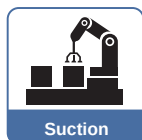


## Features

- Flow and pressure dual sensor
- Flow and pressure 4 digit, 7 segment dual LCD display
- 7 segment 8 digit LCD display. Accumulated flow rate display at a glance.

Patented

RS485 MODBUS CONTROL



Suction



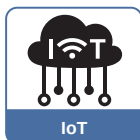
Leakage



Painting



Laser Welding



IoT



## Features Highlight

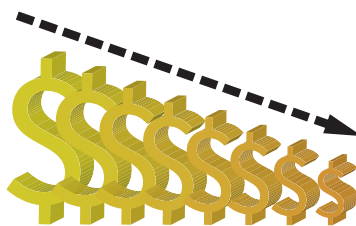
### 1 2-in-1 Design

- Pressure and flow rate simultaneous monitoring



### 2 Cost Reduction

- KFP series significantly reduces costs comparing with conventional product



### 3 High Performance

- High Precision

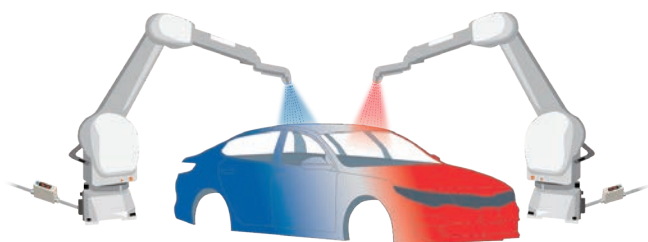
|                    | Pressure         | Flow           |
|--------------------|------------------|----------------|
| Indicator accuracy | $\pm 2\%$ F.S.   | $\pm 3\%$ F.S. |
| Repeatability      | $\pm 0.2\%$ F.S. | $\pm 1\%$ F.S. |

- Multiple Output Function

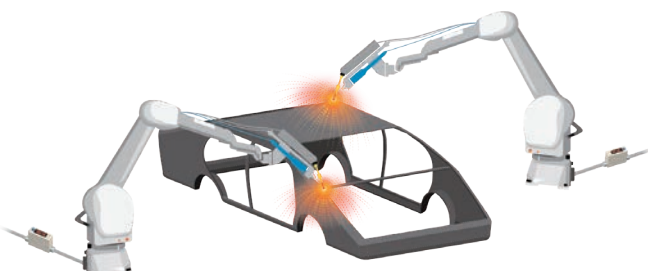
|                          |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| Digital Display          | Instantaneous flow value<br>Accumulated flow value<br>Pressure value |
| Switch Output            | NPN output<br>PNP output                                             |
| Analog output            | Voltage output 1~5 V<br>Current output 4~20 mA                       |
| Accumulated Pulse Output | 50ms pulse output                                                    |

### 4 Wide range of applications

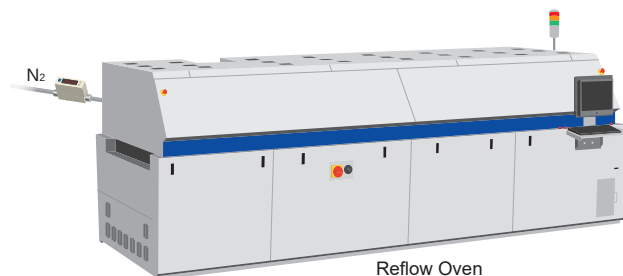
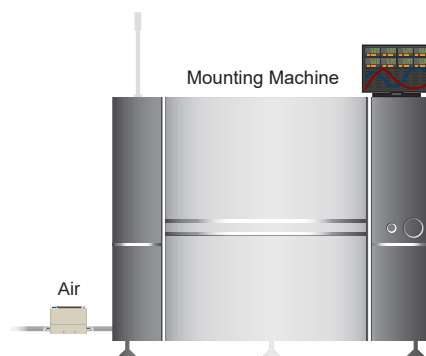
- Painting Robot :  
Air flow and pressure management of paint and coating processes



- Laser Welding Robot :  
Management of shielding gas, flow rate and pressure



- Reflow Oven / Mounting Machine :  
N<sub>2</sub> & Air consumption of the whole equipment management



