



# Installation & Maintenance Manual Digital Flow Monitor

For Air

**Series PF2A300/301  
PF2A310/311**

For Water

**Series PF2W300/301  
PF2W330/331**

For Pure Water/Chemical Fluid  
**Series PF2D300/301**



## Safety Instructions

The Digital Flow Monitor and this manual contain essential information for the protection of users and others from possible injury and property damage and to ensure correct handling. Please confirm that you fully understand the definition of the following messages (signs) before going on to read the text, and always follow the instructions.

Please read and understand the operation manuals of related apparatus before operating the flow switch.

### IMPORTANT MESSAGES

Read this manual and follow its instructions. Signal words such as WARNING and NOTE, will be followed by important safety information that must be carefully reviewed.

<b>⚠WARNING</b>	Indicates a potentially hazardous situation which could result in death or serious injury if you do not follow instructions.
<b>NOTE</b>	Gives you helpful information.

### ⚠WARNING

**Do not disassemble, modify (including change of printed circuit board) or repair.**

An injury or failure can result.

**Do not operate outside of the specification.**

Fire, malfunction or flow monitor damage can result. Please use it after confirming the specification.

**Do not operate in an environment of inflammable, explosive or corrosive gas.**

Fire or an explosion can result. This flow monitor is not an explosion proof type.

**Prepare a double interlock using another system (Mechanical interlock, etc.), and check it is operating correctly, when using this product in an interlock circuit.**

An accident by a malfunction may potentially result.

## Safety Instructions (continue)

### NOTE

Follow the instructions given below when handling the flow monitor. Otherwise, the flow monitor may be damaged or may fail, thereby resulting in malfunction.

- Do not drop, bring into collision with other objects or apply excessive shock to the unit (490m/s<sup>2</sup> or more).
- Connect wires and cables correctly.
- Do not perform wiring while power is on.
- Although the flow monitor complies with the CE Marking, it does not have lightning surge protection, therefore please apply the necessary protection to the equipment.
- Although the flow monitor complies with the CE Marking, it should be protected against any sources of surge (electro-magnetic lifter, high frequency induction furnace, motors etc.) around the flow monitor.
- Do not use with power cable or high-voltage cable in the same wire route.
- Do not use in a place in which water, oil, or chemical splashes may occur.
- Do not insert or remove flow sensor (connector) with the power ON.
- Do not press the setting buttons with a sharp pointed object.
- Turn on the power supply of a flow monitor for Air, when the flow is zero. Some initial drift occurs during ten minutes after turning the power on.
- For 3 seconds after power is turned ON the measurement output will be OFF. This includes after momentary disconnection of the power, by reset etc.)
- During initial setting or when setting the flow monitor, the measured output continues to change with the flow measurement as before setting. Please check how this will affect the equipment before use. Check the flow monitor set up after a control system is shut down, if required.

## Model Indication Method

PF2 3 -A-

### Units Specification

**No Symbol** : Unit selection function provided  
**M** : SI units fixed

### Output Specification

**0** : NPN open collector output (2 outputs)  
**1** : PNP open collector output (2 outputs)

### Flow Rate Range Specification

<b>PF2A 3</b>	<b>0</b> : 1 to 10 ℓ /min, 5 to 50 ℓ /min
	<b>1</b> : 10 to 100 ℓ /min, 20 to 200 ℓ /min, 50 to 500 ℓ /min
<b>PF2D 3</b>	<b>0</b> : 0.4 to 4 ℓ /min, 1.8 to 20 ℓ /min, 4 to 40 ℓ /min
<b>PF2W 3</b>	<b>0</b> : 0.5 to 4 ℓ /min, 2 to 16 ℓ /min, 5 to 40 ℓ /min
	<b>3</b> : 10 to 100 ℓ /min

### Applicable Sensor Specification

**A** : Air  
**D** : Pure Water/Chemical Fluid  
**W** : Water

NOTE 1: The new measurement law prohibits use in Japan of flow monitors with a unit selection function.

