3-Color Display

Digital Flow Switch for Large Flow

**Applicable fluid**: Air, N₂

- **Flow range**: Max. 12000 L/min
- **Flow ratio** *¹ 100:1
- **Wide range of flow measurement with one product**

*¹ The flow ratio is 20:1 for the current model (PF2A7□H/Large flow type).

<table>
<thead>
<tr>
<th>Port size</th>
<th>Applicable flow range [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF3A703H</td>
<td>30 3000 L type 3000</td>
</tr>
<tr>
<td>PF3A706H</td>
<td>60 6000 L type 6000</td>
</tr>
<tr>
<td>PF3A712H</td>
<td>120 12000 L type 12000</td>
</tr>
</tbody>
</table>

- **Improved drainage and resistance to foreign matter**

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

- **Pressure loss**: 75% reduction *¹

  (20 kPa → 5 kPa)

*¹ Compared with the current model (PF2A7□H/Large flow type).

- **Through bore construction**

  Reduced pressure loss
  Maintenance-free fluid passage

**PF3A7□H Series**
3-Color Display Digital Flow Switch for Large Flow PF3A7□H Series

- **3-color/2-screen display**
  
  + 2-screen display: 2-row display of main screen and sub screen

  **Upper Main display:** [Green At set point](#)

<table>
<thead>
<tr>
<th>Set value</th>
<th>Instantaneous flow rate</th>
<th>Accumulated value</th>
<th>Peak/Bottom value</th>
<th>Line name</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Lower Sub display)</td>
<td>(Upper Main display)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

  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.

- **Smallest settable increment:** 2 L/min

  Current model (PF2A7□H/Large flow type): 5 L/min

- **Grease-free**

- **Display rotates 90° and can be reversed.**

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

- **Installation Example**

  **Installation Example**

  - **Reversed display OFF**
  - **Reversed display ON**

  (Can be set with the "Reversible display mode.")
Flow control of equipment, main line, and branch line

Remote control is possible with accumulated pulse.

Multi-counter CEUS

For details, refer to the Web Catalog.

3-Color Display Digital Flow Switch for Large Flow PF3A7 □ H Series

Functions (Refer to pages 20 and 21 for details.)

- Output operation
- Simple setting mode
- Display color
- Reference condition
- Response time
- FUNC output switching function
  (Analog output ⇔ External input)
- Selectable Analog output function
- External input function
- Forced output function
- Accumulated value hold
- Peak/Bottom value display
- Display OFF mode
- Setting of security code
- Keylock function
- Reset to the default settings
- Reversible display mode
- Zero cut function
- Selection of display on sub screen
- Analog output free range function
- Error display function

Application

Flow control of equipment, main line, and branch line

Remote control is possible with accumulated pulse.

Digital flow switch to save energy!

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-color/2-screen display, Improved visibility
- Remote control is possible with accumulated pulse.

Energy Saving Program

For details, refer to the SMC website.

http://www.smcworld.com

SMC Model Selection Software Search

Energy Saving Program

Allows you to perform various calculations necessary to improve the pneumatic energy saving.

Version: 4.1.02 2017/01/31 Update

Download the program

Ver:4.1.02 2017/01/31 Update

How to install

For details, refer to the SMC website.
3-Screen Display  Digital Flow Monitor
PFG300 Series  p.14

Allows for the Monitoring of Remote Lines

Visualization of Settings

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

Push or button to adjust to the set value.

End

Easy Screen Switching

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

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.

* Either “Input of line name” or “Display OFF” can be added via the function settings.
NPN/PNP Switch Function

Analog output of 0 to 10 V is also available.

<table>
<thead>
<tr>
<th>Voltage output</th>
<th>1 to 5 V</th>
<th>Switchable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current output</td>
<td>0 to 10 V</td>
<td>Fixed</td>
</tr>
<tr>
<td>Current output</td>
<td>4 to 20 mA</td>
<td>Fixed</td>
</tr>
</tbody>
</table>

Convenient Functions

- **Copy function**
  - The settings of the master monitor can be copied to the slave monitors.

- **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.

<table>
<thead>
<tr>
<th>Current consumption</th>
<th>Reduction rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mA or less</td>
<td>Approx. 50% reduction</td>
</tr>
</tbody>
</table>

  - 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 color
- Delay time setting
- Digital filter setting
- FUNC output switching function
- Selectable analog output function
- External input function
- Forced output function
- Accumulated value hold
- Peak/Bottom value display
- Setting of security code
- Keylock function
- Reset to the default settings
- Display with zero cut-off setting
- Selection of display on sub screen
- Analog 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

Mounting example

Panel mount

Mountable side by side both vertically and horizontally

One opening!

