



### Feature

- Display can be vertically inverted. To set and watch monitor easily.
- 3-Color & 7 segment LCD display.
- 8 digit accumulated flow rate display.
- Real-time monitoring.
- RS485 Modbus control.

### Symbol



### MF01 Specification

Model		005	010	050	100	500	101	201	
Sensor element	Flow	Measured flow rate range							
	Flow direction	Unidirection							
Display	Display	4 digital (Flow) / 8 digital (Accumulated flow), 7 segment LCD display ( Red / Green / Orange )							
	Instant flow rate	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
		Min. setting scale	LPM 1 mL/min		0.01 L/min		0.1 L/min		1 L/min
	Accumulated Flow	Display range	99999999 mL		999999.99 L		9999999.9 L		99999999 L
		Min. Setting Scale *1	1 mL		0.01 L		0.1 L		1 L
Switch output	Accumulated pulse output *1	5 mL/Pulse	10 mL/Pulse	0.05 L/Pulse	0.1 L/Pulse	0.5 L/Pulse	1 L/Pulse	2 L/Pulse	
Port size	R6, F1C	●	●	●	●	●			
	R8, F4C						●	●	
Weight (with 2 meter lead wire)		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 )							

\*1. When the display unit is CFM, ft<sup>3</sup>, the actual flow is the display value×10<sup>-2</sup>.

### MF02 Specification

Model		501	102	202	
Sensor element	Measured flow rate range	2 ~ 500 L/min	5 ~ 1000 L/min	10 ~ 2000 L/min	
	Flow direction	Unidirection			
Display	Display	4 digital (Flow) / 8 digital (Accumulated flow), 7 segment LCD display ( Red / Green / Orange )			
	Instant flow rate	Display range	0 ~ 525 L/min	0 ~ 1050 L/min	0 ~ 2100 L/min
		Min. setting scale	LPM 1 L/min		
	Accumulated flow	Display range	99999999 L		
		Min. setting scale	1 L		
Switch output	Accumulated pulse output *1	5 L/Pulse	10 L/Pulse	10 L/Pulse	
Port size	Rc1/2, F7C	●	●		
	G1/2, F9C	●	●		
	Rc3/4, F10C			●	
	G3/4, F12C			●	
Weight (without 2 meter lead wire)		Approx. 281.7 g ( 500 / 1000 L ) ; Approx. 344 g ( 2000 L )			

(Continued)

### MF01 & 02 Specification

Model	MF01	MF02	
Fluid	Dry air, N <sub>2</sub> , Non-corrosive / Non-flammable gas		
Accuracy	Guaranteed range	2 ~ 100 % F.S.	
	Indicator accuracy	± 3 % F.S. ± 1 digit *1	
	Analog output accuracy	± 5 % F.S. *1	
	Repeatability	± 1 % F.S. ± 1 digit *2	± 1 % F.S. ± 1 digit ( ± 2 % F.S. when response time is set to 50 ms ) *2
	Linearity	± 3 % F.S. *2	
	Temp. characteristic	± 2 % F.S. ( 15 ~ 35 °C ); ± 5 % F.S. ( 0 ~ 15 °C, 35 ~ 50 °C ) ( compare with *3 )	± 5 % F.S. ( compare with *3 )
	Pressure characteristic	± 5 % F.S. ± 1 digit *3	
Switch output	Switch output	2 NPN : open collector 2 outputs Max. Load Current : 125 mA Max. Supply Voltage : 28 V DC Voltage Drop : ≤ 1.5 V	2 PNP : open collector 2 outputs Max. Load Current : 125 mA Max. Supply Voltage : 24 V DC Voltage Drop : ≤ 1.5 V
	Response time	800 ms ( 50 ms, 80 ms, 120 ms, 200 ms, 400 ms, 1500 ms selectable )	
	Output mode	Hysteresis Mode, Window Comparator Mode, Accumulated Output, Accumulated Pulse Output	
	Hysteresis	Adjustable	
	Output short circuit protection	Yes	
Analog output	Voltage output	Voltage Output Range: 1 ~ 5 V , Output Impedance: 1 KΩ	
	Current output	Current Output Range: 4 ~ 20 mA, Load Impedance: ≤ 300 Ω	
	Response time	≤ 100 ms	
External input	Non-voltage input, < 0.4 V, ≥ 30 ms		
Communication interface	RS485 *4,5		
Power	Power supply voltage	12 ~ 24 V DC ± 10 % , Ripple ( P-P ) ≤ 10 %	
	Current consumption	≤ 50 mA	
Environment	Working pressure range	-0.09~0.8 MPa	0~1 MPa
	Withstand pressure	1 MPa	1.5 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 )	≥ 2 MΩ ( 50 V DC, between case and lead wire )
	Withstand Voltage	1000 V AC 1-min ( between case and lead wire )	250 V AC 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/s <sup>2</sup> ( 10 G ), 3 times each in direction of X, Y and Z	
EMC	IEC 61000-6-2, IEC 61000-6-4		
Lead wire	ø4 Oil-resistance cable ( PVC ) - 26 AWG ( 0.15 mm <sup>2</sup> ) - 6 cores		