## Specifications

| Model                           |                                                                                                                                                                                                       |                                                                       | 005                                                                                                                         | 010             | 050             | 100            | 500             | 101            | 201             |               |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|----------------|-----------------|----------------|-----------------|---------------|
| Fluid                           |                                                                                                                                                                                                       |                                                                       | Dry air, N <sub>2</sub> , Non-corrosive / Non-flammable gas                                                                 |                 |                 |                |                 |                |                 |               |
| Sensor Element                  | Flow                                                                                                                                                                                                  | Measured Flow Rate Range                                              | 0 ~ 500 mL/min                                                                                                              | 0 ~ 1000 mL/min | 0 ~ 5 L/min     | 0 ~ 10 L/min   | 0 ~ 50 L/min    | 0 ~ 100 L/min  | 0 ~ 200 L/min   |               |
|                                 |                                                                                                                                                                                                       | Flow Direction                                                        | Unidirection                                                                                                                |                 |                 |                |                 |                |                 |               |
|                                 | Pressure                                                                                                                                                                                              | Rated Pressure Range                                                  | -90 ~ 800 kPa                                                                                                               |                 |                 |                |                 |                |                 |               |
| Display                         | Instant Flow Rate                                                                                                                                                                                     | 4 digital * 4 digital, 7 segment LCD display ( Red / Green / Orange ) |                                                                                                                             |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Display Range                                                         |                                                                                                                             | 0 ~ 525 mL/min  | 0 ~ 1050 mL/min | 0 ~ 5.25 L/min | 0 ~ 10.50 L/min | 0 ~ 52.5 L/min | 0 ~ 105.0 L/min | 0 ~ 210 L/min |
|                                 |                                                                                                                                                                                                       | Minimum Setting Scale                                                 | LPM                                                                                                                         | 1 mL/min        | 1 mL/min        | 0.01 L/min     | 0.01 L/min      | 0.1 L/min      | 0.1 L/min       | 1 L/min       |
|                                 |                                                                                                                                                                                                       |                                                                       | CFM ※1                                                                                                                      | 0.01 ft³/min    | 0.01 ft³/min    | 0.1 ft³/min    | 0.1 ft³/min     | 1 ft³/min      | 1 ft³/min       | 1 ft³/min     |
|                                 | Accumulated Flow                                                                                                                                                                                      | Display Range                                                         | 99999999 mL                                                                                                                 | 99999999 mL     | 999999.99 L     | 999999.99 L    | 9999999.9 L     | 9999999.9 L    | 99999999 L      |               |
|                                 |                                                                                                                                                                                                       | Minimum Setting Scale ※1                                              | 1 mL                                                                                                                        | 1 mL            | 0.01 L          | 0.01 L         | 0.1 L           | 0.1 L          | 1 L             |               |
|                                 | Pressure Display <td rowspan="4">Minimum Setting Scale</td> <td>Display Range</td> <td>0.01 ft³</td> <td>0.01 ft³</td> <td>0.1 ft³</td> <td>0.1 ft³</td> <td>1 ft³</td> <td>1 ft³</td> <td>1 ft³</td> | Minimum Setting Scale                                                 | Display Range                                                                                                               | 0.01 ft³        | 0.01 ft³        | 0.1 ft³        | 0.1 ft³         | 1 ft³          | 1 ft³           | 1 ft³         |
|                                 |                                                                                                                                                                                                       |                                                                       | kPa                                                                                                                         | -100 ~ 1000 kPa |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       |                                                                       | kgf/cm²                                                                                                                     | 1               |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       |                                                                       | bar                                                                                                                         | 0.01            |                 |                |                 |                |                 |               |
| Accuracy                        | Flow                                                                                                                                                                                                  | psi                                                                   | 0.01                                                                                                                        |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Guaranteed Range                                                      | 2 ~ 100 % F.S.                                                                                                              |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Indicator Accuracy                                                    | ± 3 % F.S. ± 1 digit ※2                                                                                                     |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Analog Output Accuracy                                                | ± 5 % F.S. ※2                                                                                                               |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Repeatability                                                         | ± 1 % F.S. ± 1 digit ※3                                                                                                     |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Linearity                                                             | ± 3 % F.S. ※3                                                                                                               |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Temp. Characteristic                                                  | ± 2 % F.S. ( 15 ~ 35 °C ) ; ± 5 % F.S. ( 0 ~ 15 °C, 35~ 50 °C ) ( compare with ※3 )                                         |                 |                 |                |                 |                |                 |               |
