Gear Flowmeter Operation Manual

Notice!

- Before installation and use, please read this manual carefully to understand the contents so that you can correctly install, connectthe circuit, operate and maintain the sensor.
- This manual should be kept in the hands of the actual end user
- This manual should be kept until the sensor is scrapped.
- The technical specifications of this product may change withoutprior notice.

Product Characteristics

- High voltage resistance (1.0-45MPa)
- High and low temperature resistance (-196℃-200℃)
- Able to measure different kinds of viscous media.
- High precision and repeatability
- Impulse output/Analog output available
- Range ratio width (1: 100)
- Broad range of measurement
- Strong corrosion and pollutant resistance (acid and alkaline)

Scope of Application

- Measurement of resin and glue
- Measurement of hydraulic oil, lubricating oil and grease
- Measurement of fuel oil
- Measurement of printing ink and asphalt
- Measurement of liquid nitrogen, refrigerant and solvent
- Measurement of edible oil, fish oil and food canning
- Fluid quantitative control system

Product Code

GF	2	F	1	P	1/ S

Special requirements: High

Texture
1: Stainless steel 2. Aluminum alloy 3: PP

Signal output
P: Impulse output **I:** 4-20 mA **RS:** 485

Connection Mode
1: Thread connection 2. Flange connection 3. Sanitary flange 4: Cutting sleeve

Sealing
F: FKM **P**:PP

Nominal diameter
2, 4, 6, 10, 15, 20 and 25

Product Designation

Product Diagram

Fig. 1 Thread Connection

Fig. 2 Quick Hoop Connection

Fig. 3 Cutting Sleeve Connection

Calculation Formula

K coefficient of gear flow transmitter (flow coefficient) defines the number of impulses per L within the unit flow precisely.

The following formula is used:

$$Q=f\times 60/K$$

Q= Instantaneous flow L/min

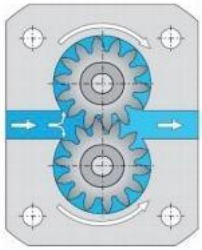
F= Frequency of output impulse (HZ)

K= Coefficient of gear flow meter (impulse/min)

Description of Principle

GearFlowmeter, Gear flowmeter is also called PD Flowermeter (positive displacement flowmeter), referred to as volumetric flowmeter, which is a relatively high-precision type of flow meter.

Gear flowmeter is a kind of flow meter that uses the pressure difference between the inlet and outlet of the liquid when it passes through the flowmeter cavity to drive a pair of gears to mesh. Two precisely matched gears are enclosed in a precision-machined cavity, and the root of each gear and the measuring cavity will form a volume cavity of equal volume. The gear is driven to rotate by the liquid, dividing it into a single known standard volume part. The total volume of the liquid is measured according to the number of times the volume cavity is repeatedly filled and discharged with the liquid in the volume part.



Let the flowmeter circulation volume be v, the number of gear rotations in a certain period of time is: N, then the volume of liquid flowing through the flowmeter per unit time is V, then: V=Nv

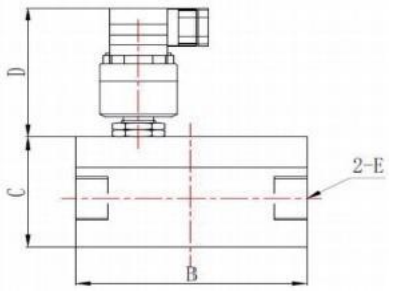
The non-contact sensor generates a pulse (P) through the induction gear. The extracted signal is digitized by the signal amplifier to present a square wave output signal. This signal can be processed by any external electronic products (such as PLC and IC processing), can be displayed on-site instantaneous flow and cumulative flow through local display instruments, and can also be displayed through wireless remote transmission based on GPRS or other forms.

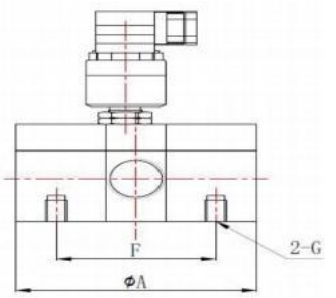
Performance Parametertable

Model	Measuring Range (l/h)	K Factor (P/L)	Pressure (bar)		Interface	Filter Diameter (μm)	
			SS304	AL		Rolling Bearing	Sliding Bearing
GF02	0.6-50	11200	50	20	G1/4	20	40
GF04	5-250	4780	50	20	G3/8	20	40
GF06	10-500	3468	50	20	G1/2	20	40
GF10	20-1200	2780	50	20	G1/2	20	40
GF15	200-3000	334	50	20	G3/4	20	150
GF25	1000-12000	59	50	20	G1	100	150
GF32/40	2000-20000	39	50	20	G1-1/4	100	150

Note: The above parameters are obtained using diesel as the calibration medium.

Product Size





(Unit: mm)

Size / Model	A	B	C	D	E	F	G	H
GF02	Φ83	79	55	75	G1/4	40	M6	19
GF04	Φ83	79	55	75	G3/8	55	M6	16
GF06	Φ83	77	65	75	G1/2	55	M6	19
GF10	Φ83	77	65	75	G1/2	55	M6	19
GF15	Φ113	107	65	75	G3/4	90	M6	28
GF25	Φ148	140	82	75	G1	110	M8	40
GF32	Φ218	160	100	75	G1-1/4	180	M8	45

Note: The above dimensions are standard product dimensions and can be customized according to the special working conditions at the customer's site.