NOTE 2: Fixed unit for instantaneous flow rate is :ℓ /min  
for integrated flow rate is :ℓ

## Specification

### For Air

Model	PF2A 300/301		PF2A 310/311		
Flow Rate Indication Range (*1)	0.5 to 10.5 ℓ /min	2.5 to 52.5 ℓ /min	5 to 105 ℓ /min	10 to 210 ℓ /min	25 to 525 ℓ /min
Set Flow Rate Range (*1)	0.5 to 10.5 ℓ /min	2.5 to 52.5 ℓ /min	5 to 105 ℓ /min	10 to 210 ℓ /min	25 to 525 ℓ /min
Minimum Set Unit (*1)	0.1 ℓ /min	0.5 ℓ /min	1 ℓ /min	2 ℓ /min	5 ℓ /min
Flow rate conversion value (Pulse width: 50msec) (*1)	0.10 /pulse	0.50 /pulse	1 ℓ /pulse	2 ℓ /pulse	5 ℓ /pulse
Unit	ℓ /min, CFM × 10 <sup>-2</sup>		ℓ /min, CFM × 10 <sup>-1</sup>		
(*2, 3) Integrated Flow Rate	ℓ , ft <sup>3</sup> × 10 <sup>-1</sup>				
Integrated Flow Rate Range	0 to 999999 ℓ				
Linearity (*4)	±5%F.S. or less				
Repeatability	±1%F.S. or less (*4)		±1%F.S. or less		
Temperature Characteristic	±1%F.S. or less (15 to 35°C, 25°C standard) ±2%F.S. or less (0 to 50°C, 25°C standard)				
Current Consumption	50mA or less (No load)		60mA or less (No load)		
Mass (Weight)	45g				
Output Specification (*5)	Switch Output or Integrated Pulse Output	NPN Open Collector PF2A 300, PF2A 310	Maximum Load Current: 80mA, Internal voltage drop: 1V or less (@ load current 80mA) Maximum Input Voltage: 30V 2 outputs		
		PNP Open Collector PF2A 301, PF2A 311	Maximum Load Current: 80mA, Internal voltage drop: 1.5V or less (@ load current 80mA) 2 outputs		

Common Specification for Air	
Ambient Temperature Range	Operation: 0 to 50°C, storage: -25 to 85°C (No condensation or freezing)
Withstand Voltage	1000VAC, 1minute, between group of external terminals and case
Insulation Resistance	50M Ω or more (@ 500VDC M), between group of external terminals and case
Resistance to Noise	1000Vp-p pulse width 1μs, rise 1ns
Vibration proof	10 to 500Hz and amplitude 1.5mm or acceleration 98m/s <sup>2</sup> whichever is smaller, 2hours each directions of X, Y and Z respectively
Impact proof	490m/s <sup>2</sup> , 3 times each directions of X, Y and Z respectively
Displayed Digits	3 digits 7-segment LED
Operation Indicator Lamp	Lit when output is ON (OUT1): Green, (OUT2): Red
Power Supply Voltage	12 to 24VDC, ripple ±10% or less
Response Time	1sec or less
Hysteresis	Hysteresis Mode: Variable (Settable starting 0), Window Comparator mode (*6): Fixed (3digits)
Enclosure	IP40 (IEC60529)

- \*1: The flow rate indication range is corresponding to the flow rate range set up at the initialization.
- \*2: With units selection function (Without units selection function, fixed to SI units (ℓ /min or ℓ ))
- \*3: Two units in normal condition (0°C/ 101.3kPa) or standard condition (20°C/ 101.3kPa/ 65%RH) can be selected.
- \*4: This is an overall accuracy combined with flow sensor PF2A 5\*\*.
- \*5: Select either switch output or pulse output of integrated flow rate by at initialization.
- \*6: Window Comparator mode. Hysteresis (H) is fixed at 3 digits. [P\_1] and [P\_2] or [n\_1] and [n\_2], must be separated by more than 7 digits. (In case of the output OUT2, n\_1,2 becomes n\_3,4 and P\_1,2 becomes P\_3,4)
- \*7: The flow monitor conforms entirely to the CE standard.