|                                 | Pressure                                                                                                                                                                                              | Pressure Characteristic                                               | ± 5 % F.S. ± 1 digit ※4                                                                                                     |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Guaranteed Range                                                      | 0 ~ 100 % F.S.                                                                                                              |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Indicator Accuracy                                                    | ± 2 % F.S. ± 1 digit ※5                                                                                                     |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Analog Output Accuracy                                                | ± 2.5 % F.S. ※5                                                                                                             |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Repeatability                                                         | ± 0.2 % F.S. ± 1 digit ※5                                                                                                   |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Linearity                                                             | ± 1 % F.S. ※5                                                                                                               |                 |                 |                |                 |                |                 |               |
| Temp. Characteristic            | ± 2 % F.S. ( compare with ※5 )                                                                                                                                                                        |                                                                       |                                                                                                                             |                 |                 |                |                 |                |                 |               |
| Switch Output                   | Response Time                                                                                                                                                                                         | Flow                                                                  | 2 NPN : open collector 2 outputs<br>Max. Load Current : 125 mA<br>Max. Supply Voltage : 28 V DC<br>Voltage Drop : ≤ 1.5 V   |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Pressure                                                              | 2 PNP : open collector 2 outputs<br>Max. Load Current : 125 mA<br>Max. Supply Voltage : 24 V DC<br>Voltage Drop : ≤ 1.5 V   |                 |                 |                |                 |                |                 |               |
|                                 | Output Mode                                                                                                                                                                                           | Flow                                                                  | 800 ms ( 50 ms, 80 ms, 120 ms, 200 ms, 400 ms, 1500 ms selectable )                                                         |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       | Pressure                                                              | 2.5 ms ( 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms, 1500 ms selectable )                                                       |                 |                 |                |                 |                |                 |               |
|                                 | Hysteresis                                                                                                                                                                                            | Flow                                                                  | Hysteresis Mode, Window Comparator Mode, Accumulated Output, Accumulated Pulse Output                                       |                 |                 |                |                 |                |                 |               |
|                                 | Output Short Circuit Proterction                                                                                                                                                                      | Pressure                                                              | One Point Set Mode, Hysteresis Mode, Window Comparator Mode                                                                 |                 |                 |                |                 |                |                 |               |
|                                 | Accumulated Pulse Output ※1                                                                                                                                                                           | Adjustable                                                            |                                                                                                                             |                 |                 |                |                 |                |                 |               |
| Analog Output                   | Voltage Output                                                                                                                                                                                        | Yes                                                                   |                                                                                                                             |                 |                 |                |                 |                |                 |               |
|                                 | Current Output                                                                                                                                                                                        | 5 mL/Pulse                                                            | 10 mL/Pulse                                                                                                                 | 0.05 L/Pulse    | 0.1 L/Pulse     | 0.5 L/Pulse    | 1 L/Pulse       | 2 L/Pulse      |                 |               |
|                                 | Response Time                                                                                                                                                                                         | 0.02 ft³/Pulse                                                        | 0.04 ft³/Pulse                                                                                                              | 0.2 ft³/Pulse   | 0.4 ft³/Pulse   | 2 ft³/Pulse    | 4 ft³/Pulse     | 7 ft³/Pulse    |                 |               |
| External Input                  |                                                                                                                                                                                                       |                                                                       | Voltage Output Range : 1 ~ 5 V ※6<br>Output Impedance : 1 KΩ                                                                |                 |                 |                |                 |                |                 |               |
| Communication Interface         |                                                                                                                                                                                                       |                                                                       | Current Output Range : 4 ~ 20 mA ※6<br>Load Impedance : ≤ 300 Ω                                                             |                 |                 |                |                 |                |                 |               |
| Power                           |                                                                                                                                                                                                       |                                                                       | Pressure : ≤ 50 ms ; Flow : ≤ 100 ms                                                                                        |                 |                 |                |                 |                |                 |               |