\*1. Condition: Inlet pressure: 300 kPa (MF01), 600 kPa (MF02), Outlet pressure: 1 atmospheric pressure, 25 °C

\*2. Condition: Outlet pressure: 1 atmospheric pressure, 25 °C.

\*3. MF01: -0.09 ~ 0.8 MPa, Outlet pressure: 1 atmospheric pressure, 25 °C.

MF02: 0 ~ 1.0 MPa, Outlet pressure : 1 atmospheric pressure, 25 °C

\*4. This function only available for output specification -02 and -04.

\*5. 4 data reading per time.

# MF01 / 02 Output circuit wiring graph

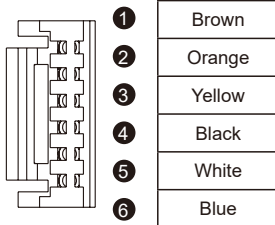
## DIGITAL FLOW SENSOR



### Output circuit wiring graph

Model	MF01/02-□-010	MF01/02-□-011	MF01/02-□-02
Connect diagram			
Output method	NPN output / Analog voltage output / External input	NPN output / Analog current output / External input	NPN output / RS-485 MODBUS mode
Model	MF01/02-□-030	MF01/02-□-031	MF01/02-□-04
Connect diagram			
Output method	PNP output / Analog voltage output / External input	PNP output / Analog current output / External input	PNP output / RS-485 MODBUS mode

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



Pin no.	Line color	Content
1	Brown	Power supply ( 12 ~ 24 V DC )
2	Orange	Analog voltage output: 1 ~ 5 V
		Analog current output: 4 ~ 20 mA
3	Yellow	External input
		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 )

## DIGITAL FLOW SENSOR

### Order example

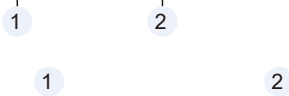
**MF02 – 501 – 010 – F7C**



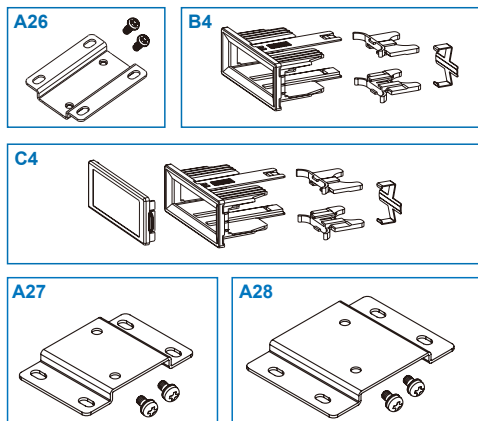
MODEL	FLOW RATE RANGE	OUTPUT METHOD	PORT SIZE
MF01	005: 500 (ml/min) 010: 1000 (ml/min) 050: 5 (l/min) 100: 10 (l/min) 500: 50 (l/min)	010: 2 NPN output + 1 Analog output (1~5V) 011: 2 NPN output + 1 Analog output (4~20mA) 02 : 2 NPN output + RS485 030: 2 PNP output + 1 Analog output (1~5V) 031: 2 PNP output + 1 Analog output (4~20mA) 04 : 2 PNP output + RS485	R6: ø6 mm F1C: Rc1/8", with internal threads
	101: 100 (l/min) 201: 200 (l/min)		R8: ø8 mm F4C: Rc1/4", with internal threads
MF02	501: 500 (l/min) 102: 1000 (l/min)		F7C: Rc1/2" F9C: G1/2"
	202: 2000 (l/min)		F10C: Rc3/4" F12C: G3/4"