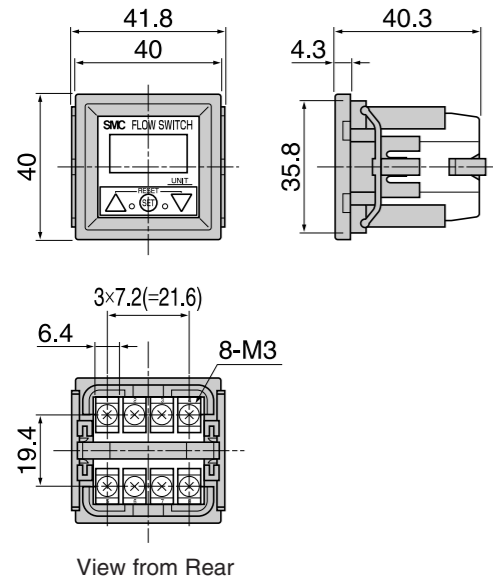
### For Pure Water or Chemical Fluid (PF2D) / For Water (PF2W)

Model	PF2D 300/301		PF2W 300/301			PF2W 330/331
Flow Rate Indication Range (*1)	0.25 to 4.5 ℓ /min	1.3 to 21.0 ℓ /min	2.5 to 45 ℓ /min	0.35 to 4.5 ℓ /min	1.7 to 17.0 ℓ /min	3.5 to 45 ℓ /min
Set Flow Rate Range (*1)	0.25 to 4.5 ℓ /min	1.3 to 21.0 ℓ /min	2.5 to 45 ℓ /min	0.35 to 4.5 ℓ /min	1.7 to 17.0 ℓ /min	3.5 to 45 ℓ /min
Minimum Set Unit (*1)	0.05 ℓ /min	0.1 ℓ /min	0.5 ℓ /min	0.05 ℓ /min	0.1 ℓ /min	0.5 ℓ /min
Flow rate conversion value (Pulse width: 50msec) (*1)	0.05 ℓ /pulse	0.1 ℓ /pulse	0.5 ℓ /pulse	0.05 ℓ /pulse	0.1 ℓ /pulse	0.5 ℓ /pulse
Unit	ℓ /min, gal(US)/min					
(*2) Integrated Flow Rate	ℓ , gal(US)					
Integrated Flow Rate Range	0 to 999999 ℓ					
Linearity	±2.5%F.S. or less		±5%F.S. or less (*3)		±3%F.S. or less (*3)	
Repeatability	±0.5%F.S. or less		±3%F.S. or less (*3)		±1%F.S. or less (*3)	
Temperature Characteristic	±1%F.S. or less (15 to 35°C, 25°C standard) ±2%F.S. or less (0 to 50°C, 25°C standard)		±5%F.S. or less (0 to 50°C, 25°C standard)		(*4)	
Current Consumption (No load)	60mA or less		50mA or less		60mA or less	
Mass (Weight)	45g					
Output Specification (*5)	Switch Output or Integrated Pulse Output	NPN Open Collector PF2D 300, PF2W 300, PF2W 330	Maximum Load Current: 80mA, Internal voltage drop: 1V or less (@ load current 80mA) Maximum Input Voltage: 30V 2 outputs			
		PNP Open Collector PF2D 301, PF2W 301, PF2W 331	Maximum Load Current: 80mA, Internal voltage drop: 1.5V or less (@ load current 80mA) 2 outputs			

Common Specification for Water / Pure Water / Chemical fluid	
Ambient Temperature Range	Operation: 0 to 50°C, storage: -25 to 85°C (No condensation or freezing)
Withstand Voltage	1000VAC, 1minute, between group of external terminals and case
Insulation Resistance	50M Ω or more (@ 500VDC M), between group of external terminals and case
Resistance to Noise	1000Vp-p pulse width 1μs, rise 1ns
Vibration proof	10 to 500Hz and amplitude 1.5mm or acceleration 98m/s <sup>2</sup> whichever is smaller, 2hours each directions of X, Y and Z respectively
Impact proof	490m/s <sup>2</sup> , 3 times each directions of X, Y and Z respectively
Displayed Digits	3 digits 7-segment LED
Operation Indicator Lamp	Lit when output is ON (OUT1): Green, (OUT2): Red
Power Supply Voltage	12 to 24VDC, ripple ±10% or less
Response Time	1sec or less
Hysteresis	Hysteresis Mode: Variable (Settable starting 0), Window Comparator mode (*6): Fixed (3digits)
Enclosure	IP40 (IEC60529)

