KITA®

INSTRUCTION MANUAL

DIGITAL FLOW AND PRESSURE SENSOR

IO-Link

KFP01A Series

CE UK CA

URL http://www.kita.com.tw

Product Safety Instructions

■ This section indicate the levels of risks with the labels of Danger, Warning and Caution.

⚠ **Danger**	Danger indicates high level of risk, will lead to fatal or serious injuries if not avoided.
⚠ **Warning**	Warning indicates medium level of risk, it might cause death or serious injuries.
⚠ **Caution**	Caution indicates low level of risk, it might result in minor injuries, such as scald, electric shock, etc. and the product, equipment and machines might be damaged.

⚠ Warning

■ Precautions for use

① **Operate within the specified voltage.**

Malfunction or damaged product, electric shock or fire may be resulted by exceeding the specified voltage range.

② **Do not exceed the maximum load current.**

It may damage the product.

③ **Do not use any load that generates surges.**

Surge protection is present but applying surge voltage repeatedly will ultimately damage the product.

When using with inductive load (such as relay or solenoid), please install a flyback diode across the load (polarity must be observed).

④ **Observed the internal voltage drop.**

When used at a specified voltage, if the sensor is functional but the load does not work, please check if the operating voltage of the load meets the following formula.

Power supply – voltage	Internal voltage > drop of sensor	Minimum operating voltage of load

⑤ **Please follow the rated range of flow and pressure to avoid damage.**

⑥ **Do not use flammable fluids and/or permeable fluids.**

They may cause fire, explosion or corrosion.

■ Working fluid and working environment

① **Do not use in an explosive gas atmosphere.**

The sensor does not have explosion-proof structure, fire, explosion or corrosion can result.

② **Do not use near a surge voltage generated area.**

If product is nearby the device of surge voltage (e.g., lightning strikes, solenoid lifters, high frequency induction furnaces, motors, etc.), please take measures against the surge sources to prevent damage.

③ **Do not use in an environment where sensors could be splashed by water or oil.**

Enclosure rating is IP40, please avoid water or oil splashed environment to prevent adversely effects.

④ **Do not use in an environment subject to large temperature cycling.**

Internal components of the sensor will be damaged by large heating/cooling cycles other than ordinary changes in temperature.

⑤ **Do not mount the product in locations where it is exposed to radiant heat.**

⚠ Warning

■ Wiring Precautions

① **Check wire color and terminal number when wiring.**

Incorrect wiring can cause permanent damages to the sensor, check wire color and terminal number according to the manual before wiring.

② **Avoid repeatedly bending or stretching the lead wire.**

It can cause damage to the sheath, or breakage of the wire.

③ **Ensure wiring insulation**

Please ensure the insulation of the wiring (including interference from other circuits and poor insulation between terminals) to prevent overcurrent from damaging the product.

④ **Please use a separate route for the product wiring and any power or high voltage wiring to avoid noise interruption.**

⑤ **Do not short-circuit the load.**

When the load is short-circuited, an error will be displayed. But excess current may cause damage to the sensor.

⑥ **Do not install the product, contact or plug terminals while power is on to avoid electric shock, malfunction or product damage.**

■ Installation Precautions

① **Ensure the flow direction of the fluid.**

Please follow flow direction indicator for installation and piping.

② **Flush out all dirt and dust by air blow before connecting the piping to the sensor.**

③ **Do not drop or hit.**

When installation, do not drop, hit or apply excessive shock ($100m/s^2$), permanent damage to the internal component of the sensor may occur.

④ **Do not install multiple products in close proximity.**

The heat generated from each product could cause the temperature to rise and change the characteristics of product or deterioration of the plastic parts. Please set the products 10mm apart from each other.

⑤ **Hold the sensor body when installing.**

The tensile strength of the cable is 24.5 N and apply excessive pulling force can cause damage to the sensor.

■ Other Precautions

① **After power is supplied, the output will remain off until the display is turned on. Please operate the sensor after the value is shown.**

② **Stop the control systems before perform setting changes.**

During the initial flow and pressure setting, the product will switch the output according to the existing settings until the changes are complete.

⚠ Caution

■ Installation Precautions

① **Please follow the specified tightening torque.**

② **Do not mount the sensor in a place that will be used as a foothold.**

The product may damage if sit or step on it accidentally.

③ **When mounting without a bracket, please use P type self-tapping screw- M3 x L 6mm.**

④ **Do not remove the fixed pin for the One-Touch Fitting.**

To avoid losing the internal parts and cause malfunction.

Please do not replace fittings by yourself.

⑤ **While installing the KFP01A-101/201 to the pipe, please apply air tube with I.D. 5 mm.**

⑥ **While installing the KFP01A-005/010/050/100/500 to the pipe, please apply air tube with I.D. 4 mm.**

■ Maintenance Precautions

① **The accuracy could change by 2 to 3% when the piping is removed or replaced.**

② **Do not touch the terminals or connectors when power is on.**

■ Disposal

① **Sensors at end-of-life must be disposed of in accordance with E-Waste regulations of the country/ region, NOT disposed of with regular garbage.**

⚠ Warning

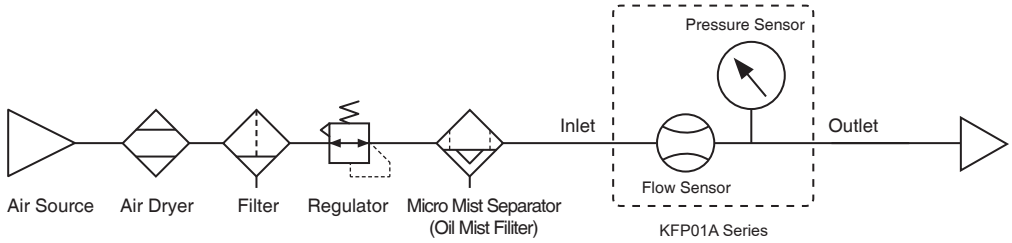
■ Fluid

① **Check the regulator and flow adjustment valve before introducing the fluid.**

② **On the inlet side, be sure to install an air filter below the filtration level of 10um.**

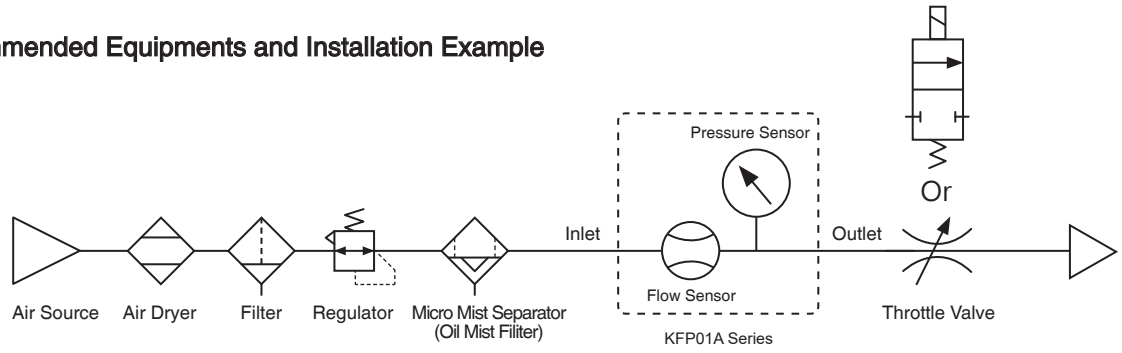
The sensing element cannot measure properly if foreign matter adheres to it.

③ **Recommended Equipments and Installation**

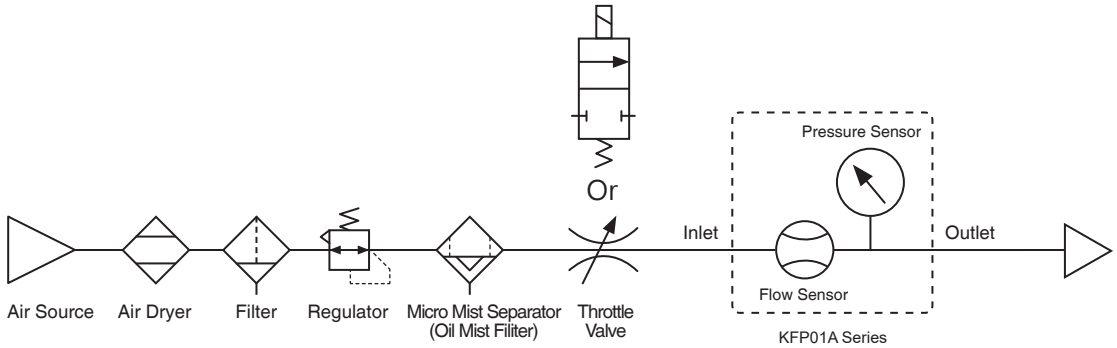


※ **NOTE** ※
When measuring the pressure of the inlet side, install a throttle valve or solenoid valve on the outlet side.
When measuring the pressure of the outlet side, install a throttle valve or solenoid valve on the inlet side.

④ **Recommended Equipments and Installation Example**



※ **NOTE :** When measuring the pressure of the inlet side, install a throttle valve or solenoid valve on the outlet side.



※ **NOTE :** When measuring the pressure of the outlet side, install a throttle valve or solenoid valve on the inlet side.

Disclaimer

① **Our warranty applies solely to our product, not to any other damages and injuries which occur by earthquakes, fires, the acts by third party, other matters, acts intentionally, acts accidentally, misuse, or other abnormal conditions that are not the responsibility of KITA.**

② **Our warranty applies solely to our product, not to any other additional damages (the loses of business profits, business interruption, etc.) incurred due to using or misusing the product.**

③ **Our warranty excludes any injuries and damages that happened by using the product beyond the specified range of function stated in the catalog or the instruction manual.**

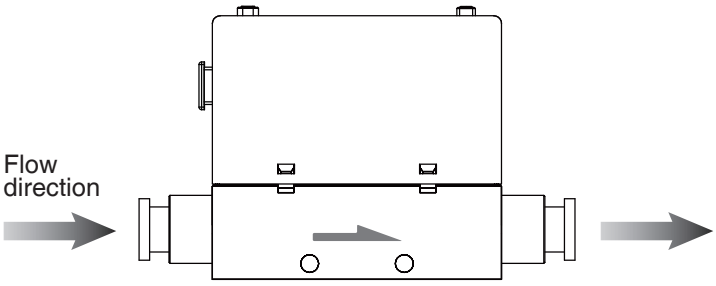
Contents

1 Installation

1.1 Piping

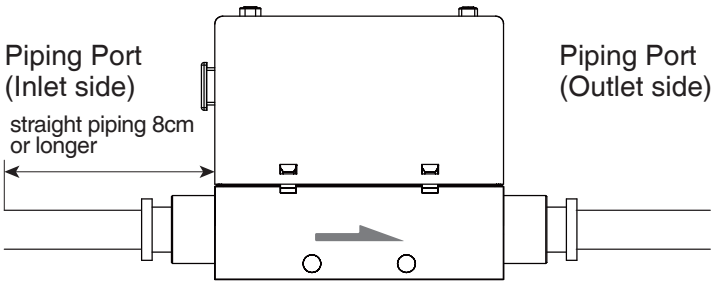
1.1.1 Piping for the One-Touch Fitting

Install the pipe by following the arrow indication that shows the air flow direction on the product.



Use straight piping 8cm or longer to connect the Piping Port (Inlet side). If straight piping is not installed, the accuracy may vary by ± 2% F.S..

※ Straight Piping: The pipe is without bending and the cross sectional areas of the pipe keeps the same.



While installing the KFP01A-101/201 to the pipe, please apply air tube with I.D. 5 mm.

While installing the KFP01A-005/010/050/100/500 to the pipe, please apply air tube with I.D. 4 mm.

※ The accuracy can vary by approximately ±2% F.S. when such tubing is not used.

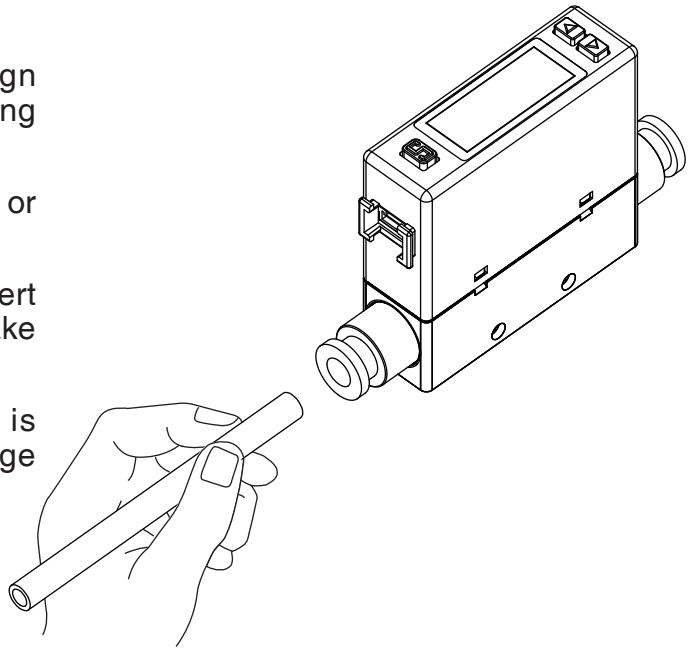
Blow the air to flush out the foreign matters, dust and etc. before installing the pipe.

Uncleaned air may cause malfunction or damage to the product.

Piping for the One-Touch Fitting, insert the tube firmly into the fitting and make sure it cannot be pulled out.

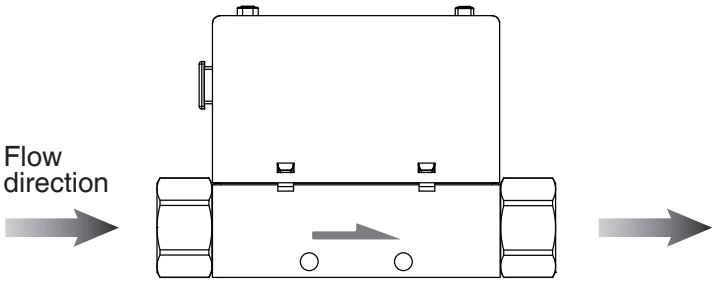
Also using the proper tube cutter is recommended to ensure square edge tube.

※ Recommends using PU tube.



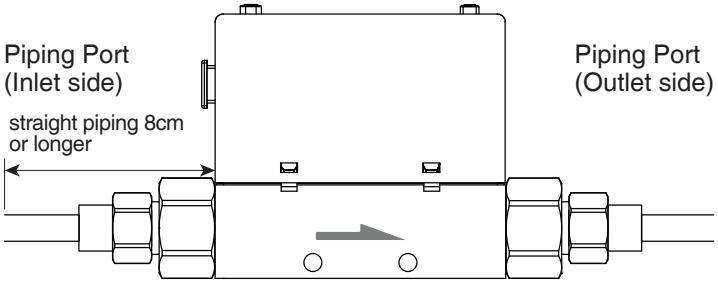
1.1.2 Piping for the internal thread

Install the pipe by following the arrow indication that shows the air flow direction on the product.



Use straight piping 8cm or longer to connect the Piping Port (Inlet side). If straight piping is not installed, the accuracy may vary by ± 2% F.S..

※ Straight Piping: The pipe is without bending and the cross sectional areas of the pipe keeps the same.



While installing the KFP01A-101/201 to the pipe, please apply air tube with I.D. 5 mm.

While installing the KFP01A-005/010/050/100/500 to the pipe, please apply air tube with I.D. 4 mm.

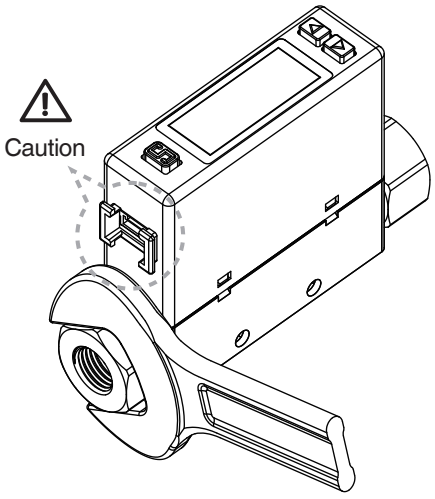
※ The accuracy can vary by approximately ±2% F.S. when such tubing is not used.

When mounting the fitting, a wrench should be used on the metal part.

Using on other parts of the product with a wrench may damage the product.

If the tightening torque is exceeded, the product can be broken.If the tightening torque is insufficient, the fitting may become loose and cause air leakage. Please refer to the applicable torque below.

After installation completed, turn on the gas and power supply for proper operation and leaking test to confirm whether the installation is correct.



Piping Specification	Required Torque
Rc1/8"	4 ~ 7 N.m
Rc1/4"	6 ~ 8 N.m

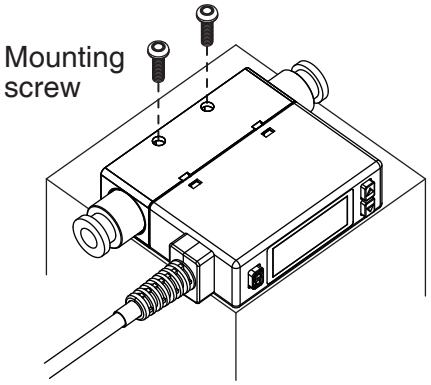
1.2 Mounting Bracket / Optional Parts

The LCD display may be difficult to see at certain angles.

