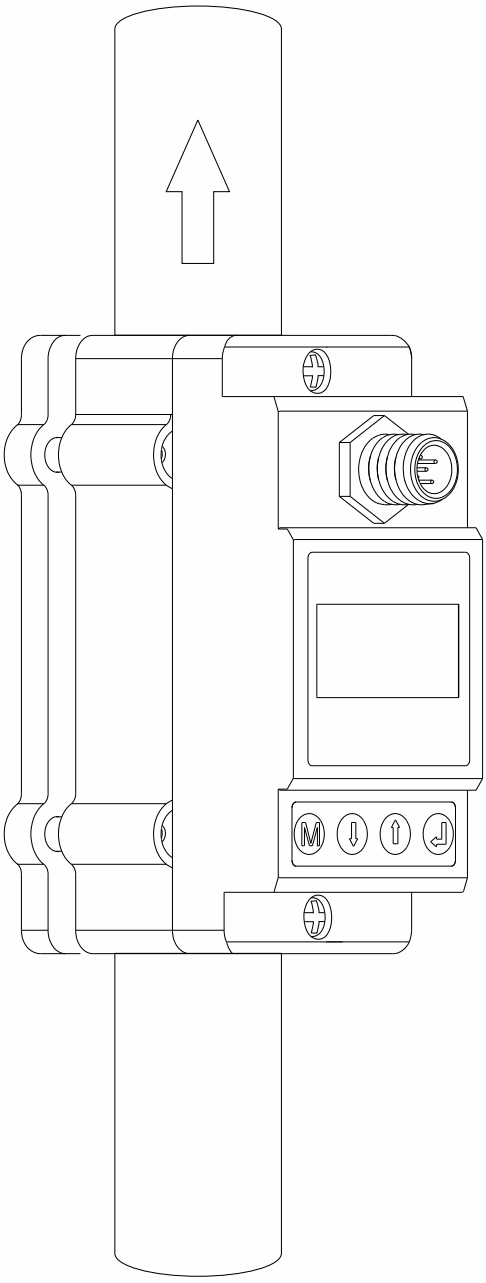
Small Pipe Ultrasonic Flowmeter
Instruction Manual



Thank you for choosing this ultrasonic flowmeter, please read this manual carefully before use.

Reversion: V1.00

Date: September 2024

Content

Notice	Thank you for choosing the Small Pipe Ultrasonic Flowmeter. This instruction manual contains the important using and operation information of the flow meter. Please read it carefully before operation to make your flow meter exert the best performance. Errors in operation may affect the normal use of the flowmeter and even lead to failures.

Forward

1.About pipe diameter

People may have customary names for pipe diameter. Engineers who use steel pipes are used to with nominal pipe diameter (DN), and plastic pipes to outer diameter (OD, φ). Plus there are different outer diameter sizes for copper pipes.

DN: is not the inner diameter nor the outer diameter, but a value in the middle of them. The connection methods of steel pipes include welding, thread fitting, etc. These pipes under higher pressure will reduce the inner diameter increasing the outer diameter to match the pipe fittings.

OD: means the outer diameter. The fittings of plastic pipes are all standard. These pipes can only change their inner diameter to bear different pressures.

Small Pipe Ultrasonic Flowmeter are designed for pipelines with different materials and installation requirements of different outer diameters. We have summarized the pipeline specifications of different countries and standards, trying to meet the needs of most pipelines in design. For details, please refer to the corresponding relationship between DN and OD in Appendix: Pipeline Specifications.

Note: no list here for different expressions and codes for inner/outer diameters of pipelines.

2.About units of measurement

Small Pipe Ultrasonic Flowmeter is a flow meter for measuring velocity, which is essentially different from volumetric ones. Customers who use volumetric flow meters get used with volume, while ultrasonic flow meters need to know the velocity range and convert it when selecting models.

Calculation:	Given the flow rate and pipe diameter, find the velocity V=(Q÷(3.14×ID2 ÷4)÷3600, in m/s.

3.About measurement conditions

Ultrasonic flow meter is an instrument for measuring velocity. When measuring, the measuring point should meet certain conditions:

- Single medium: the measuring medium should not contain particles and bubbles. Measuring with small pipes is obviously affected by impurities and bubbles. Larger pipes have better tolerance.
- Sound guiding pipe: with good sound guiding performance. No steel wire or glass fiber as liners that affect sound wave transmission.
- Flow stability: when the medium flowing is unstable and disturbed which would occur bubbles and affect its ultrasonic signal propagation, they would keep the flow meter constantly updating signal searching process and displaying values changing greatly.
- Enough pressure: many mediums will occur bubbles when flowing because of insufficient pressure. This will happen as well when the flow speed is fast. Our experience is that a pressure (back pressure) of 0.3MPa is needed even if the medium is water.
- Other conditions: please refer to the appendix for the selection of installation points.

Note

Product selection

1. When opening the package, please check the pipe size, it meets the installation of the on-site pipeline.
   The pipe size mark outer diameter of the pipe (OD or φ), if possible, measure pipe outer diameter on site to confirm that it is correct with the product;
   There are different standards for steel pipes, and the outer diameter is different, and real data helps to ensure the accuracy of the measurement;
   In fact, if the steel pipe wall more than 2 mm (DN32 and below), the measurement data will not be good, if possible, please use a pipe wall ≤ 2 mm.
2. Pipe surface and ambient temperature at the installation point, whether it meets the temperature range in the instructions.
   The standard product is suitable for fluid temperature of 50°C and ambient temperature of 50°C;
   If more than 50°C, please contact the service provider to request a high anti-temp product.
3. To obtain good measurement data,The fluid must conduct sound waves well and the fluid flow is stable.
   The viscosity is more than 300 CST (mm²/s), the concentration is too high, the impurities are more than 4%, the pressure changes when flowing, the fluid that produces bubbles when the temperature rises, then the measurement is unstable.
   If this is the case, contact the service provider to request a solution or a case study of successful measurements.
4. Standard products are non-explosion-proof and should not be used in hazardous locations or potentially explosive atmospheres.
   When it needs to be used in explosion-proof places, contact the service provider to provide relevant information about the explosion-proof case.

power supply

1. It is required to wire by the wiring plate, which has example diagrams and text descriptions.
2. The power supplies 24VDC@3W DC, check the power supply capacity.
3. Use a standard-compliant power adapter or contact service provider to purchase.