- \*1: The flow rate indication range is corresponding to the flow rate range set up at the initialization.
- \*2: With units selection function (Without units selection function, fixed to SI units (ℓ /min or ℓ ))
- \*3: This is an overall accuracy combined with flow sensor PF2W 5\*\*.
- \*4: ±1%F.S. or less (15 to 35°C, 25°C standard), ±2%F.S. or less (0 to 50°C, 25°C standard)
- \*5: Select either to switch output or pulse output of integrated flow rate at the initialization.
- \*6: Window Comparator mode. Hysteresis (H) is fixed at 3 digits. [P\_1] and [P\_2] or [n\_1] and [n\_2], must be separated by more than 7 digits. (In case of the output OUT2, n\_1,2 becomes n\_3,4 and P\_1,2 becomes P\_3,4)
- \*7: The flow monitor conforms entirely to the CE standard.

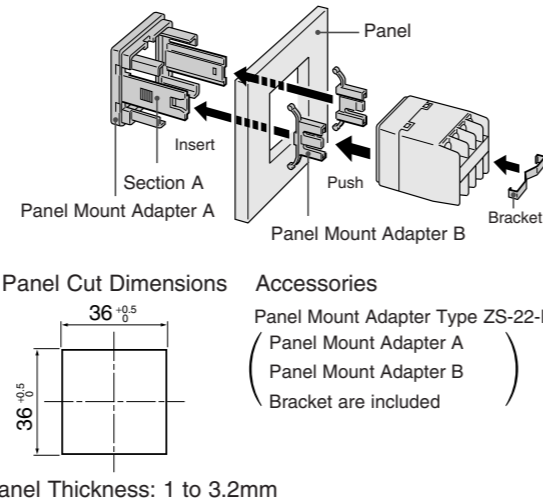
## Outline with Dimensions (in mm)



## Installation

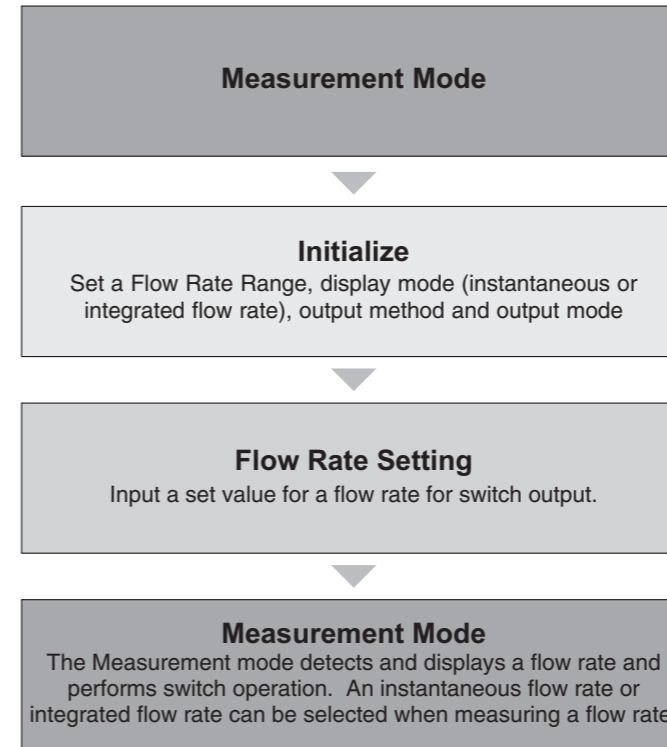
### Mounting

- Install the flow monitor into the panel, with the Panel Mount Adaptor B not fitted.
- Insert Panel Mount Adapter B supplied as an accessory into Section A of Panel Mount Adapter A. Assemble the Panel Mount Adapter B from behind until the display is fixed to the panel. The pin of Panel Mount Adapter B engages the notched part of Panel Adapter A to fix the display.
- The switch can be mounted on a panel with a thickness of 1.0 to 3.2mm.
- See the illustration below for panel cut dimensions.



## Setting

### Setting Procedures



## Initialize (continue)

### 2. Display Mode Setting

Select whether to display instantaneous flow rate or integrated flow rate. To change the Display mode, press the ▲ button and select the desired flow rate to display. Then press the SET button. [d\_1] indicates display of instantaneous flow rate and [d\_2] indicates the integrated flow rate.