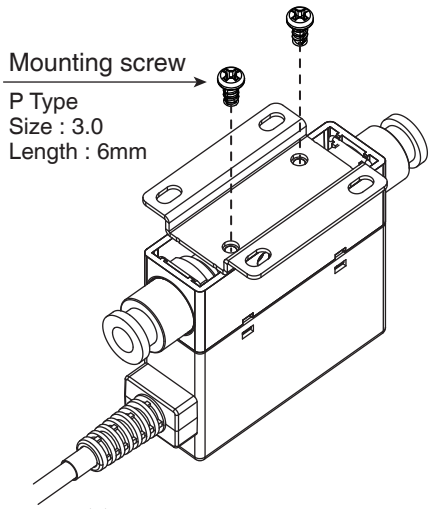
The sensor can be installed horizontally or vertically, but the flow rates may change because of the installation way of the product or piping.

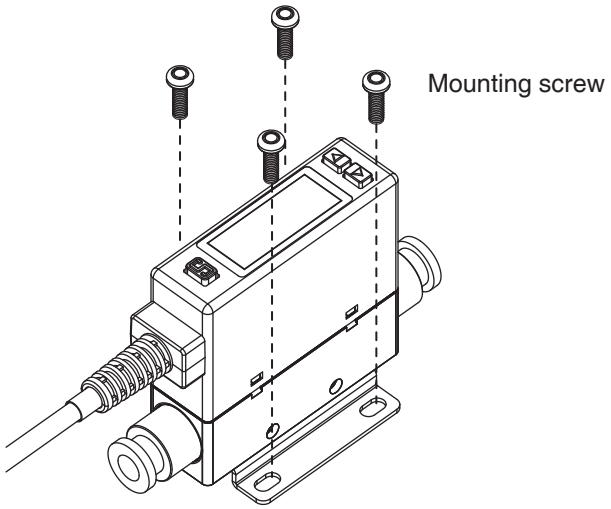
The tightening torque for screws should be under 0.5 ±0.1 N.m.

1 . Horizontal mounting (by Through-Hole)



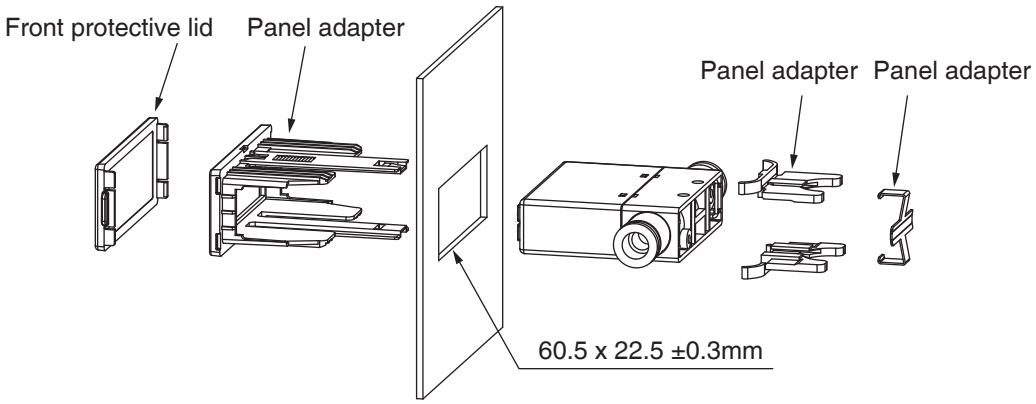
2 . Bracket mounting



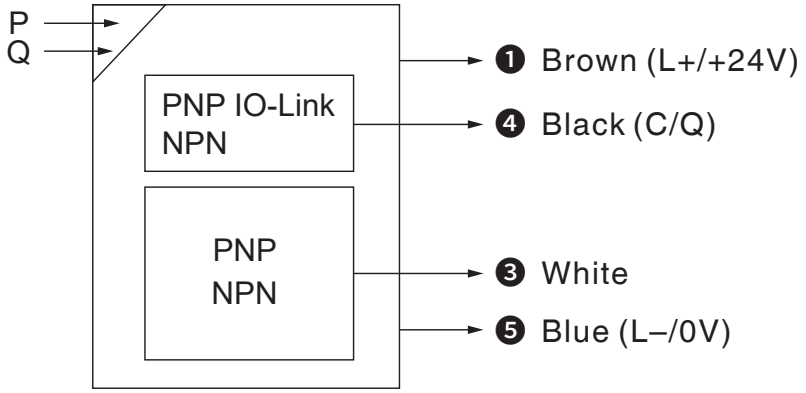


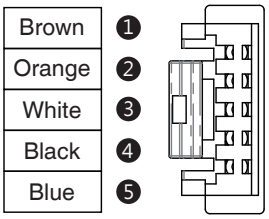
※ The tightening torque for bracket mounting screws should be under 0.5 ± 0.1 N.m.

3 . Panel mounting



1.3 Output Circuit Wiring Diagrams



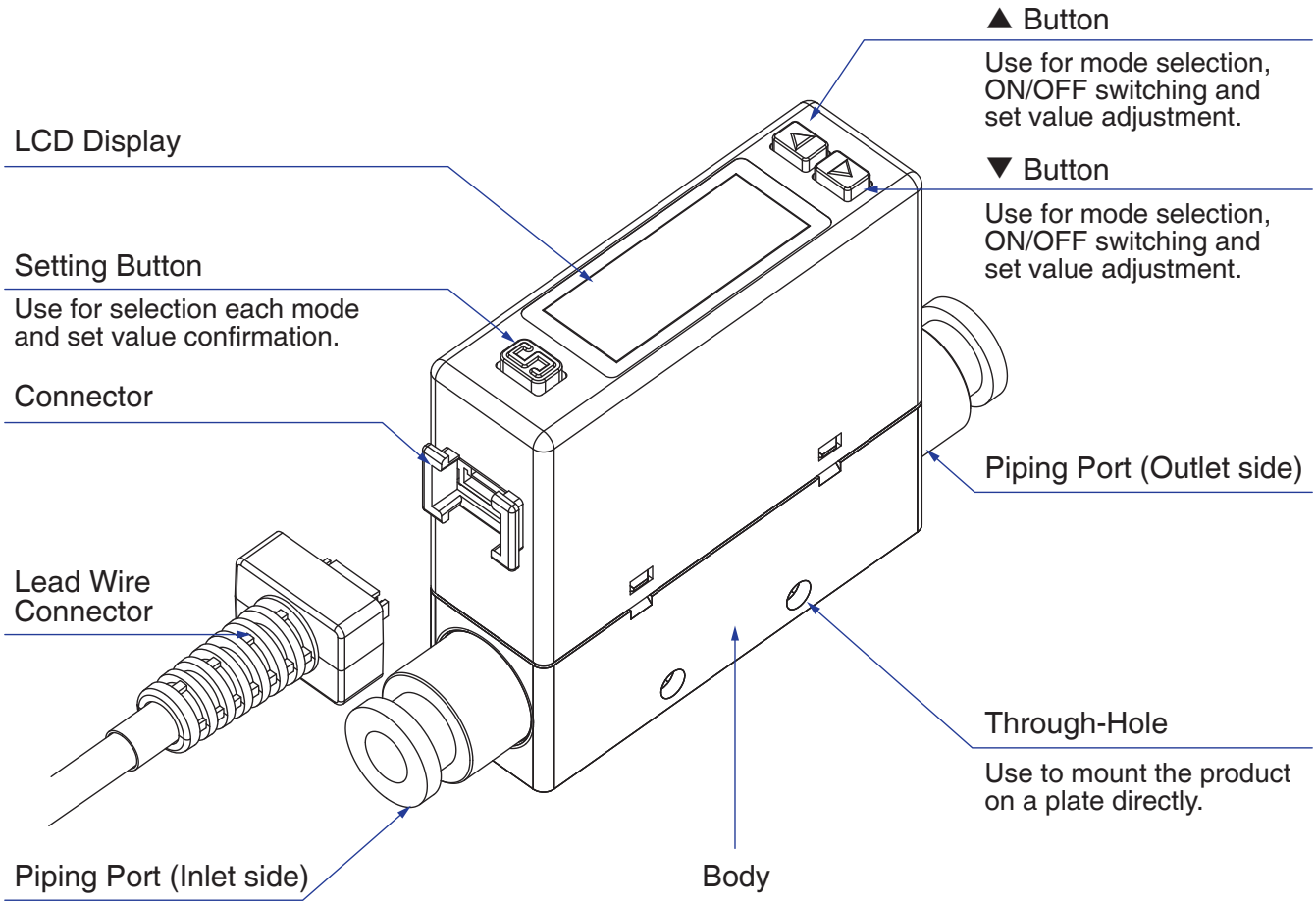


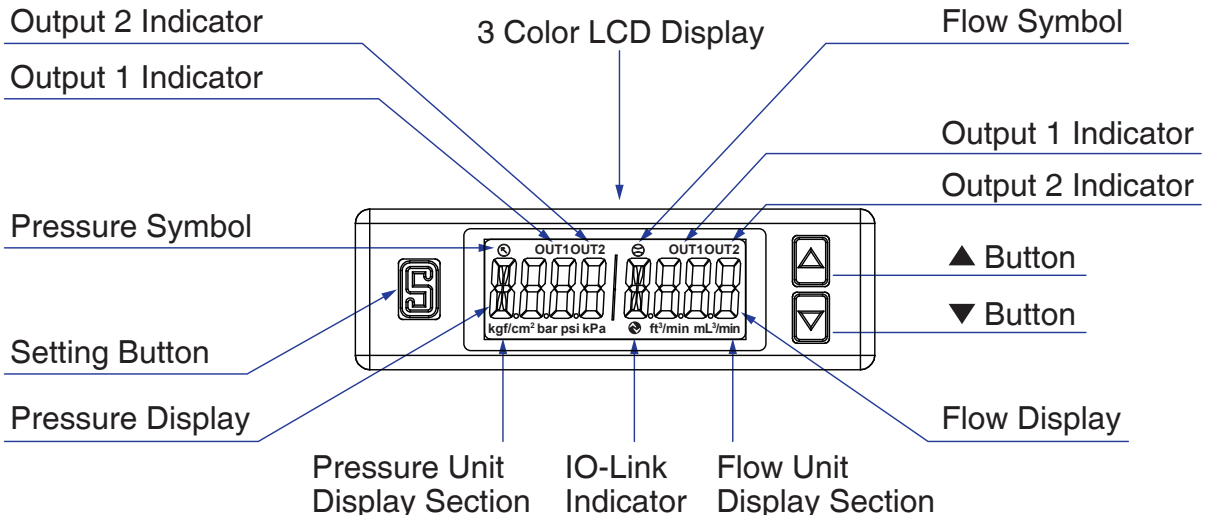
Pin No.	Line color	Content
1	Brown	Operating voltage + 24V DC
2	Orange	Not used
3	White	Switch output 2
4	Black	Switch output 1 or IO-Link (C/Q Line)
5	Blue	0V (GND)

※ NPN/PNP of switch output can be switched.

2 How to Use

2.1 Names and Functions of Individual Parts





2.2 Function Instruction

- Function Setting Mode

Function Code	Item	Default setting	Explanation	Page
[F-01]	[oUt 1] OUT1 setting		Select Output 1 corresponding to flow sensor or pressure sensor. Set the flow rate or pressure value to switch ON/OFF.	P.13
	[oUt 1] OUT1 correspondence	1StF		
	[ModE] OUT1 output mode	SP		
	[LoG 1] OUT1 output logic	H 1-A		
	[F- 1] OUT1 set value input	60% of maximum measured flow rate 005 : 300 mL/min, 010 : 600 mL/min 050 : 3.00 L/min, 100 : 6.00 L/min 500 : 30.0 L/min, 101 : 60.0 L/min 201 : 120 L/min		
	[H- 1] OUT1 hysteresis value input	10% of maximum measured flow rate 005 : 50 mL/min, 010 : 100 mL/min 050 : 0.50 L/min, 100 : 1.00 L/min 500 : 5.0 L/min, 101 : 10.0 L/min 201 : 20 L/min		
[F-02]	[oUt2] OUT2 setting		Select Output 2 corresponding to flow sensor or pressure sensor. Set the flow rate or pressure value to switch ON/OFF.	P.20
	[oUt2] OUT2 correspondence	1StF		
	[ModE] OUT2 output mode	SP		
	[LoG 1] OUT2 output logic	H 1-A		
	[F-2] OUT2 set value input	60% of maximum measured flow rate 005 : 300 mL/min, 010 : 600 mL/min 050 : 3.00 L/min, 100 : 6.00 L/min 500 : 30.0 L/min, 101 : 60.0 L/min 201 : 120 L/min		
	[H-2] OUT2 hysteresis value input	10% of maximum measured flow rate 005 : 50 mL/min, 010 : 100 mL/min 050 : 0.50 L/min, 100 : 1.00 L/min 500 : 5.0 L/min, 101 : 10.0 L/min 201 : 20 L/min		
[F-03]	[CLor] LCD Display setting		Select back light color and display mode.	P.21
	[CoL] LCD Display color setting	SoG 1		
[F-04]	[dFt] Flow/Pressure sensor setting	FLoY	Select the response time of digital filter for switch output. Pressure sensor: OFF ~ 1024ms Flow sensor: 50ms ~ 1500ms	P.22
	[FLoY] Response time of digital filter setting	800(ms)		
[F-06]	[Un it] Unit setting		Select the UNIT of pressure / flow sensor.	P.24
	[FLoY] Flow unit setting	LPn		
	[PrES] Pressure unit setting	PA		
[F-07]	[REFE] Flow reference standard setting	Anr	Select the flow value is shown under standard (ANR) or normal condition (NOR).	P.25
[F-09]	[EEPr] Accumulated value hold setting	oFF	To save the last accumulated flow value every 2 or 5 minutes.	P.26

Function Code	Item	Default setting	Explanation	Page
[F- 10]	[d i5] Flow sensor display mode setting	i n5	Select to display Instantaneous Flow or Accumulated Flow Mode.	P.27
[F- 11]	[FLU i] Fluid setting	A i r	Select desired fluid.	P.28
[F-91]	[ECo] Power-Save mode setting	n o	Select if turn on power-save mode to reduce power consumption.	P.29
[F-96]	[SY] NPN / PNP setting	PnP	Select output type.	P.30
[F-99]	[RESt] Reset to the default setting	oFF	Return to the factory default setting.	P.31

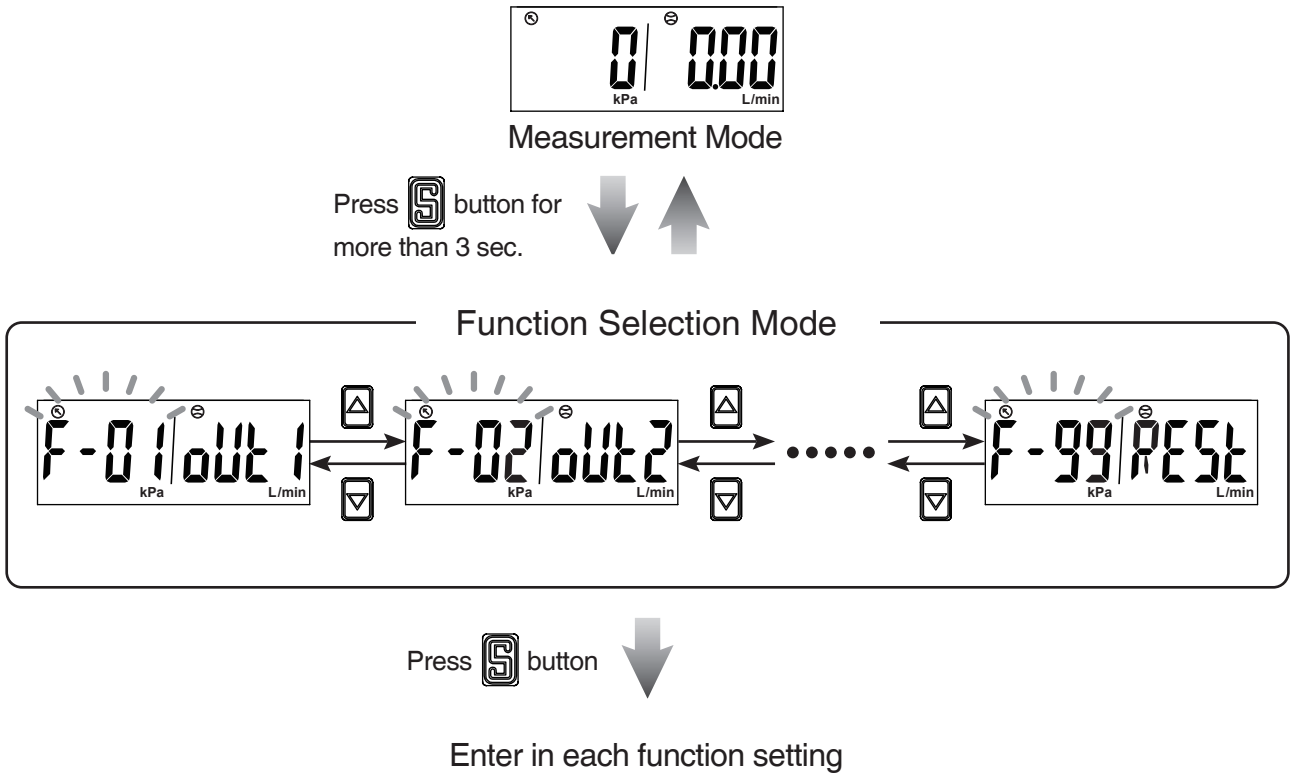
● Measurement Mode

Item	Explanation
Flow display	Display instantaneous flow rate.
Accumulated flow rate display	Display accumulated flow rate.
Instantaneous Flow rate zero setting	The displayed instantaneous flow rate value can be adjusted to "0".
Accumulated flow rate zero clear	The accumulated flow rate can be set to "0".
Peak value display	The maximum pressure or instantaneous flow can be detected when the power is supplied for a period.
Bottom value display	The minimum pressure or instantaneous flow can be detected when the power is supplied for a period.
Key lock mode	To prevent errors occurring due to unintentional changes of the set values.