| Power                           |                                                                                                                                                                                                       |                                                                       | Non-voltage input, < 0.4 V, ≥ 30 ms                                                                                         |                 |                 |                |                 |                |                 |               |
| Power                           |                                                                                                                                                                                                       |                                                                       | RS485 ※7                                                                                                                    |                 |                 |                |                 |                |                 |               |
| Power                           |                                                                                                                                                                                                       |                                                                       | 12 ~ 24 V DC ± 10 %, Ripple ( P-P ) ≤ 10 %                                                                                  |                 |                 |                |                 |                |                 |               |
| Power                           |                                                                                                                                                                                                       |                                                                       | ≤ 50 mA                                                                                                                     |                 |                 |                |                 |                |                 |               |
| Environment                     | Withstand Pressure                                                                                                                                                                                    |                                                                       | 1 MPa                                                                                                                       |                 |                 |                |                 |                |                 |               |
|                                 | Enclosure                                                                                                                                                                                             |                                                                       | IP40                                                                                                                        |                 |                 |                |                 |                |                 |               |
|                                 | Working Fluid Temp.                                                                                                                                                                                   |                                                                       | 0 ~ 50 °C ( No condensation or freezing )                                                                                   |                 |                 |                |                 |                |                 |               |
|                                 | Ambient Temp. Range                                                                                                                                                                                   |                                                                       | Operation : 0 ~ 50 °C ; Storage : -10 ~ 60 °C ( No condensation or freezing )                                               |                 |                 |                |                 |                |                 |               |
|                                 | Ambient Humidity Range                                                                                                                                                                                |                                                                       | Operation / Storage : 35 ~ 85 % R.H. ( No condensation )                                                                    |                 |                 |                |                 |                |                 |               |
|                                 | Insulation Resistance                                                                                                                                                                                 |                                                                       | ≥ 50 MΩ ( 500 V DC, between case and lead wire )                                                                            |                 |                 |                |                 |                |                 |               |
|                                 | Withstand Voltage                                                                                                                                                                                     |                                                                       | 1000 V AC in 1-min ( between case and lead wire )                                                                           |                 |                 |                |                 |                |                 |               |
|                                 | Vibration                                                                                                                                                                                             |                                                                       | Total amplitude 1.5 mm or 10 G, 10 Hz ~ 55 Hz ~ 10 Hz scan for 1 minute, 2 hours each direction of X, Y and Z               |                 |                 |                |                 |                |                 |               |
|                                 | Shock                                                                                                                                                                                                 |                                                                       | 100 m/s² ( 10 G ), 3 times each in direction of X, Y and Z                                                                  |                 |                 |                |                 |                |                 |               |
| EMC                             |                                                                                                                                                                                                       |                                                                       | 100 m/s² ( 10 G ), 3 times each in direction of X, Y and Z                                                                  |                 |                 |                |                 |                |                 |               |
| Lead Wire                       |                                                                                                                                                                                                       |                                                                       | IEC 61000-6-2, IEC 61000-6-4                                                                                                |                 |                 |                |                 |                |                 |               |
| Weight (with 2 Meter Lead Wire) |                                                                                                                                                                                                       |                                                                       | Ø4 Oil-resistance cable ( PVC ) - 26 AWG ( 0.15 mm² ) - 6 cores                                                             |                 |                 |                |                 |                |                 |               |
|                                 |                                                                                                                                                                                                       |                                                                       | Approx. 109.3 g ( Ø6 port ) ; Approx. 112.7 g ( Ø8 port ) ; Approx. 118 g ( Rc1/4" port ) ; Approx. 128.5 g ( Rc1/8" port ) |                 |                 |                |                 |                |                 |               |