### 3. Selecting Display Unit

(When [-M] is not assigned to units specification in model indication)

#### Selecting Display Unit

In case [-M] is not assigned to unit specification in model indication

Two units each in instantaneous flow rate or integrated flow rate can be selected. Pressing the ▲ or ▼ button in unit setting mode will change the units and a set value will be converted automatically. Press the SET button to set and to move to setting the output method.

Display Part	LED Display	Instantaneous Flow Rate	Integrated Flow Rate
PF2A	30*	U_1	ℓ /min
	31*	U_2	CFM× 10 <sup>-2</sup> , CFM× 10 <sup>-1</sup>
PF2D	30*	U_1	ℓ /min
		U_2	gal(us)/min
PF2W	30*	U_1	ℓ /min
	33*	U_2	gal(us)/min

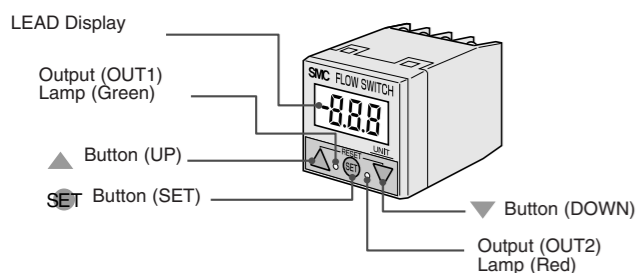
## Names and Functions of Individual Parts

### Body

- Output (OUT1) Lamp (Green):**  
Lit when OUT1 is ON. Flashes when an overcurrent error occurs.
- Output (OUT2) Lamp (Red):**  
Lit when OUT2 is ON. Flashes when an overcurrent error occurs.
- LED Display:**  
Displays the flow rate, set mode status, selected display unit and error codes.
- ▲ Button (UP):** Selects the mode and increases a set ON/OFF value.
- ▼ Button (DOWN):** Selects the mode and decreases a set ON/OFF value.
- SET Button (SET):** Changes the mode and sets a set value.

### RESET

Pressing the ▲ and ▼ buttons simultaneously will activate the RESET function. Use this function to clear errors when a problem occurs.

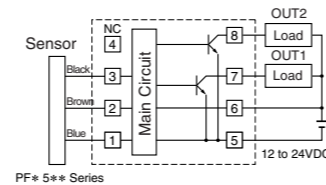


## Internal Circuit and Wiring

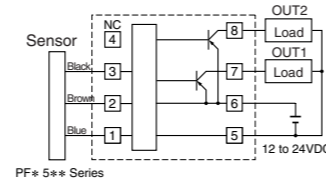
### Output Specification

Be sure to select a flow sensor from the SMC PF2\* 5\*\* series for accurate measurement of flow rates. The flow monitor outputs only switch output signals. Analog output is output directly by the flow sensor. See the operation manual of the flow sensor for further information.

-0  
NPN Open Collector Output  
2Outputs  
Max. 30V, 80mA  
Internal Voltage Drop 1V or less



-1  
PNP Open Collector Output  
2Outputs  
Max 80mA  
Internal Voltage Drop 1.5V or less



### Connection

- Turn the power off before making connection.
- Install the cable separately from the route for power cable or high-voltage cable. Otherwise, malfunction may potentially result due to noise.
- Use compression terminals for connection to the flow monitor. See the outline with dimensions diagram for details of the terminals.

## Initialize

Press and hold the SET button longer than two seconds. Release the SET button when one of the characters in the LED display column of the following table is displayed.

### 1. Flow Rate Range Setting

Select the flow rate range suitable for the sensor connected. Press the ▲ button and select the flow rate range. Press the SET button to set.

Display Part	LED Display	Sensor Part (Flow Rate Range)
PF2A	30*	10L PF2A 510 (1 to 10 ℓ /min)
		50L PF2A 550 (5 to 50 ℓ /min)
	31*	11L PF2A 511 (10 to 100 ℓ /min)
		21L PF2A 521 (20 to 200 ℓ /min)
PF2D	30*	51L PF2A 551 (50 to 500 ℓ /min)
		04d PF2D 504 (0.4 to 4 ℓ /min)
	30*	20d PF2D 520 (1.8 to 20 ℓ /min)
		40d PF2D 540 (4 to 40 ℓ /min)
PF2W	30*	04L PF2W 504 (0.5 to 4 ℓ /min)
		20L PF2W 520 (2 to 16 ℓ /min)
		40L PF2W 540 (5 to 40 ℓ /min)
	33*	11L PF2W 511 (10 to 100 ℓ /min)

### 4. Output Method Setting

Three output methods are available, namely, instantaneous switch, integrated switch and integrated pulse. The method for output to OUT1 or OUT2 is set as follows.