⚠ Note	Do not apply AC voltage! DC power supply can not be side by side with AC power, hi power equipment, inverter; use a power supply that has been insulated and well grounded. The cable length within 20 meters.

⚠ **Important**	Regarding the manual version! The product is constantly being optimized. There may be new functions added that are not reflected. Please obtain the latest electronic version from your supplier.

Installation position

1. The installation point of pipe is filled with fluid.
2. The flow direction of the installation position is from the bottom to the top, reduce the situation where the fluid in the pipe is not filled.
3. When installed horizontally, it is installed at the low level of the pipeline or at the bottom of the U-shaped pipeline, which can also ensure that the pipeline is filled with fluid.
4. The installation position requires 10 multiple the front and 5 multiple the diameter of the straight pipe to improve the stability of the measurement.
5. The upstream of the installation position, the control valve cannot be installed, the control valve will directly affect the flow of fluid, it is best to install in front of the control valve.
6. The upstream of the installation position, the pump cannot be installed. It is easy to produce bubbles or turbulence, and the straight pipe needs to have 30-50 multiple the pipe diameter.
7. During installation, the surface of the pipe should be cleaned and free of stains, paint, rust, etc.
8. When installing outdoors, please install it in a protective case to avoid direct sunlight or heat source radiation.
9. The product protection is IP54, and the protection of the split transducer is IP65, please do not install it underwater.
10. If there are bubbles in the fluid, a defoaming device should be installed to evaluate the degree of impact.
11. The installation position needs to be far away from the open outlet, it will cause a distraction or siphon situation, which requires the addition of valves at the outlet to eliminate the unstable flow pattern by reducing the valve opening.
12. When installing in a place with vibration, please add a bracket to fix the pipeline, as the vibration may cause instability in the measurement.

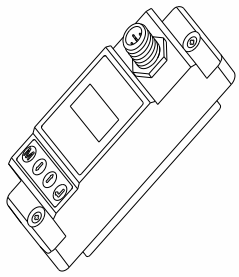
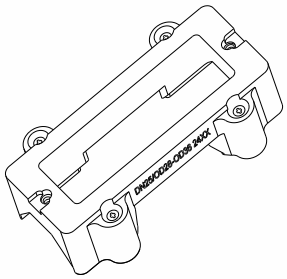
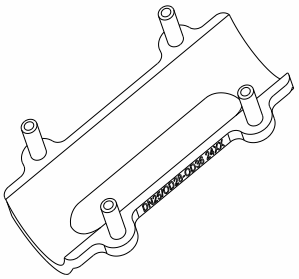
Use of the product

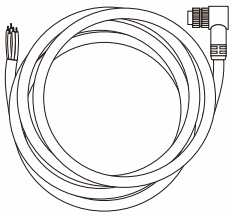
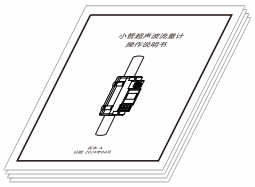
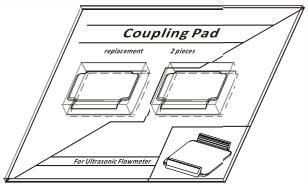
1. Turn on the power, the unit performs signal detection, according to the pipeline and flow conditions, the time is between 5s up to 1min, and the output function is used only after confirming that the signal is stable.
2. Beginning use the meter, the system will continue to correct the flow difference through the detection signal, and the flow calibration action needs to be carried out after 15-20 minutes of warm-up.
3. Accuracy range is 0.5m/s - 5.0m/s, please calibration within this range, if the pipe diameter is DN15 and below, the verification time is not less than 5min or 15L, please consult for more details.
4. For flow rates of less than 0.5 m/s, contact us to select a product that can be corrected in sections.

⚠ **Important**	1. Products cannot be used as standard meter for trade delivery. 2. The product is not intended as a standard meter for the purpose of proof of measurement.

Product Component

Before installing, please check whether all the parts are consistent. Ensure that there is no potential damage to the surface, and the screws or wires are not loose during transportation. If have any questions, please contact us or our service representative as soon as possible.

Unit	Upper bracket	Base bracket
		

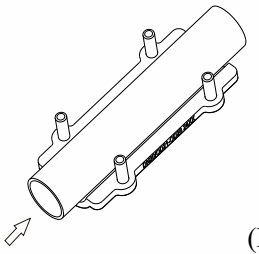
Connecting cables	Instruction manual	Coupling pad
		