- Reduced panel fitting labor
- Space saving
### Flow Switch Flow Rate Variations

<table>
<thead>
<tr>
<th>Series</th>
<th>Applicable fluid</th>
<th>Detection method</th>
<th>Rated flow range (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF2A</td>
<td>Air, N₂, CO₂</td>
<td>Thermal type (MEMS)</td>
<td>0.5 L/min: 50, 1 L/min: 100, 2 L/min: 200, 5 L/min: 500, 10 L/min: 1200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thermal type (Thermistor)</td>
<td>0.1 L/min: 10, 0.5 L/min: 50, 1 L/min: 100, 2 L/min: 200, 5 L/min: 500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bypass flow type</td>
<td>2 L/min: 300, 5 L/min: 600, 10 L/min: 1200</td>
</tr>
<tr>
<td>PF3A7H</td>
<td>Air, N₂</td>
<td>Thermal type (MEMS)</td>
<td>0.01 L/min: 10, 0.1 L/min: 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thermal type (Platinum sensor)</td>
<td>1 L/min: 500, 2 L/min: 1000, 5 L/min: 2000, 10 L/min: 4000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bypass flow type</td>
<td>2 L/min: 200, 5 L/min: 500, 10 L/min: 1000, 20 L/min: 2000</td>
</tr>
<tr>
<td>PFM</td>
<td>Dry air, N₂, Ar</td>
<td>Thermal type (MEMS)</td>
<td>0.5 L/min: 25, 1 L/min: 50, 2 L/min: 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bypass flow type</td>
<td>5 L/min: 500, 10 L/min: 1000, 20 L/min: 2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20 2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20 2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 3000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>60 6000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120 12000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>600</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12000</td>
</tr>
</tbody>
</table>

### Availability of the digital flow monitor PFG300

- PFG300: Page 9
- PFG300: Page 14

### Detection method

- Thermal type (MEMS)
- Thermal type (Thermistor)
- Thermal type (Platinum sensor)
- Bypass flow type

### Rated flow range (L/min)

- 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 300, 500, 1000, 2000, 3000, 6000, 12000

### Digital flow monitor PFG300

- PFMV: Page 106
- PFG300: Page 106

### PFG300

- PF2A: Page 106
- PF3A7H: Page 106
- PFM: Page 106
- PFMB: Page 106
- PFMC: Page 106
- PFMV: Page 106
<table>
<thead>
<tr>
<th>Series</th>
<th>PFMV</th>
<th>PFM</th>
<th>PFMB</th>
<th>PFMC</th>
<th>PF2A</th>
<th>PF3A7H</th>
</tr>
</thead>
<tbody>
<tr>
<td>MONITOR UNIT</td>
<td>PFMV3</td>
<td>PFM</td>
<td>PFG300</td>
<td>PFG300</td>
<td>Monitor unit: IP40</td>
<td>Monitor unit: IP40</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP40</td>
<td>IP40</td>
<td>IP40</td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
</tr>
<tr>
<td>Fluid</td>
<td>Dry air, N₂</td>
<td>Dry air, N₂, Ar, CO₂</td>
<td>Dry air, N₂</td>
<td>Dry air, N₂</td>
<td>Air, N₂</td>
<td>Air, N₂</td>
</tr>
<tr>
<td>Setting</td>
<td>Digital</td>
<td>Digital</td>
<td>Digital</td>
<td>Digital</td>
<td>Digital</td>
<td>Digital</td>
</tr>
<tr>
<td>Rated flow range</td>
<td>0 to 0.5 L/min</td>
<td>0 to 1 L/min</td>
<td>0.2 to 10 L/min</td>
<td>5 to 500 L/min</td>
<td>1 to 10 L/min</td>
<td>30 to 3000 L/min</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>12 to 24 VDC ±10%</td>
<td>24 VDC ±10%</td>
<td>12 to 24 VDC ±10%</td>
<td>12 to 24 VDC ±10%</td>
<td>12 to 24 VDC ±10%</td>
<td>24 VDC ±10%</td>
</tr>
<tr>
<td>Temperature characteristics (0 to 50°C)</td>
<td>±2% F.S. (15 to 35°C)</td>
<td>±5% F.S. (0 to 50°C)</td>
<td>±2% F.S. (15 to 35°C)</td>
<td>±5% F.S. (0 to 50°C)</td>
<td>±2% F.S. (15 to 35°C)</td>
<td>±5% F.S. (0 to 50°C)</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±1% F.S. (Fluid: Dry air)</td>
<td>Analog output: ±2% F.S.</td>
<td>±1% F.S. (Fluid: Dry air)</td>
<td>Analog output: ±2% F.S.</td>
<td>Monitor unit: IP40</td>
<td>Monitor unit: IP40</td>
</tr>
<tr>
<td>Window comparator mode: Variable</td>
<td>Window comparator mode: Variable</td>
<td>Window comparator mode: Variable</td>
<td>Window comparator mode: Variable</td>
<td>Window comparator mode: Variable</td>
<td>Window comparator mode: Variable</td>
<td>Window comparator mode: Variable</td>
</tr>
<tr>
<td>Output</td>
<td>NPN/PNP open collector</td>
<td>NPN/PNP open collector</td>
<td>NPN/PNP open collector</td>
<td>NPN/PNP open collector</td>
<td>NPN/PNP open collector</td>
<td>NPN/PNP open collector</td>
</tr>
<tr>
<td></td>
<td>Analog voltage output</td>
<td>Analog voltage output</td>
<td>Analog voltage output</td>
<td>Analog voltage output</td>
<td>Analog voltage output</td>
<td>Analog voltage output</td>
</tr>
<tr>
<td></td>
<td>Analog current output</td>
<td>Analog current output</td>
<td>Analog current output</td>
<td>Analog current output</td>
<td>Analog current output</td>
<td>Analog current output</td>
</tr>
<tr>
<td>Display</td>
<td>2-color LED display</td>
<td>2-color LCD display</td>
<td>3-color LCD display</td>
<td>LED display</td>
<td>3-color LCD display</td>
<td></td>
</tr>
</tbody>
</table>

* The monitor unit shows the PFG300 and PFMV3.
CONTENTS

3-Color Display  Digital Flow Switch for Large Flow PF3A7□H Series
3-Screen Display  Digital Flow Monitor PFG300 Series