- 1) First, the output method for OUT1 is set.
  - \* Press the ▲ button and select the instantaneous switch, integrated switch or integrated pulse.
  - \* Press the SET button to set.
- 2) Select one output method for OUT2 from three output methods by pressing the ▲ button, as in OUT1.
  - \* Press the SET button to set.

**Initialize (continue)**

**5. Output Mode Setting**

Two output modes are available, namely, the Reverse Output mode and Non-Reverse Output mode. An output mode for OUT1 and OUT2 is set.

1)First, the output method for OUT1 is set.

\*Press the ▲ button and select the Reverse Output mode or Non-Reverse Output mode.



\*Press the SET button to set.

[1\_n] indicates the Reverse Output mode and [1\_P] indicates the Non-Reverse Output mode.



2)Select one output method for OUT2 from the Reverse Output mode and Non-Reverse Output mode by pressing the ▲ button, as in OUT1.

\*Press the SET button to set.



[2\_n] indicates the Reverse Output mode and [2\_P] indicates the Non-Reverse Output mode.



**Display Function of Integrated Flow Rate Value**

- Press the ▼ button first, then the SET button, to press both buttons simultaneously. Integration starts when [-] begins flashing.
- Lower three digits of an integrated value are always displayed. Press the ▼ button when wishing to check upper three digits.
- Pressing the ▲ button enables to display an instantaneous flow rate even during integration.
- To stop integration, press the ▼ button first, then the SET button, to press both buttons simultaneously. The display will keep the present integrated value. To clear display of an integrated value, press both the ▲ and ▼ buttons simultaneously longer than two seconds. To further continue integration from the saved value, repress the ▼ button first, then the SET button, to press both buttons simultaneously.

**Instantaneous Flow Rate Setting Mode (continue)**

5. Press the ▲ or ▼ buttons to select a desired set value. Press the ▲ button to increase the set value or the ▼ button to decrease the set value.
6. Press the SET button to set the value and to move to the setting mode for OUT2. Set the set value as in OUT1. When the Reverse Output mode is selected for the OUT2 setting in initialization, [n\_3] or [n\_4] and the set value will be displayed alternately. When the Non-Reverse Output mode is selected in initialization, [P\_3] or [P\_4] and the set value will be displayed alternately.
7. Completing settings for [n\_1] to [n\_4] ([P\_1] to [P\_4] in the Non-Reverse Output mode) will finish flow rate setting and the mode will return to the Measurement mode.

**Integrated Flow Rate Setting Mode**

- The switch is set to an integrated flow rate. or
  - Integrated flow rate is displayed by switching lower three digits and upper three digits. Settings are made also by dividing into lower three digits and upper three digits.
1. Press and hold the SET button and release when [F\_1] or [F\_3] is displayed. Proceed to Step 3. if [F\_3] is displayed. ([F\_1] will be displayed when the instantaneous switch has been selected for any switch output in initialization. In other cases, [F\_3] will be displayed.)
  2. When [F\_1] is displayed, push the ▲ button till the display shows [F\_3]. The subsequent setting operation will be the same as that when [F\_3] is displayed. Set as follows.
  3. Set as follows if [F\_3] is displayed.
    - 1) Press the SET button and display the lower three digits of the integrated flow rate of OUT1.
    - 2) Press the ▲ or ▼ buttons and adjust the set value to the desired value.
    - 3) Press the SET button to set. The upper three digits of OUT1 will be displayed.
    - 4) Press the ▲ or ▼ buttons and adjust the set value to the desired value.
    - 5) Press the SET button to set. The lower three digits of OUT2 will be displayed.
    - 6) Press the ▲ or ▼ buttons and adjust the set value to the desired value.
    - 7) Press the SET button to set. The upper three digits of OUT2 will be displayed.
    - 8) Press the ▲ or ▼ buttons and adjust the set value to the desired value.
    - 9) Press the SET button to finish setting the integrated flow rate and the mode will return to the Measurement mode.

