

Ultrasonic Flowmeter

Type ST Operation Manual



Notice

Thank you for choosing Model ST Ultrasonic Flow Meter.

This instruction manual contains the important using and operation information of the flow meter. Please read carefully the reference manual before operation to make your flow meter exert the best performance.

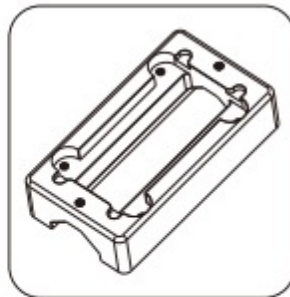
If you make a mistake there will be affected the meter's working and reduce the meter's life or cause some malfunctions.

Product component

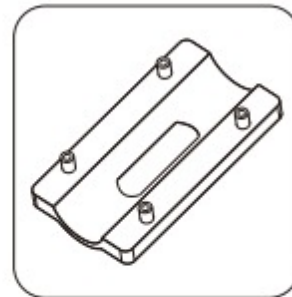
Inspection should be made before installing the Flow meter. Check to see if the spare parts are in accordance with the packing list. Make sure that there is no potential damage to the enclosure due to a loose screw or loose wire, which occurred during transportation. Any questions, please contact your representative as soon as possible.



EtM™



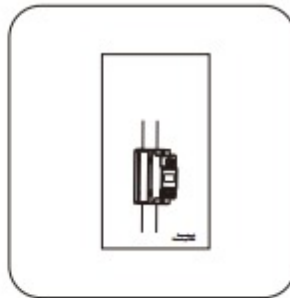
Upper bracket



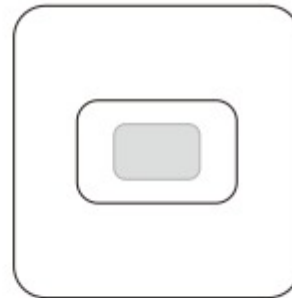
Base bracket



Connecting cables



Instruction manual



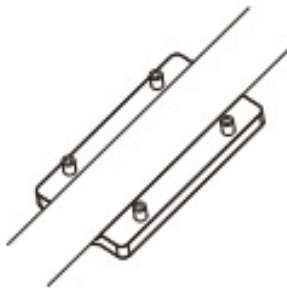
Coupling agent

EtM™ installation and connect

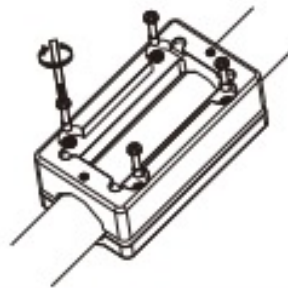
Once the EtM™ is installed, the flow meter can be connected.

You can be found the cable have 5pin terminals, As per wiring diagram to connect 4-20mA Output, RS485.

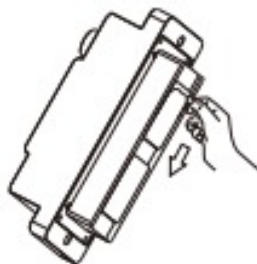
Step1: Make sure no dirt, paint, or other stains on the surface of the tube. Then put the bottom parts on the side of the pipe.



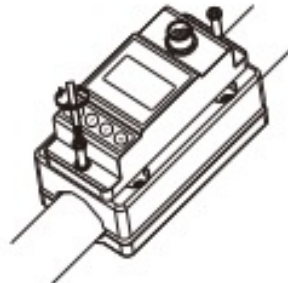
Step2: Align the bracket to the pipe position; Install screw on top part of the bracket, the bottom part of the bracket will automatically connect with the top part. Tighten the four M4 screws.