Performance index

ITEM	Description
Pipe range	DN6~DN100 (OD9~OD115)
Accuracy	±2.0% (±0.5m/s ~ 5.0m/s)
Flow range	0.1m/s ~ 5.0m/s
Repeatability	0.8%
Response Time	500ms
Analog output	4-20mA; maximum load: 600Ω
Alarm output	OCT output; alarm value; total pulse (option)
Communication	RS485, support modbus communication protocol
Power supply	24VDC@3W
Cable length	Std.2.0m, extend up to 20.0m
Keypad	Four light touch buttons
Screen	1.3" OLED 128*64 display screen; refresh rate: 3.3Hz. (180 degree rotation for easy reading)
Units	Metric and imperial units are available, Cubic Meters (m3), Liters (L), USA Gallons (GAL), /hour, /min. default unit setting: m3/h
Totalizer	Seven bit digit
History data	Day, month, year totalizer, data can be saved for 10 years without loss
Liquid	Water, Seawater, Oil, chemical..
Piper material	Stainless steel pipe, carbon steel pipe, copper pipe, plastic pipe...
Case material	Aluminum alloy
Environment temp	-10℃-50℃
Liquid temp	-10℃-50℃
Environment humidity	0-95% relative humidity, without condensation
Viscosity	<300CST (mm^2/s)
IP Grade	IP54/IP65

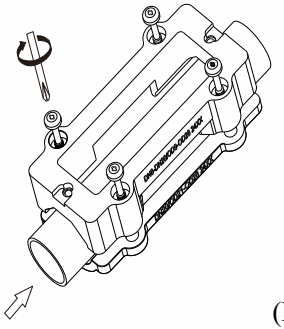
Installation and Connect

1.Make sure no dirt, paint, or other stains on the surface of the target pipe. Then put the base bracket on it. (Figure1)



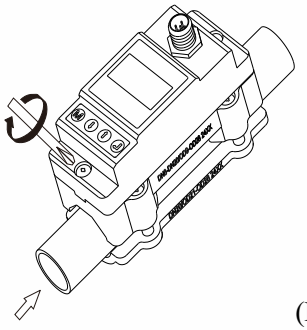
(Figure1)

2.Align the upper bracket; tighten four M4 screws on the upper bracket, the base bracket will automatically connect with. (Figure2)



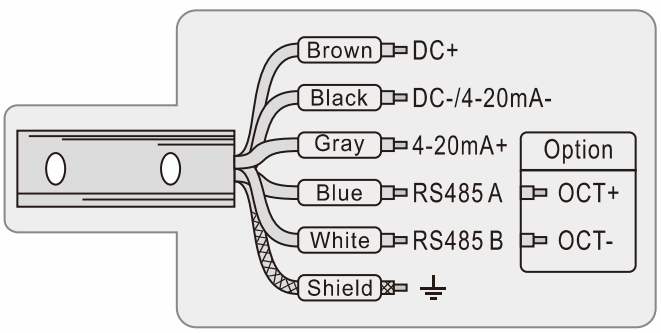
(Figure2)

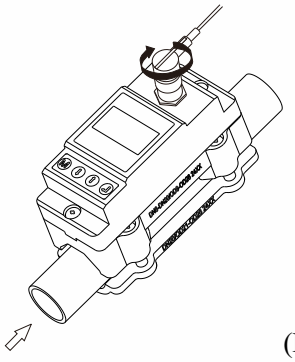
3. Put the meter into upper (Keep the coupling pads well installed) , tighten the two screws and the installation is complete (Figure3)



(Figure3)

4.Take out the connecting cable and connect the plug to the socket of the meter, the plug is directional, and the end of the cable points downstream, and it can be tightened. Connect the DC power, The Unit will work. (Figure4)

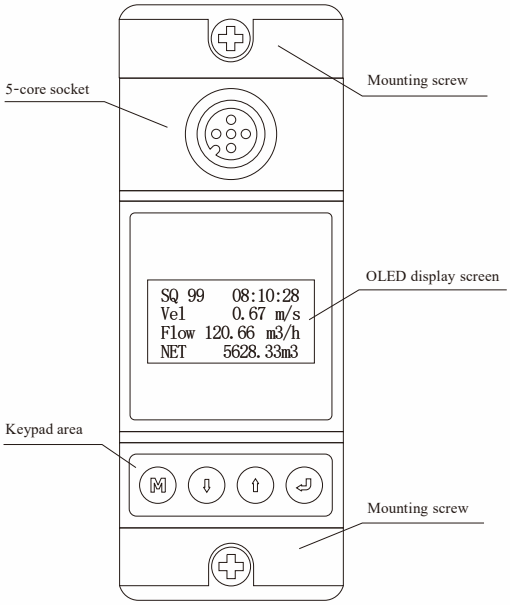




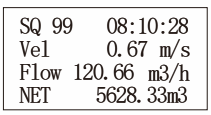
(Figure4)

Panel functions

Mounting screw、5-core socket、OLED display screen、keypad area. (Figure5)

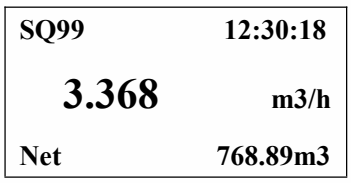


(Figure5)

Serial number	Icon	Name	Explain
1		Menu key	Setting and display mode switch, when setting mode, you can return to the previous menu.
2		Down key	Scroll down and select the menu to move to the next digit.
3		Up key	Scroll up and select the menu, selecting the number as you go up and cycling from 0 to 9.
4		Enter key	Enter
5		Mounting screw*2	M4 does not remove screws M4, for host fixing.
6		5-core socket	M12 Aviation socket, power supply and output.
7		OLED display screen	1.3"OLED display screen, poor ambient light easy to reading.

Power on

When the flow meter is powered on, its self-diagnosis program starts as well.



Signal Quality (SQ value)

SQ value is short for Signal Quality. It indicates the level of the detected signal. The SQ value is a number from 00~99. 00 means no signal is detected, while 99 means the best signal.