**Selecting Flow rate Display Unit**

(Only for PF2A3\*\* for Air)

Either units in normal condition or standard condition (ANR) can be selected.

Normal condition: 0°C/ 101.3kPa  
Standard condition: 20°C/ 101.3kPa/ 65%RH

Press the ▲ button and select the display unit, then press the SET button to set. [nor] indicates Normal condition and [Anr] indicates Standard condition.



When normal condition is selected the indicator shown in right illustration will be lit.



**Instantaneous Flow Rate Setting Mode**

Manually set an actuation value of the instantaneous-value switch in case the instantaneous switch is selected in initialization. The output method is also set in accordance with the set value. Set the output method while referring to the output method described later in this manual.

1. Press and hold the SET button and release when [F-1] is displayed.
2. Press the SET button to input a set value in [n\_1] (P\_1 in the Non-Reverse Output mode) for OUT1. When the Reverse Output mode is selected in initialization, [n\_1] and the set value will be displayed alternately. (When the Non-Reverse Output mode is selected in initialization, [P\_1] and the set value will be displayed alternately.)
3. Press the ▲ or ▼ buttons to select a desired set value. Press the ▲ button to increase the set value or the ▼ button to decrease the set value.
4. Press the SET button to set the value and to move to the setting mode for [n\_2] (P\_2 in the Non-Reverse Output mode). When the Reverse Output mode is selected in initialization, [n\_2] and the set value will be displayed alternately. (When the Non-Reverse Output mode is selected in initialization, [P\_2] and the set value will be displayed alternately.)

**Auto Presetting**

The flow rate flowing through the flow switch will be set as a reference value and a Hysteresis (H) will be set automatically at a value 3digits lower when setting auto preset input.

The output method for setting by auto presetting is only hysteresis mode.

1. Press and hold the SET button and release when [F\_1] is displayed.
2. Press the ▲ button and change [F\_1] in the display to [F\_2].
3. Press the SET button and set the auto preset state of OUT1. The display will change to show [AP1]. (When OUT1 setting is not needed, press the ▲ and ▼ button simultaneously.)
4. Prepare the equipment to set the flow rate of OUT1 and flow fluid at the required flow rate through the flow sensor.
5. Pressing the SET button will automatically read the flow rate. A value 3digits lower will be set automatically as a Hysteresis (H). The display will show [A1L] and the set value alternately.
6. Press the SET button to set and move to auto preset state of OUT2. The display will change to show [AP2]. (When OUT2 setting is not needed, press the ▲ and ▼ buttons simultaneously.)
7. Prepare the equipment to set the flow rate of OUT2 and flow fluid at the required flow rate through the flow sensor.
8. Pressing the SET button will automatically read the flow rate. A value 3digits lower will be set automatically as a Hysteresis (H). The display will show [A2L] and the set value alternately.
9. Press the SET button to finish the Auto Presetting mode and the mode will return to the Measurement mode.

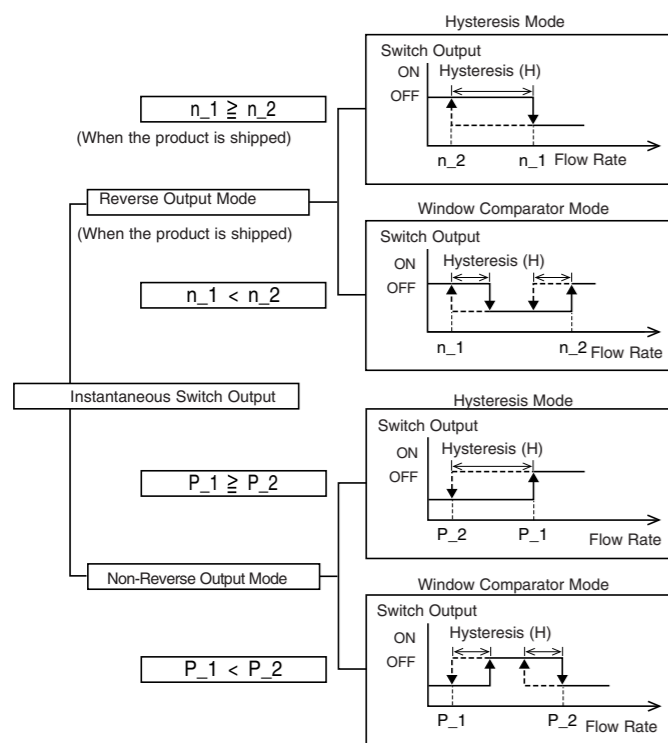
**Output Selection**

**Instantaneous Switch Output Method**

Four output methods can be selected by selecting an output mode and by combining large and small set values of OUT1 and OUT2. One of these four output methods can be selected for each output.

