Ultrasonic Flowmeter Manual
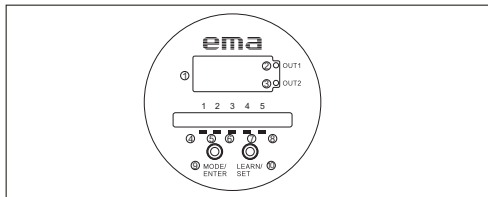
Analogue and switches output

■ English

T | IP68 | CE | RoHS

www.ema-electronic.com

Panel control and display

①	7-segment display	Display of current parameters, parameters and parameter value
②	Out1	OUT1 output mode, default is light on (PNP)
③	Out2	OUT2 output mode, default is light on (I)
④	LED1	OUT1 output status: light on with the output
⑤	LED2	OUT2 output status: ASP>AEP light on
⑥	LED3	Signal reception status, the light will be on when empty pipe or poor signal reception
⑦	LED4	Low temperature alarm, when the temperature is lower than 0 °C, the light is on
⑧	LED5	Direction determination: the direction of fluid motion and product marking direction is different,Then the lights are on
⑨	MODE/ENTER	Parameter selection and parameter value acknowledgement
⑩	LEARN/SET	Setting of learn mode/parameter value

Operation mode

Run mode
· When the power is on, the unit is in the Run mode. It monitors and output the signal according to the set parameters.
· The output value of analogue signal is related to the system measured distance.
· The digital display indicates current parameters setting. The LEDs display the system measured status and system output status.

Lock/Unlock
· Lock: This unit features auto-lock function. If there is no button pressed in 1 minute under Run mode, the unit will be locked automatically.
· Unlock: Keeping pressing "SET" button under normal temperature display status (Run mode), and then press "MODE/ENTER" for 10 seconds until the "ULC" is displayed, meaning that the unit is unlock.

Programming Mode
(Setting of the parameter value)
After unlocking the unit, it enters to the Programming mode. When selecting the menu, then enter the parameter display of the menu. Keep pressing "LEARN/SET" until the parameter value is beginning to flash in high level, internally the unit remains in the RUN mode. It continues monitoring the existing parameters until the setting is changed.
It is able to change the parameter value by pressing "LEARN/SET" button, and then pressing "MODE/ENTER" to select the data. When the data is in lowest level, press "MODE/ENTER" to confirm the setting. The unit return to "Run mode" when no button is pressed for 5 seconds.

Reset factory default
Keeping pressing "SET" and "MODE/ENTER" at the same time, then connect the power. When flashing "FAC" twice, then it is successful to reset factory default.
Factory default is on lock mode.

Function menu

Menu	Function	Range	Method	Remark
SP1	Switching point 1	1.5...250 l/min	Setting from left to right	Flow
rP1	Switching point 2	1.5...250 l/min	Setting from left to right	Flow
ASP	Analogue 1	1.5...250 l/min	Setting from left to right	Flow
AEP	Analogue 2	1.5...250 l/min	Setting from left to right	Flow
OU1	Output 1 mode selection	PnP		PNP output
		nPn		NPN output
OU2	Output 2 mode selection	I		Current
		v		Voltage
DiS	Digital display	L_M	Unit: l/min	Instantaneous flow
		M3H	Unit: m³/h	Instantaneous flow
		M_S	Unit: m/s	Instantaneous flow
		MMM	Unit: m³	Cumulative flow
		L	Unit: L	Cumulative flow
		T		Select ambient temperature display
		S		Select analogue display
CLR	Delete cumulative flow data	N_o		Undelete
		ALL		Delete

❺

Function menu

Switching output

SP1/RP1	Flow/V	Output Status
SP1 < RP1	V < SP1	Output
	SP1 < V < RP1	Delay
	V > RP1	No output
S1P > RP1	V < SP1	No output
	SP1 < V < RP1	Delay
	V > RP1	Output

Analogue output

ASP/AEP	Flow/V	Output Status
ASP < AEP	V ≤ ASP	4mA
	ASP < V < AEP	4−20mA average distribution
	V ≥ AEP	20mA
ASP > AEP	V ≤ AEP	4mA
	AEP < V < ASP	4−20mA average distribution
	V ≥ ASP	20mA