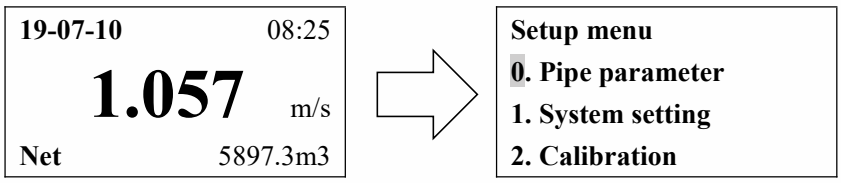
Normally, the measurement position should be properly installed and coupling compound should be good contact with the pipe until the signal quality detected is as strong as possible.

Quick Set – up

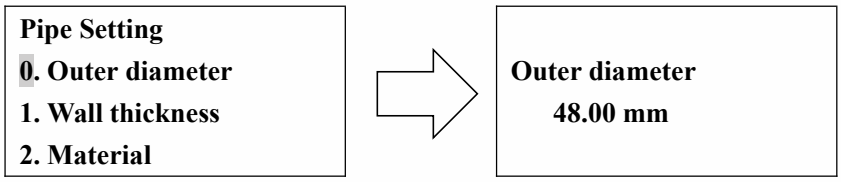
For quickly putting into use. Here below are the quick setups (not Including output's setup):

Remark	When the flow meter has been installed well on a pipe that is filled with bubble-free and impurity-free liquid medium, and has been powered on with figure display, the setting operation can be performed.

STEP1: when under the main interface, press M will display setup menu, select *0.Pipe parameter*, press ↵ will, enter this item's set up:

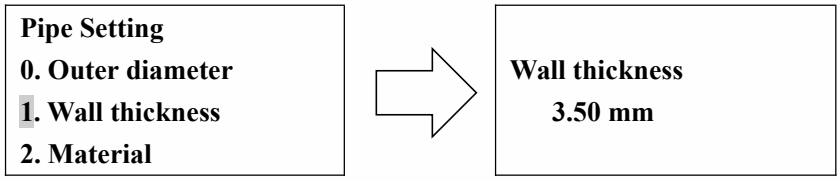


STEP2: select *0.Outer diameters*, press ↵ to enter its modification, press ↑ and ↑ will shift and select numbers. press ↵ will confirm the modification and turn back to the previous menu.

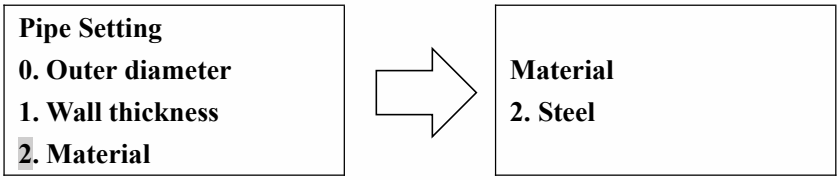


⚠ Note	The built-in parameters can be modified according to the actual pipe diameter on site.

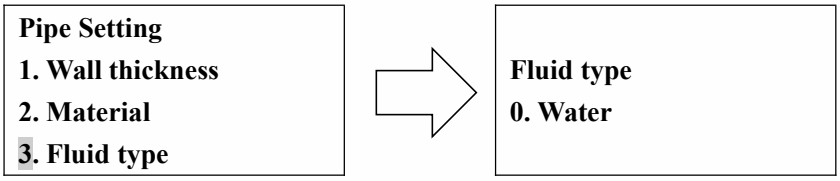
STEP3: select *1.Wall thickness*, press to enter modification, press and will shift and select numbers. Press will confirm the modification and turn back to the previous menu.



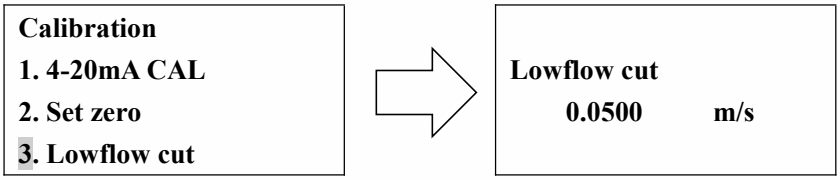
STEP4: select *2.Material*, press to enter modification, press and to select, press will confirm the selection and turn back to the previous menu.



STEP5: select *3.Fluid type*, press to enter selection, press and to select, press will confirm the selection and turn back to the previous menu.

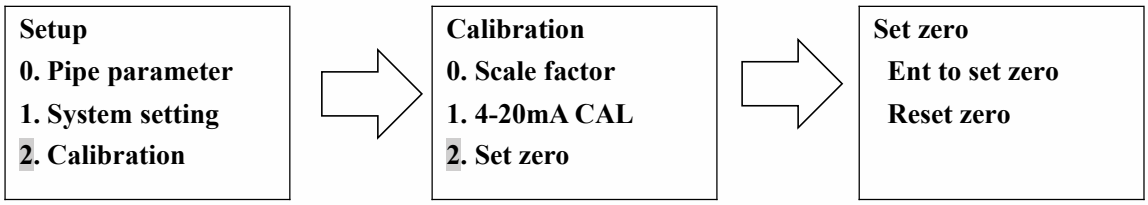


STEP6: select *3.Low flow cut*, press to enter modification, press and will shift and select numbers. Press will confirm the modification and turn back to the previous menu.



⚠ Note	The default value is 0.05m/s. Thick-walled stainless steel pipe needs to be set to 0.10 ~ 0.15 m/s.

STEP7: press M to turn to previous menu, select *2.Calibration*, press ↵ and select *2.Set zero*, press ↵ twice to set it. Do not do anything till it finishes setting and turn to previous menu automatically.



⚠ Note	Before performing this step, it is necessary to ensure that the medium inside the pipeline is in a static state, otherwise this operation step is prohibited! This step is required for both initial installation and relocation installation!
	If it does not return to the main interface, or still with numerical flow rate, please check 1. If the earlier setups are correct? 2. If the SQ value is smaller than 50, check its installation.

STEP8: Installation completed, record measurement data for future reference.