### Mounting accessories

**MP – A27**

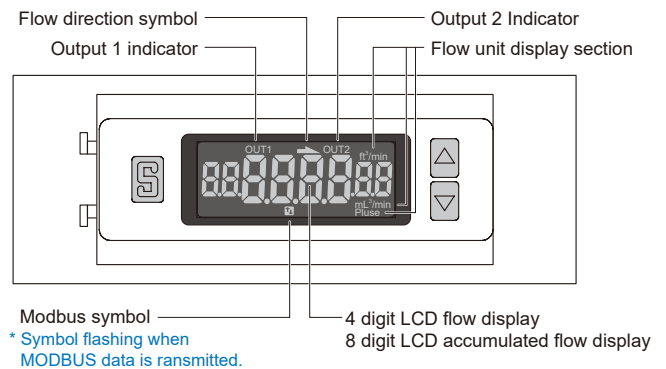


MODEL	OPTION PARTS
MF01	A26: Mounting bracket B4: Panel adapter C4: Panel adapter + Front protective lid
MF02	A27: Mounting bracket, for 501, 102 A28: Mounting bracket, for 202

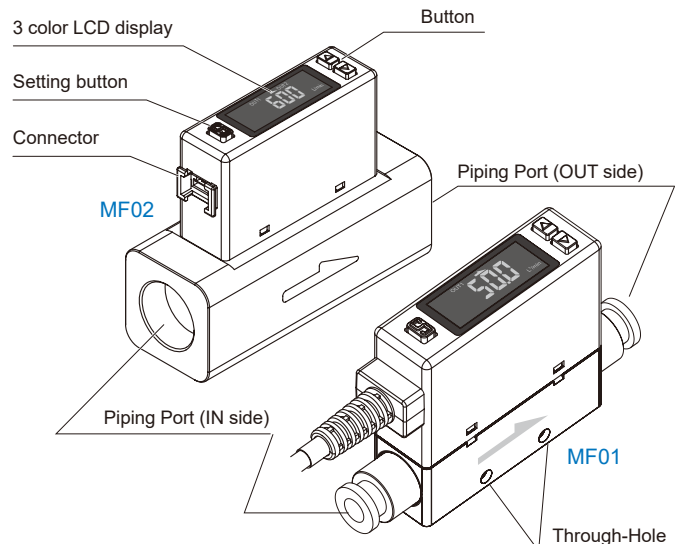


### Name and functions of individual parts

#### Panel