2.3 Operation Instructions

Function Selection Mode

At Measurement Mode, press S button for more than 3 sec. to display [F-01]. Press △ or ▽ button to select other setting functions.
Press S for 3 sec. at Function Setting Mode to return to Measurement Mode.



2.3.1 [F-01] OUT1 Setting

Setting corresponding sensor and operating mode of OUT1.

- **1. Instantaneous flow setting**

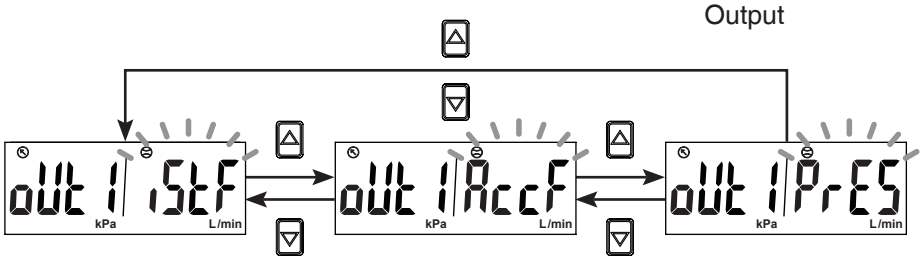
  Press ▲ or ▼ button at Function Selection Mode to display [F-01] [out1].

Press S button

Sensor Selection

Press ▲ or ▼ button to select instantaneous flow of OUT1.

Selected Output | Set Value



Instantaneous flow | Accumulated flow | Pressure

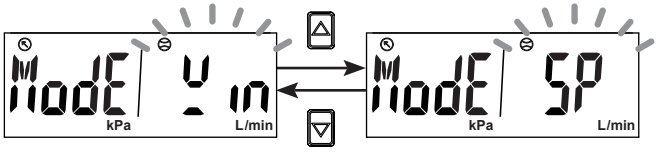
Press S button

Output Mode Setting

Select output mode :

Press ▲ or ▼ button to select output mode of instantaneous flow of OUT1.

Selected Mode | Set Value



Window Comparator Mode | One Point Set Mode

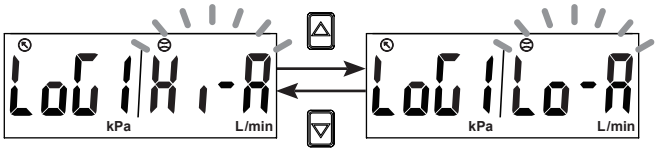
Press S button (to be continued)

Output Logic Setting

OUT1 logic setting :

Press ▲ or ▼ button to select OUT1 logic.

Output Logic Set Value



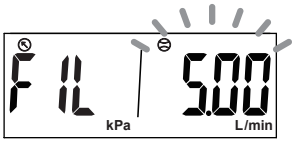
High active Low active

Press S button

Set Value Setting

OUT1 set value setting :

Press ▲ or ▼ button to adjust the set value.



Selected Mode Set Value

One Point Set Mode [SP] : [F- 1]

Window Comparator Mode [Y in] : [F 1L] , [F 1H]

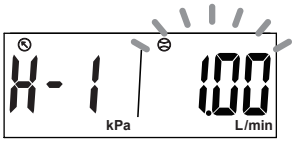
Selected Mode Set Value

Press S button

Hysteresis Setting

Hysteresis setting :

Press ▲ or ▼ button to adjust hysteresis value.



Hysteresis Mode Set Value

Press S button to return to Function Selection Mode

● 2. Accumulated flow setting

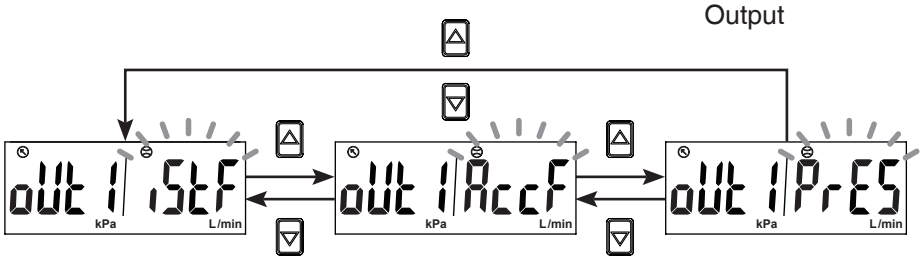
Press ▲ or ▼ button at Function Selection Mode to display [F-01] [out1].

Press S button

Sensor Selection

Press ▲ or ▼ button to select accumulated flow of OUT1.

Selected Output | Set Value



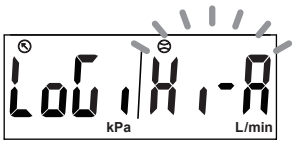
Instantaneous flow | Accumulated flow | Pressure

Press S button

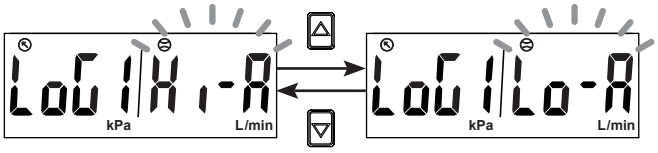
Output Logic Setting

OUT1 logic setting :

Press ▲ or ▼ button to select OUT1 logic.



Output Logic | Set Value



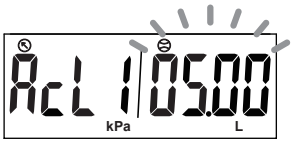
High active | Low active

Press S button (to be continued)

Set Value Setting

OUT1 set value setting :

Press ▲ or ▼ button to adjust the set value.



Selected Mode　Set Value

Selected Mode　Set Value

Press S button to return to Function Selection Mode

● 3. Pressure setting

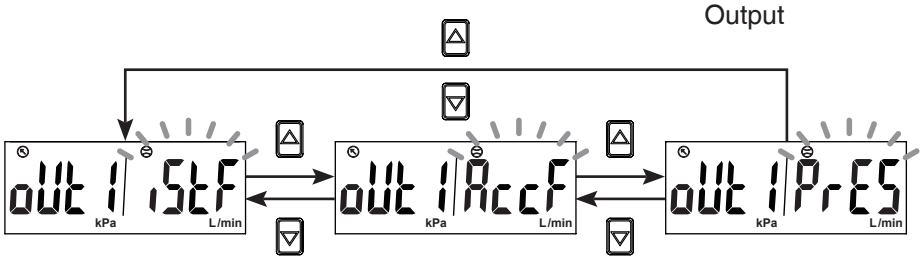
Press ▲ or ▼ button at Function Selection Mode to display [F-01] [out1].

Press S button

Sensor Selection

Press ▲ or ▼ button to select pressure of OUT1.

Selected Output | Set Value



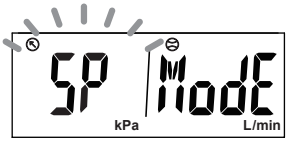
Instantaneous flow | Accumulated flow | Pressure

Press S button

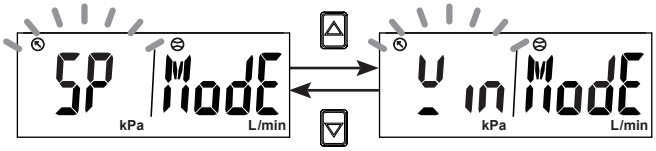
Output Mode Setting

Select output mode :

Press ▲ or ▼ button to select output mode of pressure of OUT1.



Set Value | Selected Mode



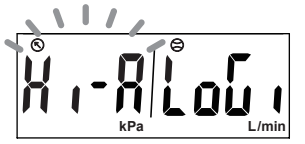
One Point Set Mode | Window Comparator Mode

Press S button (to be continued)

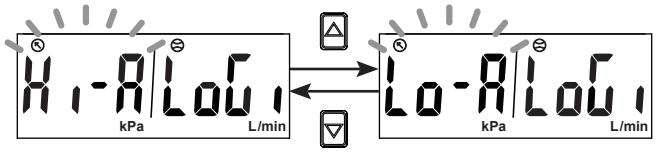
Output Logic Setting

OUT1 logic setting :

Press ▲ or ▼ button to select OUT1 logic.



Set Value Output Logic



High active Low active

Press S button

Set Value Setting

OUT1 set value setting :

Press ▲ or ▼ button to adjust the set value.

Set Value Mode

One Point Set Mode [SP] : [P-1]

Window Comparator Mode [Win] : [P1L] , [P1H]

Set Value Mode

Press S button

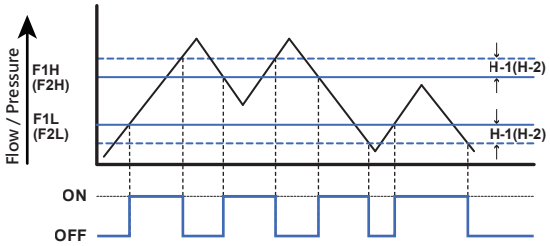
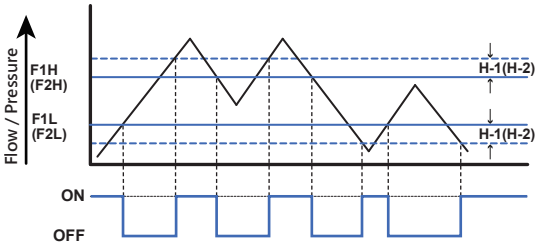
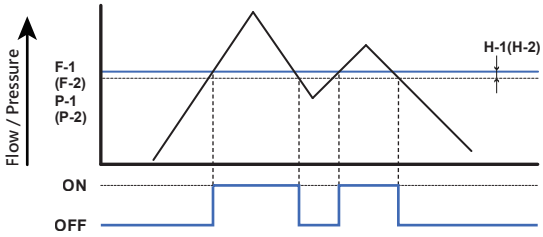
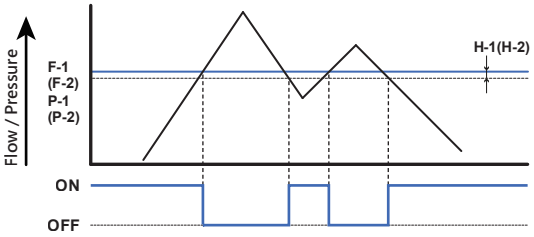
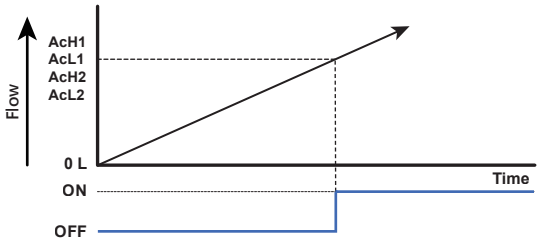
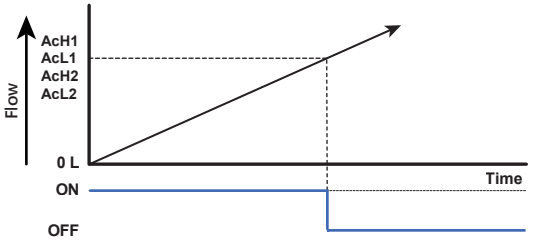
Hysteresis Setting

Hysteresis setting :

Press ▲ or ▼ button to adjust hysteresis value.

Set Value Hysteresis Mode

Press S button to return to Function Selection Mode

Logic High Active	Logic Low Active
Window Comparator Mode	**Window Comparator Mode**
	
One Point Set Mode	**One Point Set Mode**
	
Accumulated Output Mode	**Accumulated Output Mode**
	

2.3.2 [F-02] OUT2 Setting

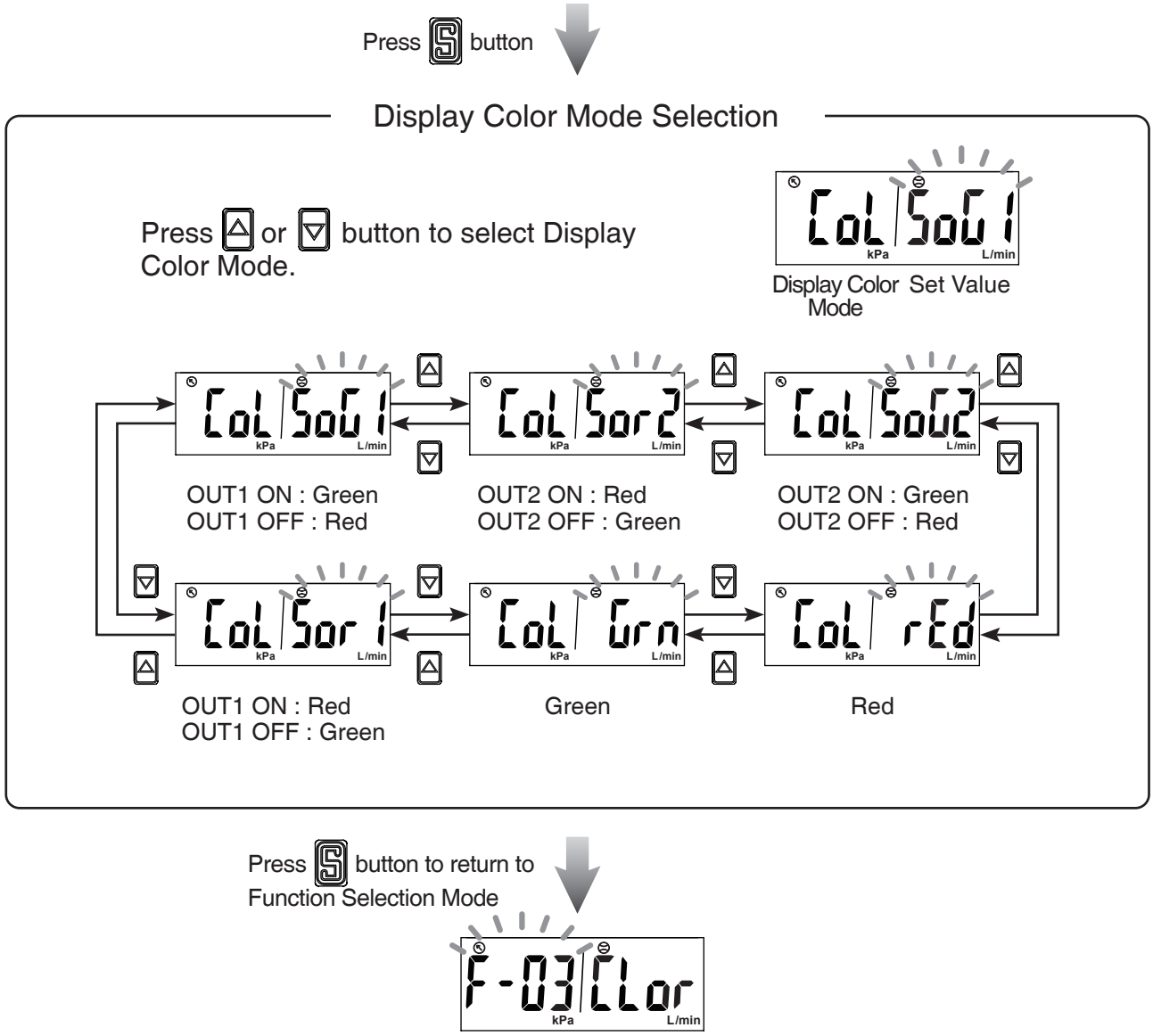
Setting corresponding sensor and operating mode of OUT2.

1. Press ▲ or ▼ button at Function Selection Mode to start "OUT 2 Setting" [F-02] [oUt2].
2. Check the [F-01] for the same follow setting.

2.3.3 [F-03] LCD Display Color Setting

6 LCD Display Color Modes of output value selection.

Press ▲ or ▼ button at Function Selection Mode to display [F-03] [CLor].

