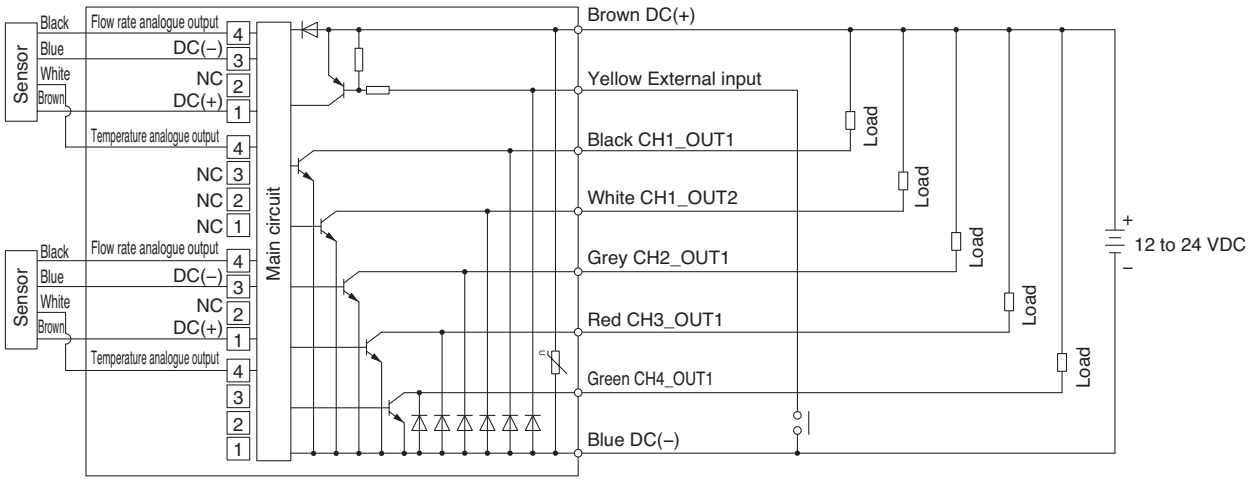
When used as a switch output device



Internal Circuits and Wiring Examples

When using the PF3W5□-1T (with temperature sensor) and measuring instantaneous flow and temperature simultaneously

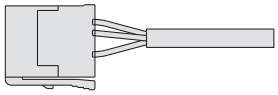
Example) PF3W520-03-1T (2 units) + PFG200-M (for 4 analogue outputs with 2 units)

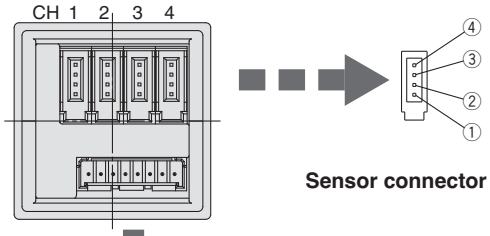


* When connecting the flow rate analogue output and temperature analogue output using a digital flow switch with a temperature sensor, use two e-con connectors per sensor.

Dimensions

Connector (Option)

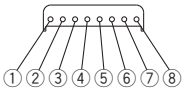


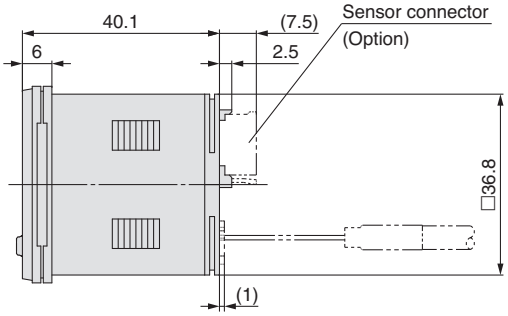


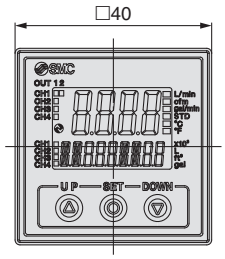
Pin no.	Terminal
①	DC (+)
②	N.C
③	DC (–)
④	IN (1 to 5 V)

Sensor connector (4P x 4)

Power supply/Output connector (8P)

