KOFLOC Kyoto

Small Karman Vortex Flow Meter

FM01 Series

Instruction Manual

KOFLOC Corp.

- **Checking the product**

FM0101/0102/0103/0105/0107 is shipped after thoroughly inspected by our company. Be sure to check the following points:

1. Visually check the unit for any damage.
2. You will see type name, basic specifications, and product No. marked on the nameplate seal on the case top.

Confirm that the specifications are as ordered.

■ Cautions in handling

I. Storing

(1) Select a storage place to satisfy the following conditions.

- Place not exposed to rain and water.
- Place free from vibration and impact.
- Temperature and humidity should be as follows. Preferably ordinary temperature (25°C, 65%RH).

  Temperature: -10 to 60°C
  Humidity: 5 to 95%RH
- Place free from corrosive gas.

(2) The product should be kept in the same package as shipped from our company.

(3) If measured fluid remains in the tube hole after used once, it should be cleaned completely before storing.

II. Installation place

Pay attention to the following points so that this flow meter can be used safely and accurately over a long period of time.

(1) The applicable fluid of this instrument should be liquid, and industrial water in conformity with pure water/tap water.

(2) Avoid the use at a place subject to direct sunlight or radiant heat. If it must be used at such a place, sufficient shielding/insulating should be done.

(3) Avoid installation under corrosive gas atmosphere.

(4) This instrument is of splash proof structure (JIS C 0920) but rain or water must be avoided.

(5) It should be installed at a place with less vibration or impact.

(6) Near electromagnetic noise source, malfunction may occur, and it should be installed away from it or magnetic shield should be provided.

(7) Secure a long straight tube length as much as possible to avoid the effect of turbulent or pulsating flow.
Recommended value of the straight tube length is 10D for the upstream portion and 5D or more for the downstream portion.
D = diameter of piping

(8) The flow direction should be in agreement with the arrow mark direction of the main body portion.

III. Cautions

(1) Avoid water pressure exceeding the specified value and cleaning with reverse flow, which will damage the sensor portion and cause failure.

(2) If measured fluid in the tube hole is frozen, the sensor portion may be damaged. If there is the possibility of freezing, take heat insulation measures.

(3) FM01 series including threaded portion is made of resin. Excessive tightening when fitting and unnecessary external force must be avoided.

(4) Do not hold the output cable when carrying the product. The soldered connection of the cable and electronic circuit may be damaged.

(5) The circuit portion must not be subjected to dew condensation.

IV. Insulation resistance/dielectric strength test

The insulation resistance/dielectric strength test must not be conducted because there is the possibility of the electronic circuit being damaged.

■ Warranty

1. The contents of warranty

① Warranty period

The warrant period shall be one year after the shipment.

② Warranty range

If a malfunction of the product you purchased occurs because of our responsible reasons, offer of substitute or it will be charge-free repaired in our factory. But if a malfunction of the machine occurs due to the following reasons, even within the warrant period, it becomes the outside for a warranty.

(a) Malfunctions due to erroneous applications, repairs or remodeling.
(Including the case in which the manufacturing specification differs from the application conditions.)

(b) Malfunctions due to the falling after the purchase.

(c) Malfunctions caused by natural disasters such as fire, earthquake, water disaster and lightning stoke, or riots or wars.

(d) Malfunctions caused by mixing-in of foreign matters out of the piping.

(e) Malfunctions caused by the peculiar problems due to combinations with other built in equipment.

In addition, a warranty here means the warranty of the product simple substance of our company. So the damage induced by failure of the products of our company shall be eliminated from the object of warranty.

1. Outline

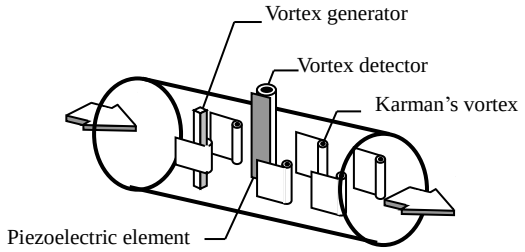
FM01 series vortex flow meter measures flow velocity (vortex) of liquid (water) running through the tube hole, detects vortex frequency proportional to the velocity, and outputs 4 to 20mA through the processing circuit.