3-Color Display  Digital Flow Switch for Large Flow PF3A7□H Series
How to Order ................................................................. p. 9
Specifications ................................................................. p. 10
Flow Range ................................................................. p. 11
Analog Output ............................................................... p. 11
Pressure Loss ............................................................... p. 11
IN Side Straight Section and Accuracy ............................. p. 12
Internal Circuits and Wiring Examples .............................. p. 12
Construction: Parts in Contact with Fluid ......................... p. 13
Dimensions ................................................................. p. 13

3-Screen Display  Digital Flow Monitor PFG300 Series
How to Order ................................................................. p. 14
Specifications ................................................................. p. 15
Internal Circuits and Wiring Examples .............................. p. 16
Dimensions ................................................................. p. 17
PF3A7□H/Function Details ............................................... p. 20
PFG300/Function Details ................................................ p. 22
Safety Instructions ........................................................ Back Cover
3-Color Display
Digital Flow Switch for Large Flow
PF3A7□H Series

How to Order

PF3A7□H

Type
- 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
- Nil
- Rc
- N
- NPT
- F
- G

Port size

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>Rated flow range</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1</td>
<td>03 06 12</td>
</tr>
<tr>
<td>14</td>
<td>1 1/2</td>
<td>— 06 12</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>— — 12</td>
</tr>
</tbody>
</table>

Output specification

<table>
<thead>
<tr>
<th>Symbol</th>
<th>OUT</th>
<th>FUNC</th>
<th>Applicable monitor unit model</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>NPN</td>
<td>Analog voltage output ⇔ External input</td>
<td>PF3G300 series</td>
</tr>
<tr>
<td>DS</td>
<td>NPN</td>
<td>Analog current output ⇒ External input</td>
<td>PF3G310 series</td>
</tr>
<tr>
<td>ES</td>
<td>PNP</td>
<td>Analog voltage output ⇔ External input</td>
<td>PF3G300 series</td>
</tr>
<tr>
<td>FS</td>
<td>PNP</td>
<td>Analog current output ⇒ External input</td>
<td>PF3G310 series</td>
</tr>
</tbody>
</table>

Option

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

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Option</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-37-A</td>
<td>Lead wire and M12 connector</td>
<td>Length: 3 m</td>
</tr>
</tbody>
</table>
Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>PF3A703H</th>
<th>PF3A706H</th>
<th>PF3A712H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Applicable fluid(^1)</td>
<td>Air, Nitrogen</td>
<td>Air, Nitrogen</td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>0 to 50°C</td>
<td>0 to 50°C</td>
<td>0 to 50°C</td>
</tr>
<tr>
<td>Detection method</td>
<td>Thermal type</td>
<td>Thermal type</td>
<td>Thermal type</td>
</tr>
<tr>
<td>Rated flow range</td>
<td>30 to 3000 L/min</td>
<td>60 to 6000 L/min</td>
<td>120 to 12000 L/min</td>
</tr>
<tr>
<td>Set point range</td>
<td>30 to 3150 L/min</td>
<td>60 to 6300 L/min</td>
<td>120 to 12600 L/min</td>
</tr>
<tr>
<td>Smallest settable</td>
<td>0 to 999,999,999,990 L</td>
<td>0 to 999,999,999,990 L</td>
<td>0 to 999,999,999,990 L</td>
</tr>
<tr>
<td>Accumulated volume per pulse (Pulse width = 50 ms)</td>
<td>Select from 100 L/pulse or 1000 L/pulse.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accumulated value hold function (^6)</td>
<td>Interval of 2 or 5 minutes can be selected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>Rated pressure range</td>
<td>0.1 to 1.5 MPa</td>
<td>0.1 to 1.5 MPa</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>24 VDC ±10%</td>
<td>24 VDC ±10%</td>
<td>24 VDC ±10%</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Current consumption</td>
<td>150 mA or less</td>
<td>150 mA or less</td>
</tr>
<tr>
<td>Power consumption</td>
<td>1000 VAC for 1 minute between terminals and housing</td>
<td>1000 VAC for 1 minute between terminals and housing</td>
<td>1000 VAC for 1 minute between terminals and housing</td>
</tr>
<tr>
<td>Environment</td>
<td>Piping specification</td>
<td>R1c, NPT1, G1</td>
<td>R1c 1/2, NPT1 1/2, G1 1/2</td>
</tr>
<tr>
<td>Main materials of parts in contact with fluid</td>
<td>Aluminum alloy, PPS, HNBR</td>
<td>Aluminum alloy, PPS, HNBR</td>
<td>Aluminum alloy, PPS, HNBR</td>
</tr>
<tr>
<td>Lead wire with connector</td>
<td>3 m</td>
<td>3 m</td>
<td>3 m</td>
</tr>
<tr>
<td>Weight</td>
<td>Piping specification</td>
<td>R610 g, NPT610 g</td>
<td>R610 g, NPT610 g</td>
</tr>
<tr>
<td>Lead wire with connector</td>
<td>±10 g</td>
<td>±10 g</td>
<td>±10 g</td>
</tr>
</tbody>
</table>

\(^1\)Air quality grade is JIS B 8392-1:2012 [3.6-1] and ISO 8573-1:2010 [3.6-1].

\(^6\)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.