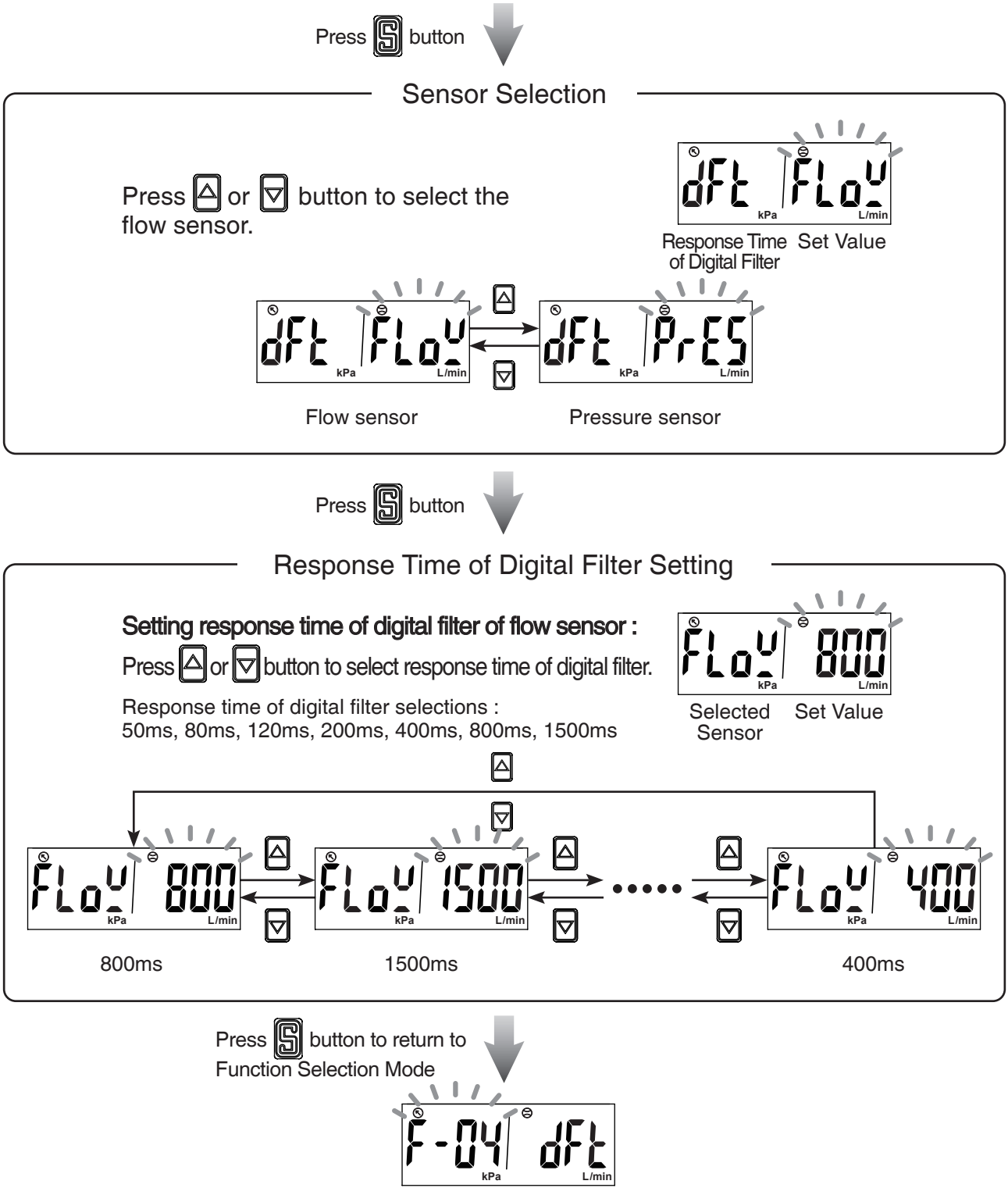


2.3.4 [F-04] Response Time of Digital Filiter Setting

Select proper response time of digital filter to avoid output chattering.

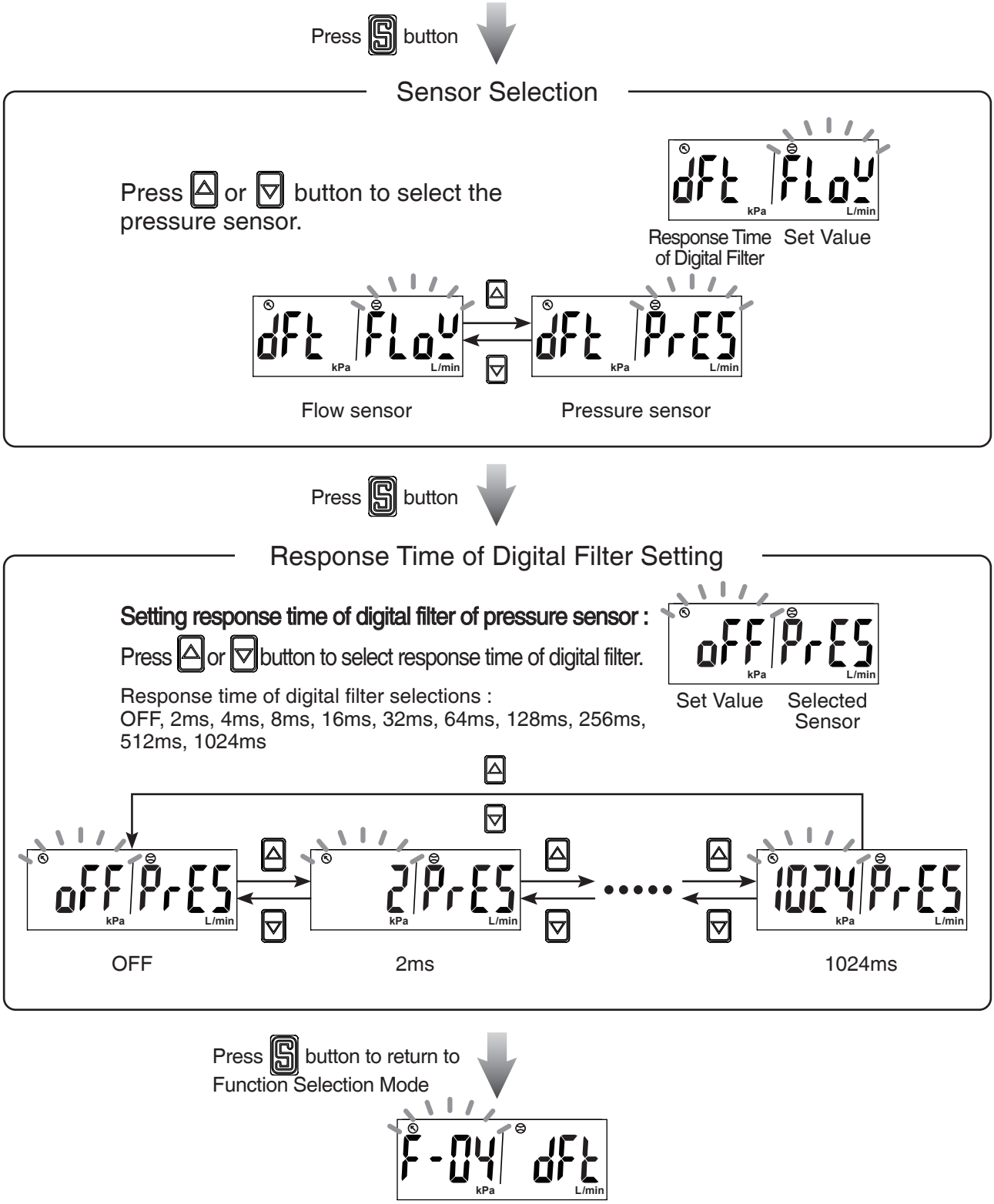
- **1. Flow sensor setting**

  Press ▲ or ▼ button at Function Selection Mode to display [F-04] [dFt].



● 2. Pressure sensor setting

Press ▲ or ▼ button at Function Selection Mode to display [F-04] [dFt].



2.3.5 [F-06] Unit Setting

Select the flow unit and pressure unit of the sensor.

Press ▲ or ▼ button at Function Selection Mode to display [F-06] [Unit].

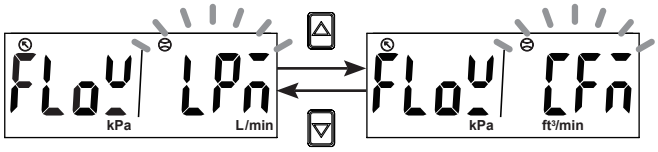
Press S button

Flow Unit Selection

Press ▲ or ▼ button to select the flow sensor.

Flow Sensor Set Value

Flow unit selections :
LPM(L/min), CFM(ft^3/min*10^{-2})



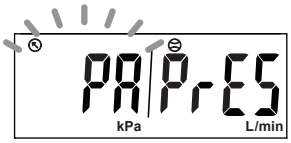
LPM (L/min) CFM (ft^3/min*10^{-2})

※ NOTE : When the measured flow rate range is 500mL/min or 1000mL/min, the unit of LPM is selected to represent the unit in mL/min.

Press S button

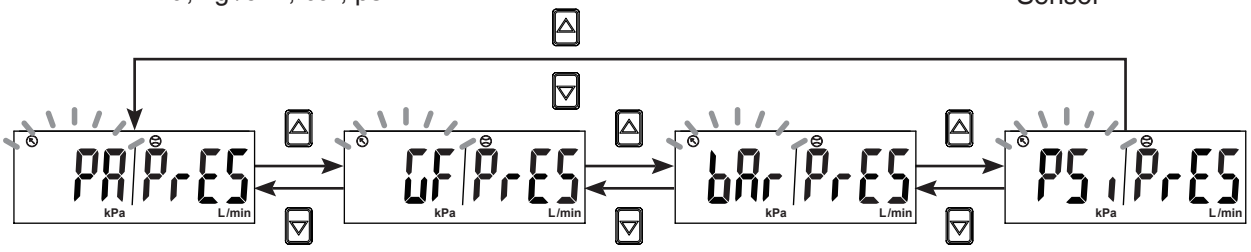
Pressure Unit Setting

Press ▲ or ▼ button to select pressure unit.



Set Value Pressure Sensor

Pressure unit selections :
kPa, kgf/cm^2, bar, psi



kPa kgf/cm^2 bar psi

Press S button to return to Function Selection Mode

2.3.6 [F-07] Flow Reference Standard Setting

Select the flow value is shown under standard or normal condition.

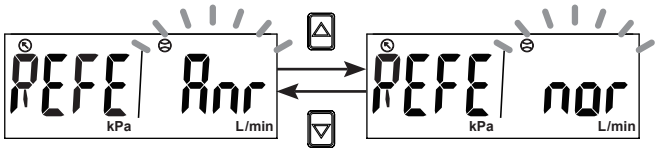
Press ▲ or ▼ button at Function Selection Mode to display [F-07] [REFE].

Press S button

Flow Reference Standard Setting

Press ▲ or ▼ button to select the standard or normal condition.

Flow Reference Set Value



Standard conditon (ANR) Normal condition (NOR)

※ NOTE :

1. Stardard condition (ANR): the display value is calculated under 20°C, 1atm.
2. Normal condition (NOR): the display value is calculated under 0°C, 1atm.
3. Flow rate in the specification is the value at standard condition (ANR).

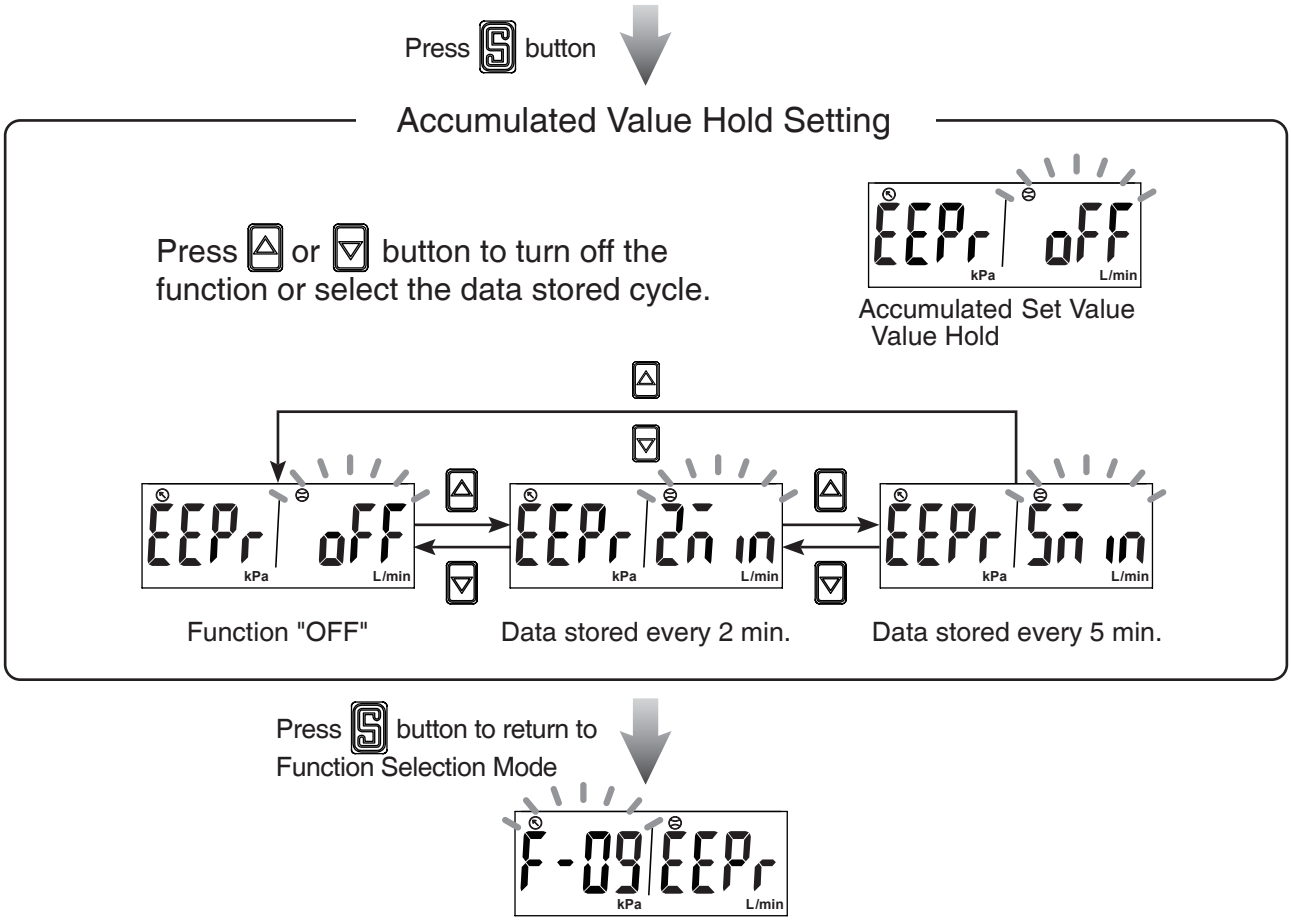
Press S button to return to Function Selection Mode

2.3.7 [F-09] Accumulated Value Hold Setting

The default setting is "OFF", the accumulated flow value is zeroed when the power supply is turned off.

Select this function to keep accumulated flow value to be stored in permanent memory and reload the recent saved accumulated value after power supply turns on.

Press ▲ or ▼ button at Function Selection Mode to display [F-09] [EEPr].



※ NOTE :

The maximum writable limit of the memory device is 1 million cycles.

If the sensor is operated 24 hours per day, the durability is calculated as below :

- 5 minutes x 1 million cycles = 5 million minutes = 9.5 years
- 2 minutes x 1 million cycles = 2 million minutes = 3.8 years

2.3.8 [F- 10] Flow Sensor Display Mode Setting

Select to display Instantaneous Flow or Accumulated Flow Mode.

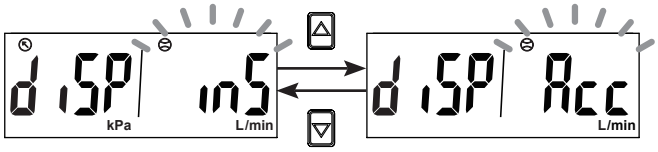
Press ▲ or ▼ button at Function Selection Mode to display [F- 10] [d ISP].

Press S button

Display Mode Setting

Press ▲ or ▼ button to select display mode.

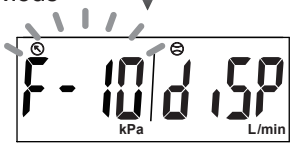
Display Flow　Set Value



Instantaneous Flow Mode　Accumulated Flow Mode

※ NOTE : When the measured flow rate range is 500mL/min or 1000mL/min, the accumulated flow is selected and the unit will become in mL/min.