Prerequisites

A.Before installing the flowmeter to the main pipeline, check the following contents in the packaging box:
Flowmeter body
Product operation manual
Certificate of conformity (after-sales registration card)
Accessories (flanges, joints, etc.)

B.Mechanical and electrical installation must be performed by qualified personnel;

C.The pipeline must be cleaned in advance to ensure that there are no particles larger than 120 mesh in the pipeline, especially welding slag, rust blocks, raw tape and other foreign objects must be cleaned up to avoid irreversible damage to the flowmeter;

D.If there are interference sources (such as inverters, etc.) around the flowmeter installation location, the signal line must use a cable with a metal shielding wire;

Flow Meter Installation Instructions

The gear flowmeter can be installed horizontally or vertically;

The pipeline pressure should be kept consistent and stable as much as possible;

The liquid in the pipeline must be kept full;

The pipeline must be free of bubbles, which will affect the accuracy of measurement;

The flowmeter must be fixed and cannot be placed in the air, and should be kept horizontal with the installation pipeline;

Normal pressure (50bar) pipelines can be sealed with the flowmeter using raw tape. If installed on high-pressure pipelines, it is recommended to use combined gaskets and metal spiral wound gaskets.

The flowmeter should be used within the range specified on the nameplate as much as possible, and the upper limit should not exceed 10%; It is recommended that chemical pipelines or pipelines with key processes should add bypasses at the flowmeter installation site to ensure that the liquid can be temporarily circulated from the bypass in emergency conditions such as failure of the flowmeter, so as to facilitate emergency maintenance of the flowmeter.

Intelligent DSP Sensor Interface Definition and Wiring

LD-85 Digital Display Sensor

Supply Voltage	9-26VDC
Output Type	4-20mA(Two, three, four-wire system)
	Two-way switch (high and low flow alarm, relay)
	Pulse (push-pull, three-wire)
	RS485 supports Modbus-RTU protocol
Display	LCD display
Probe Operating Temperature	-40 to 140 degrees
Ambient Temperature	40 to 80 degrees
Electrical Interface	M12*1 connector (with 2 meters of cable)
Unit Resolution	0.001
Power Supply Reverse Connection Protection	Yes
No-Load Current	Current output type: 20mA
Accuracy	±0.5% of reading
Repeatability	0.1%
Casing Material	SS304
Protection Level	Ip65

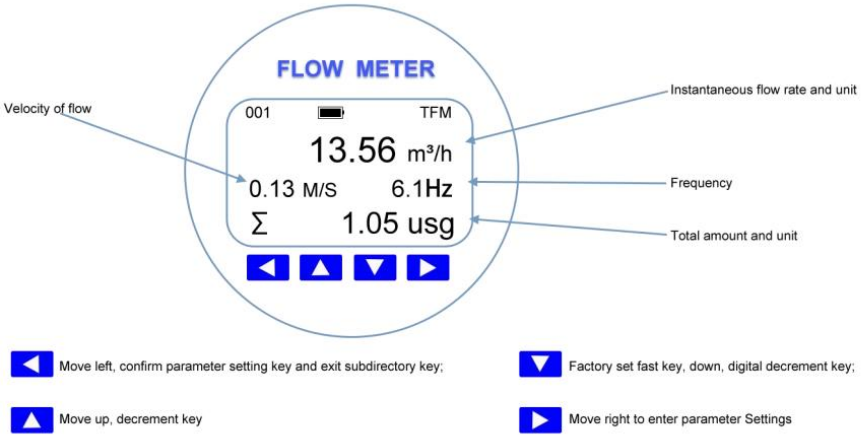
Intelligent DSP Sensor Interface Definition and Wiring

LDH-85 Current High Temperature Sensor

Output Type	4-20mA (two, three, four wire)
	Pulse (three wire)
	RS485, support Modbus-RTU protocol
Probe Operating Temperature	-40 to 200 degrees
Ambient Temperature	-40 to 80 degrees
Other parameters are the same as above	

DSP Interface Definition

① Shift left, confirm parameter settings and exit sub-directory key;
Factory setting quick key, shift down, decrement key;
Shift up, decrement key;