For flow switch precautions and specific product precautions, refer to the “Operation Manual” on the SMC website. Click here for details.
Flow Range

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum value of rated flow range</th>
<th>Maximum value of rated flow range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF3A703H</td>
<td>30 L/min</td>
<td>3000 L/min</td>
</tr>
<tr>
<td></td>
<td>0 L/min</td>
<td>3150 L/min</td>
</tr>
<tr>
<td>PF3A706H</td>
<td>60 L/min</td>
<td>6000 L/min</td>
</tr>
<tr>
<td></td>
<td>0 L/min</td>
<td>6300 L/min</td>
</tr>
<tr>
<td>PF3A712H</td>
<td>120 L/min</td>
<td>12000 L/min</td>
</tr>
<tr>
<td></td>
<td>0 L/min</td>
<td>12600 L/min</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage output (1 to 5 V)</th>
<th>Current output (4 to 20 mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 V</td>
<td>4 mA</td>
</tr>
<tr>
<td>1.04 V</td>
<td>4.16 mA</td>
</tr>
<tr>
<td>5 V</td>
<td>20 mA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage output (0 to 10 V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 V</td>
</tr>
<tr>
<td>0.1 V</td>
</tr>
<tr>
<td>10 V</td>
</tr>
</tbody>
</table>

Analog Output

Flow/Analog Output

<table>
<thead>
<tr>
<th>0 L/min</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage output (1 to 5 V)</td>
<td>1 V</td>
<td>1.04 V</td>
</tr>
<tr>
<td>Current output (4 to 20 mA)</td>
<td>4 mA</td>
<td>4.16 mA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>0 L/min</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage output (0 to 10 V)</td>
<td>0 V</td>
<td>0.1 V</td>
</tr>
</tbody>
</table>

Pressure Loss (Reference Data)

PF3A703H (for 3000 L/min)

PF3A706H (for 6000 L/min)

PF3A712H (for 12000 L/min)
IN Side Straight Section and Accuracy (Reference Data)

PF3A703H (for 3000 L/min)

- With ø1/2" connected
- With ø3/4" connected
- Elbow piping (1")

PF3A706H (for 6000 L/min)

- With ø1" connected
- With ø1 1/4" connected
- Elbow piping (1 1/2")

PF3A712H (for 12000 L/min)

- With ø1 1/4" connected
- Elbow piping (2")

Accuracy [%F.S.]

<table>
<thead>
<tr>
<th>Straight section [d]</th>
<th>0%</th>
<th>±2%</th>
<th>±3%</th>
<th>±4%</th>
<th>±5%</th>
<th>±6%</th>
<th>±7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Do not connect equipment or piping which may generate a fluctuation in the flow or drift at the IN side of the product. When installing a regulator at the IN side of the product, make sure that hunting 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.
- *Straight section* means a section of piping without any bends or rapid changes in the cross sectional area.

Internal Circuits and Wiring Examples

NPN + Analog output selected

PF3A703H-H-SS/DS-.....

Max. applied voltage: 28 V, Max. load current: 80 mA, Internal voltage drop: 1 V or less
CS: Analog output: 1 to 5 V or 0 to 10 V
Output impedance: 1 kΩ
DS: Analog output: 4 to 20 mA
Max. load impedance: 600 Ω
Min. load impedance: 50 Ω

NPN + External input selected

PF3A703H-H-SS/DS-.....

Max. applied voltage: 28 V, Max. load current: 80 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 + Analog output selected

PF3A703H-H-SS/DS-.....

Max. load current: 80 mA, Internal voltage drop: 2 V or less
ES: Analog output: 1 to 5 V or 0 to 10 V
Output impedance: 1 kΩ
FS: Analog output: 4 to 20 mA
Max. load impedance: 600 Ω
Min. load impedance: 50 Ω

PNP + External input selected

PF3A703H-H-SS/DS-.....

Max. load current: 80 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

PF3A703H-H-SS/DS-.....

Max. 20 V, 80 mA

Brown DC(+)
Black OUT
White Analog output
Blue DC(-)

0 V ——— 50 ms or ——— 50 ms

Digital Flow Switch for Large Flow PF3A7□□□"H Series
Construction: Parts in Contact with Fluid

PF3A703H/706H/712H

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>2</td>
<td>Branch passage</td>
<td>PPS</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Gasket</td>
<td>HNBR</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sensor base</td>
<td>PPS</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Gasket</td>
<td>HNBR</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Sensor</td>
<td>Au, Pt, Al2O3</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions

Lead wire and M12 connector

(Part no.: ZS-37-A)

Cable Specifications

<table>
<thead>
<tr>
<th>Conductor</th>
<th>Nominal cross section</th>
<th>AWG23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>Outside diameter</td>
<td>Approx. 1.1 mm</td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td>Brown, Blue, Black, White</td>
</tr>
<tr>
<td>Sheath</td>
<td>Finished outside diameter</td>
<td>ø4</td>
</tr>
</tbody>
</table>

1: Brown  2: White  3: Blue  4: Black  

Pin no.  Pin name  Wire color
1  DC(+)  Brown
2  FUNC  White
3  DC(−)  Blue
4  OUT  Black

* 4-wire type lead wire and M12 connector used for the PF3A series.
3-Screen Display
Digital Flow Monitor
PFG300 Series

How to Order

PFG 300 - RT - M - L

Type
3 Remote type monitor unit

Input specification

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Applicable flow switch model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Voltage input</td>
<td>PF3A7_H-CS/ES series</td>
</tr>
<tr>
<td>1</td>
<td>Current input</td>
<td>PF3A7_H-DS/FS series</td>
</tr>
</tbody>
</table>