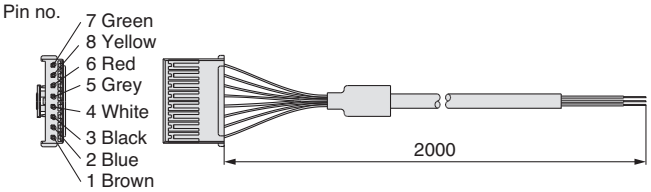






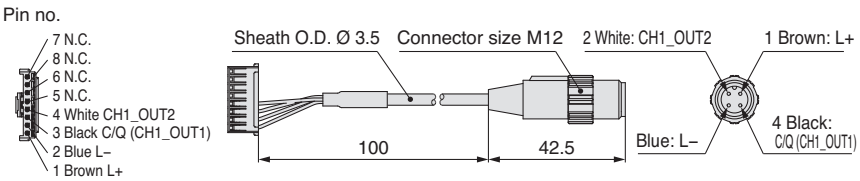
Pin no.	Terminal	
	PFG200/PFG201	PFG202/PFG203
①	DC (+)	L+
②	DC (–)	L–
③	CH1_OUT1	C/Q (CH1_OUT1)
④	CH1_OUT2	
⑤	CH2_OUT1	
⑥	CH3_OUT1	
⑦	CH4_OUT1	
⑧	Auto-shift input	N.C.

Power supply/Output connection cable (Accessory)

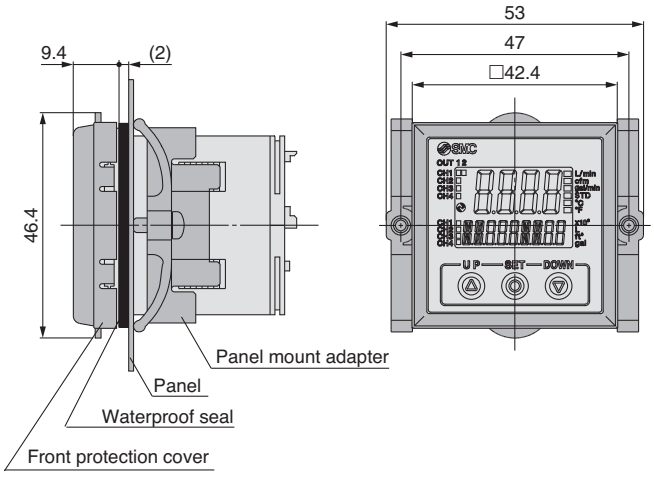


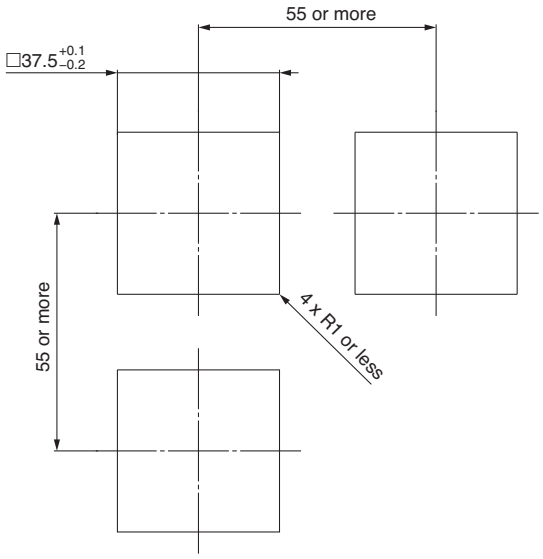
Power supply with M12 connector/Output cable (Made to Order)

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



Front protection cover + Panel mount adapter



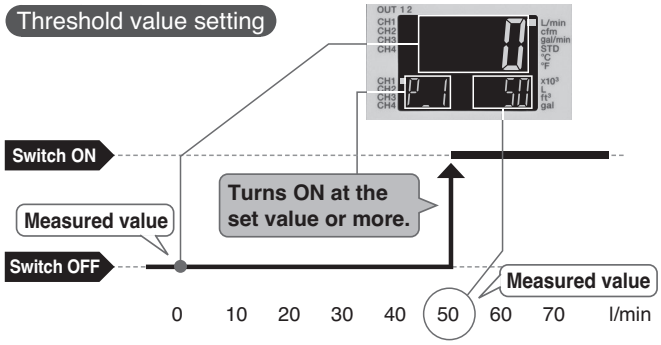


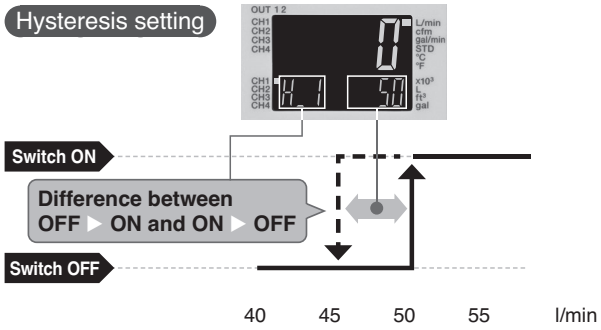
Panel fitting dimensions
Applicable panel thickness:
0.5 to 8 mm