### NOTE

※1 : CFM ( ft<sup>3</sup>/min\*10<sup>-2</sup> ) and ft<sup>3</sup>\*10<sup>-2</sup>

※2 : CONDITION : Inlet Pressure : 300 kPa , Outlet Pressure : 1 atmospheric pressure, 25 °C

※3 : CONDITION : Outlet Pressure : 1 atmospheric pressure, 25 °C

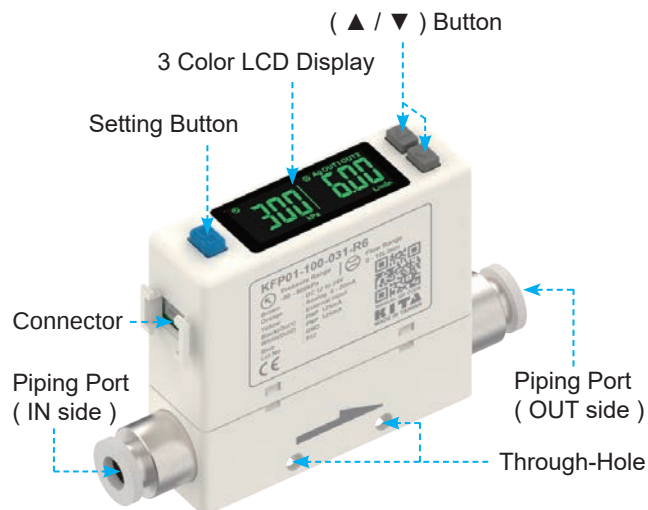
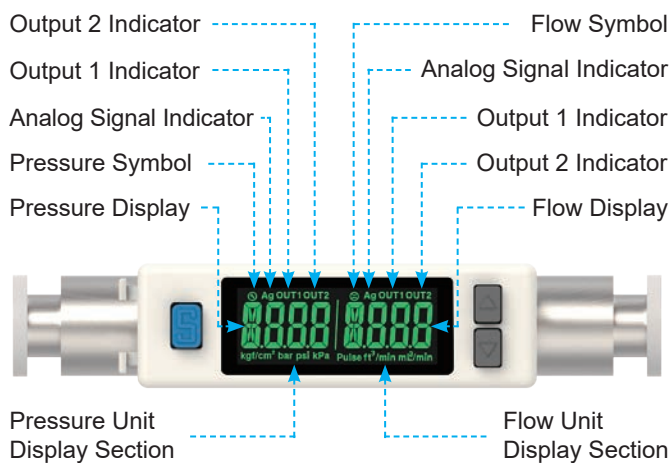
※4 : -90 ~ 800 kPa, Outlet Pressure : 1 atmospheric pressure, 25 °C

※5 : Outlet flow rate = 0 L/min, 25 °C

※6 : PWM output, corresponding to pressure sensor 0 ~ 1000 kPa

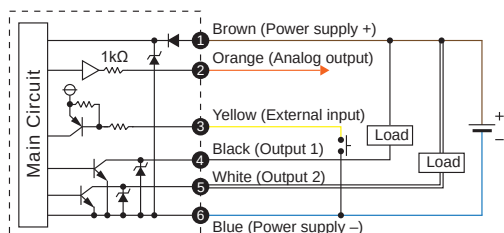
※7 : This function only available for Output Specification -02 and -04.

## Panel Description

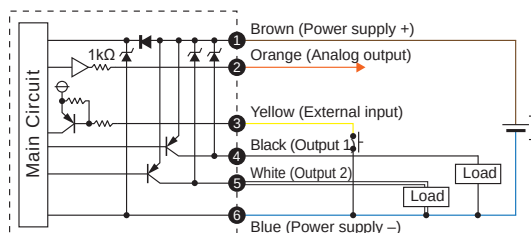


## Output Circuit Wiring Diagrams

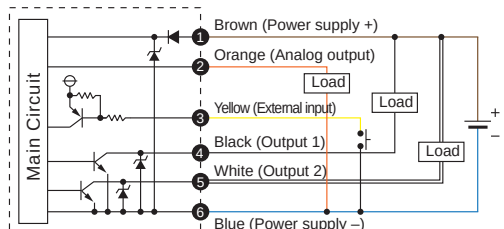
### NPN Output / Analog Voltage Output / External Input



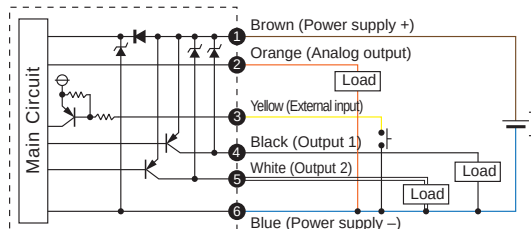
### PNP Output / Analog Voltage Output / External Input