It is a small plastic vortex flow meter, and the velocity and flow rate in a wide range of use, the output signal is 0.5 to 4L/min for FM0101, 2 to 16L/min for FM0102, 4 to 40L/min for FM0103, 10 to 150L/min for FM0105, and 25 to 250L/min for FM0107.

This instrument has no movable portion, pressure loss is small, output signal is proportional to the volume flow rate, and it is superior in linearity and reproducibility.

For the main body, PPS resin (polyphenylene sulfide) is used to secure mechanical strength and high reliability. It has a simple structure with less liquid accumulation, thus realizing maintenance-free without necessity of periodical checking/maintenance.

Measuring principle



2. Standard Specifications

■ Main specifications

Item	Specification		
	Current	Pulse	Indicator
Fluid	Pure water, industrial water (in conformity with tap water)		
Material	Body: PPS, Cover: PBT Output cord: conductor = tinned bare annealed copper wire, sheath = heat-resistant/cold-resistant PVC		
Accuracy	±3%F.S.	±3%F.S.	Current accuracy: ±3%F.S. Indication accuracy: ±3%F.S. ±1digit
Reproducibility	±0.5%		
Maximum working output	1MPa（10kgf/㎠）		
Fluid temperature	0-70℃		
Ambient temperature	0-50℃		
Supply voltage	12VDC (or 24VDC)		
Output	4-20mADC	Open collector MAX.10mA/30V DC FM0101: 800Hz@4L/m FM0102: 800Hz@16L/m FM0103: 584Hz@40L/m FM0105: 900Hz@150L/m FM0107: 750Hz@250L/m	4-20mADC
Load resistance	0-250Ω (250 to 500Ω at 214VDC)		
Time constant	1 second		
Waterproofing	Splash-proofing structure (JIS C0920)		
Cable length	2m terminated (pre-tinning)	2m terminated (pre-tinning)	3m terminated (pre-tinning)
Weight	60g (main body) 165g (main body)	60g (main body) 165g (main body)	100g (main body) 205g (main body)

Caution in using

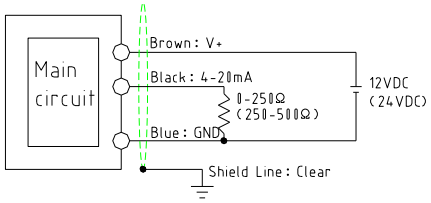
No excessive tightening torque should not be given to the main body and fitting screw because they are made of resin.

❑Model and diameter , flow range, connection

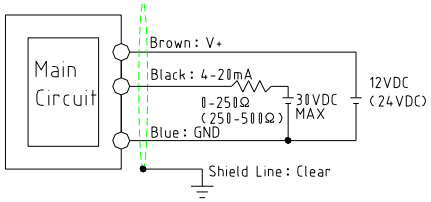
MODEL	DIAMETER	FLOW RANGE	FITTINGS
FM0101	L	LOW FLOW : 0.5～4 L/min	R3/8(PT3/8 MALE)
FM0102	M	MIDDLE FLOW : 2～16 L/min	R1/2(PT1/2 MALE)
FM0103	H	LARGE FLOW : 4～40 L/min	R1/2(PT1/2 MALE)
FM0105	H	LARGE FLOW : 10～150 L/min	EQUAL TO ESLON UNION 25A
FM0107	H	LARGE FLOW : 25～250 L/min	R1·1/4 (PT1·1/4 MALE)

3. Connection

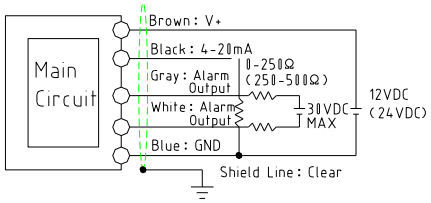
Specification(Electric Current)