PFG200 Series
Function Details

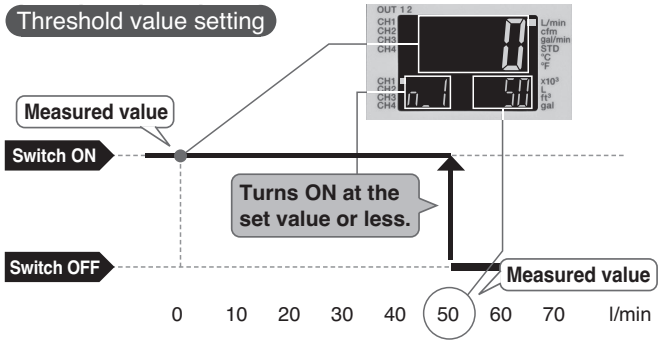
Display examples of the main and sub (set value) screens of each mode. (When 100 l/min range is selected)

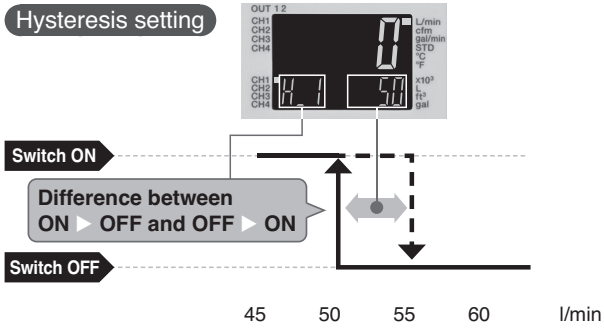
Hysteresis mode, Normal output



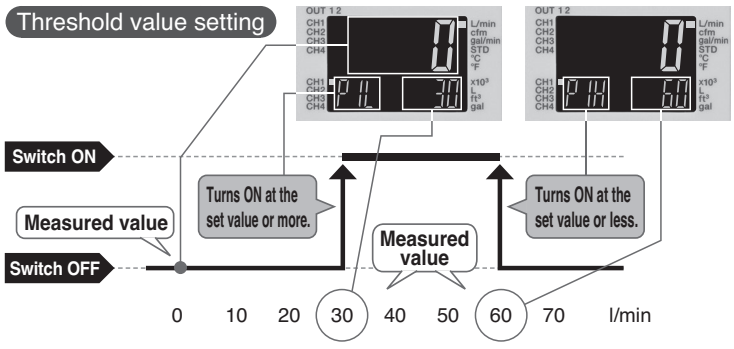


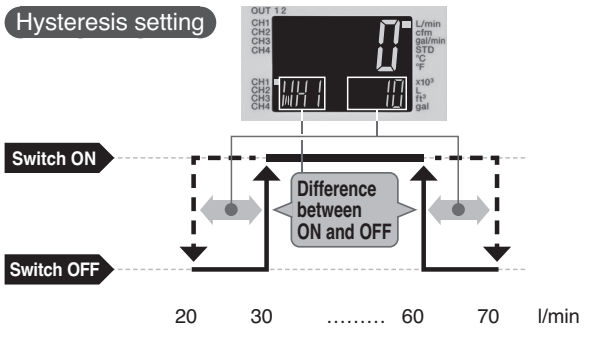
Hysteresis mode, Reversed output



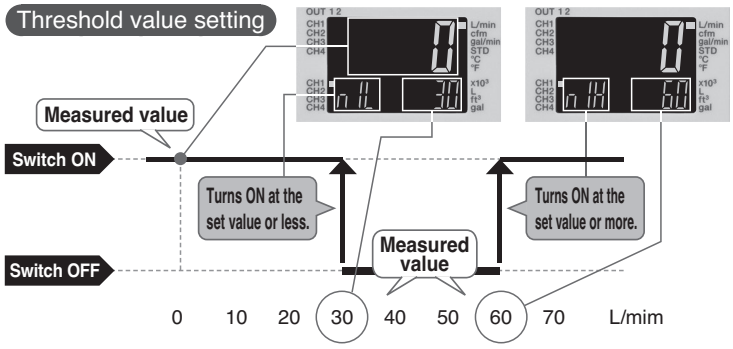


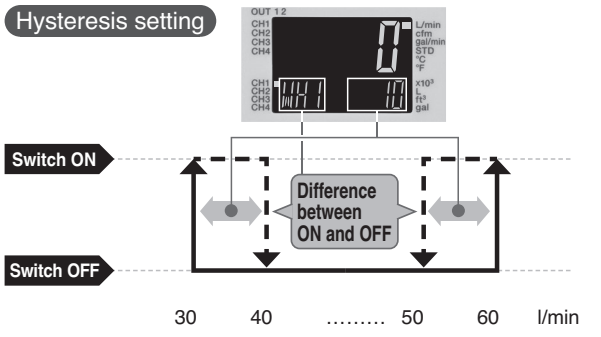
Window comparator mode, Normal output





Window comparator mode, Reversed output





Function Details

A Peak/Bottom value indication function

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

When the ⓞ and ⓥ buttons are simultaneously pressed for 1 second or longer, while “holding”, the held value will be reset.

B Key-lock function

This function prevents operation errors such as accidentally changing setting values.

C External input function

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

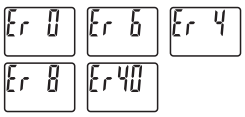
Accumulated value external reset: The accumulated flow value is reset via external input signal.
In accumulated increment mode, the accumulated value will reset to and increase from zero.
In accumulated decrement mode, the accumulated value will reset to and decrease from the set value.

∗ When the accumulated value is stored to memory, every time the accumulated value external reset is activated, the memory will be accessed. Take into consideration that the max. number of times the memory can be accessed is 970,000 times. The total number of external inputs and the accumulated value memorising time interval should not exceed 970,000 times.

Peak/Bottom value reset: The peak value and bottom value are reset.

D Error display function

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

Error name	Error code	Description	Action
Over current error		The load current applied to the switch output has exceeded the maximum value. ∗1 indicates the channel with an error.	Turn the power off and remove the cause of the over current. Then supply the power again.
Above the upper limit of the display range		The flow rate or temperature exceeds the upper limit of the setting range.	Decrease the flow rate or temperature.