❻

Adjustment

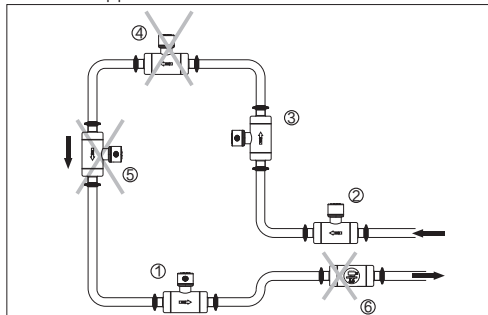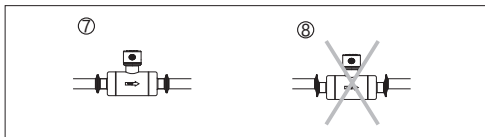|		
①		Press "MODE/ENTER" key several times to select the menu values that need to be adjusted or observed, and press the "SET" key to display the parameters corresponding to the current menu.
②		After choosing the parameter, adjust the value by pressing the "SET" key until high point of parameter flashes. Press "SET" key, the number of value increase flashily.Press "MODE/ENTER" key, and the number of value decrease to low point. For other adjustments, press "SET" key until the parameter value is switched.
③		For numerical values: when flashing number is at the lowest point, quickly press "MODE/ENTER" key (Confirm), the parameter value is displayed again, and the set parameter value become valid. For other adjustments: quickly press the "MODE/ENTER" key (confirm), the parameter value is displayed again, and the set parameter values become valid.

Connection
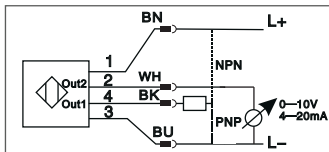
Core color:
1 = BN (Brown)
2 = WH (White)
3 = BU (Blue)
4 = BK (Black)

❼

Installation Notice

1. When using the flowmeter, ensure that the fluid in the pipeline is full. It is recommended to install it as shown in ①②③ in the figure.
2. In the installation mode shown as ④⑤ , it is easy to cause the phenomenon that the water in the pipeline cannot be filled when working, which will lead to inaccurate measurement of the flowmeter.
3. The flowmeter cannot be placed horizontally as shown in ⑥ , which will lead to the accumulation of air inside the flowmeter, resulting in inaccurate measurement.
4. Please install as shown in ⑦ , The center of the flowmeter pipe is consistent with that of the process pipe,It cannot be offset as shown in ⑧ , otherwise the measurement will be inaccurate
5. If there are elbows at both ends of the flowmeter, ensure that the straight pipe at the inlet end of the flowmeter is greater than 5 times the diameter of the pipe, and the outlet end is greater than 3 times the diameter of the pipe.
6. If there is a valve, pump and other areas where the flow rate changes greatly at the connection between the flowmeter and the pipeline, it must be ensured that the distance between the connection between the flowmeter and the pipeline and the valve is greater than 15 times the diameter of the pipeline.
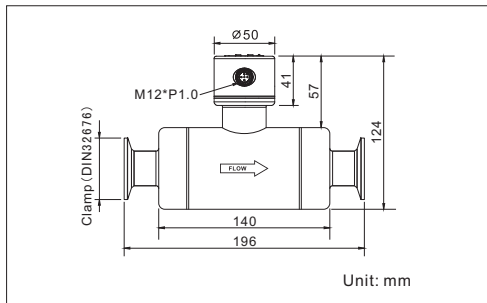

❽

Electrical Connection

⚠ 1. The unit must be connected by a technical electrician.
2. The national and international regulations for the installation of electrical equipment must be adhered to.
Voltage supply to EN50178,SELV,PELV
3. Disconnect the power before connecting the unit.

Technical Parameters

Pipe diameter	DN25
Operating Voltage [V]	20…30 DC
Range [L/min]	1.5…250
Voltage drop [V]	<3.5
Reversed polarity protection	yes
Overload protection	yes
Temperature compensation	yes
Watchdog	yes
Consumption of current [mA]	<20
Accuracy / deviation [%]	0.5
Min. resolution [L/mm]	0.03
Output response time[s]	5
Output	output 1: PNP or NPN, output 2:4-20mA or 0-10V
Analogue output load [ohm]	4…20mA, Max. (Ub-10V)x50
Maximum switching output load [mA]	400
Switching output characteristics	setting as NO or NC
	setting as PNP or NPN
	setting as SP point and RP point
Operating temperature [℃/℉]	0…80/32…176
Storage temperature [℃/℉]	−20…80/−4…176
Protection classification	IP68/IP69K
Insulation resistance [mΩ]	<100(500 VDC)
Housing material	Stainless steel 316L;PPS;PVDF
Weight [KG]	2.95
Connection	Quick Connector/Clamp and Thread G1"

Dimensions

Unit: mm

Usage and Storage notice

1. The ultrasonic flowmeter is suitable for pure fluid, which cannot contain too many solid impurity particles and air bubbles.

2. The accuracy is reduced when the flow rate is lower than 0.1m/s.

3. The flowmeter can perform two-way flow measurement, and the direction of the fluid in the current pipeline can be judged through the panel LED light (LED5) and the direction of the flowmeter mark.