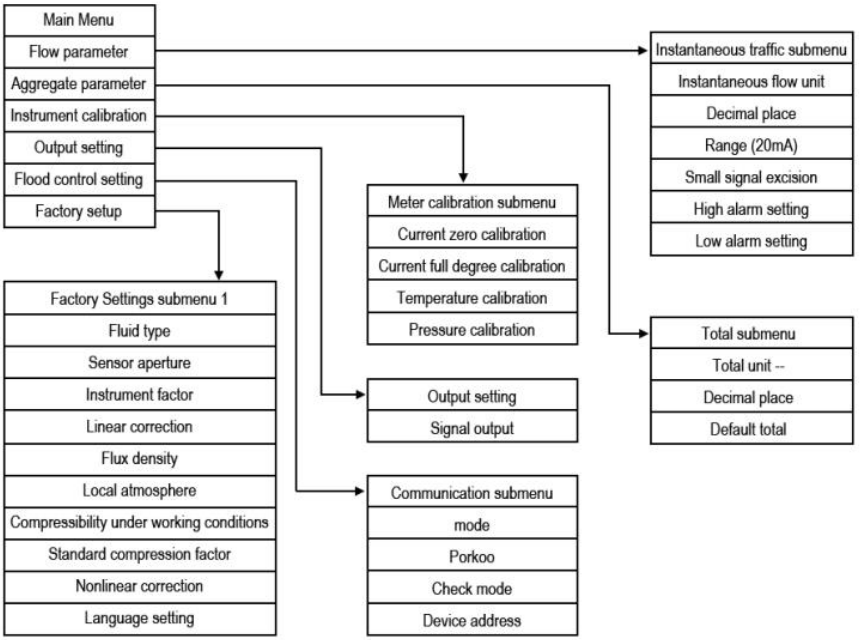
Move left, confirm parameter setting key and exit subdirectory key;

Factory set fast key, down, digital decrement key;

Move up, decrement key

Move right to enter parameter Settings

Sensor Menu Structure



Sensor Parameter Description

Instantaneous flow parameter setting

Flow Unit	Options: LU/s、L/m、L/h、m3/s、m3/m、m3/h、Nm3/h、USG/s、USG/m、USG/h、Kg/s、Kg/m、Kg/h、t/s、t/m、t/hm **Default Value: m3/h** Define the units of instantaneous flow rate: L (liter), h (hour), t (ton), s (second), m (minute), ml (milliliter)
Flow Decimal Places	**Options: 0, 1, 2, 3, Default: 1** **Defines the number of decimal places for instantaneous flow**
Range	Setting range: 9999999.00-0.00m3/h, default value: 100.0m3/h When the instantaneous flow reaches the range, the converter outputs 20mA. Changing this parameter will affect the current output, high alarm and low alarm, etc. Note: When you modify this setting value (range), please pay attention to the unit of this parameter (range). You can modify the unit of this parameter (range) as needed.
Signal Cutoff	Setting range: 9.90～0.00%, default value: 0.0% This setting value is the percentage of the range
High Alarm	Setting range: 99.00～1.00%, default value: 90.0% This setting value is a percentage of the range. For example, if this value is set to 10, it is equal to 10% of the range. If the absolute value of the instantaneous flow is greater than (range × 10%), the converter outputs a high alarm signal and the high alarm contact closes.
Low Alarm	Setting range: 99.00～0.00%, default value: 0.0% This setting value is a percentage of the range. For example, if this value is set to 10, it is equal to 10% of the range. If the absolute value of the instantaneous flow is less than (range × 10%), the converter outputs a low alarm signal and the low alarm contact closes.
Damping Time	**Set wall range*30.0～0.1, default value: 1**

Total quantity setting: define the relevant parameters of the total quantity

Total Quantity Unit	Options: L(liter), m³, Nm3, USG, Kg, t(ton)sml **Default value: m³** **Defines the total quantity unit**
Lowest Number Of Decimal Places	**Options: 0, 1, 2, 3, default value: 1** **Defines the number of decimal places for the total amount**
Preset Total Quantity	Options: 99999999.00-0.00 m3/h, default value: 0.0 m3/h **Clear the total amount or set the total amount**

Sensor Parameter Description

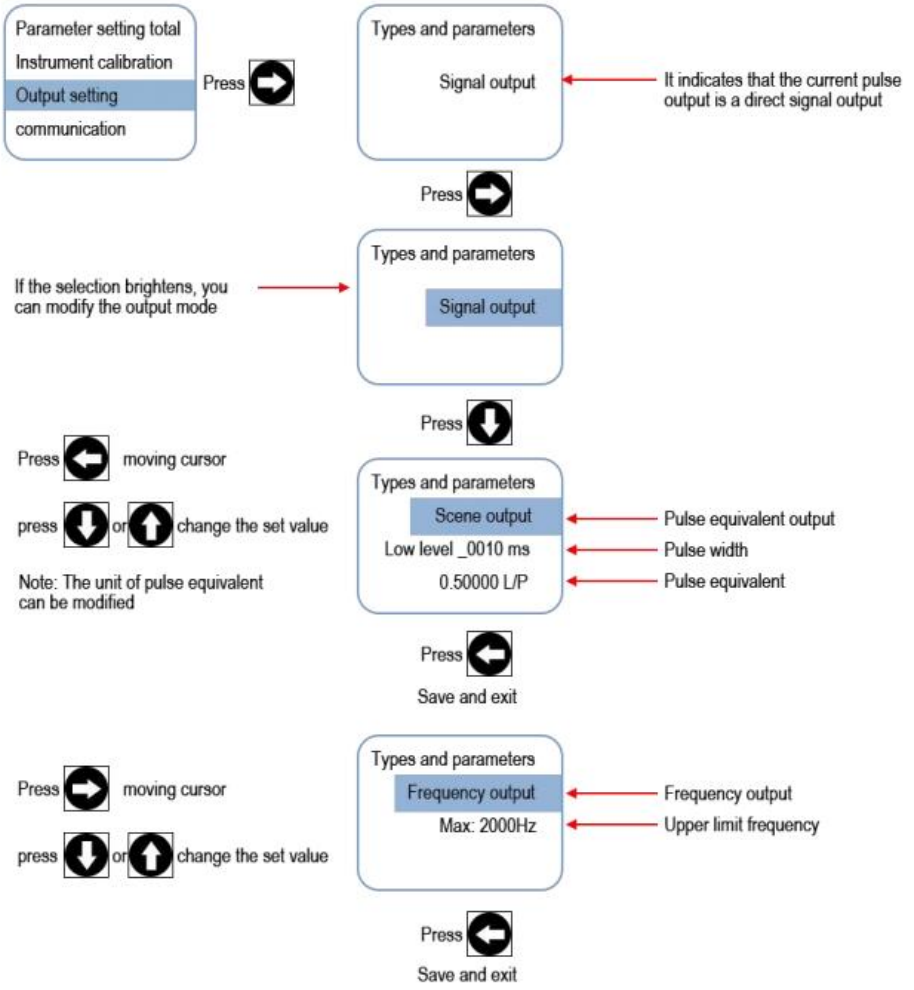
Instrument calibration: calibrate current output and calibrate temperature and pressure measurement circuits