Below the lower limit of the display range		The flow rate or temperature exceeds the lower limit of the setting range. A sensor may be disconnected or mis-wired.	Decrease the flow rate or temperature. Check the sensor connection.
Accumulated flow error		The accumulated flow has exceeded the accumulated flow range.	Reset the accumulated flow.
System error		Internal data error	Turn the power off and then on again. If the failure cannot be solved, please contact SMC for investigation.

If the error cannot be reset after the above measures are taken, or errors other than those above are displayed, please contact SMC for investigation.

E Delay time setting

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

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

F Zero-cut setting (F14)

When the flow display value is close to zero, this function forces the display to zero.
The range to display zero can be changed within the range of 0.0 to 10.0 %.

Example: When the PF2A711 (100/Lmin range), zero-cut value = 1.0 %, 0 is displayed in the range of –9 to 9 kPa.

G Power-saving mode (F80)

Power-saving mode can be selected.
It shifts to power-saving mode automatically when there is no button operation for 30 seconds.
The product is set to normal mode (Power-saving mode is OFF) at the time of factory shipment.
(When in power-saving mode, [ECo] will flash in the sub screen and the operation light will be ON (only when the switch is ON).)

H Setting of security code (F81)

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

I Accumulated value hold

The accumulated value is not cleared even when the power supply is turned OFF.
The accumulated value is memorised every 5 minutes during measurement and continues from the last memorised value when the power supply is turned ON again.
The life time of the memory device is 970,000 access times. Take this into consideration before using this function.

Function Details

J Snap shot function

The current flow rate value can be stored to the switch output ON/OFF set point.
When the items on the Sub display (left) are selected in either 3 step setting mode, Simple setting mode or Setting of each function mode, by pressing the ▲ and ▼ buttons simultaneously for 1 second or longer, the value of the sub display (right) will show "----", and the values corresponding to the current flow rate are automatically displayed.