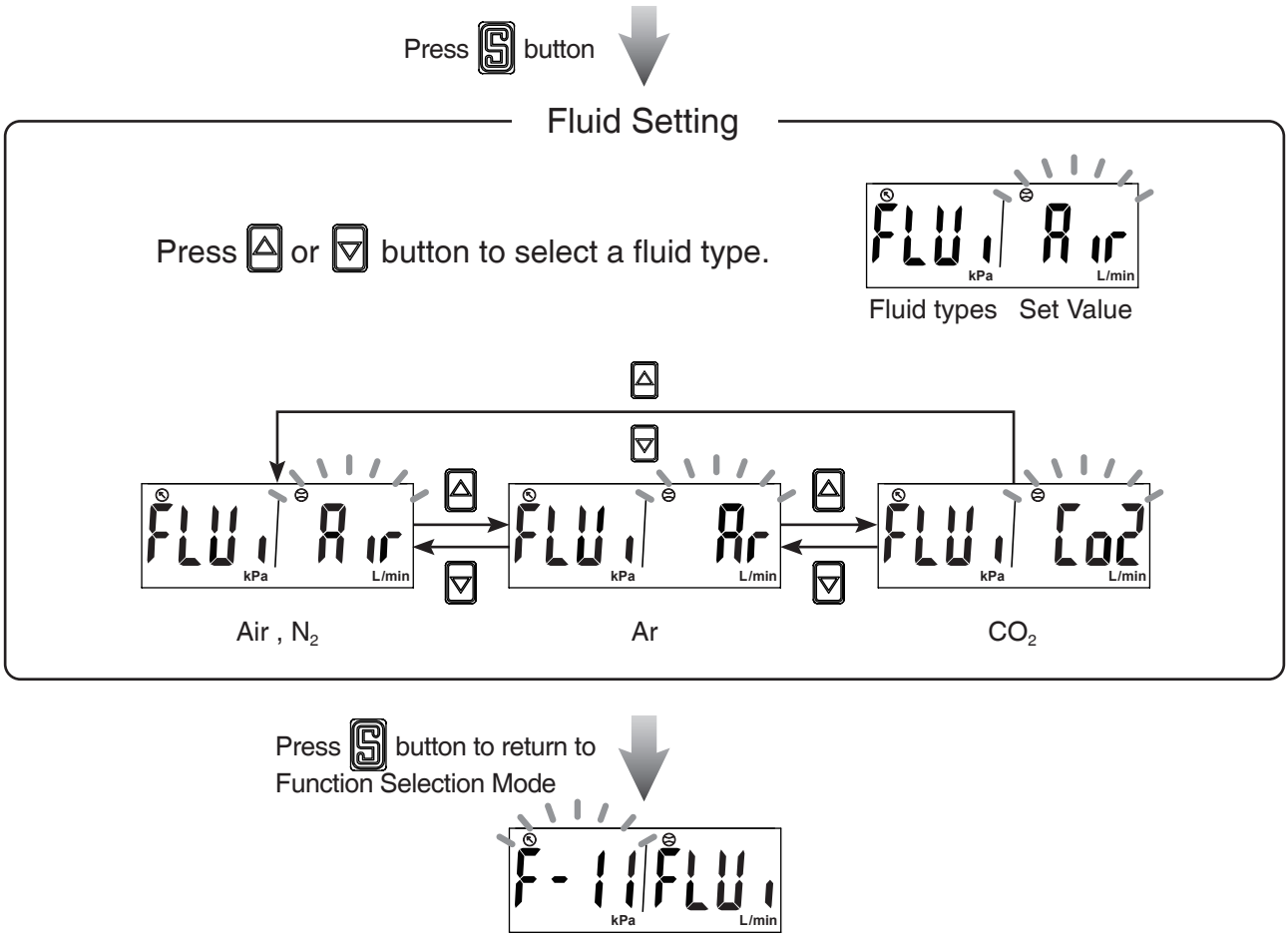
Press S button to return to Function Selection Mode



2.3.9 [F- 11] Fluid Setting

Select the desired fluid. The fluid of default setting is dry air or N_2.

Press ▲ or ▼ button at Function Selection Mode to display [F- 11] [FLU 1].



2.3.10 [F-91] Power-Save Mode Setting

Select Power-Save Mode at Measurement Mode.

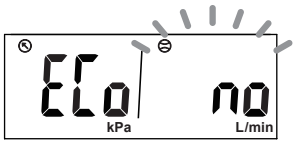
During the Power-Save Mode, the main display will turned off if no buttons is pressed in 30 sec., press any keys to leave the Power-Save Mode.

Press ▲ or ▼ button at Function Selection Mode to display [F-91] [ECo].

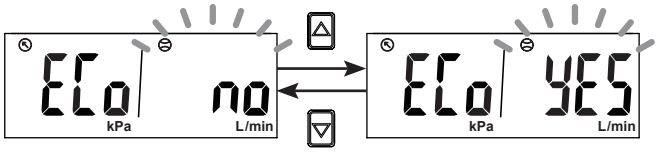
Press S button

Power-Save Mode Setting

Press ▲ or ▼ button to turn on the power-save mode.



Power-Save Set Value Mode



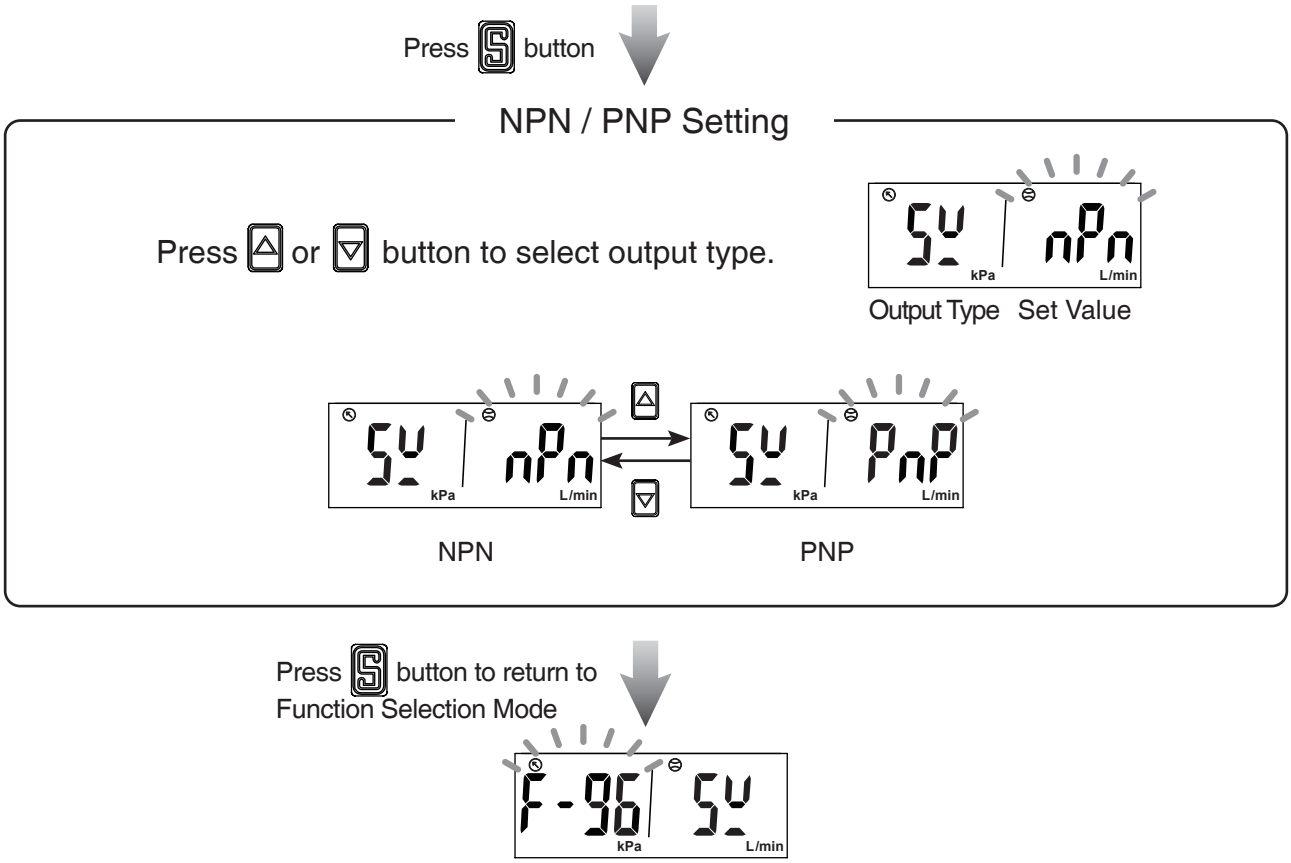
Power-save mode "OFF" Power-save "ON"

※ NOTE : During the Power-Save Mode, the decimal point will flash.

Press S button to return to Function Selection Mode

2.3.11 [F-96] NPN / PNP Setting

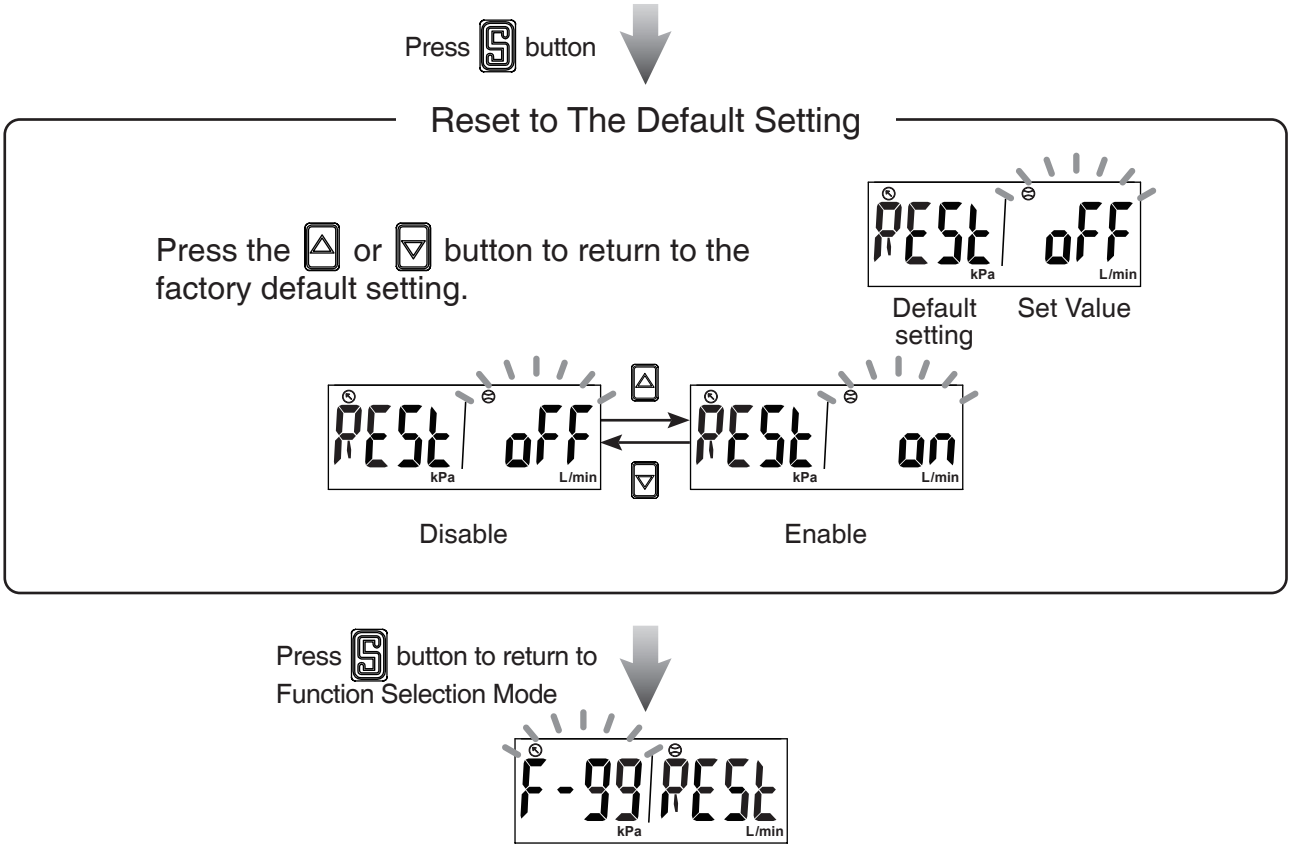
Press ▲ or ▼ button at Function Selection Mode to display [F-96] [SY].



2.3.12 [F-99] Reset to the Default Setting

The factory default settings can be restored.

Press ▲ or ▼ button at Function Selection Mode to display [F-99] [RESt].

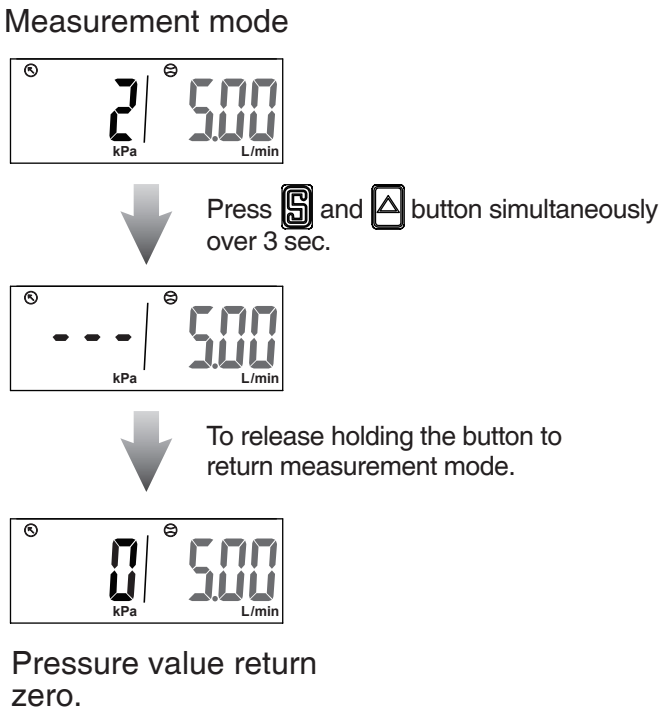


2.3.13 Pressure Zero Adjustment Function

The displayed value can be adjusted to "0" when the pressure is within ±3% F.S. of the zero point at the time of shipment from the factory.

< Operation >

Press S and △ button simultaneously over 3 sec. at the measurement mode (not Accumulated flow value display mode) until display [---]. And release holding the button to return measurement mode.

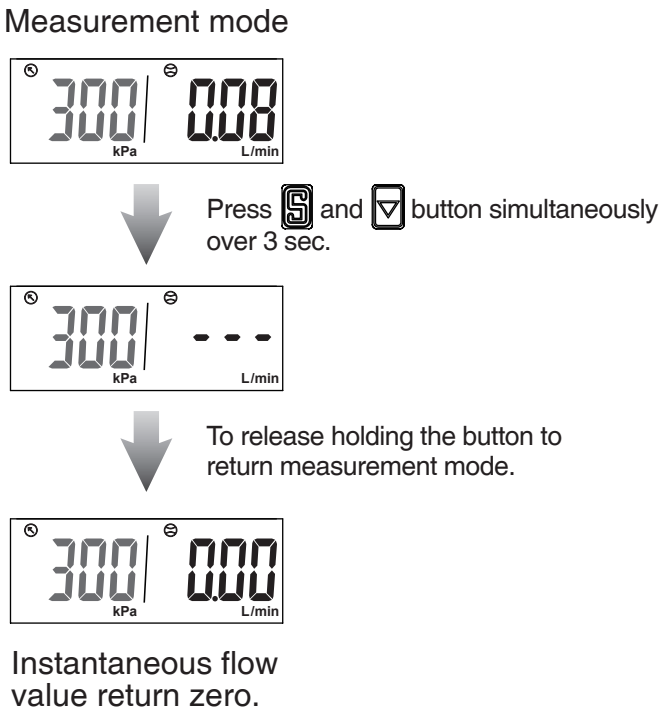


2.3.14 Instantaneous Flow Zero Adjustment Function

The displayed value can be adjusted to "0" when the measured flow is within ±5% F.S. of the zero point at the time of shipment from the factory.

< Operation >

Press S and ▽ button simultaneously over 3 sec. at the measurement mode (not Accumulated flow value display mode) until display [---]. And release holding the button to return measurement mode.



2.3.15 Reset Accumulated Flow Function

Accumulate flow value return to zero.

< Operation >

Press ▲ and ▼ button simultaneously over 3 sec. at the measurement mode (Accumulated flow value mode) until display zero.

And release holding the button to return measurement mode.

Measurement mode

Press ▲ and ▼ button simultaneously over 3 sec.

Accumulated value display zero.
To release holding the button to return measurement mode.