Output specification

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Applicable flow switch model</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT</td>
<td>2 outputs (NPN/PNP switching type) + Analog voltage output(^1,2)</td>
<td>PF3A7_H-CS/ES series</td>
</tr>
<tr>
<td>SV</td>
<td>2 outputs (NPN/PNP switching type) + Analog current output(^3)</td>
<td>PF3A7_H-DS/FS series</td>
</tr>
<tr>
<td>XY</td>
<td>2 outputs (NPN/PNP switching type) + Copy function</td>
<td>PF3A7_H-CS/ES series</td>
</tr>
</tbody>
</table>

Unit specification

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Units selection function(^1,2)</td>
</tr>
<tr>
<td>Nil</td>
<td>Without lead wire</td>
</tr>
</tbody>
</table>

Unit specification

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Power supply/output connection lead wire (Lead wire length: 2 m)</td>
</tr>
</tbody>
</table>

Output specification

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT</td>
<td>2 outputs (NPN/PNP switching type) + Analog voltage output(^1,2)</td>
</tr>
<tr>
<td>SV</td>
<td>2 outputs (NPN/PNP switching type) + Analog current output(^3)</td>
</tr>
<tr>
<td>XY</td>
<td>2 outputs (NPN/PNP switching type) + Copy function</td>
</tr>
</tbody>
</table>

Unit specification

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<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Units selection function(^1,2)</td>
</tr>
<tr>
<td>Nil</td>
<td>Without lead wire</td>
</tr>
</tbody>
</table>

Output specification

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT</td>
<td>2 outputs (NPN/PNP switching type) + Analog voltage output(^1,2)</td>
</tr>
<tr>
<td>SV</td>
<td>2 outputs (NPN/PNP switching type) + Analog current output(^3)</td>
</tr>
<tr>
<td>XY</td>
<td>2 outputs (NPN/PNP switching type) + Copy function</td>
</tr>
</tbody>
</table>

Unit specification

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Units selection function(^1,2)</td>
</tr>
<tr>
<td>Nil</td>
<td>Without lead wire</td>
</tr>
</tbody>
</table>

Options/Part Nos.
When only optional parts are required, order with the part numbers listed below.

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Option</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-28-CA-4</td>
<td>Sensor connector</td>
<td>For PF3A7_H</td>
</tr>
<tr>
<td>ZS-46-A1</td>
<td>Bracket A</td>
<td>Tapping screw: Nominal size 3 x 8 L (2 pcs.)</td>
</tr>
<tr>
<td>ZS-46-A2</td>
<td>Bracket B</td>
<td>Tapping screw: Nominal size 3 x 8 L (2 pcs.)</td>
</tr>
<tr>
<td>ZS-46-B</td>
<td>Panel mount adapter</td>
<td></td>
</tr>
<tr>
<td>ZS-46-D</td>
<td>Panel mount adapter + Front protection cover</td>
<td></td>
</tr>
<tr>
<td>ZS-46-5L</td>
<td>Power supply/output connection lead wire</td>
<td>5-core, 2 m</td>
</tr>
<tr>
<td>ZS-27-01</td>
<td>Front protection cover</td>
<td></td>
</tr>
</tbody>
</table>

Connection Example

PF3A7\_H
Lead wire and M12 connector (Option for PF3A7\_H)

Sensor connector

PFG300
Power supply/output connection lead wire

Sensor connector

PFG300
Power supply/output connection lead wire
### Specifications

<table>
<thead>
<tr>
<th>Applicable SMC flow switch</th>
<th>PFG300 series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>PFG3A703H</td>
</tr>
<tr>
<td>Rated flow range</td>
<td>30 to 3000 L/min</td>
</tr>
<tr>
<td></td>
<td>PFG3A706H</td>
</tr>
<tr>
<td></td>
<td>60 to 6000 L/min</td>
</tr>
<tr>
<td></td>
<td>PFG3A712H</td>
</tr>
<tr>
<td></td>
<td>120 to 12000 L/min</td>
</tr>
</tbody>
</table>

#### Flow

<table>
<thead>
<tr>
<th>Set point range</th>
<th>Accumulated flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instantaneous flow</td>
<td>~150 to 3150 L/min</td>
</tr>
<tr>
<td>Accumulated flow</td>
<td>0 to 999,999,999,990 L</td>
</tr>
<tr>
<td>Instantaneous flow</td>
<td>~300 to 6300 L/min</td>
</tr>
<tr>
<td>Accumulated flow</td>
<td>0 to 999,999,999,990 L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smallest settable increment</th>
<th>Accumulated flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instantaneous flow</td>
<td>2 L/min</td>
</tr>
<tr>
<td>Accumulated flow</td>
<td>5 L/min</td>
</tr>
<tr>
<td>Instantaneous flow</td>
<td>10 L</td>
</tr>
<tr>
<td>Accumulated flow</td>
<td>100 L</td>
</tr>
</tbody>
</table>

#### Electrical

- **Power supply voltage**: 12 to 24 VDC ±10% (24 VDC when the PFG3A7H is connected)
- **Current consumption**: 25 mA or less
- **Protection**: Polarity protection

#### Accuracy

- **Accuracy**: ±0.5% F.S. ± Minimum display unit (Ambient temperature of 25°C)
- **Analog output accuracy**: ±0.5% F.S. (Ambient temperature of 25°C)
- **Repeatability**: ±0.1% F.S. ± Minimum display unit