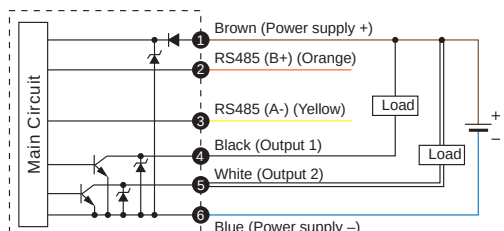
### NPN Output / Analog Current Output / External Input



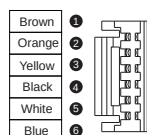
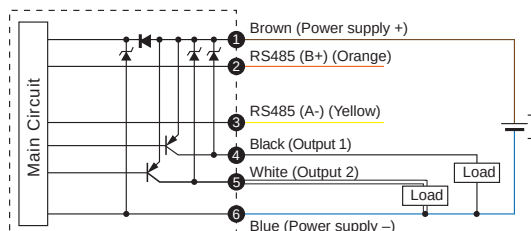
### PNP Output / Analog Current Output / External Input



### NPN Output / RS485 MODBUS Mode



### PNP Output / RS485 MODBUS Mode



| Pin No. | Line color | Content                                                                            |
|---------|------------|------------------------------------------------------------------------------------|
| 1       | Brown      | Power supply (12 ~ 24 V DC)                                                        |
| 2       | Orange     | Analog voltage output : 1 ~ 5 V<br>Analog current output : 4 ~ 20 mA<br>RS485 (B+) |
| 3       | Yellow     | External input<br>RS485 (A-)                                                       |
| 4       | Black      | Output 1 (Max. load current : 125 mA)                                              |
| 5       | White      | Output 2 (Max. load current : 125 mA)                                              |
| 6       | Blue       | 0 V (GND)                                                                          |

\* Procedure to wiring RS485 products : To prevent product damage due to short circuit , MUST do RS485 line connection BEFORE power line connection.

## Ordering Information

**K F P 0 1 - 0 0 5 - 0 1 0 - R 6**

### Flow Rate Range

005 : 500 mL/min  
010 : 1000 mL/min  
050 : 5 L/min  
100 : 10 L/min  
500 : 50 L/min  
101 : 100 L/min  
201 : 200 L/min

### Output Specifications

010 : 2 NPN output + Analog output 1 ~ 5 V  
011 : 2 NPN output + Analog output 4 ~ 20 mA  
02 : 2 NPN output + RS485  
030 : 2 PNP output + Analog output 1 ~ 5 V  
031 : 2 PNP output + Analog output 4 ~ 20 mA  
04 : 2 PNP output + RS485

### Port Size

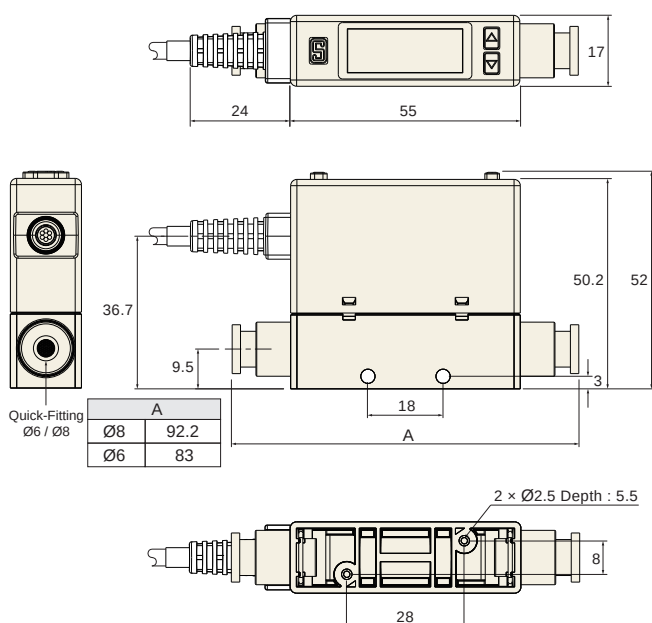
R6 : Ø6 mm, for Flow Rate Range 005, 010, 050, 100, 500  
R8 : Ø8 mm, for Flow Rate Range 101, 201  
F1C : Rc1/8", with internal threads, for Flow Rate Range 005, 010, 050, 100, 500  
F4C : Rc1/4", with internal threads, for Flow Rate Range 101, 201