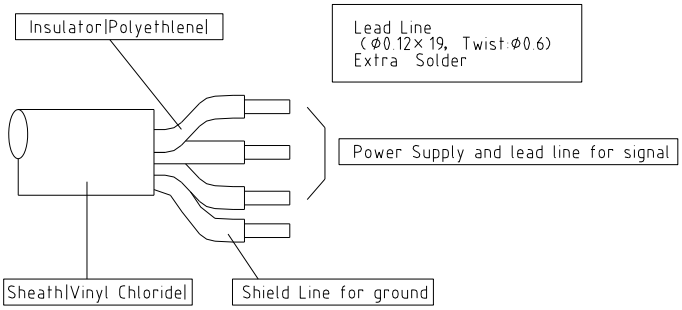
Specification(Pulse)



Specification(With indicator)



Input/Output Line

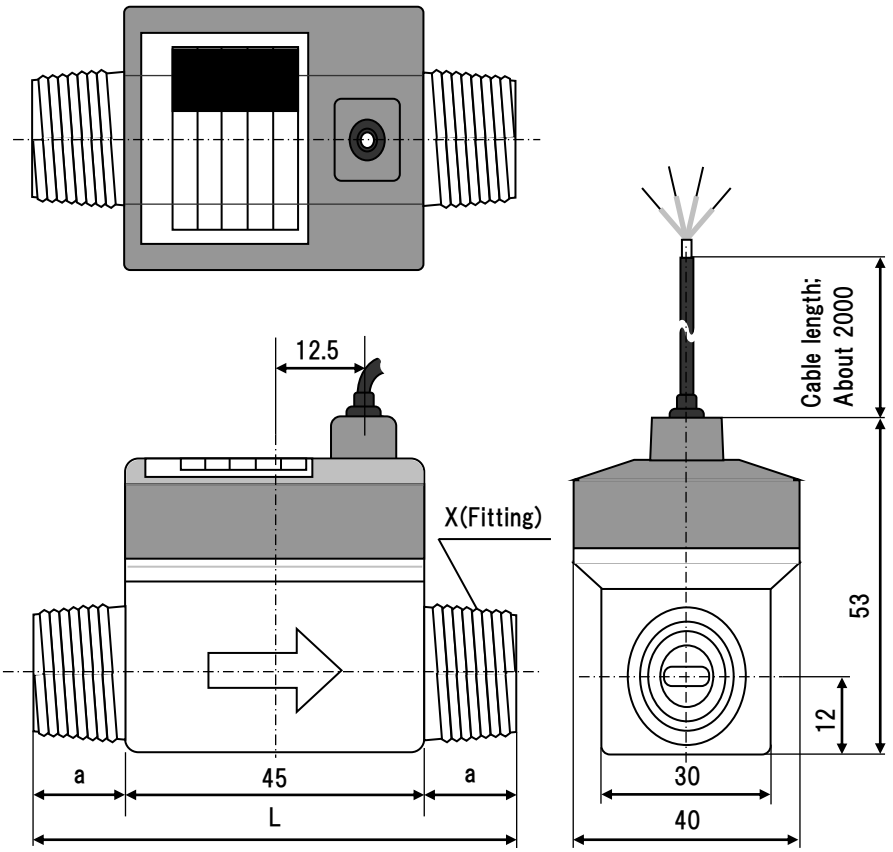


4. Outline

MODEL	DIMENSIONS		FITTINGS
	a	L	X
FM0101	17.8	80.6	R3/8
FM0102	17.5	80.0	R1/2
FM0103	17.5	80.0	R1/2
FM0105	32.5	110.0	About 25A
FM0107	30.0	105.0	R1 1/4

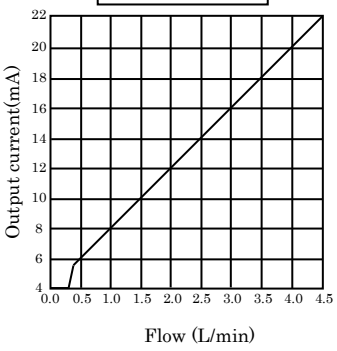
Caution in use:

Please be careful not to increase excessive clamping torque because the body and the mounting screws are made of regin.