#### 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.

#### Analog output

- **Output type**: Voltage output: 1 to 5 V, 0 to 10 V (only when the power supply voltage is 24 VDC)
- **Impedance**: 
  - Voltage output: 1 kΩ
  - Current output: Maximum load impedance: 300 Ω (at power supply output of 12 V), 600 Ω (at power supply voltage of 24 VDC)

#### External input

- **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 kΩ), Current input: 4 to 20 mA DC (Input impedance: 51 Ω)
- **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: L/min, cfm (ft³/min)
  - Display range: ~150 to 3150 L/min to 0 to 999,999,999,990 L
  - Minimum display unit: 2 L/min to 10 L
- **Display**: LCD
- **Number of displays**: 3-screen display (Main screen, Sub screen)
- **Display color**: 1) Main screen: Red/Green, 2) Sub screen: Orange
- **Number of display digits**: 5 digits (7 segments)
- **Indicator LED**: LED ON when switch output is ON, OUT1/2: Orange

#### Digital filter

- **5 ms or less**
- **Variable from 0 to 999,999,999,900 L**
- **Accumulated value hold function**: Intervals of 2 or 5 minutes can be selected. The stored accumulated flow is held even when the power supply is OFF.

#### Environment

- **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/Storage: 25% to 85% RH (No condensation or freezing)

#### Standards

- **CE, RoHS**

#### 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 × 1.5 million = 7.5 million min = 14.3 years
   - 2 min interval: life is calculated as 2 min × 1.5 million = 3 million min = 5.7 years
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 analog 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 10³ lights up.
10. Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.
Internal Circuits and Wiring Examples

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

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

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

Accumulated pulse output wiring examples

NPN (2 outputs) type

PNP (2 outputs) type
Bracket A  
(Part no.: ZS-46-A1)

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)

Cable Specifications

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC (+)</td>
</tr>
<tr>
<td>2</td>
<td>N.C.</td>
</tr>
<tr>
<td>3</td>
<td>DC (-)</td>
</tr>
<tr>
<td>4</td>
<td>IN*</td>
</tr>
</tbody>
</table>

* 1 to 5 V or 4 to 20 mA

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

**Individual mounting**

```
31 ± 0.4
31 ± 0.4
31 ± 0.4
4 x R2 or less
```

**Multiple (2 pcs. or more) secure mounting**

*Horizontal*

```
31 x n pcs. + 3.5 x (n pcs. - 1)
```

*Vertical*

```
3 x n pcs. x 3.5 x (n pcs. - 1)
```

**Panel mount example**

*Horizontal*

Panel mount example

*Vertical*

Panel mount example
PF3A7□H Series
Function Details

For setting of functions and operation method, refer to the Operation Manual from the SMC website Documents/Download --> Instruction Manuals. Click here for details.

■ Output operation
The output operation can be selected from the following:
Output (hysteresis mode and window comparator mode) corresponding to instantaneous flow, or output (accumulated output and pulse output) corresponding to accumulated flow.
( Default setting: Hysteresis mode, Normal output )

■ Simple setting mode
Only the set values for instantaneous flow and accumulated flow can be changed. Output mode, output type, display color, and accumulate pulse output cannot be changed.

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

■ Reference condition
The display unit can be selected from standard condition or normal condition.

■ Response time
The response time can be selected to suit the application.
( Default setting: 1 s ) The effect of fluctuation and flickering of the display can be reduced by setting the response time to 2 seconds or 5 seconds.

■ FUNC output switching function
Analog output or external input can be selected.
( Default setting: Analog output )

■ Selectable analog output function
1 to 5 V or 0 to 10 V can be selected for the analog voltage output type.
( Default setting: 1 to 5 V )

■ External input function
The accumulated flow, peak value and bottom value can be reset remotely.
Accumulated value external reset: A function to reset the accumulated flow value when an external input signal is applied.
In accumulated increment mode, the accumulated value will reset to, and increase from zero.
In accumulated decrement mode, the accumulated value will reset to, and decrease from the set value.

■ Forced output function
The output is turned on/off in a fixed state when starting the system or during maintenance. This enables confirmation of the wiring and prevents system errors due to unexpected output.
For the analog output type: When ON, the output will be 5 V (or 10 V when 0 to 10 V is selected) or 20 mA, and when OFF, 1 V (or 0 V when 0 to 10 V is selected) or 4 mA.
+ 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.

■ Accumulated value hold
Accumulated value is not cleared even when the power supply is turned off. The accumulated value is memorized every 2 or 5 minutes during measurement, and continues from the last memorized value when the power supply is turned on again. The maximum writable limit of the memory device is 1.5 million times, which should be taken into consideration.

■ Peak/Bottom value display
The maximum (minimum) flow rate is detected and updated from when the power supply is turned on. In peak (bottom) value display mode, this maximum (minimum) flow rate is displayed.

■ Display OFF mode
This function will turn the display OFF.
In the display OFF mode, three digits "_ _ _" on the right of the sub display will flash.
If any button is pressed during this mode, the display reverts to normal for 30 seconds to allow checking of the flow, etc.
When the flow monitor (PFG300 series) is connected, the displayed values might be different due to an error. When the flow monitor display is used, it is recommended to set this product to the display OFF mode.

■ Setting of security code
The user can select whether a security code must be entered to release the key lock. At a time of shipment from the factory, it is set such that the security code is not required.