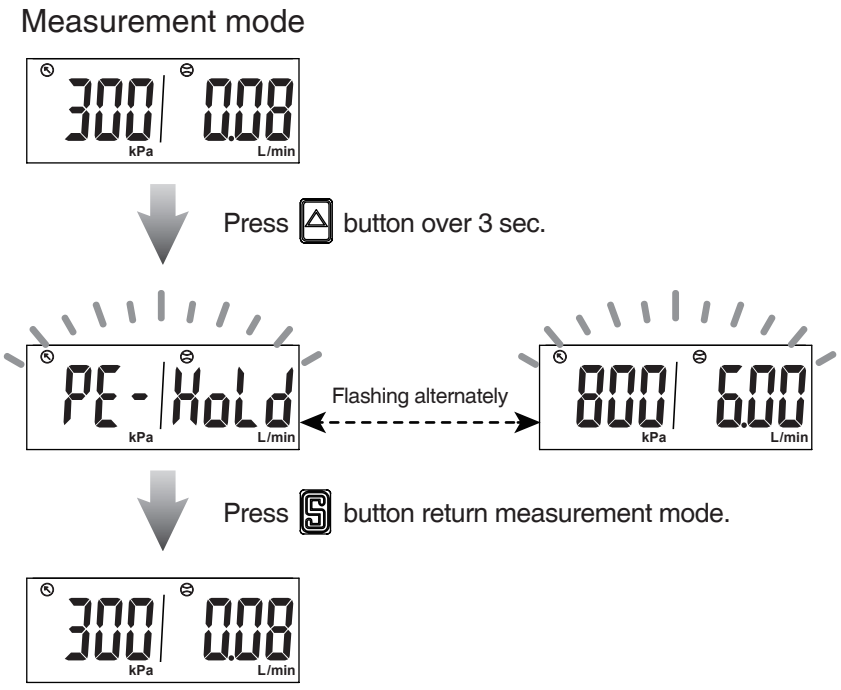
2.3.16 Peak Value Display

The maximum pressure and instantaneous flow, from when the power was supplied to this moment, is detected and updated.

< Operation >

Press [△] button over 3 sec. at the measurement mode. The maximum value will be displayed flashing, and is held.

Press [S] button return to the measurement mode.



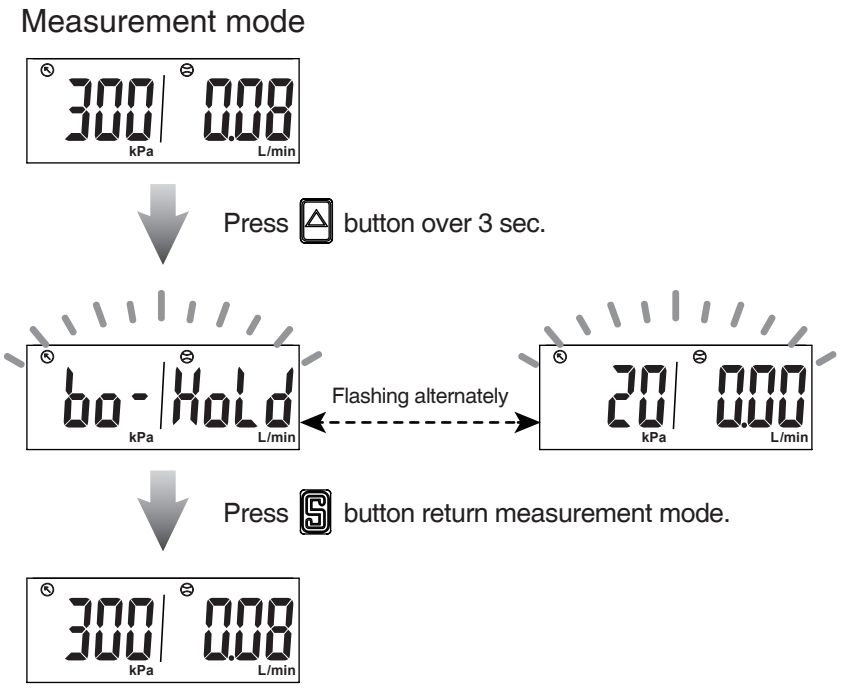
2.3.17 Bottom Value Display

The minimum pressure and instantaneous flow, from when the power was supplied to this moment, is detected and updated.

< Operation >

Press ▽ button over 3 sec. at the measurement mode. The minimum value will be displayed flashing, and is held.

Press S button return to the measurement mode.



2.3.18 Key Lock Mode

Prevent accidental changes to settings parameters. When lock function is ON and user mistakenly presses button, screen will flash [KEY] [Loc] for 3 seconds.

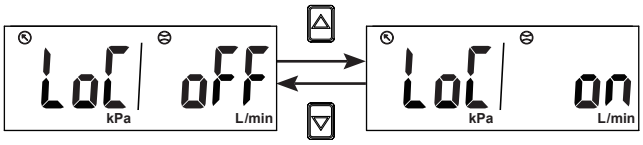
< Operation >

Press S button over 5 sec. at measurement mode to select key lock/unlock setting.

Key Lock / Unlock Setting

Press ▲ or ▼ button to select locking or unlocking of the key.

Lock Selected Mode



Unlock Lock

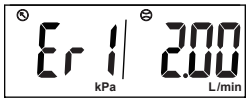
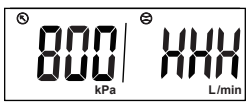
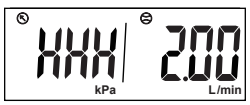
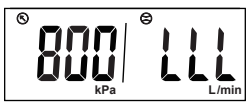
※ NOTE : Lock function is ON, accidental button presses flash as illustrated.

Display for 3 sec.

3 IO-Link Status Indicator Description

Indicator Light	Display	Status
	OFF	SIO Mode
	Flashing	Connecting / Disconnected
	ON	IO-Link Mode

4 Error Code Instruction

Error Type	Error Code	Error Condition	Troubleshooting
OUT1 Excess Load Current Error		Output 1 load current is more than 150 mA	Turn power off and check the cause of overload current or lower the current load under 150 mA, then restart.
			
OUT2 Excess Load Current Error		Output 2 load current is more than 150 mA	
			
Zero Adjustment Error		The instantaneous flow is over ±5% F.S. of the zero point.	Perform the zero clear function again under no flow conditions.
		The pressure value is over ±3% F.S. of the zero point.	Perform the zero clear function again under no pressure conditions.
System Error		Memory error	Turn power off, and then restart. If error condition remains, please return to factory for inspection.
Applied Flow/Pressure Error		The instantaneous flow has exceeded the upper limit of the flow display range.	Reduce the flow to the display range.
		The pressure has exceeded the upper limit of the pressure display range.	Reduce the pressure to the display range.
		The instantaneous flow has exceeded the lower limit of the flow display range.	Ensure the flow is in the correct direction.
		The pressure has exceeded the lower limit of the pressure display range.	Increase the pressure to the display range.

5 Specifications

Model				005	010	050	100	500	101	201
Fluid				Dry air, N_2, CO_2, Ar, 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		-100 ~ 1000 kPa						
Display				4 digital x 4 digital, 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
		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 ft^3/min	0.01 ft^3/min	0.1 ft^3/min	0.1 ft^3/min	1 ft^3/min	1 ft^3/min	1 ft^3/min
	Accumulated Flow	Display Range		99999999 L	99999999 L	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
				0.01 ft^3	0.01 ft^3	0.1 ft^3	0.1 ft^3	1 ft^3	1 ft^3	1 ft^3
	Pressure Display	Display Range		-100 ~ 1000 kPa						
		Minimum Setting Scale	kPa	1						
			kgf/cm^2	0.01						
			bar	0.01						
			psi	0.1						
Accuracy	Flow *2	Guaranteed Range		2 ~ 100 % F.S.						
		Indicator Accuracy		± 3% F.S. ± 1 digit *3						
		Repeatability		± 1% F.S. ± 1 digit *4						
		Linearity		± 3% F.S. *4						
		Temp. Characteristic		± 5% F.S. *4						
		Pressure Characteristic		± 5% F.S. ± 1 digit *5						
	Pressure	Guaranteed Range		0 ~ 100 % F.S.						
		Indicator Accuracy		± 2% F.S. ± 1 digit *6						
		Repeatability		± 0.2% F.S. ± 1 digit *6						
		Temp. Characteristic		± 2% F.S. *6						
Switch Output				2 NPN : open collector 2 outputs Max. Load Current : 150 mA Max. Supply Voltage : 24 V DC Voltage Drop : ≤ 1.5 V			2 PNP : open collector 2 outputs Max. Load Current : 150 mA Max. Supply Voltage : 24 V DC Voltage Drop : ≤ 1.5 V			
	Output Mode	Instant Flow		One Point Set Mode, Window Comparator Mode						
		Accumulated Flow								
		Pressure								
	Hysteresis			Adjustable						
	Response Time of Digital Filter	Flow		800 ms (50, 80, 120, 200, 400, 1500 ms selectable)						
		Pressure		OFF (2, 4, 8, 16, 32, 64, 128, 256, 512, 1024 ms selectable)						
	Output Short Circuit Proterction			Yes						
Power	Power Supply Voltage			24V DC ± 10 %, Ripple (P-P) ≤ 10 %						
	Current Consumption			≤ 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)						
	Withstand Voltage			1000V AC in 1-min (between case and lead wire)						
	Insulation Resistance			≥ 50 MΩ (500V DC , 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						
Lead Wire				Ø4 PVC - 26 AWG (0.15 mm^2) - 5 cores						
Weight (with 2 meter lead wire)				Approx. 112.1g (Ø6 port) ; Approx. 116g (Ø8 port) ; Approx. 122.4g (Rc1/4" port) ; Approx. 132.4g (Rc1/8" port)						

NOTE : *1. CFM (ft^3/min x 10^{-2}) and ft^3 x 10^{-2}
*2. Accuracy: It is based on dry compressed air and KITA standard flow meter. It is a reference only for other gases.
*3. CONDITION : Inlet Pressure : 300 kPa , Outlet Pressure : 1 atmospheric pressure, 25 °C.
*4. CONDITION : Outlet Pressure : 1 atmospheric pressure, 25 °C.
*5. -0.1 ~ 1 MPa, Outlet Pressure : 1 atmospheric pressure, 25 °C.
*6. Outlet flow rate = 0 L/min, 25 °C

• IO-Link Specifications

Type	Device
Version	V1.1 *1
Communication Speed	COM2 (38.4bps)
Configuration File	IODD file *2
Mini Cycle Time	4.6 ms
Process Data Length	Input data : 5 (6 bit BDC, 32 bit PDV) byte, Output data : 0 byte
On Request Data Communication	Available
Data Storage Function	Available
Event Function	Available

Vendor ID	1254 (0x04E6)
Device ID	KFP01A-005-L-☐ : 8 (0x000008) KFP01A-010-L-☐ : 9 (0x000009) KFP01A-050-L-☐ : 10 (0x00000A) KFP01A-100-L-☐ : 11 (0x00000B) KFP01A-500-L-☐ : 12 (0x00000C) KFP01A-101-L-☐ : 13 (0x00000D) KFP01A-201-L-☐ : 14 (0x00000E)

NOTE : *1. IO-Link Interface and System Specification, V1.1.3, June 2019
*2. IO-Link device description (IODD) is available on KITA web site : www.kita.com.tw

6 Process Data

1.Process Data Input

Bit Offset	Item	Note
0	Instantaneous Flow Rate OUT1 output	OFF = 0 ; ON = 1
1	Instantaneous Flow Rate OUT2 output	OFF = 0 ; ON = 1
2	Accumulated Flow OUT1 output	OFF = 0 ; ON = 1
3	Accumulated Flow OUT2 output	OFF = 0 ; ON = 1
4	Pressure OUT1 output	OFF = 0 ; ON = 1
5	Pressure OUT2 output	OFF = 0 ; ON = 1
6 ~ 7	No used	
8 ~ 23	Pressure measurement value	Unsigned 16 bit
24 ~ 39	Instantaneous flow measurement value	Unsigned 16 bit

2.PDI Data Structure

Bit Offset	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24
Item	Instantaneous flow measurement value (PDV)															

Bit Offset	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8
Item	Pressure measurement value (PDV)															

Bit Offset	7	6	5	4	3	2	1	0
Item	No used		P-OUT2	P-OUT1	A-OUT2	A-OUT1	F-OUT2	F-OUT1

NOTE：F-OUT1：Instantaneous flow output 1　A-OUT1：Accumulated flow output 1　P-OUT1：Pressure output 1
F-OUT2：Instantaneous flow output 2　A-OUT2：Accumulated flow output 2　P-OUT2：Pressure output 2

3.PDV - Pressure

Unit	Setting Range	Gradient	Intercept	Display Dot
kPa	-105 ~ 1050	0.017624170291	-105	0
kgf/cm^2	-1.07 ~ 10.71	0.000179751278	-1.07	2
bar	-1.05 ~ 10.50	0.000176241703	-1.05	2
psi	-15.2 ~ 152.3	0.002555886168	-15.2	1

Conversion formula of the process data and pressure measurement value.
Pressure measurement value = Gradient x PDV + Intercept
Pressure set value = Gradient x Parameter + Intercept

4.PDV - Instantaneous Flow

Series	Unit	Fluid Type	Setting Range	Gradient	Intercept	Display Dot
005	mL/min	Air/Ar	0 ~ 525	0.008010986496	0	0
		CO_2	0 ~ 263	0.004013122759	0	0
	$ft^3/min *10^{-2}$	Air/Ar	0 ~ 1.85	0.000028229191	0	2
		CO_2	0 ~ 0.93	0.000014190890	0	2
010	mL/min	Air/Ar	0 ~ 1050	0.016021972992	0	0
		CO_2	0 ~ 525	0.008010986496	0	0
	$ft^3/min *10^{-2}$	Air/Ar	0 ~ 3.71	0.000056610971	0	2
		CO_2	0 ~ 1.86	0.000028381781	0	2
050	L/min	Air/Ar	0 ~ 5.25	0.000080109865	0	2
		CO_2	0 ~ 2.63	0.000040131228	0	2
	$ft^3/min *10^{-2}$	Air/Ar	0 ~ 18.5	0.000282291905	0	1
		CO_2	0 ~ 9.3	0.000141908904	0	1
100	L/min	Air/Ar	0 ~ 10.5	0.000160219730	0	2
		CO_2	0 ~ 5.25	0.000080109865	0	2
	$ft^3/min *10^{-2}$	Air/Ar	0 ~ 37.1	0.000566109712	0	1
		CO_2	0 ~ 18.6	0.000283817807	0	1
500	L/min	Air/Ar	0 ~ 52.5	0.000801098650	0	1
		CO_2	0 ~ 26.3	0.000401312276	0	1
	$ft^3/min *10^{-2}$	Air/Ar	0 ~ 185	0.002822919051	0	0
		CO_2	0 ~ 93	0.001419089036	0	0
101	L/min	Air/Ar	0 ~ 105	0.001602197299	0	1
		CO_2	0 ~ 52.5	0.000801098650	0	1
	$ft^3/min *10^{-2}$	Air/Ar	0 ~ 371	0.005661097124	0	0
		CO_2	0 ~ 186	0.002838178073	0	0
201	L/min	Air/Ar	0 ~ 210	0.003204394598	0	0
		CO_2	0 ~ 105	0.001602197299	0	0
	$ft^3/min *10^{-2}$	Air/Ar	0 ~ 742	0.011322194247	0	0
		CO_2	0 ~ 371	0.005661097124	0	0

Conversion formula of the process data and instantaneous flow measurement value.
Instantaneous flow measurement value = Gradient x PDV + Intercept
Instantaneous flow set value = Gradient x Parameter + Intercept

5.PDV - Accumulated Flow

Series	Unit	Setting Range	Gradient	Intercept	Display Dot
005	mL/min	0 ~ 9999999	1	0	0
	$ft^3/min *10^{-2}$	0 ~ 999999.99	0.01	0	2
010	mL/min	0 ~ 99999999	1	0	0
	$ft^3/min *10^{-2}$	0 ~ 999999.99	0.01	0	2
050	L/min	0 ~ 999999.99	0.01	0	2
	$ft^3/min *10^{-2}$	0 ~ 9999999.9	0.1	0	1
100	L/min	0 ~ 999999.99	0.01	0	2
	$ft^3/min *10^{-2}$	0 ~ 9999999.9	0.1	0	1
500	L/min	0 ~ 9999999.9	0.1	0	1
	$ft^3/min *10^{-2}$	0 ~ 99999999	1	0	0
101	L/min	0 ~ 9999999.9	0.1	0	1
	$ft^3/min *10^{-2}$	0 ~ 99999999	1	0	0
201	L/min	0 ~ 99999999	1	0	0
	$ft^3/min *10^{-2}$	0 ~ 99999999	1	0	0

Conversion formula for accumulated flow.
Accumulated flow value = Gradient x Parameter + Intercept

7 IO-Link Parameter Setting

1.Direct Parameters Page 1

Address	Access	Parameter Name	Initial Value (dec)	Contents
0x07 0x08	Read	Vendor ID	0x04E6 (1254)	KITA SENSOR TECH.CO.,LTD
0x09 0x0A 0x0B	Read	Device ID	0x000008 (8)	KFP01A-005-L- ☐
			0x000009 (9)	KFP01A-010-L- ☐
			0x00000A (10)	KFP01A-050-L- ☐
			0x00000B (11)	KFP01A-100-L- ☐
			0x00000C (12)	KFP01A-500-L- ☐
			0x00000D (13)	KFP01A-101-L- ☐
			0x00000E (14)	KFP01A-201-L- ☐