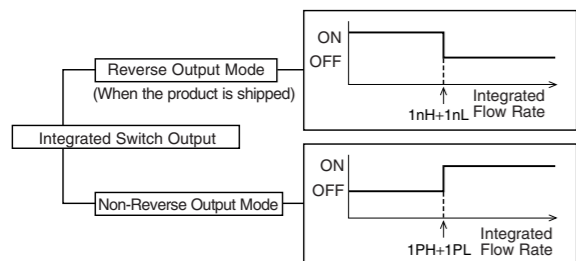
- OUT1 and OUT2 can be set independently.
- The minimum flow rate conversion set unit will be 1 digit. Refer to the specification for the set flow rate units.
- When setting in the Auto Presetting mode, the Hysteresis mode will be set automatically. Hysteresis in this case will be 3 digits fixed.
- In the Window Comparator mode, leave between [P\_1] and [P\_2] or between [n\_1] and [n\_2] a value of more than 7 digits.
- The following is given using OUT1 as an example. The descriptions for OUT2 are the same as those for OUT1, under the conditions that [n\_1] and [n\_2] should be replaced by [n\_3] and [n\_4] and [P\_1] and [P\_2] should be replaced by [P\_3] and [P\_4].

**Output Selection (continue)**



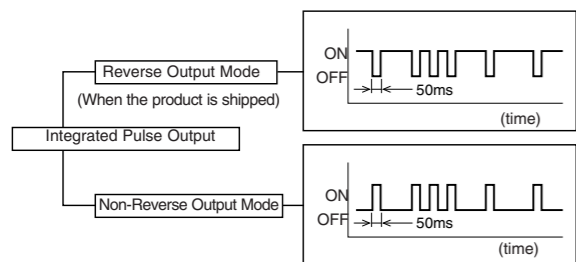
**Integrated Switch Output**

- Two output methods can be selected by selecting an output mode. One of these two output methods can be selected for each output.
- OUT1 and OUT2 can be set independently.
- The following is given using OUT1 as an example. The descriptions for OUT2 are the same as those for OUT1, under the conditions that 1nL and 1nH should be replaced by 2nL and 2nH and 1PL and 1PH should be replaced by 2PL and 2PH.



**Integrated Pulse Output**

- Pulse output for integrated flow rate measurement.



**Other Functions**

**Key Lock Function**

This function prevents errors such as changing a set value by mistake.

**Lock**

- Press and hold the **SET** button longer than three seconds. The display will change to show [F\_1] → [\*\*\*] → [unL]. Release the button when [unL] is displayed. [\*\*\*]: Refer to the LED display column in the table (Initialize section)
- Press the **▲** button to set the display to [Loc]
- Press the **SET** button to set and return to the Measurement mode.

**Unlock**

- Press and hold the **SET** button longer than three seconds. Release the button when [Loc] is displayed.
- Press the **▲** button to change the display to [unL]
- Press the **SET** button to set and return to the Measurement mode.

**Error Display and Troubleshooting**

In case an error occurs, take the following actions:

LED Display	Error Nature	Troubleshooting
Er 1	A current exceeding 80mA is flowing to OUT1.	Turn the power off. Check the load and wiring of OUT1.
Er 2	A current exceeding 80mA is flowing to OUT2.	Turn the power off. Check the load and wiring of OUT2.
Er 4	Set data has been changed due to an unknown reason.	Reset and return the settings to those that were set when the equipment was delivered to you. If the settings cannot be reset to those that were set when the equipment was shipped, your equipment has to be examined by SMC.
- - -	A fluid is flowing at a flow rate higher than the rated value.	Reduce the flow below the rated value. Error display will automatically be reset when the flow reduces to below the rated value.

To reset display of Error 1, 2 or 4, press the **▲** and **▼** buttons simultaneously.

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