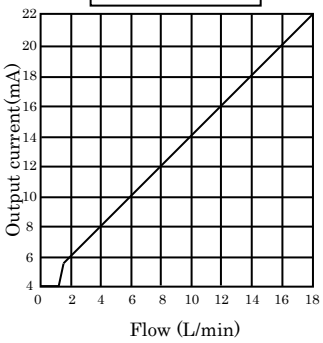


5. Putout Property

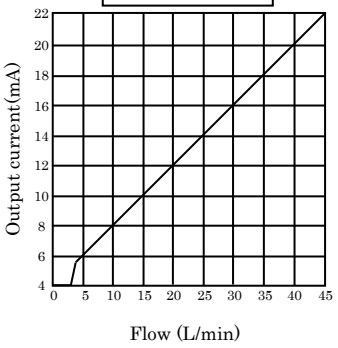
FM0101



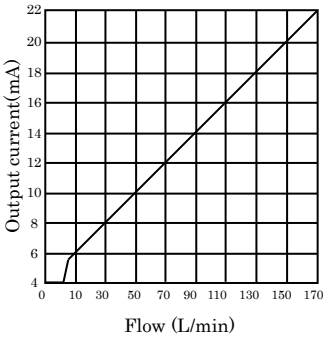
FM0102



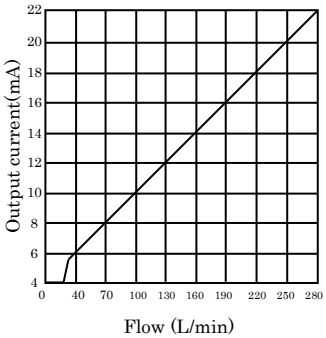
FM0103