Output mode	Configurable items	Sub display (left)	Snap shot function
Hysteresis mode	Set value	P_1 (n_1) / P_2 (n_2)	○
	Hysteresis	H_1 / H_2	○
Window comparator mode	Set value	PiL (niL), PiH (niH) / P2L (n2L), P2H (n2H)	○
	Hysteresis	-HY1 / -HY2	×
Accumulated output mode	Set value	PI, P2, nI, n2	×

K Output check function

The output is forced ON/OFF when starting the system or during maintenance. This enables confirmation of the wiring and prevents system errors due to unexpected output.

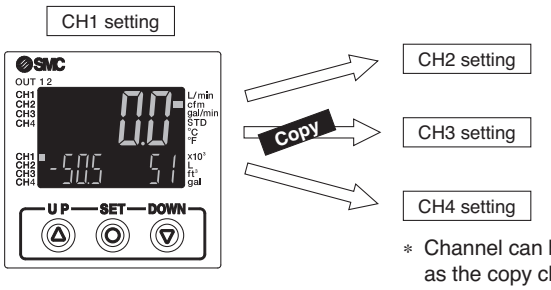
* Also, the increase or decrease of the flow will not change the ON/OFF status of the output while the forced output function is activated.

L Channel to channel copy function (F95)

Information that can be copied includes the following:
F0 (system setting): Connected range, displayed unit
F1 (OUT1 setting), F3 (digital filter), F10 (sub-screen setting), F14 (zero-cut setting)

When CH1 is copied to CH2, CH3, and CH4, information on OUT1 in CH1 will be copied.
When CH2 (CH3, or CH4) is copied to CH1, information on OUT1 in CH2 (CH3, or CH4) will be copied only to OUT1 in CH1.

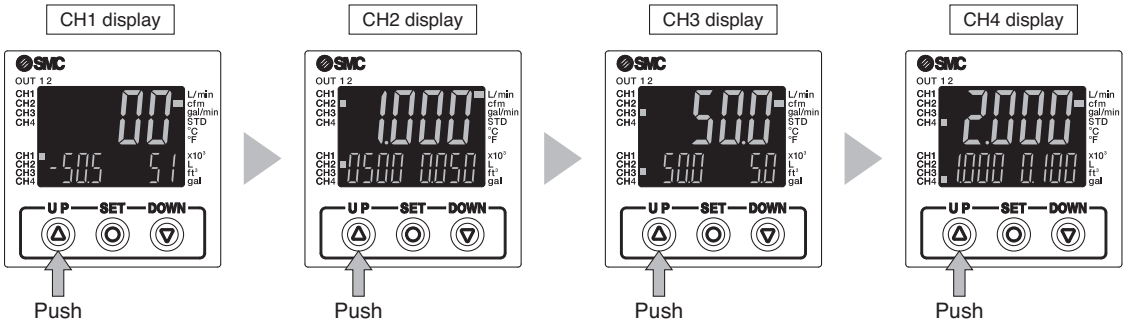
* When the channel to channel copy function is used, the copied pressure set value may vary by ±1 digit.
  Example) When copying CH1 to another channel



* Channel can be selected as the copy channel.

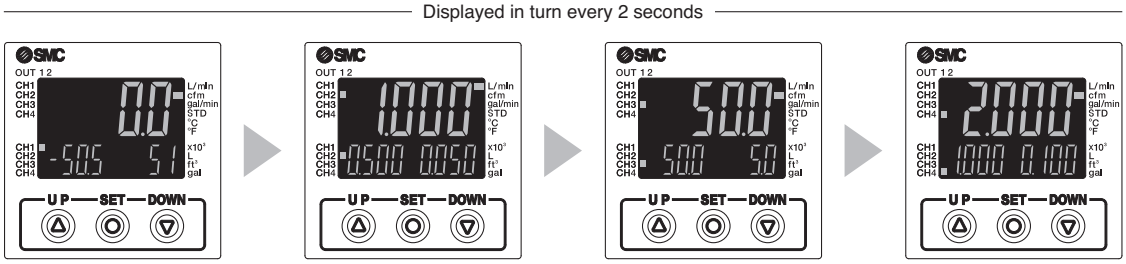
M Channel select function

Flow value for the selected channel is displayed.
The function setting of each channel is performed on the selected channel.



N Channel scan function

Flow values for each channel are displayed in turn every 2 seconds.



⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) [1], and other safety regulations.

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

1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogueue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogueue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first. [2] Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogueue for the particular products.

2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

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

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