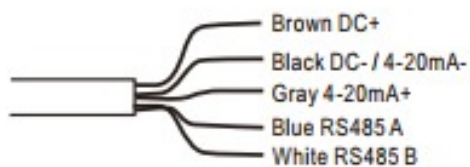
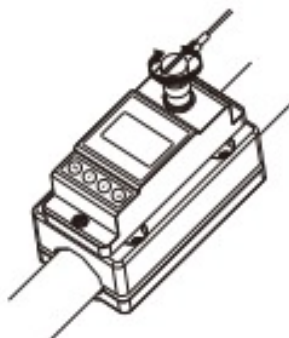
Step3: Take the cover off the sensor.



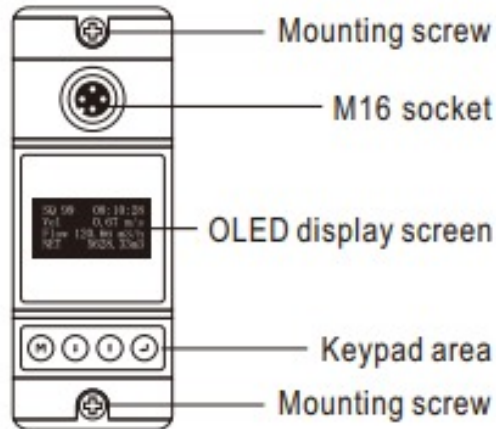
Step4: Put the flow meter into Upper bracket, and tighten two M4 screws.



Step5: Take out the cable, connect it to the socket, and tighten up. Then connect to the output.



Panel function



Powering on

As soon as the Flow meter is switched on, the self-diagnosis program will start to run.

SQ 88	12:30:29
3.325 m ³ /h	
NET	723.58 m ³

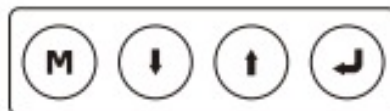
Signal Quality (SQ value)

Q value is short for Signal Quality. It indicates the level of the signal detected. Q value is indicated by numbers from 0~99 represents the minimum signal detected while 99 represent the maximum.

Normally, the transducer position should be adjusted repeatedly and coupling compound should be checked frequently until the signal quality detected is as strong as possible.

Keypad Functions

Follow these guidelines when using the Flow meter keypad:



M Setting or display mode, when it is setting mode, that can return to the previous menu, **↓** and **↑** scroll up and down to select the menu, when press **↓** move to next digit, press **↑** and the numbers scroll from 0 to 9, you can select the number. Press **J** to confirm.



Window descriptions

Display Menu

- When the power on, the meter will display Velocity/Net Totalize.



19-06-22	12:30
1.035 m/s	
NET	723.58 m ³

Display date and time, velocity and net totalize.

- Press  will display Flow Rate/Net Totalize, press  will return to previous menu.



SQ 88	12:30:29
3.325 m ³ /h	
NET	723.58 m ³

Display signal quality. Time, flow rate and velocity.

- Press  will display Flow Rate/ Velocity/Net Totalize, press  will return to previous menu.

SQ 88	12:30:29
Vel	1.035 m/s
Flow	3.325 m ³ /h
NET	723.58 m ³

Display signal quality. Time, velocity, flow rate and net totalize.

- Press  will display Run time/Daily Totalize /Month Totalize /Year Totalize, press  will return to previous menu.

Runtime	216h
Day	79.632 m ³
Mth.	2382.3 m ³
Year	28984 m ³

Display Run time, Date, Month and Year net totalize.

Setup Menu

- Press  will display Setup menu.

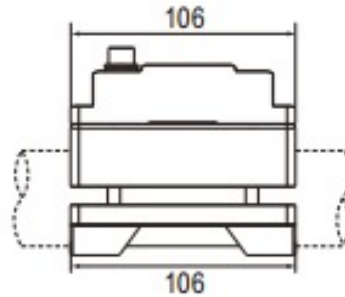
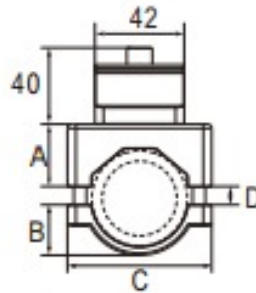
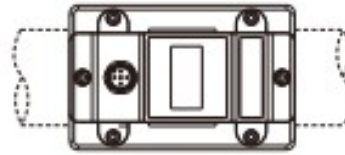
Setup menu
0. Pipe parameter
1. System setting
2. Calibration