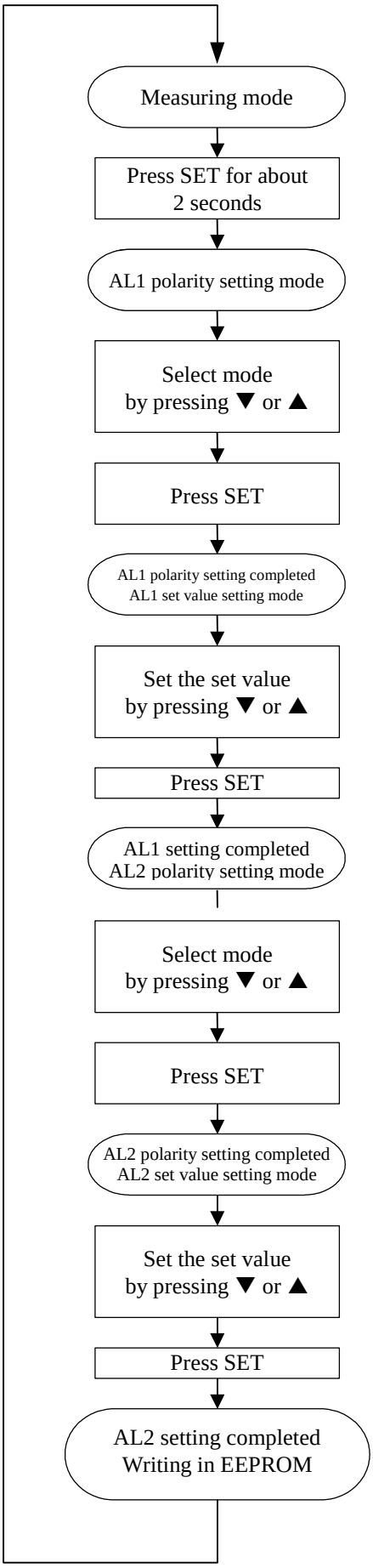
FM0105

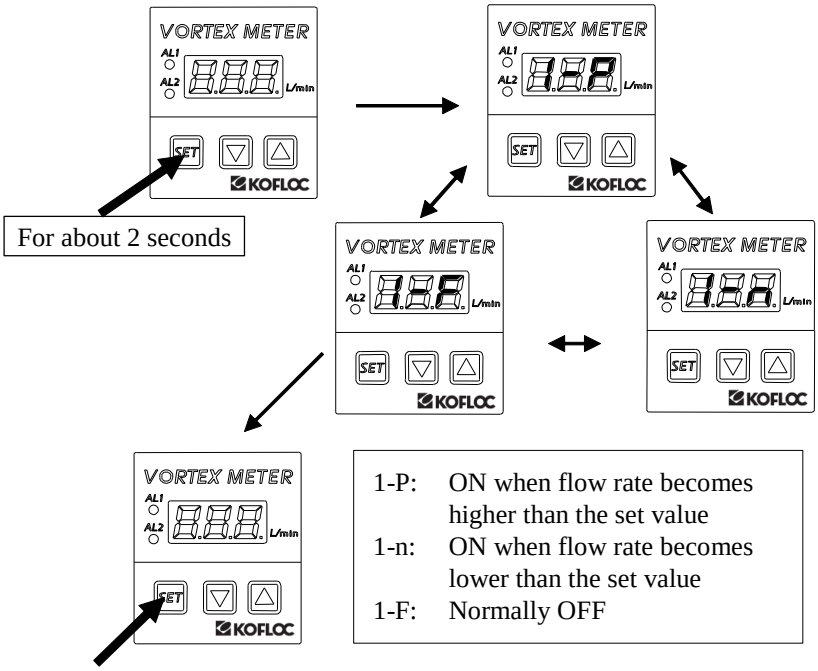


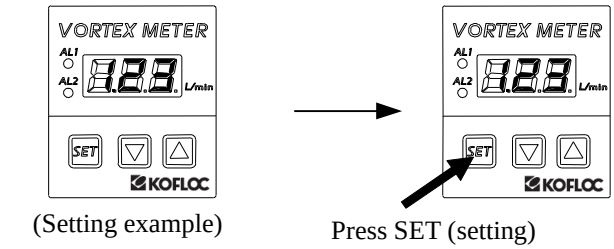
FM0107

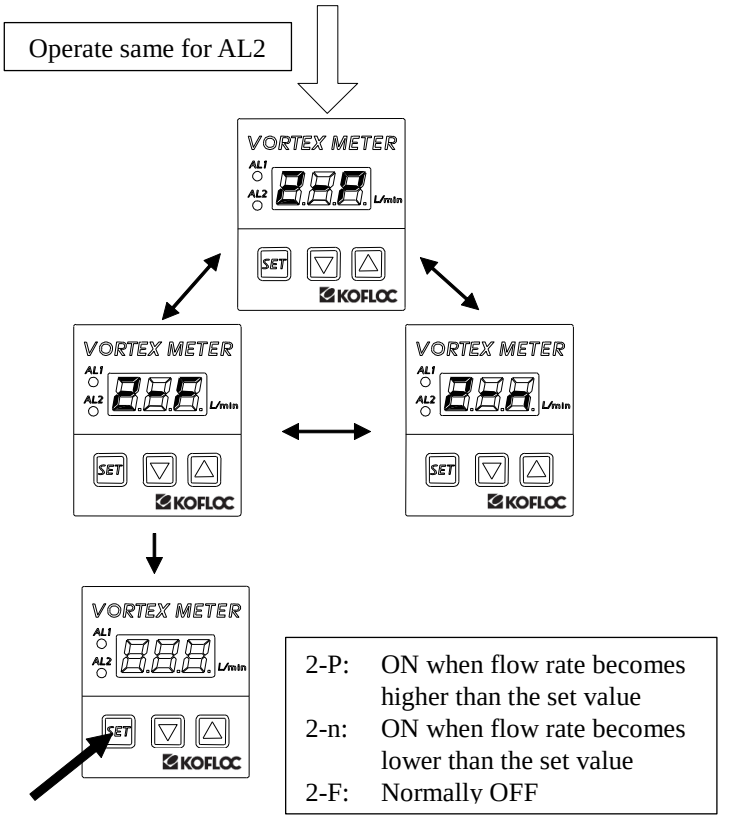


6. Alarm setting