description



#### Body description



# MF01 Dimensions

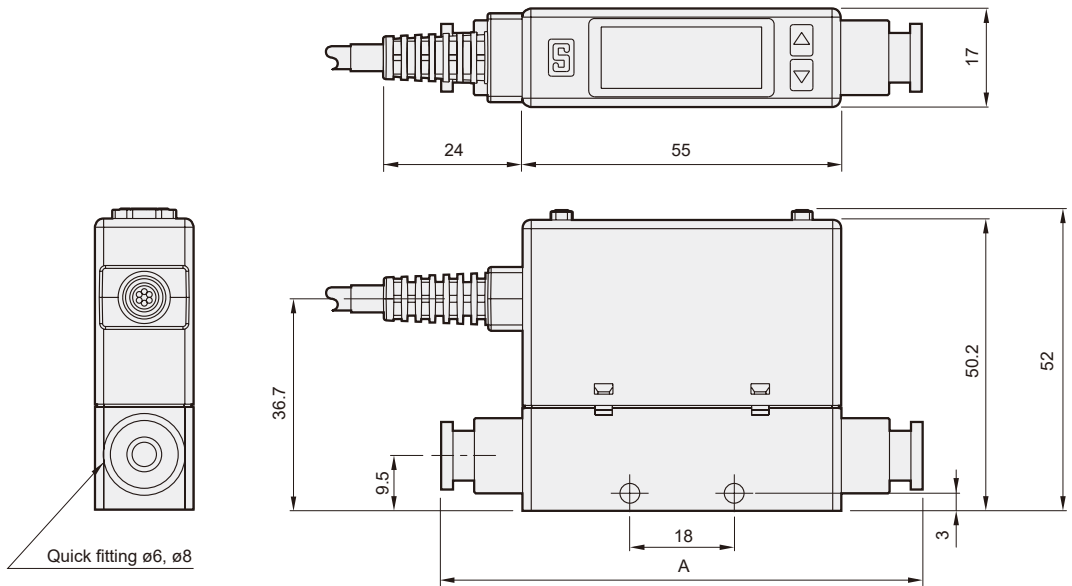
## DIGITAL FLOW SENSOR



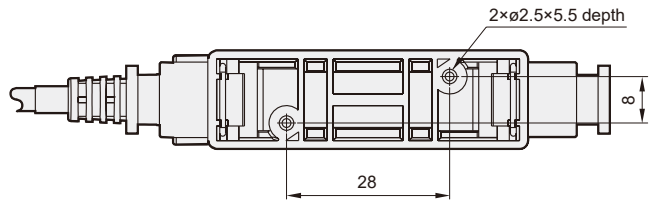
Port size

R6 (ø6)

R8 (ø8)



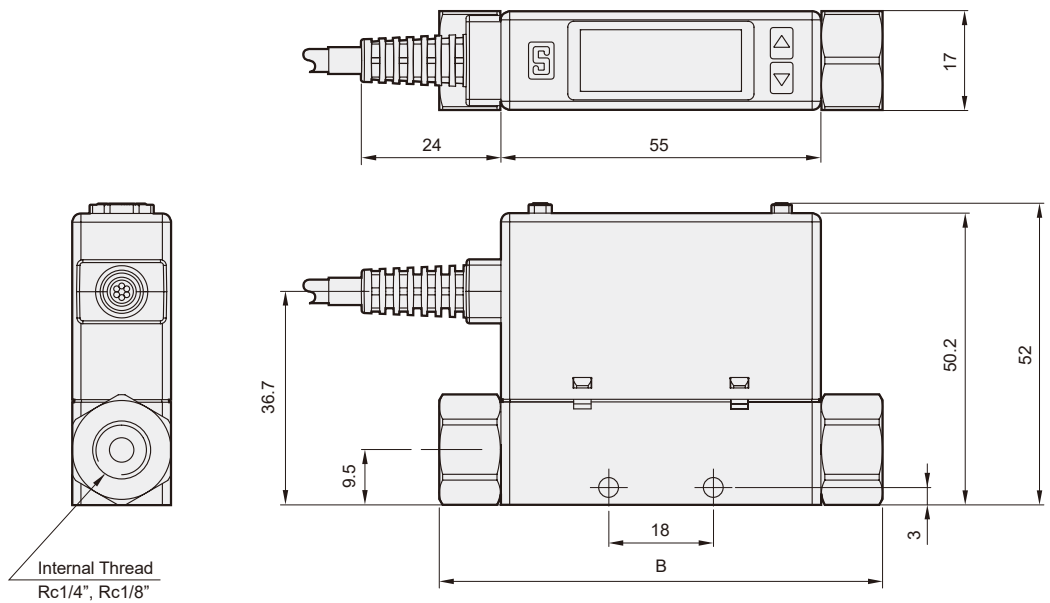
Code Tube I.D.	A (mm)
ø8	92.2
ø6	83



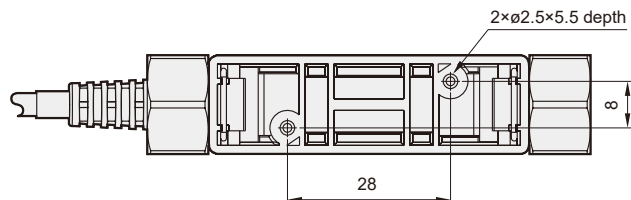
Port size

F1C (Rc1/8")

F4C (Rc1/4")