Current Zero Point Calibration	**Floating point number: 5.0～3.0, default value: 0.0** After entering this submenu, use a multimeter to measure the current output value. If the current value is not equal to 4.0mA, enter the actual value measured by the multimeter, and the converter will automatically complete the 4mA current output calibration. Standard value. Note: If the current output deviation is too large, multiple corrections are required to verify the requirements. The maximum input value for each correction is 5.0
Current Full Scale Calibration	**Floating point number: 21.0～19.0, default value: 0.0** After entering this submenu, use a multimeter to measure the current output value. If the current value is not equal to 20.0mA, enter the actual value measured by the multimeter, and the converter will automatically complete the 20mA current output calibration. Note: If the current output deviation is too large, multiple corrections are required to verify the requirements. The maximum input value for each correction is 21.0

Output settings: Set the parameters of three output modes: equivalent output, frequency output and signal output

Frequency Upper Limit	Floating point number: 5000.0-100.0Hz, default value: 2000.0 Output frequency (Hz) = instantaneous flow rate (m3/h) ÷ range (m3/h) × upper frequency limit (Hz) For example: instantaneous flow rate is equal to 100m3/h, range is equal to 200m3/h, and upper frequency limit is set to 2000HZ. At this time, the output frequency corresponding to the instantaneous flow rate of 100 m3/h is 1000HZ
Pulse Equivalent	Floating point number: 9999.0-0.0, default value: 0.0 **The unit of pulse equivalent is: L (liter)/pulse. Users can change the unit of pulse equivalent as needed: USG/P, Kg/P, t/P, Nm3/P, m3/P**
Pulse Width h(ms)	Floating point number: 1000.0~0.0ms, default value: 0.0 When the pulse width is set to "0", the pulse duty cycle is: 1:1
Signal Output	Notes on original signal output: 1. It only distinguishes between frequency output and equivalent output 2. Nonlinear correction also works on original signal output 3. It is related to instrument coefficient **K F(HZ)=3600/(Q*K)** **Q: instantaneous flow (m3/h); K: instrument coefficient**

Output setting operation flow chart



Communication settings: Set RS485 communication parameters

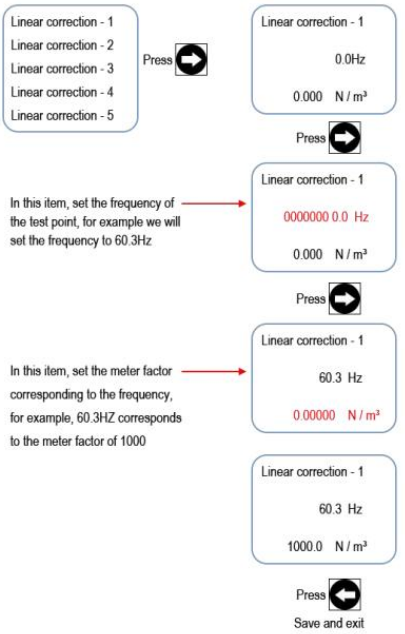
Mode	Options: Modbus-RTU, Modbus-ASCII Default: Modbus-RTU
Baud Rate	Options: 1200, 2400, 4800, 9600, 19200, 38400 Default value: 19200 Note: Please set the baud rate not lower than 9600
Check Method	Options: None, Even, Odd Default: Odd
Device Address	Value: 247~1, default value: 1

Factory parameter setting: first password 052500

Fluid Type	Options: Liquid operating flow rate Default value: Liquid operating flow rate
Diameter	Options: 15, 20, 25, 32, 40, 50, 65, 80, 100, 125, 150, 200 mm Default: 50 mm
Instrument Factor	Floating point number, default value: automatically corresponds to each caliber Q (instantaneous flow, m3/h) = 3600 × F (frequency, HZ) ÷ k (k coefficient)) After completing the actual flow detection, you need to set the final K coefficient here. Among them, K (k coefficient) represents: the number of pulses output per cubic meter

Schematic flow of linear correction operation

Linear correction



After completing the first linear correction, you enter "linear correction-2".