Project	Setting values (for example)
Name/Location number	Workshop1 NU001
Installation site	Vertical installation/Flow direction from bottom to top
Product series number	S/N 30001399
SQ	99
Outer diameter	48.00mm
Wall thickness	3.50mm
Material	Steel
Fluid type	Water
Low flow cut	0.0800 m/s
Set zero	0.000 m/s
Vel	1.068m/s
Flow	3.368m3/h
Net	0..089m3

⚠ Note	Please provide the above form/content for any consultation during installation, so that the service engineer can quickly provide guidance and support. If permitted, please provide a photo/video of the installation point for quick guidance and troubleshooting.

Main screens

When power on, the meter will display Flow Rate/ Net Totalize.

SQ99	**12:30:18**
3.368	**m3/h**
Net	**768.89m3**

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

Runtime	**216h**
Day	**79.068m3**
Mth.	**3839.8m3**
Year	**13768.6m3**

Press ⬇ will display Flow Rate/ S.TOT, press ⬆ will return to previous menu.

SQ99	**12:30:18**
3.368	**m3/h**
S.ToT	**8.89m3**

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

SQ99	**12:30:18**
Vel	**1.068m/s**
Flow	**3.368m3/h**
Net	**768.89m3**

Press ⬇ will display Velocity/ Net Totalize, press ⬆ will return to previous menu.

20-03-18	**12:30**
1.068	**m/s**
Net	**768.89m3**

Setup Menu

Press (M) will display Setup menu.

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

All options are as follows:

Setup menu
0. Pipe parameter
1. System setting
2. Calibration
3. Output setting
4. History data

Setup Menu – Pipe parameters

Press (↓) select *0.Pipe parameter*, then (↵) display:

Pipe Setting
0. Outer diameter
1. Wall thickness
2. Material

All options are as follows:

Pipe Setting
0. Outer diameter
1. Wall thickness
2. Material
3. Fluid type

0. Outer diameter: input target pipeline outer diameter.
1. Wall thickness: input target pipeline wall thickness.
2. Material: PVC, Carbon steel, Steel, Copper pipe...
3. Fluid type: Water, Sea Water, Oil (input the correct sound velocity for measuring fluid).

Setup Menu – System setting

Press select *1.System setting*, then press to display:

System Setting
0. System unit
1. Flow rate unit
2. Total unit

All options are as follows:

System Setting
0. System unit
1. Flow rate unit
2. Total unit
3. Total RESET
4. Time set
5. System lock
6. System INFO
7. Display dir.
8. Damping
9. Display format

0. System unit: Metric, English.
1. Flow rate unit: m3/h, LPM, GPM, LPH.
2. Total unit: m3, L, GAL.
3. Total RESET: selecting “YES” will reset all cumulative quantities.
4. Time set: change the time to minutes and default to 30 seconds.

yy-mm-dd hh:mm
20-03-18 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

Set the lock to the system, with the following steps:

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

Unlock the system, follow the steps below:

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" it by the last designated password. The password is composed of 1 to 4 numbers.

6. System INFO

System INFO **Flowmeter** **SN:30001399** **V1.00**	**Manual Totalizer** **ENT To Start** **0.000m3/h** **SQ99 0.000L**	**Manual Totalizer** **ENT To Stop** **1.239m3/h** **SQ99 1.056L**	**Manual Totalizer** **ENT To Restart** **0.000m3/h** **SQ99 0.000L**

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.

Important	**Manual Totalizer:** electronic scales can be used to calibrate the flow meter. Under "System INFO" menu, press 5 times ↵ to enter Manual Totalizer, press ↵ to start measurement, press ↵ again to stop, as to make a single measurement and calculation. If the electronic scale is used to weigh and calculate the single measurement value of the flow meter, the error value can be obtained, which can be used to correct the Scale Factor of the flow meter.

7. Display direction

Display direction. **0. Normal** **1. Inversion**

Select the display direction of the screen, which can be rotated by 180 degrees.
(suitable for vertical measurement, the flow direction is inconsistent with the screen display.)

8. Damping

Damping
003

When the displayed value of flow instability changes greatly, DAMPING can be set to adjust the measurement response speed of the flow meter. Unit for it is second.

9. Display format

Display format
0. x0.001
1. x0.01
2. x0.1
3. x1

The display digit of the measured value can be set by the indentation function, and 3 digits after the decimal point are displayed by default. You can choose to display 2 decimal places, 1 decimal place, 0 decimal places or not to display decimals.

Setup Menu – Calibration

Press, select *2.Calibration*, then press to display:

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

All options are as follows:

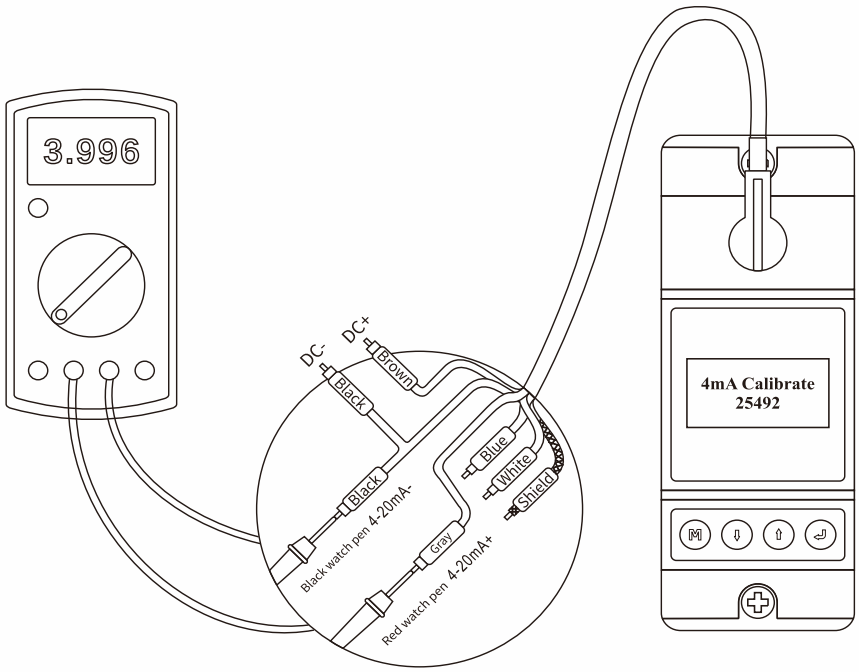
Calibration
0. Scale factor
1. 4-20mA CAL
2. Set zero
3. Lowflow cut
4. Manual zero
5. Hi AGC
6. Negative flow