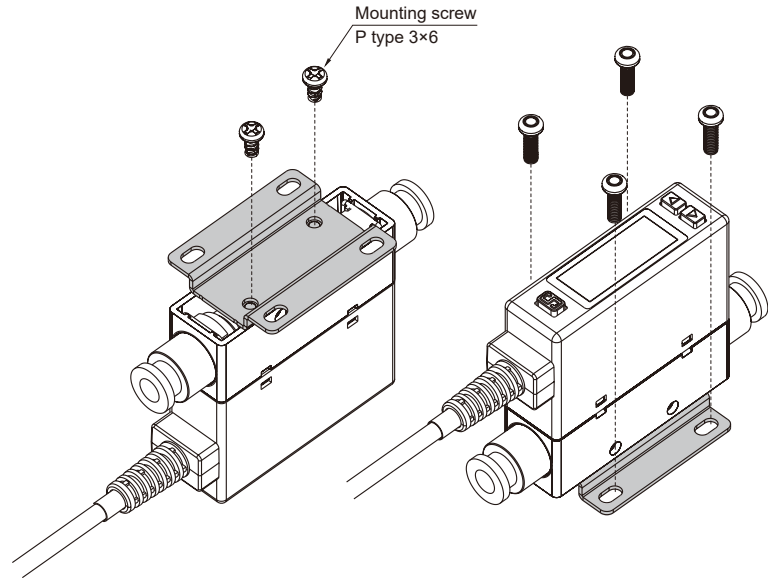
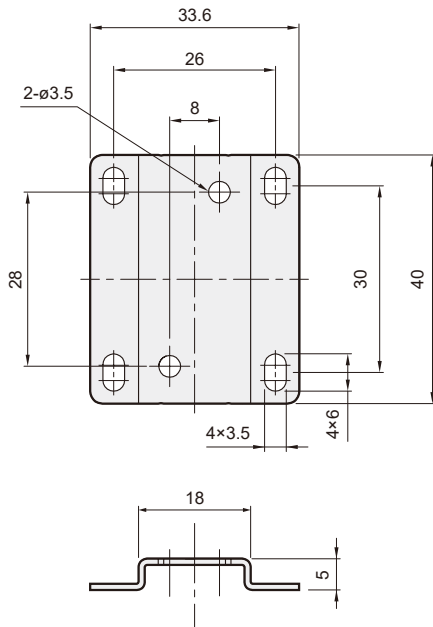


Code Thread	B (mm)
Rc1/8"	76.2
Rc1/4"	76.2



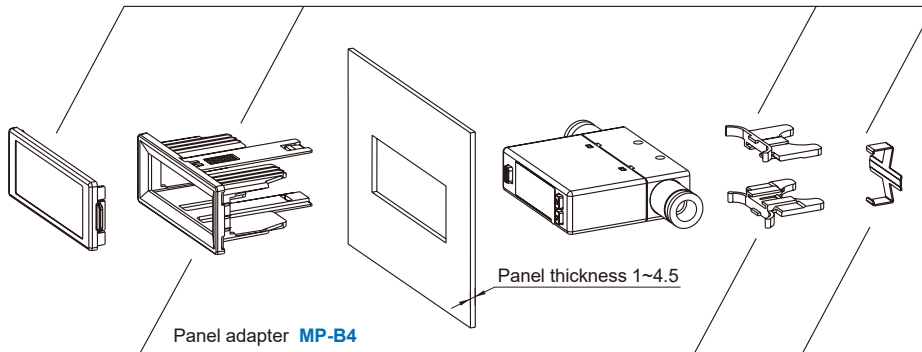
### Mounting bracket

#### MP-A26

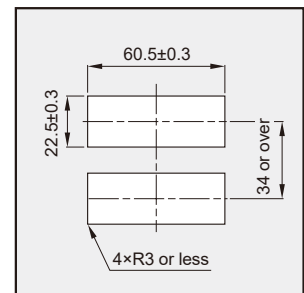


### Panel type

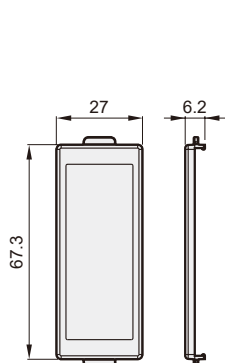
#### Front protective lid + Panel adapter MP-C4