2.ISDU Parameters

Index (dec)	Subindex	Access	Parameters	Initial Value	Remarks
0x0002 (2)	0	Write	System command		Refer to the table 1
0x000C (12)	0	Read / Write	Device access lock	0x0000	Refer to the table 2
0x0010 (16)	0	Read	Vendor name	KITA SENSOR TECH.CO.,LTD	
0x0011 (17)	0	Read	Vendor text	http://www.kita.com.tw	
0x0012 (18)	0	Read	Product name	Example : KFP01A-005-L	
0x0013 (19)	0	Read	Product ID	Example : KFP01A-005-L	
0x0014 (20)	0	Read	Product text	Flow & Pressure Sensor	
0x0015 (21)	0	Read	Serial number	xxxxxxxxxxxxxxx	
0x0016 (22)	0	Read	Hardware version	Vx.y	
0x0017 (23)	0	Read	Software version	Vx.y	
0x0018 (24)	0	Read / Write	Application specific tag	xxx	
0x0019 (25)	0	Read / Write	Function tag	xxx	
0x001A (26)	0	Read / Write	Location tag	xxx	
0x0024 (36)	0	Read	Device status parameter		Refer to the table 3
0x0025 (37)	0	Read	Device detailed state parameter		Refer to the table 4
0x0028 (40)	0	Read	Process data input		The latest value of process data can be read

Table 1

Value (dec)	Function Definition	Description
0x80 (128)	Device reset	Restarts the device
0x81 (129)	Application reset	Clear peak / bottom value
0x82 (130)	Restore factory settings	Restores factory default values
0x83 (131)	Back-to-box	The parameter of the device are set to factory default values and communication will be inhibited until the next power cycle.
0xA0 (160)	Pressure value return to zero	Executes zero clear
0xA1 (161)	Instantaneous flow value return to zero	Executes zero clear
0xAA (170)	Clear the peak/bottom value of pressure	Executes clear
0xAB (171)	Clear the peak/bottom value of instantaneous flow	Executes clear
0xAC (172)	Accumulate flow value return to zero	Executes zero clear

Table 2

Value (dec)	Description
0x0000 (0)	Key unlock (initial value)
0x0008 (8)	Key lock

Table 3

Value (dec)	State Definition
0x00 (0)	Normal operation
0x01 (1)	Maintenance inspection required
0x02 (2)	Out of specification
0x03 (3)	Function check
0x04 (4)	Failure

Table 4

Array	Event Content	Event Classification		Event Code
		Definition	Value	
1	Internal failure	Error	0xF4	0x1801
2	OUT2(PIN3) overload / short circuit	Error	0xF4	0x8D01
3	Pressure overrun	Warning	0xE4	0x8CA1
4	Flow overrun	Warning	0xE4	0x8CA2
5	Accumulated flow overrun	Warning	0xE4	0x8CA3

3.Product Individual Parameters

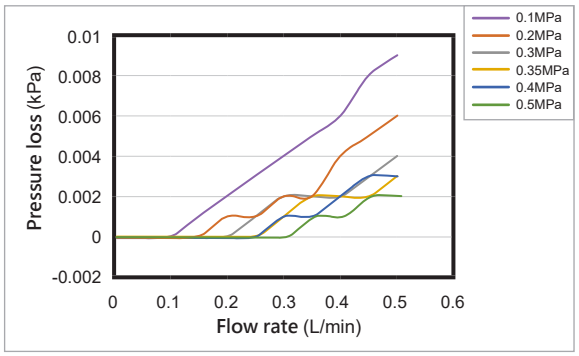
Index (dec)	Subindex	Access	Parameters	Data Storage	Data Type	Initial Value	Remarks
0x03E8 (1000)	0	Read Write	Output 1 selection	Y	Uint16	Instantaneous flow	0 : Instantaneous flow 1 : Accumulated flow 2 : Pressure
0x03E9 (1001)	0	Read Write	Output 2 selection	Y	Uint16	Instantaneous flow	0 : Instantaneous flow 1 : Accumulated flow 2 : Pressure
0x044C (1100)	0	Read Write	Backlight	Y	Uint16	SoG1	0 : Red 1 : Green 2 : Sor1 3 : SoG1 4 : Sor2 5 : SoG2
0x0474 (1140)	0	Read Write	ECO function	Y	Uint16	OFF	0 : OFF 1 : ON
0x0475 (1141)	0	Read Write	Key lock function	Y	Uint16	Unlock	0 : Unlock 1 : Lock
0X07D0 (2000)	0	Read Write	Pressure unit	Y	Uint16	kPa	0 : kPa 2 : kgf/cm^2 3 : bar 4 : psi
0x07D1 (2001)	0	Read Write	Digital filter time of pressure value	Y	Uint16	OFF	0 : OFF 1 : 2ms 2 : 4ms 3 : 8ms 4 : 16ms 5 : 32ms 6 : 64ms 7 : 128ms 8 : 256ms 9 : 512ms 10 : 1024ms
0x0834 (2100)	0	Read Write	Flow reference standard	Y	Uint16	ANR	0 : ANR 1 : NOR
0x0835 (2101)	0	Read Write	Flow unit	Y	Uint16	LPM	0 : LPM 1 : CFM
0x0836 (2102)	0	Read Write	Fluid type	Y	Uint16	Air	0 : Air 1 : Ar 2 : CO_2
0x0837 (2103)	0	Read Write	Flow display setting	Y	Uint16	Display Instantaneous flow	0 : Instantaneous flow 1 : Accumulated flow
0x0839 (2105)	0	Read Write	Digital filter time of flow value	Y	Uint16	800ms	0 : 50ms 1 : 80ms 2 : 120ms 3 : 200ms 4 : 400ms 5 : 800ms 6 : 1500ms
0x083B (2107)	0	Read Write	Accumulated flow storage time	Y	Uint16	OFF	0 : OFF 1 : 2min 2 : 5min
0x1388 (5000)	1	Read Write	Instantaneous flow of OUT1 Set value 1 FL-1	Y	Uint16	005 : 250mL/min 010 : 500mL/min 050 : 2.50L/min 100 : 5.00L/min 500 : 25.0L/min 101 : 50.0L/min 201 : 100L/min	
	2	Read Write	Instantaneous flow of OUT1 Set value 2 F-1 ,FH-1	Y	Uint16	050 : 300mL/min 010 : 600mL/min 050 : 3.00L/min 100 : 6.00L/min 500 : 30.0L/min 101 : 60.0L/min 201 : 120L/min	

Index (dec)	Subindex	Access	Parameters	Data Storage	Data Type	Initial Value	Remarks
0x1389 (5001)	1	Read Write	Switch logic of instantaneous flow of OUT1	Y	Uint8	High active	0 : High active 1 : Low active
	2	Read Write	Output mode of instantaneous flow of OUT1	Y	Uint8	One point mode	1 : One point mode 2 : Window mode
	3	Read Write	Instantaneous flow of OUT1 Hysteresis H-1	Y	Uint16	005 : 50mL/min 010 : 100mL/min 050 : 0.50L/min 100 : 1.00L/min 500 : 5.0L/min 101 : 10.0L/min 201 : 20L/min	
0x138A (5002)	1	Read Write	Instantaneous flow of OUT2 Set value 1 FL-2	Y	Uint16	005 : 250mL/min 010 : 500mL/min 050 : 2.50L/min 100 : 5.00L/min 500 : 25.0L/min 101 : 50.0L/min 201 : 100L/min	
	2	Read Write	Instantaneous flow of OUT2 Set value 2 F-2 ,FH-2	Y	Uint16	005 : 300mL/min 010 : 600mL/min 050 : 3.00L/min 100 : 6.00L/min 500 : 30.0L/min 101 : 60.0L/min 201 : 120L/min	
0x138B (5003)	1	Read Write	Switch logic of instantaneous flow of OUT2	Y	Uint8	High active	0 : High active 1 : Low active
	2	Read Write	Output mode of instantaneous flow of OUT2	Y	Uint8	One point mode	1 : One point mode 2 : Window mode
	3	Read Write	Instantaneous flow of OUT2 Hysteresis H-2	Y	Uint16	005 : 50mL/min 010 : 100mL/min 050 : 0.50L/min 100 : 1.00L/min 500 : 5.0L/min 101 : 10.0L/min 201 : 20L/min	
0x1392 (5010)	0	Read Write	Accumulated flow of OUT1 Ad-1	Y	Uint32	005 : 250mL 010 : 500mL 050 : 2.50L 100 : 5.00L 500 : 25.0L 101 : 50.0L 201 : 100L	
0x1393 (5011)	1	Read Write	Switch logic of Accumulated flow of OUT1	Y	Uint8	High active	0 : High active 1 : Low active
	2	Read Write	Output mode of Accumulated flow of OUT1	Y	Uint8	Accumulated flow mode	128 : Accumulated flow mode
0x1394 (5012)	0	Read Write	Accumulated flow of OUT2 Ad-2	Y	Uint32	005 : 250mL 010 : 500mL 050 : 2.50L 100 : 5.00L 500 : 25.0L 101 : 50.0L 201 : 100L	
0x1395 (5013)	1	Read Write	Switch logic of Accumulated flow of OUT2	Y	Uint8	High active	0 : High active 1 : Low active
	2	Read Write	Output mode of Accumulated flow of OUT2	Y	Uint8	Accumulated flow mode	128 : Accumulated flow mode

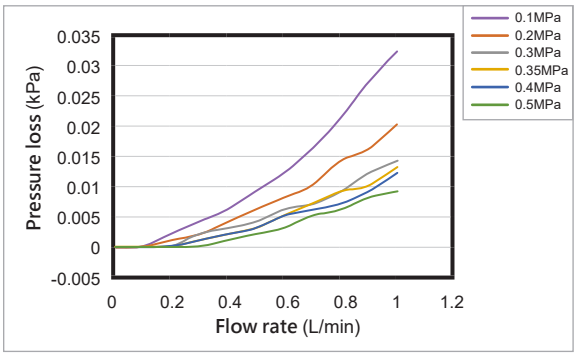
Index (dec)	Subindex	Access	Parameters	Data Storage	Data Type	Initial Value	Remarks
0x139C (5020)	1	Read Write	Pressure of OUT1 Set value 1 PL-1	Y	Uint16	500 kPa	
	2	Read Write	Pressure of OUT1 Set value 2 P-1,PH-1	Y	Uint16	600 kPa	
0x139D (5021)	1	Read Write	Switch logic of pressure of OUT1	Y	Uint8	High active	0 : High active 1 : Low active
	2	Read Write	Output mode of pressure of OUT1	Y	Uint8	One point mode	1 : One point mode 2 : Window mode
	3	Read Write	Pressure of OUT1 Hysteresis H-1	Y	Uint16	100 kPa	
0x139E (5022)	1	Read Write	Pressure of OUT2 Set value 1 PL-2	Y	Uint16	500 kPa	
	2	Read Write	Pressure of OUT2 Set value 2 P-2,PH-2	Y	Uint16	600 kPa	
0x139F (5023)	1	Read Write	Switch logic of pressure of OUT2	Y	Uint8	High active	0 : High active 1 : Low active
	2	Read Write	Output mode of pressure of OUT2	Y	Uint8	One point mode	1 : One point mode 2 : Window mode
	3	Read Write	Pressure of OUT2 Hysteresis H-2	Y	Uint16	100 kPa	
0x1F40 (8000)	0	Read	Current instantaneous flow value	N	Uint16		
0x1F41 (8001)	0	Read	Current accumulated flow value	N	Uint32		
0x1F42 (8002)	0	Read	Current pressure value	N	Uint16		
0x2008 (8200)	1	Read	Maximum instantaneous flow value	N	Uint16		
	2	Read	Minimum instantaneous flow value	N	Uint16		
0x200A (8202)	1	Read	Maximum pressure value	N	Uint16		
	2	Read	Minimum pressure value	N	Uint16		

8 Pressure Loss Characteristics

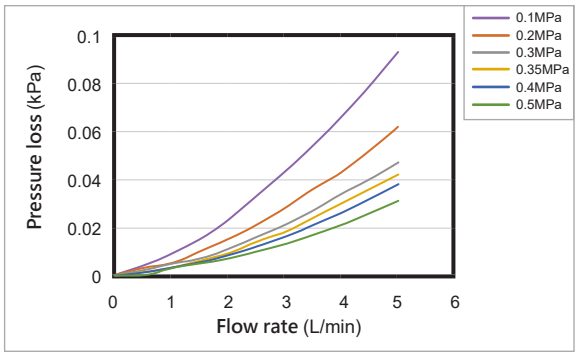
● KFP01A-005 (0.5 L/min)



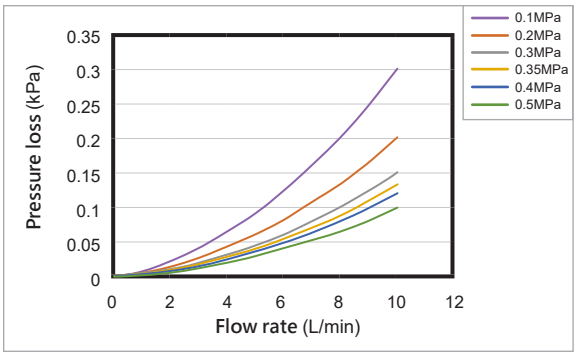
● KFP01A-010 (1 L/min)



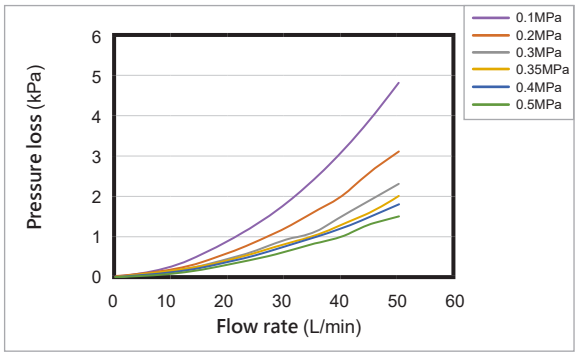
● KFP01A-050 (5 L/min)



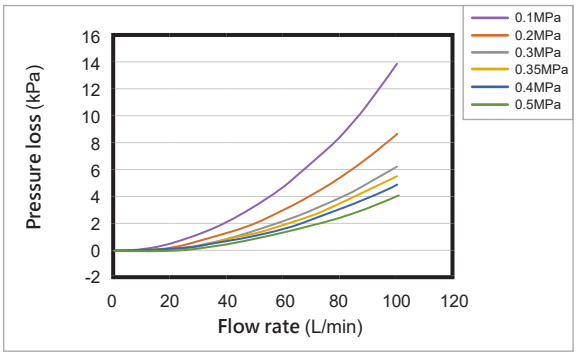
● KFP01A-100 (10 L/min)



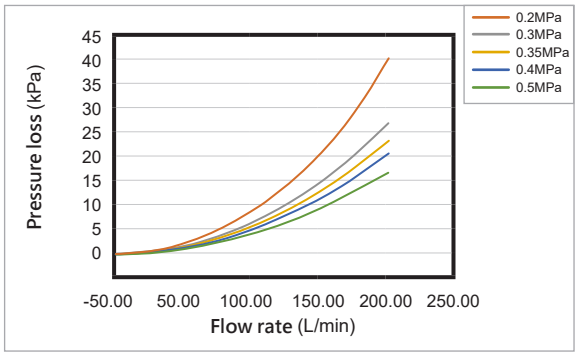
● KFP01A-500 (50 L/min)



● KFP01A-101 (100 L/min)

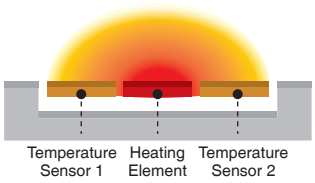


● KFP01A-201 (200 L/min)



9 Thermal Mass Flow Sensor Principles

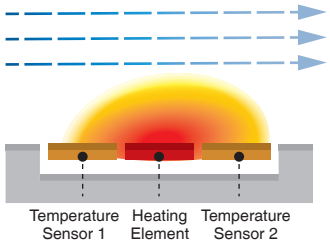
Symmetric Temperature Profile No Flow



(a) : No Flow

In the absence of flow, the heat from the heater spreads evenly left and right, so the temperature distribution is like (a).

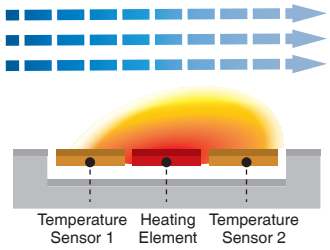
Skewed Temperature Profile Small Flow



(b) : Small Flow

When flow begins, the inlet side is cooled by the flow, the outlet side is warmed by the heat of the inlet side of the heater, and the temperature distribution is like (b).

Skewed Temperature Profile Large Flow



(c) : Large Flow

When the flow increases, it becomes a distribution like (C). Since the temperature distribution before and after the heater is proportional to the flow rate, the flow rate can be determined from the ratio.

10 Ordering Information

KFP01A - 005 - L - R6

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

L : IO-Link

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.