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 with 1.98 on the flow meter. This means that the best scale factor constant is 1.01 (2/1.98).

1. 4-20mA CAL: the current loop has been calibrated before delivery. Press and to display 4mA or 20mA, check the displayed value of current cycle output with ammeter. If it exceeds the allowable tolerance, the current loop can be recalibrated.

4mA Calibrate **25492**	**20mA Calibrate** **4555**

The displayed value has no meaning, it is only used for internal recording. During calibration, simply use the up and down keys to check the displayed value of the ammeter (multimeter). The following is a schematic diagram of the connection: (Figure6)



(Figure6)

2. Set zero

Set zero **Ent To set zero** **Reset zero**	**Set zero** **Waiting…** **SQ99** **Vel 0.038m/s**

Press , users can reset the zero point, do not do anything (Waiting…) during the setting process, it will automatically return to the main interface when completed with the flow rate of "0.000". If return to the main interface and the flow rate is not "0", it means that the setting is unsuccessful, please check whether the installation is correct.

Note	Please do not do this zero reset when SQ is 0. It is necessary to operate under the condition that SQ is greater than 50 and stable.

3. Low flow cut

Lowflow cut
0.0500 m/s

This function can prevent the data accumulation error caused by the flow meter continuing to read after the pump stops working and the liquid is still flowing in the pipe at a low speed. Generally, it is recommended to input 0.05m/s as the cut-off point of low flow, and the cut-off value of low flow do not influence the measurement results. Under normal circumstances, SS304 or SS316 pipe with a wall thickness of more than 2mm will receive false signals due to the interference of pipe wall signals in practical use, and it is recommended to cut them at a low flow rate of 0.08m/s or above.

4. Manual zero

Manual zero
0.0000 m3/h

Not commonly used, only suitable for experienced operators to manually set zero when other methods are not suitable, manually input the value and add it to the measured value to get the actual value.

5. Hi AGC

Hi AGC
0. OFF

High-gain switches are generally not required, and only special weak signal pipes can be tried to open.

6. Negative flow

Negative flow
0. OFF

The negative flow switch, when on, will measure the negative flow and count it into the cumulant, and when off , it can prevent the measurement error caused by the back flow of the medium.

Setup Menu – Output setting

Press select *3.Output Setting*, and then display:

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

All options are as follows:

Output setting
0. RS485 Setup
1. 4-20mA range
2. Alarm value
3. OCT output
4. OCT multiplier
5. Batch Control

0. RS485 Setup

RS485 Setup
0. Network addr
1. RS485 Baudrate
2. RS485 Parity
3. RS485 Stopbit

Serial port parameter setting, which must match the connection parameters of the device.

0. Network addr: optional 1-249.

1. RS485 Baudrate: optional 2400, 4800, 9600, 19200; The data length is 8.

2. RS485 Parity: inspec mode optional 0.NONE; 1.EVEN; 2.ODD.

3. RS485 Stopbit: optional 0.Stop_1bit; 1.Stop_2bit.

Note	Default serial port parameters: 9600, 8, None, 1.

1. 4-20mA range

4mA value **0.00 m3/h**

20mA value **15.00 m3/h**

According to the flow value, set the current cycle output value as: 4mA and 20mA.

Note	The flow value corresponding to 4-20mA is related to pipe diameter and real flow rates. For the setting range, please refer to Appendix: maximum flow and minimum flow, and the output current signal represents instantaneous flow.

2. Alarm value

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 here, 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 here, will activate the alarm in the OCT hardware or relay output signal.

3. OCT output

OCT output
0. Total Pulse
1. Alarm output
2. No Signal
3. Batch Control

0. Total Pulse: the pulse equivalent range can be set (0.01L~100m3), and the corresponding pulse number will be output when the set totalize is measured.
1. Alarm output
2. No Signal
3. Batch Control

4. OCT multiplier

OCT multiplier
0. x0.001
1. x0.01
2. x0.1
3. x1
4. x10
5. x100

Select pulse output multiplier.

Note	Please note that when outputting cumulative pulses, the maximum number of pulses output per second cannot be greater than 40.