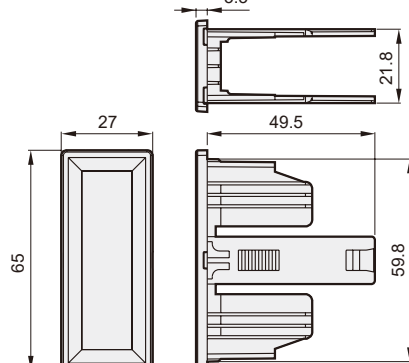
#### Panel cut dimensions



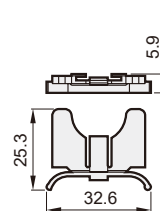
#### Front protective lid



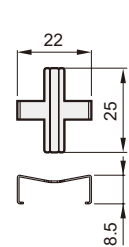
#### Panel adapter



#### Panel adapter

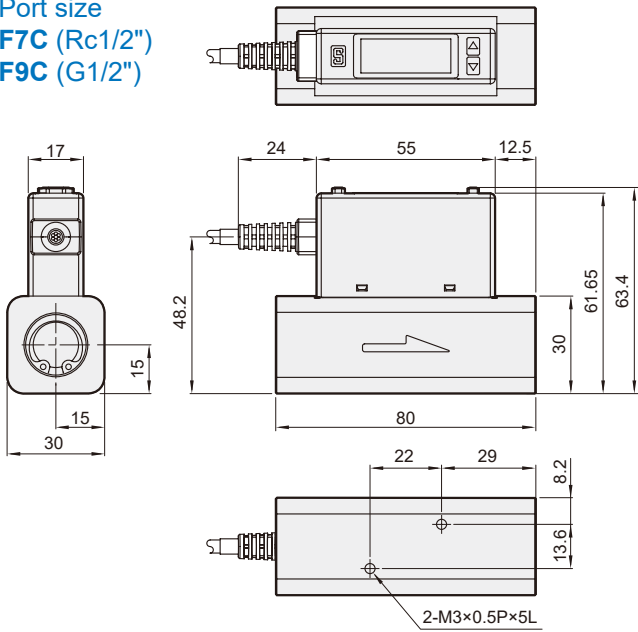


#### Panel adapter

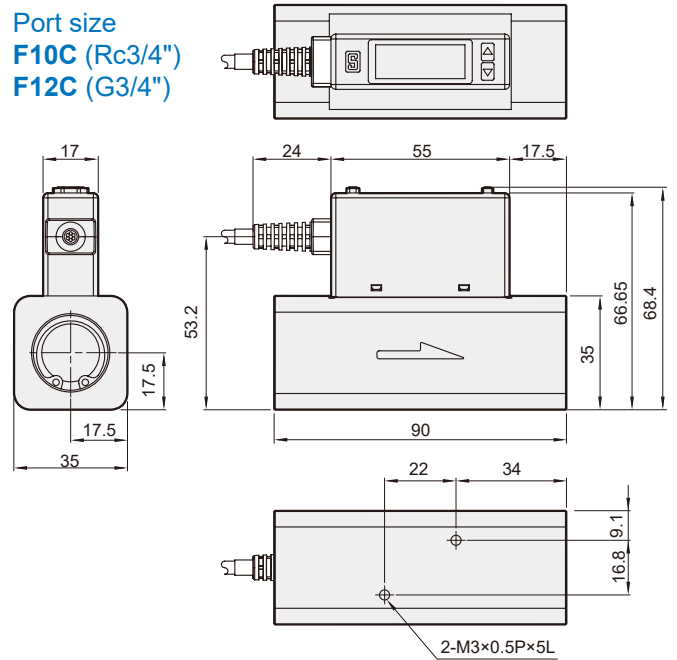


### Dimensions

Port size  
**F7C (Rc1/2")**  
**F9C (G1/2")**

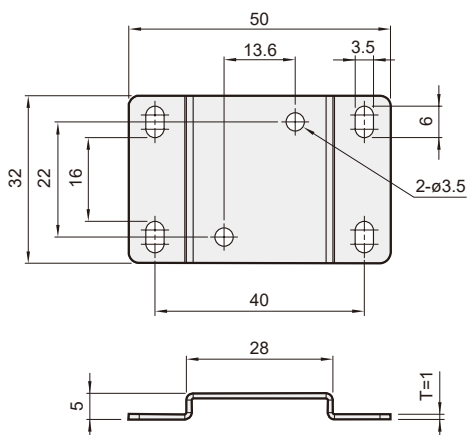
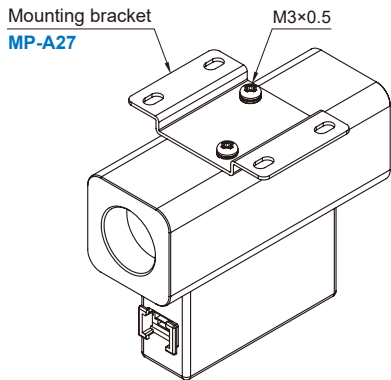


Port size  
**F10C (Rc3/4")**  
**F12C (G3/4")**



### Mounting bracket

**MP-A27**



**MP-A28**