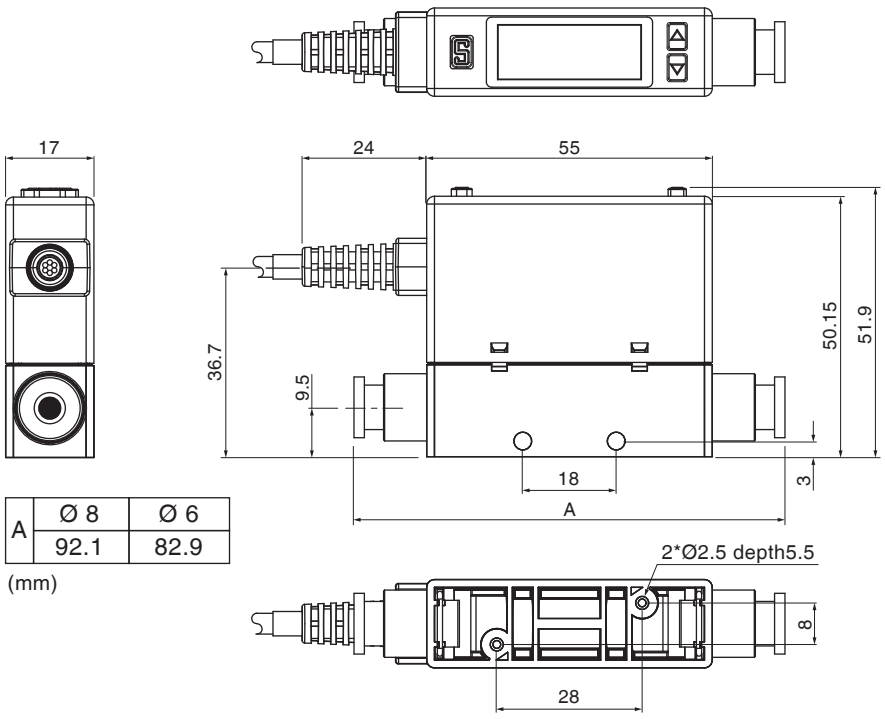
Optional Parts

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

11 Dimensions

1.Product

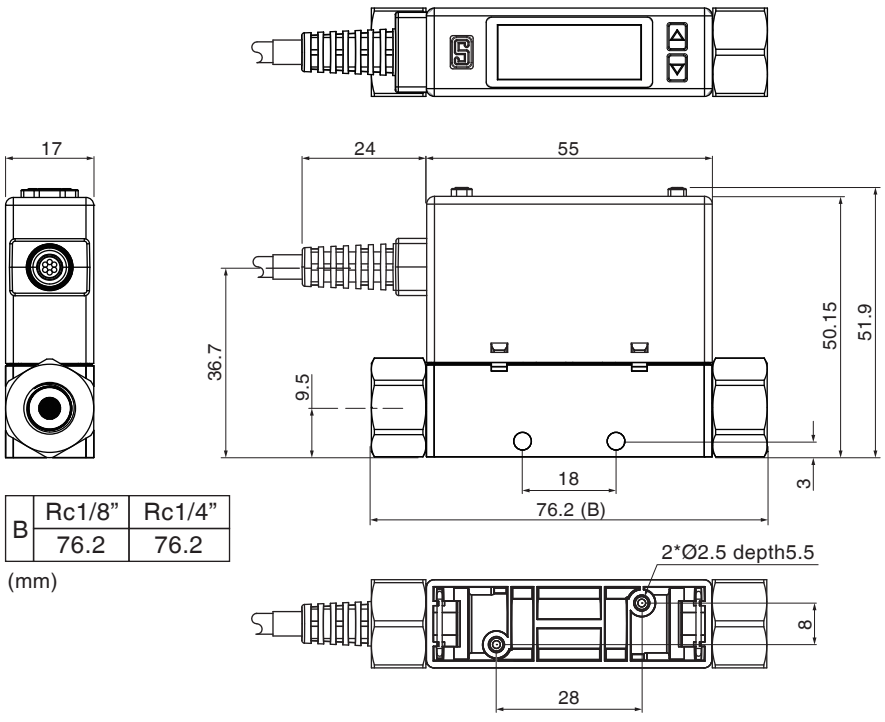
● Ø6,Ø8



A	Ø 8	Ø 6
	92.1	82.9

(mm)

● Rc1/8",Rc1/4"

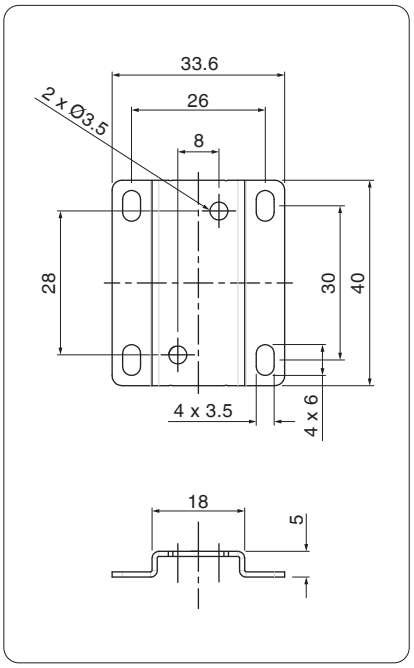


B	Rc1/8"	Rc1/4"
	76.2	76.2

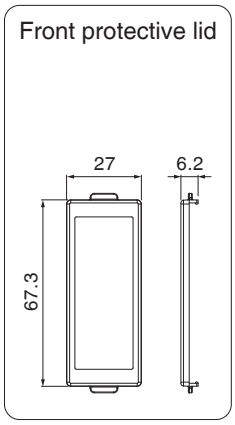
(mm)

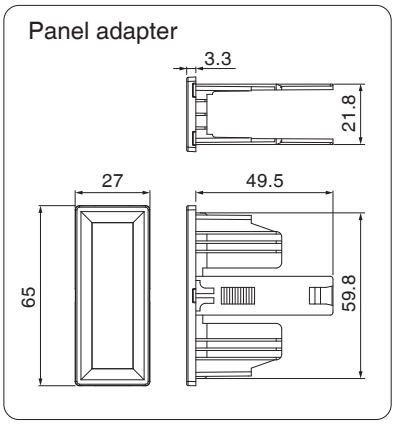
Unit：mm

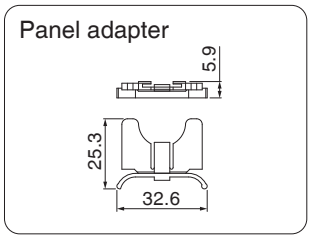
2.Mounting Bracket

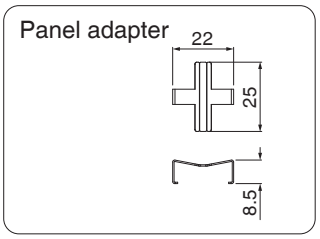


3.Panel Mounting

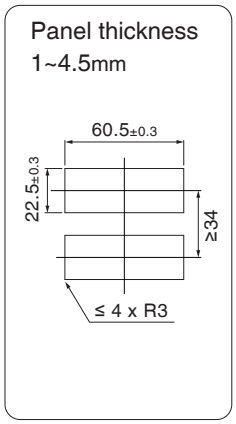








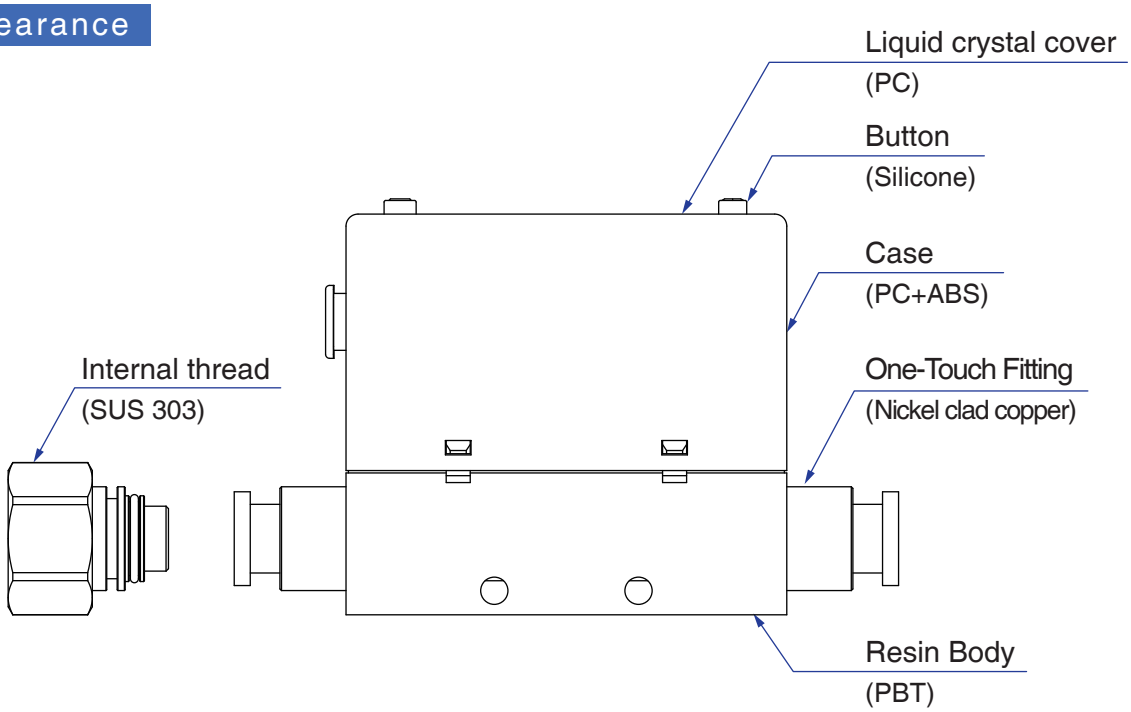
4.Panel Cut-Out



Unit：mm

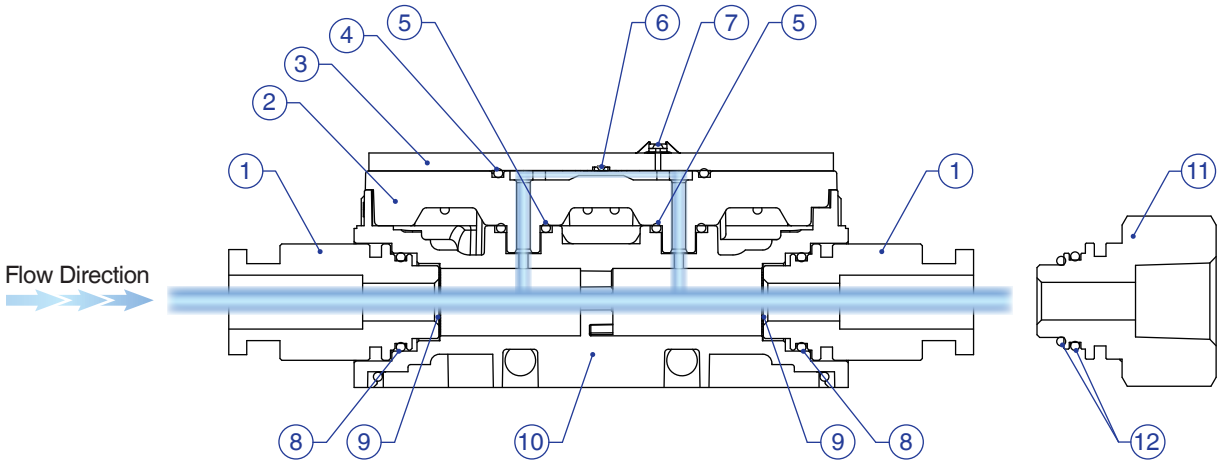
12 Construction

Appearance



Wetted Parts

● Flow Rate Range 005, 010, 050, 100



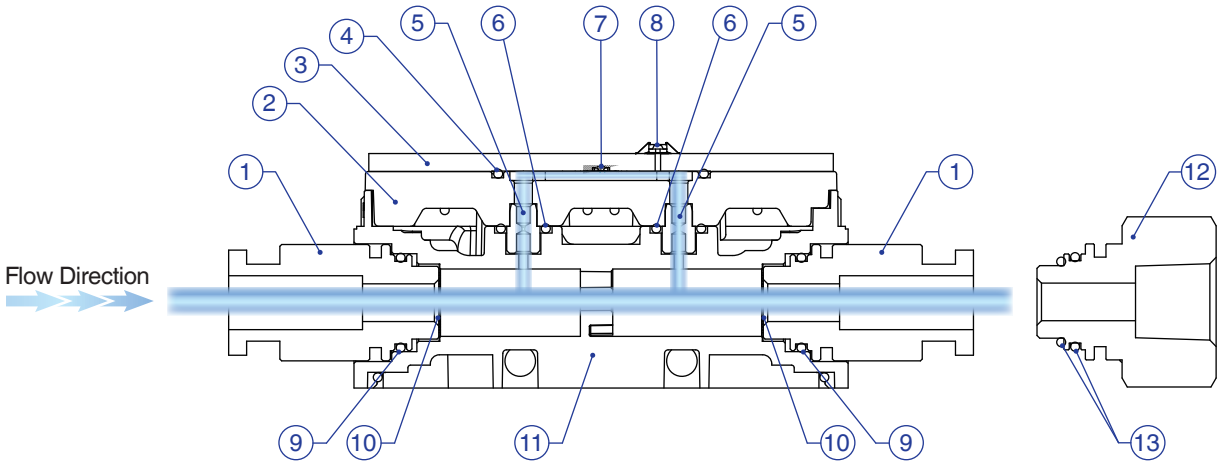
Component Parts

NO.	Description	Material
1	One-Touch Fitting	Nickel clad copper
2	Module Holder	PBT
3	Sensor Board	GE4F
4	O-ring	Viton
5	O-ring	Viton
6	Sensor	Si

NO.	Description	Material
7	Sensor	Si
8	O-ring (One-Touch Fitting)	NBR
9	Port Filter	SUS 304
10	Resin Body	PBT
11	Internal thread	SUS 303
12	O-ring (Internal thread)	Viton

Wetted Parts

● Flow Rate Range 500

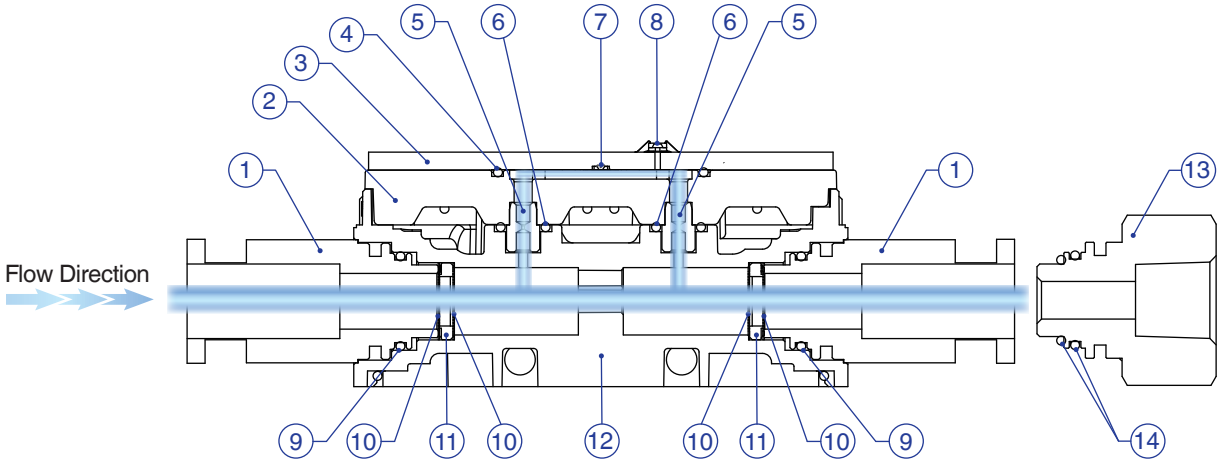


Component Parts

NO.	Description	Material
1	One-Touch Fitting	Nickel clad copper
2	Module Holder	PBT
3	Sensor Board	GE4F
4	O-ring	Viton
5	Throttle	SUS 303
6	O-ring	Viton
7	Sensor	Si

NO.	Description	Material
8	Sensor	Si
9	O-ring (One-Touch Fitting)	NBR
10	Port Filter	SUS 304
11	Resin Body	PBT
12	Internal thread	SUS 303
13	O-ring (Internal thread)	Viton

● Flow Rate Range 101, 201



Component Parts

NO.	Description	Material
1	One-Touch Fitting	Nickel clad copper
2	Module Holder	PBT
3	Sensor Board	GE4F
4	O-ring	Viton
5	Throttle	SUS 303
6	O-ring	Viton
7	Sensor	Si

NO.	Description	Material
8	Sensor	Si
9	O-ring (One-Touch Fitting)	NBR
10	Port Filter	SUS 304
11	Spacer	PPS
12	Resin Body	PBT
13	Internal thread	SUS 303
14	O-ring (Internal thread)	Viton