Note: The test point with the highest frequency must be the first point. Set the frequency from large to small.

Parameter Settings

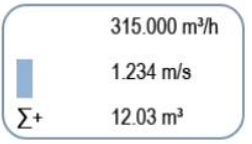


Figure 1 Instantaneous flow display interface

Press to enter the menu setting, as shown in Figure 2:

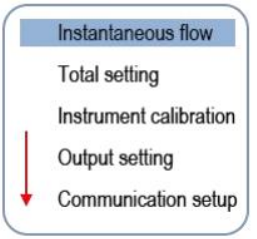


Figure 2

In the interface shown in Figure 2, press or you can select different submenus. Press to return to the flow display interface, as shown in Figure 1;Press or select submenu, press enter submenu to set parameters. For example, we need to set the instantaneous flow parameter "Number", when the instantaneous flow parameter submenu brightens, press it to display as shown in Figure 3 below:

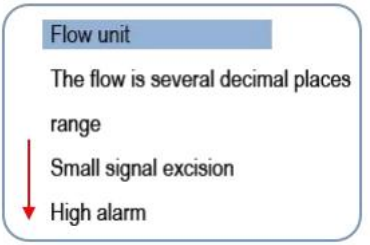


Figure 3n

Press or select the parameter you have modified. The selected parameter will light up. If you need to return to the menu shown in Figure 2, press ; If you need to enter the next level menu, press to set parameters, as shown in Figure 4:

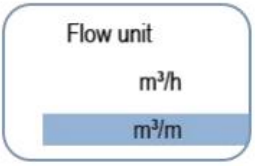


Figure 4

In this case, press or to modify the parameter, for example, as shown in Figure 4, you need to convert the instantaneous flow unit ".m³ /h "is" m³ /m ", then press , and the instantaneous flow unit will become "m³ /m", as shown in Figure 5:

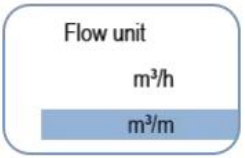


Figure 5

After modifying the parameters, if you need to save the settings, press and the system will save them automatically, as shown in Figure 6:

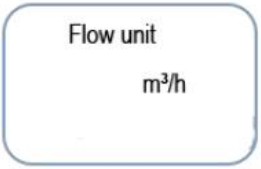


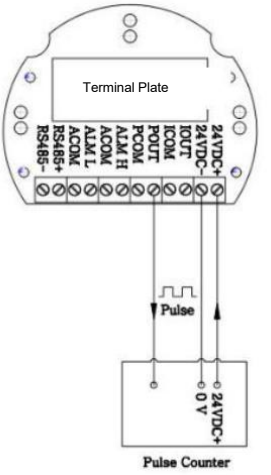
Figure 6

In this case, press save the Settings and push out (Figure 3).

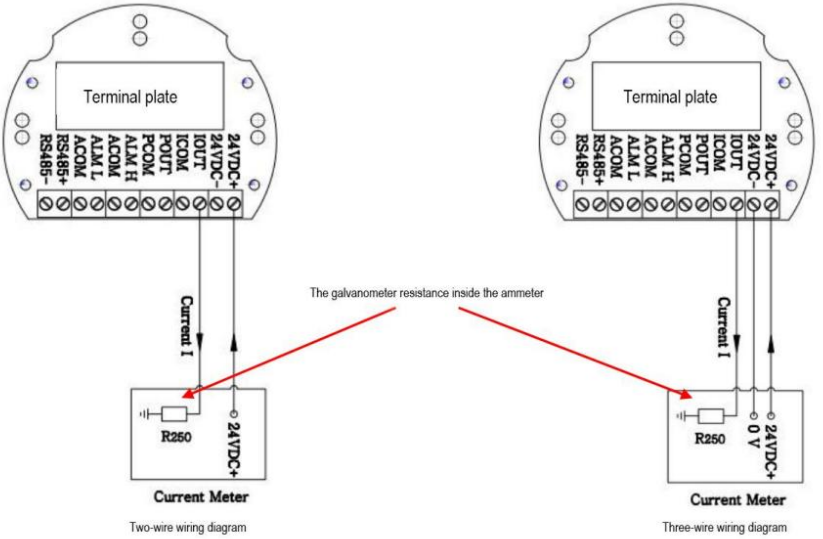
Terminal Definition

Terminal block screen printing	Function	Remark
24V+	DC18-36V+	power supply24V+
24-	DC 18~36v -	power supply24V-
IOUT	4~20Ma +	Load voltage<=-500Ω
ICOM	4~20mA -	
POUT	Frequency & Pulse Output+	
PCOM	Frequency & pulse output common terminal	
ALMH	High alarm +	It is recommended to use a 24VDC intermediate relay, load current ≤30mA
ACOM	High alarm common	
ALML	Low alarm +	
ACOM	Low alarm common -	
RS+	RS485+	RS485 Terminal Blocks
RS-	RS485-	