■ Key-lock function
Prevents operation errors such as accidentally changing setting values

■ Reset to the default settings
The product can be returned to its factory default settings.

■ Reversible display mode
When the switch is used upside down, the orientation of the display can be rotated to make it easier to read by using the reversible display function.

■ Zero cut function
When the flow is close to 0 L/min., the product will round the value down and zero will be displayed. A flow value may be displayed even when the flow rate is 0 L/min. due to high pressure or depending on the installation. The zero cut function will force the display to zero. The range to display zero can be changed.
Example) Vertical mounting, with fluid direction: Bottom to top
Selection of display on sub screen

The display on the sub screen in measuring mode can be set.

<table>
<thead>
<tr>
<th>Accumulated value display</th>
<th>Set value display</th>
<th>Peak value display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the accumulated value</td>
<td>Displays the set value</td>
<td>Displays the peak value</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bottom value display</th>
<th>Line name display</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the bottom value</td>
<td>Displays the line name (Up to 5 alphanumeric characters can be input.)</td>
<td>Displays nothing</td>
</tr>
</tbody>
</table>

Analog output free range function

This function allows a flow that generates an output of 5 V (or 10 V when 0 to 10 V is selected) or 20 mA to be changed. The value can be changed between 10% of the maximum value of the rated flow and the maximum value of the display range.

Error display function

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

<table>
<thead>
<tr>
<th>Display</th>
<th>Error name</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Er 1</td>
<td>OUT over current error</td>
<td>A load current of 80 mA or more is applied to the switch output (OUT).</td>
<td>Eliminate the cause of the over current by turning off the power supply and then turn it on again.</td>
</tr>
<tr>
<td>HH</td>
<td>Instantaneous flow error</td>
<td>The flow rate exceeds the maximum value of the display range.</td>
<td>Decrease the flow rate.</td>
</tr>
<tr>
<td>999999 flashes x 10⁶</td>
<td>Accumulated flow error</td>
<td>The flow rate exceeds the accumulated flow rate.</td>
<td>Clear the accumulated flow rate.</td>
</tr>
<tr>
<td>Er 0</td>
<td>System error</td>
<td>Internal data error</td>
<td>Turn the power off and then on again.</td>
</tr>
<tr>
<td>Er 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the error cannot be solved after the instructions above are performed, please contact SMC for investigation.
**PFG300 Series**  
**Function Details**

**Output operation**  
The output operation can be selected from the following:  
- Output (hysteresis mode and window comparator mode) corresponding to instantaneous flow or output (accumulated output and pulse output) corresponding to accumulated flow.  
(Default setting: Hysteresis mode, Normal output)

**Simple setting mode**  
Only the set values for instantaneous flow and accumulated flow can be changed. Output mode, output type, display color, and accumulate pulse output cannot be changed.

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

- **Color Selection**  
  - Green for ON, Red for OFF  
  - Red for ON, Green for OFF  
  - Red all the time  
  - Green all the time

**Display with zero cut-off setting**  
When the flow is close to 0 L/min, the product will round the value down and zero will be displayed. A flow value may be displayed even when the flow rate is 0 L/min due to high pressure or depending on the installation. The zero cut function will force the display to zero. The range to display zero can be changed.

**Digital filter setting**  
The time for the digital filter can be set to the sensor input. Setting the digital filter can reduce chattering of the switch output and flickering of the analog output and the display.  
The response time indicates when the set value is 90% in relation to the step input.  
(Default setting: 0 s)

**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.  

<table>
<thead>
<tr>
<th>Delay Time (s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 s</td>
<td></td>
</tr>
<tr>
<td>0.05 to 0.1 s (increment of 0.01 s)</td>
<td></td>
</tr>
<tr>
<td>0.1 to 1.0 s (increment of 0.01 s)</td>
<td></td>
</tr>
<tr>
<td>1 to 10 s (increment of 1 s)</td>
<td></td>
</tr>
<tr>
<td>20 s</td>
<td></td>
</tr>
<tr>
<td>30 s</td>
<td></td>
</tr>
<tr>
<td>40 s</td>
<td></td>
</tr>
<tr>
<td>50 s</td>
<td></td>
</tr>
<tr>
<td>60 s</td>
<td></td>
</tr>
</tbody>
</table>

**FUNC output switching function**  
Analog output, external input, or copy function can be selected.  
(Default setting: Analog output)

**Selectable analog output function**  
1 to 5 V or 0 to 10 V can be selected for the analog voltage output type.  
(Default setting: 1 to 5 V)

**Settable analog output function**  
The settable analog output function can be selected.  
(Selection: 1 to 5 V)

**External input function**  
The accumulated flow, peak value, and bottom value can be reset remotely.  
**Accumulated value external reset:** A function to reset the accumulated flow value when an external input signal is applied.  
In accumulated increment mode, the accumulated value will reset to and increase from zero.  
In accumulated decrement mode, the accumulated value will reset to and decrease from the set value.

* When the accumulated value is stored to memory, every time the accumulated value external reset is activated, the memory will be accessed. Take into consideration that the maximum number of times the memory can be accessed is 1.5 million times. The total number of external inputs and the accumulated value memorizing time interval should not exceed 1.5 million times.

**Peak/Bottom value reset:** Peak and bottom value are reset.

**Reset to the default settings**  
The product can be returned to its factory default settings.

**Display with zero cut-off setting**  
When the flow is close to 0 L/min, the product will round the value down and zero will be displayed. A flow value may be displayed even when the flow rate is 0 L/min due to high pressure or depending on the installation. The zero cut function will force the display to zero. The range to display zero can be changed.