5. Batch Control

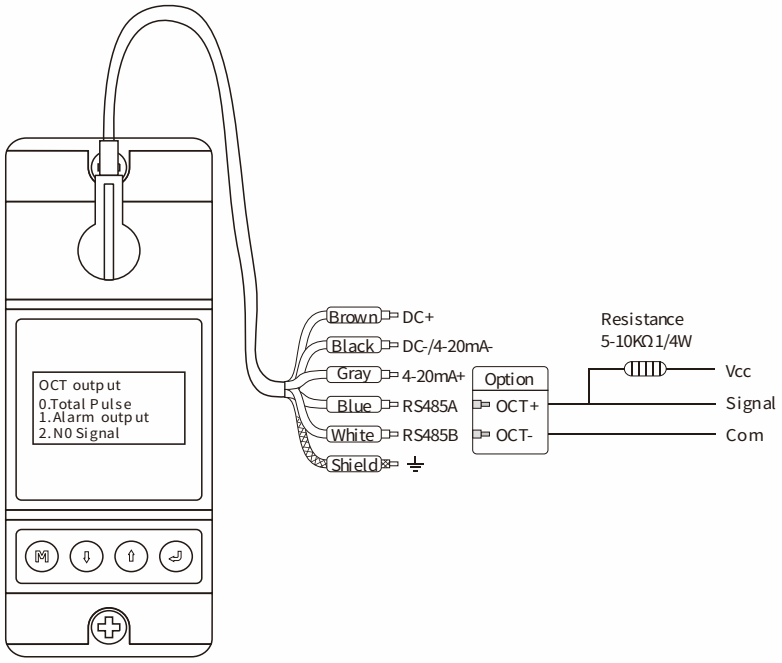
Batch Control
0. Batch Total
1. Key Input：OFF
B.T： 0.000m³

0. Batch Total: set up flow rate value of batch control.
1. Key Input: manual switch control (switch can also be controlled by RS485).

B.T: batch control displays the flow rate value in real time.

OCT Wiring diagram

To select OCT output, you need to connect a 5-10k pull-up resistor at the OCT+ end. At the Vcc and Com end, add a 5-24VCD power supply.



Setup Menu – History data

Press ↓, select *4.History data*, and then ↵ to display:

History data
0. By Day
1. By Month
2. By Year

Review the historical flow data totalizer for any day in the last 64 days, any month in last 64 months and any year in the last 10 years.

Rated flow range

Model		-9.53	-12.7	-15	-20	-25	-32
Pipe OD	mm	φ9.53	φ12.7	φ15	φ20	φ25	φ32
Pipe ID DN	DN	DN6	DN8	DN10	DN15	DN20	DN25
Pipe ID NPS	NPS	1/8"	1/4"	3/8"	1/2"	3/4"	1"
OD range	mm	9-15	9-15	15-21	15-21	21-28	28-36
Flow	L/min	0.2-20	0.44-30	0.57-50	0.92-70	1.36-150	2.71-200
Flow	m³/h	0.01-1	0.03-2	0.03-3	0.06-4	0.08-10	0.16-15

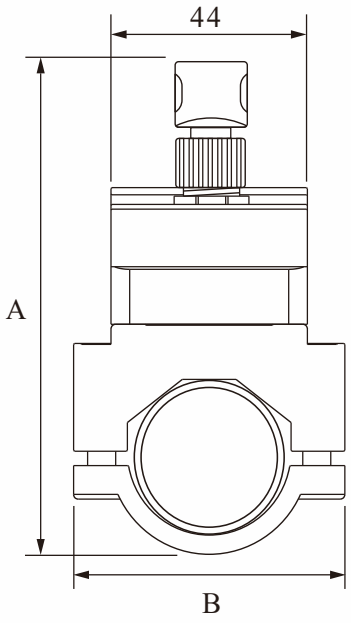
Model		-40	-50	-63	-75	-90	-110
Pipe OD	mm	φ40	φ50	φ63	φ75	φ90	φ110
Pipe ID DN	DN	DN32	DN40	DN50	DN65	DN80	DN100
Pipe ID NPS	NPS	1.2"	1.5"	2"	2.5"	3"	4"
OD range	mm	36-44	44-52	52-66	66-80	80-95	100-115
Flow	L/min	4.24-330	6.8-460	9.54-700	14.8-1030	21.8-1360	36.5-2170
Flow	m³/h	0.25-20	0.41-30	0.57-40	0.89-60	1.31-80	2.19-130

*The measurable flow range is (0.1m/s-5.0m/s), and the accuracy flow range is (0.5m/s-5.0m/s).

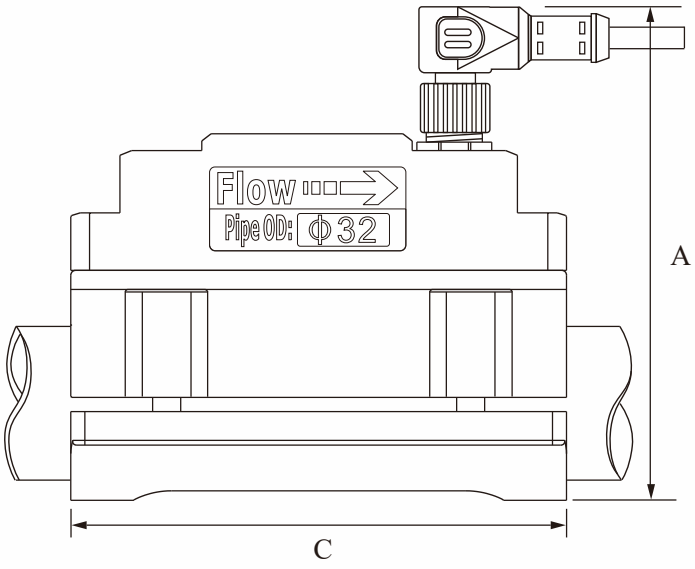
Specifications and Dimensions

Model	DN	ID	OD range （mm）	A（Max） （mm）	B （mm）	C （mm）
-φ9.53	DN6	1/8"	9-15	98	54	106
-φ12.7	DN8	1/4"	9-15	98	54	106
-φ15	DN10	3/8"	15-21	95	54	106
-φ20	DN15	1/2"	15-21	95	54	106
-φ25	DN20	3/4"	21-28	103	54	106
-φ32	DN25	1"	28-36	111	62	106
-φ40	DN32	1.2"	36-44	119	70	106
-φ50	DN40	1.5"	44-52	127	78	106
-φ63	DN50	2"	52-66	144	92	130
-φ75	DN65	2.5"	66-80	158	106	136
-φ90	DN80	3"	80-95	173	121	150
-φ110	DN100	4"	100-115	193	141	174