Wiring pulse output wiring



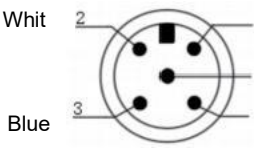
Wiring Current Wiring Diagram



No display wiring diagram

Wiring Pulse Wiring Diagram

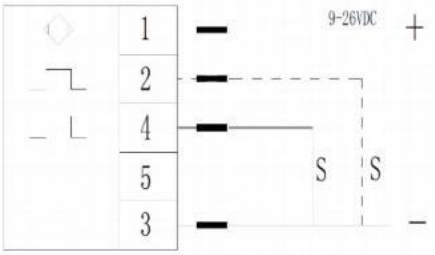
M12*1 Connector Wiring Diagram



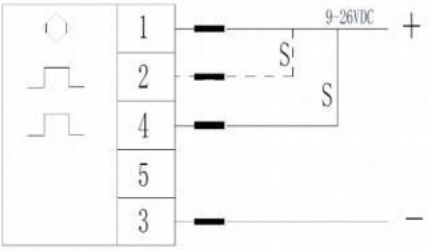
Brown	VDC+
Blue	VDC-
Black	PULSE

PLC Terminal Wiring Diagram

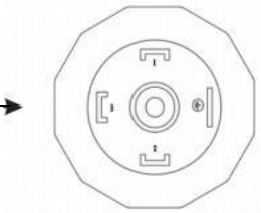
PNP Type



NPN Type



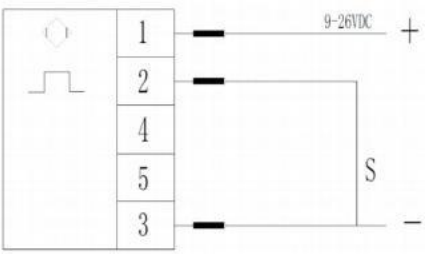
Hirschmann Connectors



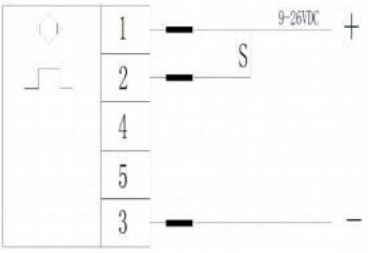
Pin1 brown24VDC+
Pin2 blue24VDC-
Pin3 Free
Pin4 Free

PLC Terminal Wiring Diagram

PNP Type



NPN Type



Current Signal Sensor

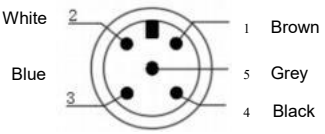
Voltage Signal Sensor

Supply Voltage	9-26VDC
Output Type	4-20mA
	1-5V&2-10V
Probe Operating Temperature	-40℃-140℃
Ambient Temperature	-40℃-80℃
Electrical Interface	M12*1 connector
	Hirschmann connector
	M20*1.5 Metal explosion-proof joint
Power Supply Reverse Connection Protection	Yes
No-Load Current	Voltage output type: 8mA
	Current output type: 10mA
Protection Level	IP65

ASH/VSH
Current High Temperature Sensor

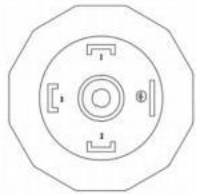
Output type	4-20mA
	1-5V&2-10V
Probe operating temperature	-40℃-200℃
Ambient temperature	-40℃-80℃
The remaining parameters are the same as above	

Wiring Current signal wiring diagram
M12*1 connector wiring diagram



4-20mA signal wiring (2-wire system)
Brown VDC+
Blue VDC-

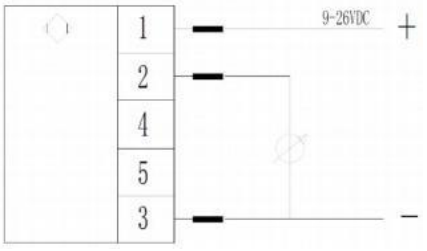
Hirschmann Connector



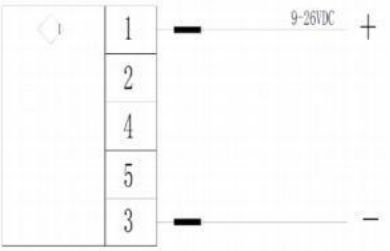
4-20mA signal wiring (2-wire system)
Pin1 Brown VDC+
Pin2 Blue VDC-

PLC Terminal Wiring Diagram

Linear Voltage (3-Wire)



4-20mA (2-Wire)



Digital display sensor

LD-45 Digital Sensor

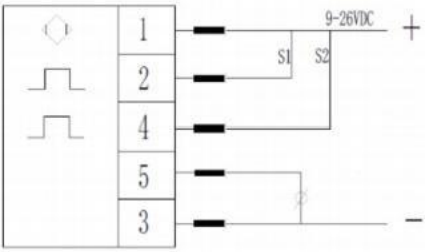
Supply Voltage	9-26VDC
Output Type	4-20mA(Three-wire system)
	Two-way switch quantity (relay)
	Pulse (push-pull, three-wire)
Probe Operating Temperature	-40℃-140℃
Ambient Temperature	-40℃-80℃
Electrical Interface	M12*1 connector (with 2m cable)
Display	LCD display
Unit Resolution	0.001
Power Supply Reverse Connection Protection	Yes
No-Load Current	Current output type: 20mA
Accuracy	±0.5% of reading
Repeatability	0.1%
Casing Material	SS304
Protection Level	IP65