**Forced output function**  
The output is turned on/off in a fixed state when starting the system or during maintenance. This enables the confirmation of wiring and prevents system errors due to unexpected output.  
For the analog output type: When ON, the output will be 5 V (or 10 V when 0 to 10 V is selected) or 20 mA, and when OFF, 1 V (or 0 V when 0 to 10 V is selected) or 4 mA.  
* Also, an increase or decrease of the flow will not change the on/off status of the output while the forced output function is activated.

**Accumulated value hold**  
The accumulated value is not cleared even when the power supply is turned off. The accumulated value is memorized every 2 or 5 minutes during measurement and continues from the last memorized value when the power supply is turned on again.  
The maximum writable limit of the memory device is 1.5 million times, which should be taken into consideration.

**Peak/Bottom value display**  
The maximum (minimum) flow rate is detected and updated from when the power supply is turned on. In peak (bottom) value display mode, this maximum (minimum) flow rate is displayed.

**Setting of security code**  
The user can select whether a security code must be entered to release the key lock. At a time of shipment from the factory, it is set such that a security code is not required.

**Key-lock function**  
Prevents operation errors such as accidentally changing setting values.

**Display with zero cut-off setting**  
When the flow is close to 0 L/min, the product will round the value down and zero will be displayed. A flow value may be displayed even when the flow rate is 0 L/min due to high pressure or depending on the installation. The zero cut function will force the display to zero. The range to display zero can be changed.
Selection of display on sub screen

The display on the sub screen in measuring mode can be set.

<table>
<thead>
<tr>
<th>Display Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set value display</td>
<td>Displays the set value</td>
</tr>
<tr>
<td>Accumulated value display</td>
<td>Displays the accumulated value</td>
</tr>
<tr>
<td>Peak value display</td>
<td>Displays the peak value</td>
</tr>
<tr>
<td>Bottom value display</td>
<td>Displays the bottom value</td>
</tr>
<tr>
<td>Line name display</td>
<td>Displays the line name (Up to 5 alphanumeric characters can be input.)</td>
</tr>
<tr>
<td>OFF</td>
<td>Displays nothing</td>
</tr>
</tbody>
</table>

Analog output free range function

This function allows a flow that generates an output of 5 V (or 10 V when 0 to 10 V is selected) or 20 mA to be changed. The value can be changed between 10% of the maximum value of the rated flow and the maximum value of the display range.

Error display function

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

<table>
<thead>
<tr>
<th>Display</th>
<th>Error name</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Er 1</td>
<td>OUT over current</td>
<td>A load current of 80 mA or more is applied to the switch output (OUT).</td>
<td>Eliminate the cause of the over current by turning off the power supply and then turning it on again.</td>
</tr>
<tr>
<td>Er 2</td>
<td>Instantaneous flow</td>
<td>The flow rate exceeds the maximum value of the display range.</td>
<td>Decrease the flow rate.</td>
</tr>
<tr>
<td>Er 3</td>
<td>Reverse flow</td>
<td>There is a reverse flow equivalent to –5% or more. (Except PF3A/3H series)</td>
<td>Change the flow to the correct direction.</td>
</tr>
<tr>
<td>Er 4</td>
<td>Accumulated flow</td>
<td>The flow rate exceeds the accumulated flow rate range.</td>
<td>Clear the accumulated flow rate.</td>
</tr>
<tr>
<td>Er 5</td>
<td>System error</td>
<td>Internal data error</td>
<td>Turn the power off and then on again.</td>
</tr>
<tr>
<td>Er 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 8</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Er 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Er 13</td>
<td>Copy error</td>
<td>The copy function does not operate properly.</td>
<td>After clearing the error by pressing the  and  buttons simultaneously for a minimum of 1 second, check the wiring and the model, and then attempt to copy again.</td>
</tr>
</tbody>
</table>

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

The settings of the master monitor can be copied to the slave monitors, reducing setting labor and minimizing the risk of setting mistakes. The set value can be copied to up to 10 flow monitors simultaneously. (Maximum transmission distance: 4 m)

1) Wire as shown in the figure on the left.
2) Select the slave monitor which is to be the master, and change it into a master using the buttons. (In the default setting, all flow monitors are set as slaves.)
3) Press the button on the master monitor to start copying.

**Selection of power saving mode**

Power saving mode can be selected. It shifts to the power saving mode without button operation for 30 seconds. It is set to the normal mode (Power saving mode is OFF) at a time of shipment from the factory. (During power saving mode, [ECo] will flash in the sub screen and the operation light is ON (only when the switch is ON)).

* There may be a difference in the displayed value on the connected flow switch and the flow monitor. When the flow monitor display is being used, it is recommended to set the flow switch display to OFF mode.
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:** Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

> **Warning:** Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

> **Danger:** Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

### Safety Instructions

**Caution:**

1. **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

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

2. **Only personnel with appropriate training should operate machinery and equipment.**

   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

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

**Warning:**

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.

2. **Defense, rocketry, spacecraft, nuclear energy**, and other safety regulations.

**Caution:**

1. **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.**

   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. **For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.**

   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. **Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.**

   1) Vacuum pads are excluded from this 1 year warranty.
   2) A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, any vacuum pad 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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**Revision History**

- **Edition B**: The digital flow monitor PFG300 series has been added.
- Number of pages has been increased from 16 to 28.

**V2**

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**Safety Instructions** Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.