### Optional Parts

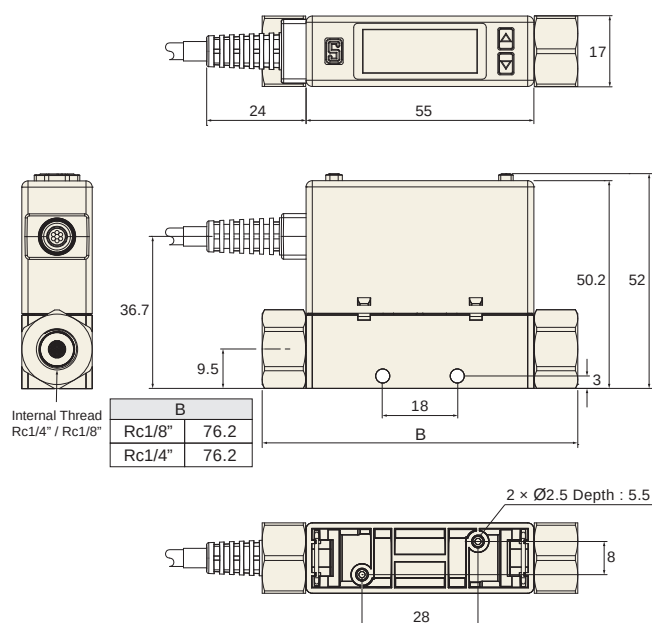
BT-26 : Mounting bracket PA-H : Panel adapter + Front protective lid  
PA-G : Panel adapter

## Dimensions

### Port Size : Ø6, Ø8

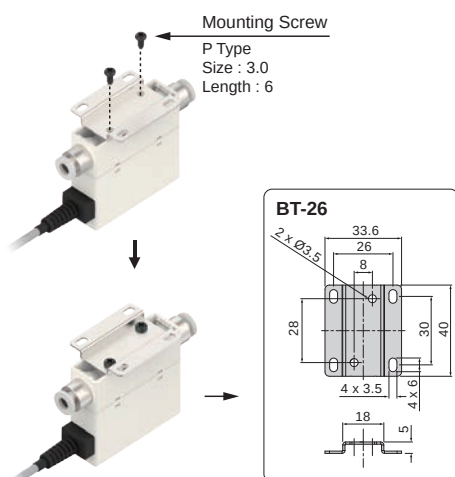


### Port Size : Rc1/8", Rc1/4"

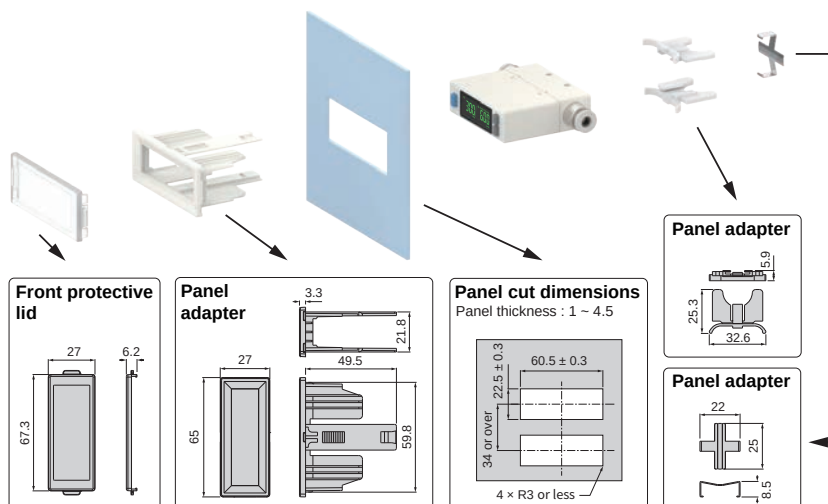


## Optional Parts Dimensions

### 1 Mounting Bracket



### 2 Panel Mount Adapter + Front Protective Lid



Unit : mm