LDH-45 Current High Temperature Sensor

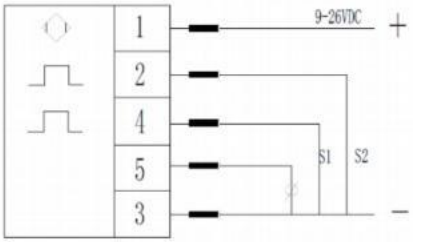
Output type	4-20mA(Three-wire system)
	Pulse (three-wire)
Probe operating temperature	-40℃-200℃
Ambient temperature	40℃-80℃
The remaining parameters are the same as above	

Wiring Diagram

PNP+ Analog



NPN+Analog



Daily Maintenance and Storage

1. When in use, the measured liquid should be kept clean and free of fibrous and granular impurities.

2. When the gear flowmeter is put into operation, the order of opening and closing the valve is: For the pounder without bypass pipe installed, first open the upstream valve of the transmitter with medium opening, then slowly open the downstream valve to run at a small flow rate for 10 minutes, and then fully open the upstream valve to the required normal flow rate

3. For the gear flowmeter with bypass pipe, first fully open the bypass pipe valve, open the upstream valve with medium opening, then slowly open the downstream valve, close the opening of the bypass valve, and let the transmitter run at a small flow rate for 10 minutes, then fully open the upstream valve and fully close the bypass valve (to ensure no leakage), and finally adjust the downstream valve opening to the required normal flow rate.

4. When opening and closing the valve, it should be as smooth as possible. If automatic control is used for opening and closing, it is best to use the "two-stage opening, two-stage closing" method for medium and large-caliber sensors to prevent the sudden impact of liquid from causing water hammer effect and damaging the gear.

5. To ensure the normal operation of the transmitter for a long time, it is necessary to strengthen the operation inspection at ordinary times. Once an abnormality is found, measures should be taken to eliminate it in time. Pay special attention to monitoring the rotation of the gears. If an abnormal sound is heard, the transmitter should be checked in time.

6. When the gear flow meter is not in use, the internal liquid should be cleaned and protective covers should be added at both ends of the transmitter to prevent dust from entering, and then stored in a dry place.

Flow Meter Maintenance

The following situations require disassembly and cleaning

1.After the first startup, the medium in the pipeline is stationary, i.e. solidified or oxidized;

2.After the flow meter has been running for a period of time, it needs to be stopped for a long time;

3.After the flow meter has been running for 8,000 hours continuously, it is recommended to stop the machine for calibration;

4.The flow meter's gears are stuck due to particles or foreign matter, and the flow function fails.

Disassembly and Cleaning

The flowmeter needs to be disassembled and cleaned. You can determine whether it needs to be disassembled and cleaned by simple judgment.

1.The instantaneous flow of the flowmeter becomes significantly smaller when there is no change in the pipeline conditions (valve closed, solenoid valve closed, and the opening of the regulating mechanism becomes smaller);

2.The water output at the outlet of the flowmeter becomes significantly smaller;

When the above two situations occur, it can be judged that the flowmeter needs to be disassembled and cleaned.

Before disassembling, ensure that the pipeline has no pressure, empty pipes and flushed, and ensure that there is no corrosive liquid or anything harmful to the human body.

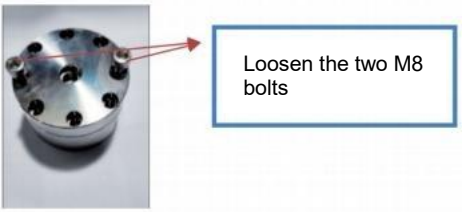
To disassemble, please follow the steps below

1. Mark the flow meter body for easy reinstallation;

2. Loosen the 8 M6 hexagonal threads on the body;

3. Then use the 2 M8 hexagonal bolts provided to screw into the two corresponding bolt holes on the upper cover, and remove the upper cover symmetrically in a clockwise direction (do not use sharp objects or screwdrivers to separate the upper cover and the body, as this will easily damage the shaft, bearings and related parts, causing the flow meter to exceed the accuracy or be scrapped;

4. After disassembly, put the gasket and gear into clean water to rinse them, and at the same time take out the sealing ring and clean the sealing ring groove.



Reinstall

1. After thorough cleaning, reassemble the gasket, gear parts and sealing ring into the flow meter body;

2. After reinstalling, gently move it by hand. If it can rotate smoothly and flexibly, you can reinstall the upper cover. When reinstalling the upper cover, ensure that the upper cover is parallel to the body;