Unit: mm



End view



Side view

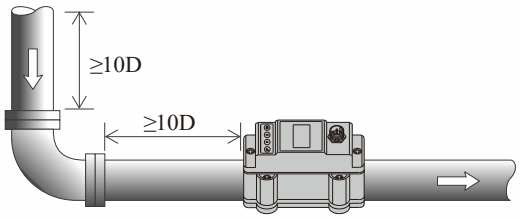
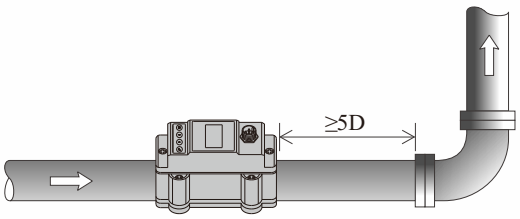
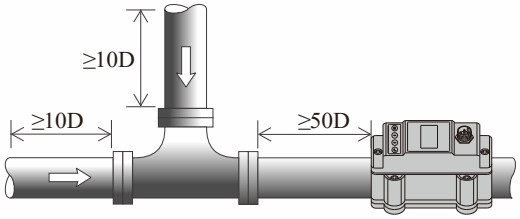
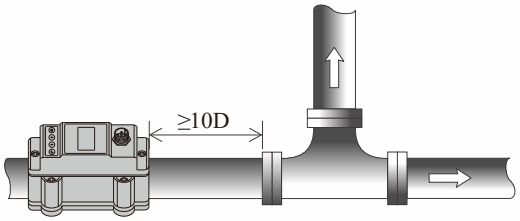
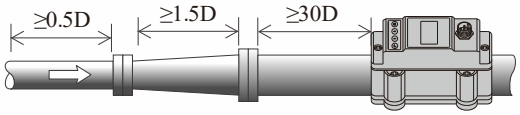
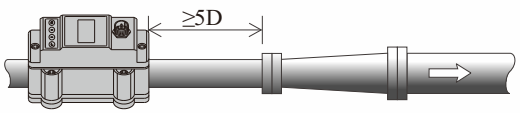
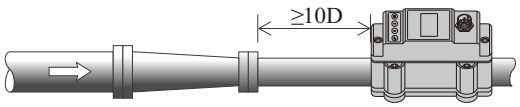
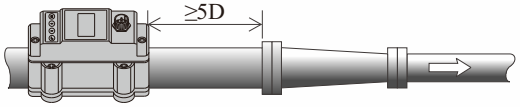
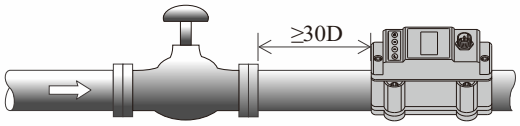
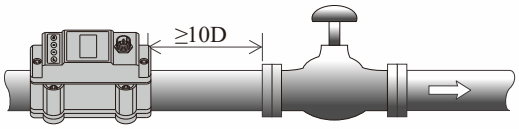
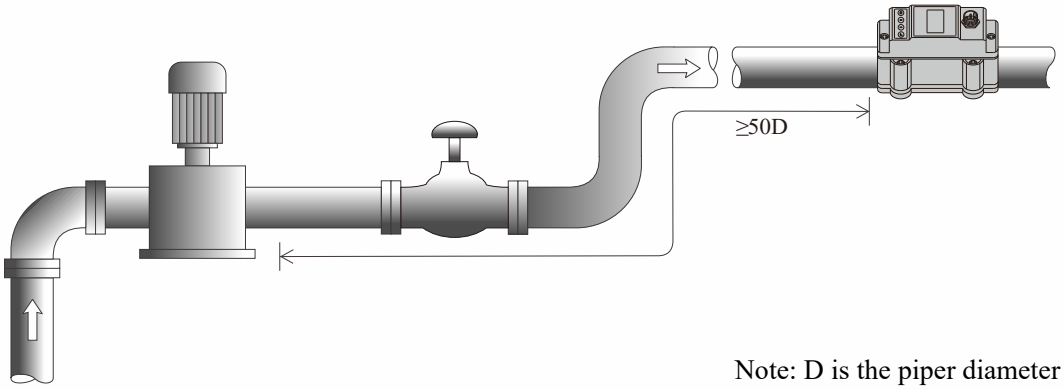
Installation Site Selection

Choose a pipe section, which is always full of liquid, such as a vertical pipe with flow in the upward direction or a full horizontal pipe.

Ensure that the pipe surface temperature at the measuring point is within the transducers temperature limits.

Consider the inside condition of the pipe carefully, If possible, select a section of pipe where the inside is free excessive corrosion or scaling. Choose a section of sound conducting pipe.

Examples acceptable measurement site selections are illustrated on the figure on the below:

Site	Installation point front straight section	Straight pipe section after installation point
Elbow		
Tee		
Expanded pipes		
Reducing pipe		
Valve		
Pump		Note: D is the piper diameter

Product warranty

- Flow meters have been strictly tested before leaving factory. If any malfunction occurs, please contact us or our agents immediately and provide details of the malfunction.
- The warranty is for one full year after the date that product is delivered at the receiving place.
- Scope of Warranty
  - If any malfunctions within the one-year warranty, we would repair the product free of charge.
  - The following situations are not covered by the warranty:

    If the product is not used properly in accordance with the manual or technical requirements

    (including unsuitable conditions, unsuitable environment, etc.).

    If the malfunction is caused by the user's incorrect operation, such as incorrectly connecting the devices.

    If the hardware and software are amended or fixed without suggestion or permission.