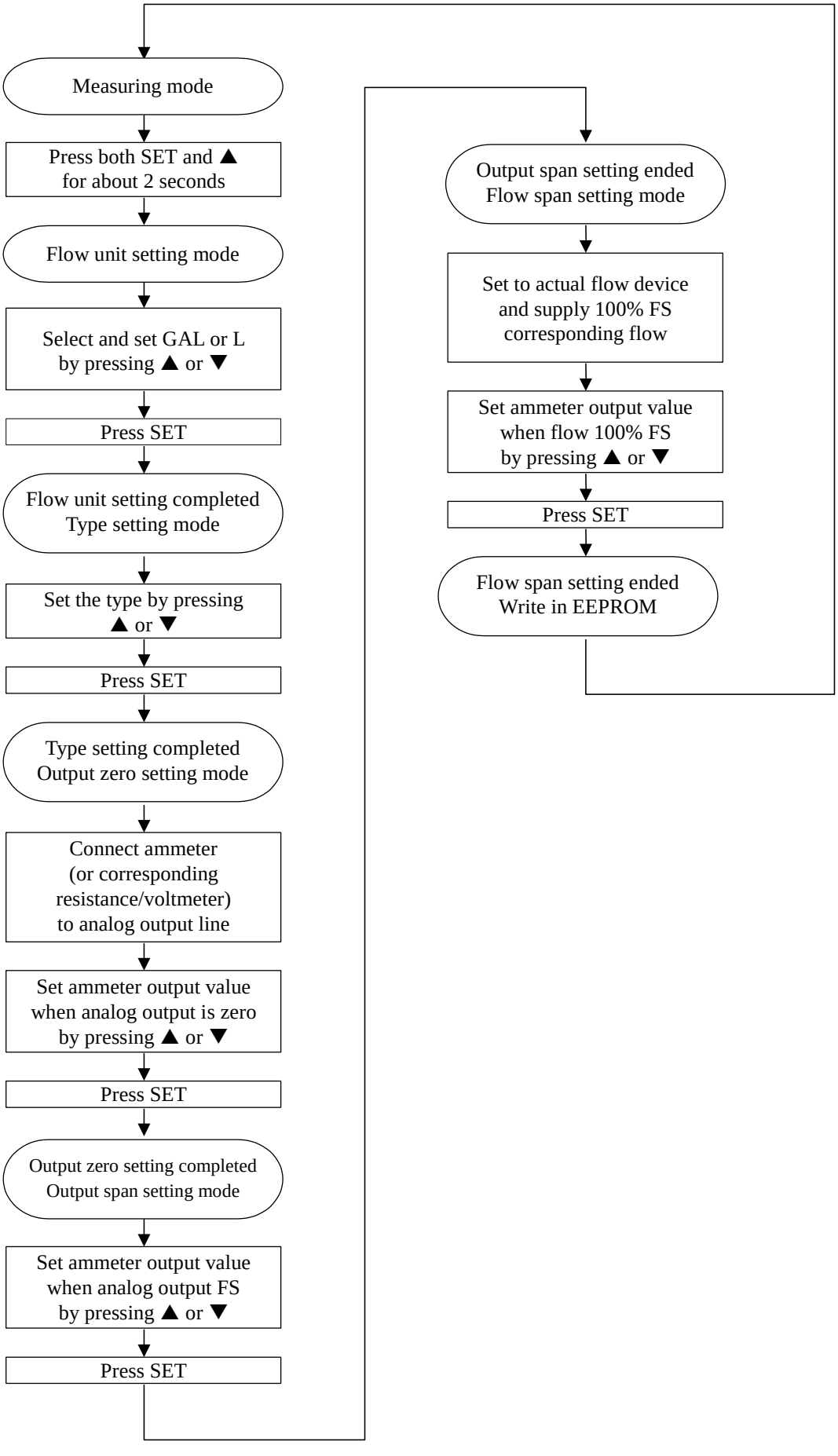






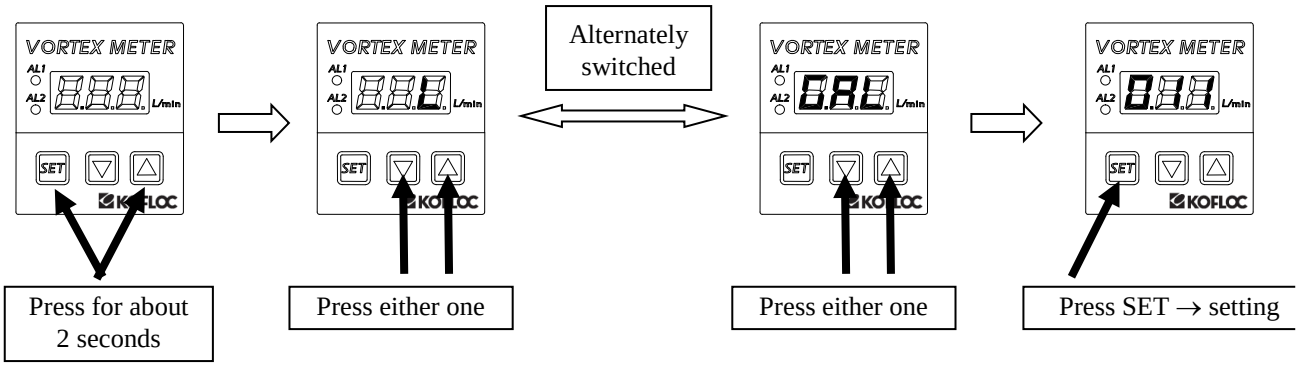


7. Other settings



(1) Setting flow unit

(In case of L/min) (In case of gal/min)

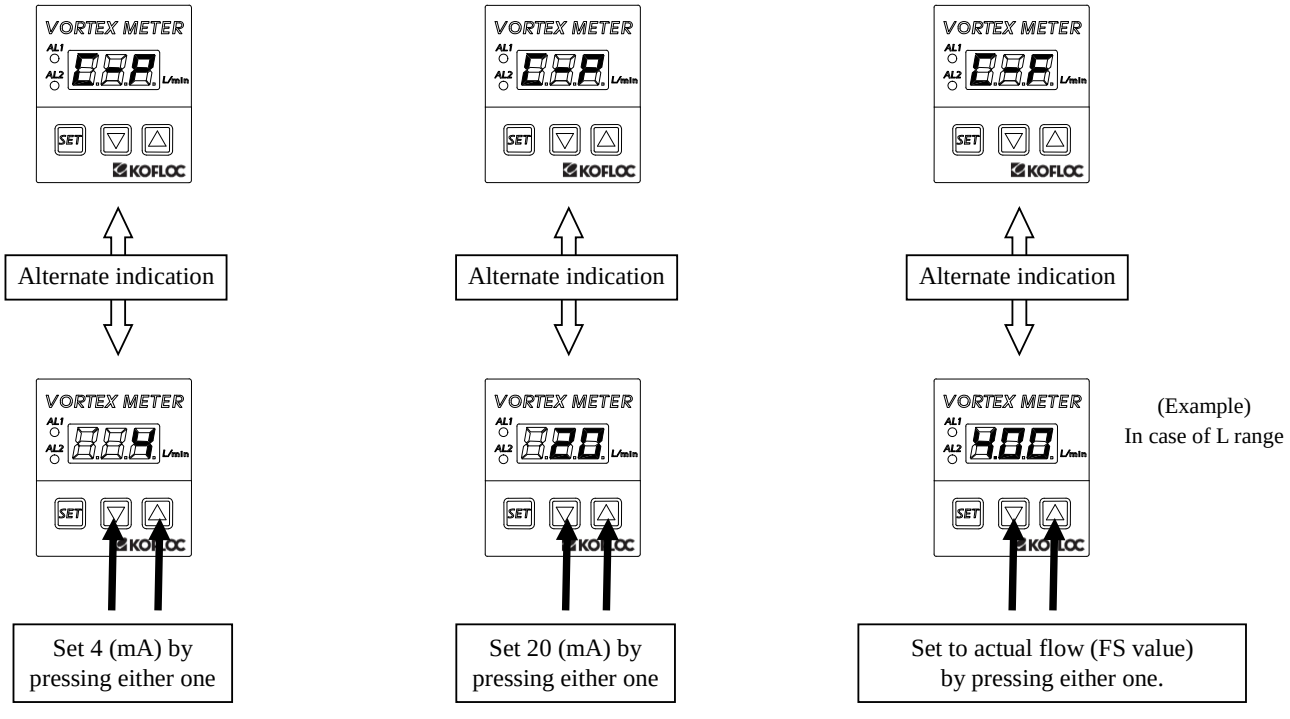


(2) Setting of output zero

(3) Setting of output span

(4) Setting of flow span

* Supplying FS flow with actual flow device



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URL : http://www.kofloc.co.jp