3. Diagonally lock the hexagon socket screws and tighten the hexagon socket torque as follows:

M6	SS304	10NM
M6	12.9	30NM
M8	SS304	50NM
M12	12.9	145NM
M16	12.9	380NM

Product Parts Diagram

Name: Hexagon socket bolt, upper cover, gear component, shaft body

Troubleshooting Table

Fault Phenomenon	Cause Analysis	Elimination Method
The liquid flows normally but the display instrument does not show anything	1. The power supply is not connected or the wiring between the sensor and the instrument is incorrect or there is an open circuit, short circuit, poor contact, etc.; 2. The preamplifier is faulty; 3. The gear is stuck.	1. Turn on the power supply or check whether the wiring is correct, and use a multimeter to find the fault point; 2. Check the preamplifier; 3. Remove foreign matter and clean or replace the gear. When replacing the gear, recalibrate to obtain a new instrument coefficient.
The flow rate display value gradually decreases even though no flow rate reduction operation is performed	1. Is the filter clogged? 2. The valve core on the sensor pipeline is loose, and the valve opening is automatically reduced; 3. The transmitter gear is blocked by debris, which increases the resistance and slows down the speed.	1. Clean the filter; 2. Repair or replace the valve; 3. Remove the sensor and clean it.
The liquid does not flow, the flow rate display is not zero or the displayed value is unstable	1. The transmission wire shielding is poorly grounded, and external interference signals are mixed into the input end of the display instrument; 2. The pipeline vibrates, and the gear vibrates accordingly, generating an erroneous signal; 3. The internal fault of the display instrument generates interference.	1. Check whether the grounding terminal of the shielding layer display instrument is well grounded; 2. Reinforce the pipeline or tighten the sensor screws; 3. Repair the display instrument.

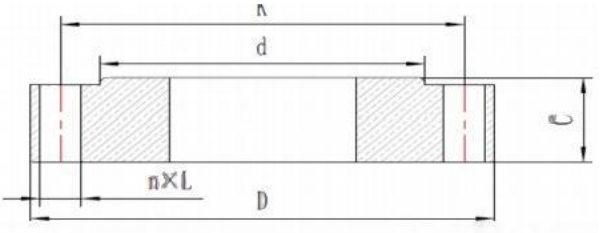
Appendix 1 Correspondence Address Table

Variable Name	Register First Address	Register Length	Instruction Code	Data Type
Instantaneous Flow Rate	0×01	0×02	0×04	32-bit single-precision floating point number
Instantaneous Flow Rate Unit	0×03	0×01	0×04	16-bit unsigned integer
Total Amount	0×04	0×04	0×04	64-bit double-precision floating point number
Total Amount Unit	0×08	0×01	0×04	16-bit unsigned integer
Temperature	0×09	0×02	0×04	32-bit single-precision floating point number
Pressure	0×0b	0×02	0×04	32-bit single-precision floating point number
Total Amount (m^3)	0×0	0×02	0×03 0×04	32-bit single-precision floating point number
Continuous (Continuous Single-Precision Floating Point Numbers)				
Instantaneous Flow	0×14	0×02	0×04	32-bit single-precision floating point number
Total Amount	0×16	0×02	0×04	32-bit single-precision floating point number
Temperature	0×18	0×02	0×04	32-bit single-precision floating point number
Pressure	0×1a	0×02	0×04	32-bit single-precision floating point number
Continuous (Continuously Reversed Single-Precision Floating-Point Numbers)				
Instantaneous Flow	0×1e	0×02	0×04	32-bit single-precision floating point number (inverted)
Total Amount	0×20	0×02	0×04	32-bit single-precision floating point number (inverted)
Temperature	0×22	0×02	0×04	32-bit single-precision floating point number (inverted)
Pressure	0×24	0×02	0×04	32-bit single-precision floating point number (inverted)

Unit Definition

	Unit	Code	Unit	Code	Total	Temperature
Instantaneous flow	Nm3/h	0x00	usg/h	0x09	Nm3	0x00
	Nm3/m	0x01	usg/m	0x0a	m3	0x01
	Nm3/s	0x02	usg/s	0x0b	L	0x02
	m3/h	0x03	kg/h	0x0c	usg	0x03
	m3/m	0×04	kg/m	0x0d	kg	0×04
	m3/s	0x05	kg/s	0x0e	t	0x05
	L/h	0x06	t/h	0x0f		
	L/m	0x07	t/m	0x10		
	L/s	0x08	t/s	0x11		

Appendix 2: GB/T9112-2010 (RF) 1.6Mpa, 2.5Mpa.4.0Mpa Plate Steel Pipe Flange Dimensions



Dimension Units:mm

Nominal Diameter GB \ Nominal Pressure Mpa	D Flange Outer Diameter			K Bolt Hole Center Distance			L Bolt Hole Diameter			N Number Of Bolts			C Flange Thickness		
	1.6	2.5	4.0	1.6	2.5	4.0	1.6	2.5	4.0	1.6	2.5	4.0	1.6	2.5	4.0
15	95	95	95	65	65	65	14	14	14	4	4	4	14	14	14
20	105	105	105	75	75	75	14	14	14	4	4	4	16	16	16
25	115	115	115	85	85	85	14	14	14	4	4	4	16	16	16
32	140	140	140	100	100	100	18	18	18	4	4	4	18	18	18
40	150	150	150	110	110	110	18	18	18	4	4	4	18	18	18
50	165	165	165	125	125	125	18	18	18	4	4	4	20	20	20
65	185	185	185	145	145	145	18	18	18	8	8	8	20	22	22
80	200	200	200	160	160	160	18	18	18	8	8	8	20	24	24
100	220	220	220	180	190	190	18	22	22	8	8	8	22	26	26
125	250	250	250	210	220	220	18	26	26	8	8	8	22	28	28
150	285	285	285	240	250	250	22	26	26	8	8	8	24	30	30