The following options are available (by  or  buttons)

- 0. Pipe parameter
- 1. System setting
- 2. Calibration
- 3. Output setting

Dimensions

Model	A (mm)	B (mm)	C (mm)	D(mm)	
				min	max
ST-Ø25	25	15	58	1.5/Ø25	4.5/Ø28
ST-Ø32	28.5	18.5	58	1.5/Ø32	4.5/Ø35
ST-Ø40	29.5	24	68	1.5/Ø38	8.5/Ø45



Product warranty

The product have been stridly tested before leaving factory. If any malfunction occurs, please contact us or our agents immediately and provide details of the malfunction.

Warranty

The warranty is for one full year after the date that product is delivered at the designated place.



Scope of warranty

If any malfunction is caused by us within the one-year warranty, we would repair the product free of charge.

The following situations are not covered by the warranty.





- If product is not used properly in accordance to the manual or technical requirements (including unsuitable conditions, unsuitable environment, etc.).
- If the malfunction is caused by purchasers or purchasers' software.
- If product is amended or fixed without our permission.

Setup Menu – Pipe parameter

Press , Select 0.Pipe parameter, then  display:

```
Pipe parameter
0. Outer diameter
1. Wall thickness
2. Material
```


The following options are available (by  or  buttons)










0. Outer diameter
1. Wall thickness
2. Material: Move  or  can option PVC, Carbon steel, Steel, Copper pipe.
3. Fluid type: Move  or  can option Water, Sea Water, Oil... etc.

Setup Menu – System setting

Press , Select 1.System setting, then  display:

```
System setting
0. System Unit
1. Flow rate unit
2. Total unit
```

The following options are available (by  or  buttons)

0. System Unit: Move  or  can option Metric, English.
1. Flow rate unit: Move  or  can option m³/h, LPM, GPM.
2. Total unit: Move  or  can m³, L, GAL.
3. Totalize RESET: All parameters are reset, Press , move  or  arrow to select "YES" or "NO". After "YES" is selected.
4. Time set

```
yy-mm-dd hh:mm
19-06-20 12:30
```

Generally, it is unnecessary to modify date time as the system is provided with a highly reliable perpetual calendar chip.

5. System lock

System lock System unlocked	System lock ENT to lock	ENT key word 0000	System lock System locked OK
System lock System locked	System lock ENT to unlock	ENT key word 0000	System lock System unlocked OK

Once the system is locked, any modifications to the system are prohibited, but the parameter is readable. "Unlock" using your designated password. The password is composed of 1 to 4 numbers.

6. System INFO

System INFO ST Flowmeter SN: X30005000 V1.00	Manual Totalizer ENT To Start	Manual Totalizer ENT To Stop 1.239 m ³ /h SQ 88 1.056L	Manual Totalizer ENT TO Restart 1.239 m ³ /h SQ 88 1.056L
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System INFO: Display serial number (SN) of the meter. This SN is the only one assigned to each flow meter ready to leave the factory. The factory uses it for files setup and for management by the user.

Set zero: Press ; reset "Zero Point" which was set by the user.

Manual Totalizer: The manual totalize is a separate totalize.

Press  to start, and press  to stop it. It is used for flow measurement and calculation.

Setup Menu – Calibration



Press , Select 2. Calibration, and then  display:

Calibration 0. Scale factor 1. 4-20mA CAL 2. Set zero
--


0. Scale factor

Refers to the ratio between "actual value" and "reading value". For example, when the measurement is 2.00, and it is indicated at 1.98 on the instrument, the scale factor reading is 2/1.98. This means that the best scale factor constant is 1.01.

Scale factor 1.000

1. 4-20mA CAL: Check if the current loop has been calibrated before leaving the factory. Press  move  to display 4mA or 24mA, and at the same time, check with an ammeter to verify that Current Loop output displayed values. It is necessary to re-calibrate the current loop, if over the permitted tolerance.

4mA Calibrate 4200	20mA Calibrate 25800
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2. Set zero: Press ; reset "Zero Point" which was set by the user.

Set zero Ent To set zero Reset zero	Set zero Waiting... SQ 88 Vel 0.035 m/s
---	--



3. Lowflow cut: Flow rate falls below the low flow cutoff value.

Low flow cut 0.030 m/s

The flow indication is driven to zero. This function can prevent the flow meter from reading flow after a pump as shut down but there is still liquid movement in the pipe, which will result in totalization error.

Generally, 0.03m/s is recommended to enter as the low flow cutoff point. The low flow cutoff value has no relation to the measurement results once the velocity increases over the low flow cutoff value.

Setup Menu – Output

Press , Select 3.Output setting, and then  display:

0. RS485 setup

```
Output setting
0. RS485 Setup
1. 4-20mA range
2. Alarm value
```

The window used to set serial port. Its connection with the equipment of its serial port set of parameters must match. The first choice of data that baud rate: 2400, 4800, 9600, 19200 choice.

The second option that in check, None.

Data length fixed to eight;

Stop bit for a fixed length;

Factory serial port parameters for the default "9600, 8, None, 1".

1. 4-20mA Range

```
4mA Calibrate
4200
```

```
20mA Calibrate
25800
```

Set the Current Loop output value according to the flow value at 4mA, and 20mA. The flow unit is m³/h.

2. Alarm value(Option)

```
Alarm value
0. LOW value
1. High value
```

Enter the low alarm value; any of the measured flow, which is lower than the low value, will activate the alarm in the OCT hardware or relay output signal.

Enter the high alarm value; any of the measured flow, which is higher than the high value, will activate the alarm in the OCT hardware or relay output signal.

Performance index

Product: ETM™ flow meter, Model: ST					
Model		ST-Φ25	ST-Φ32	ST-Φ40	
Pipe size	Pipe OD(mm)	25	32	40	
	Pipe ID(mm)	20	25	32	
	NPS	3/4"	1"	1-1/4"	
	DN(mm)	20	25	32	
Flow Range (L/min)	0.5m/s	9.42	14.72	24.12	
	1.5m/s	28.27	44.17	72.36	
	5m/s	94.22	147.22	241.20	
Dimensions (mm)	Electric Unit	106X42X51			
	Base bracket	106X58X40	106X58X47	106X68X53.5	
Weight (KG)	Electric Unit	0.19			
	Base bracket	0.35	0.33	0.41	
Accuracy		2.0% (±0.5m/s ~ 5.0m/s)			
Repeatability		0.8%			
Data Storage		Day, monthly, and year flow totalizer			
Response Time		2s			
Analog Output		4~20mA, Maximum load: 600Ω			
Alarm Output		OCT, High and low flow alarm function (optional)			
Communication		RS485			
Power Supply		24 VDC			
Cable Length		2m			
Keypad		Four light touch buttons			
Screen		OLED 128*64 display screen			
Units		Metric and imperial units are available, Cubic Meters(m3), Liters(L), USA Gallons(GAL) /hour, /min, Default unit setting: m3/h			
Totalizer		Six bit digit			
Liquid		Water, Chemical, Oil			
Piper Material		Carbon Steel, Stainless Steel, PVC			
Case Material		Aluminum alloy			
Environment Temp.		0°C - 50°C			
Liquid Temp.		0°C - 50°C			
Environment Humidity		0-95% relative humidity, without condensation			
IP Grade		IP54			

KLINGER Danmark A/S
Nyager 12-14
DK-2605 Brøndby
Denmark
Phone +45 4364 6611