MF30 Series Manual

2023

MF30 Series Micro Quality Specification

Application Fields:
Aerospace, Semiconductor Processing, Medical Biology, Electronic Automobile, Iron and Steel Metallurgy, Marine Electronics, Industrial Gas Production and Other Industries.

1. Product Introduction

The micro gas mass flow meter is specially designed for the measurement and process control of various small flow gases.This series of sensors are made of advanced micro-electromechanical system (MEMS) flow sensor chips and are suitable for all kinds of clean gases. The unique packaging technology makes it applicable to all kinds of pipe diameters, low cost, easy to install, and no need temperature and pressure compensation, can replace traditional volumetric or differential pressure flow meters.

2. Product Features

★ Using micro-electromechanical system (MEMS) flow sensor chip, the sensor has high precision, high sensitivity, and anti-strong interference and other characteristics.

★ The zero point of the sensor is stable.

★ High accuracy and good repeatability within the measuring range .

★ Standard mechanical interface, easy to install .

★ RS485 communication output, standard MODBUS RTU protocol .

★ LCD is used to display instantaneous flow and cumulative flow, which is clear and intuitive and easy to read.

★ 4~20mA standard current signal output and pulse output are optional.

3. Technical Parameters

Working Power Supply	DC1 2 - 24V/100mA	Accuracy (%)	±(2.0+0.2 FS) %
Medium Temperature	-10~55 ℃	Humidity	<95%RH (no frost, no ice)
Work Pressure	≤ 1.6 MPa	Show	Instantaneous Flow, Cumulative Flow
Output	4-20mA / RS485	Communication	Modbus R TU (RS485

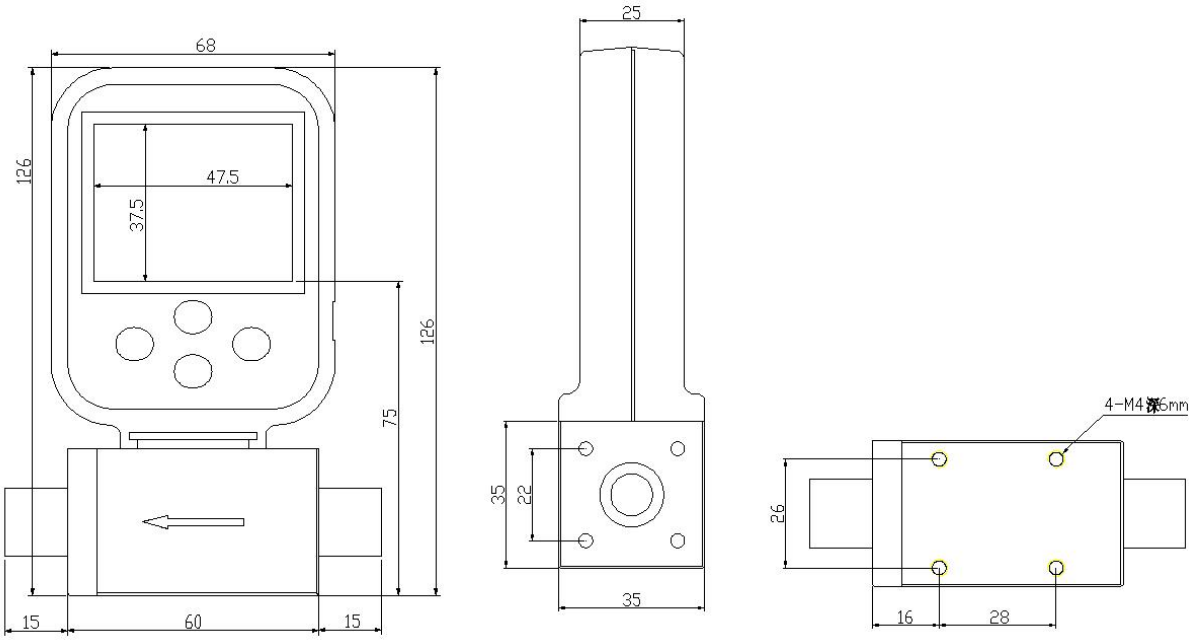
Method	Optional	Protocol	Output)
Mechanical Connection	NPT1/2 External Thread G3/8 External Thread	Response Time (ms)	50-1000

Note: The above data were measured at 25 ℃ , 101.32kPa, dry air.

Minimum Measurable Flow Rate: 2.8 NL/ min

Maximum Measurable Flow Rate: 10 00NL/ min

4. Mechanical Dimensions

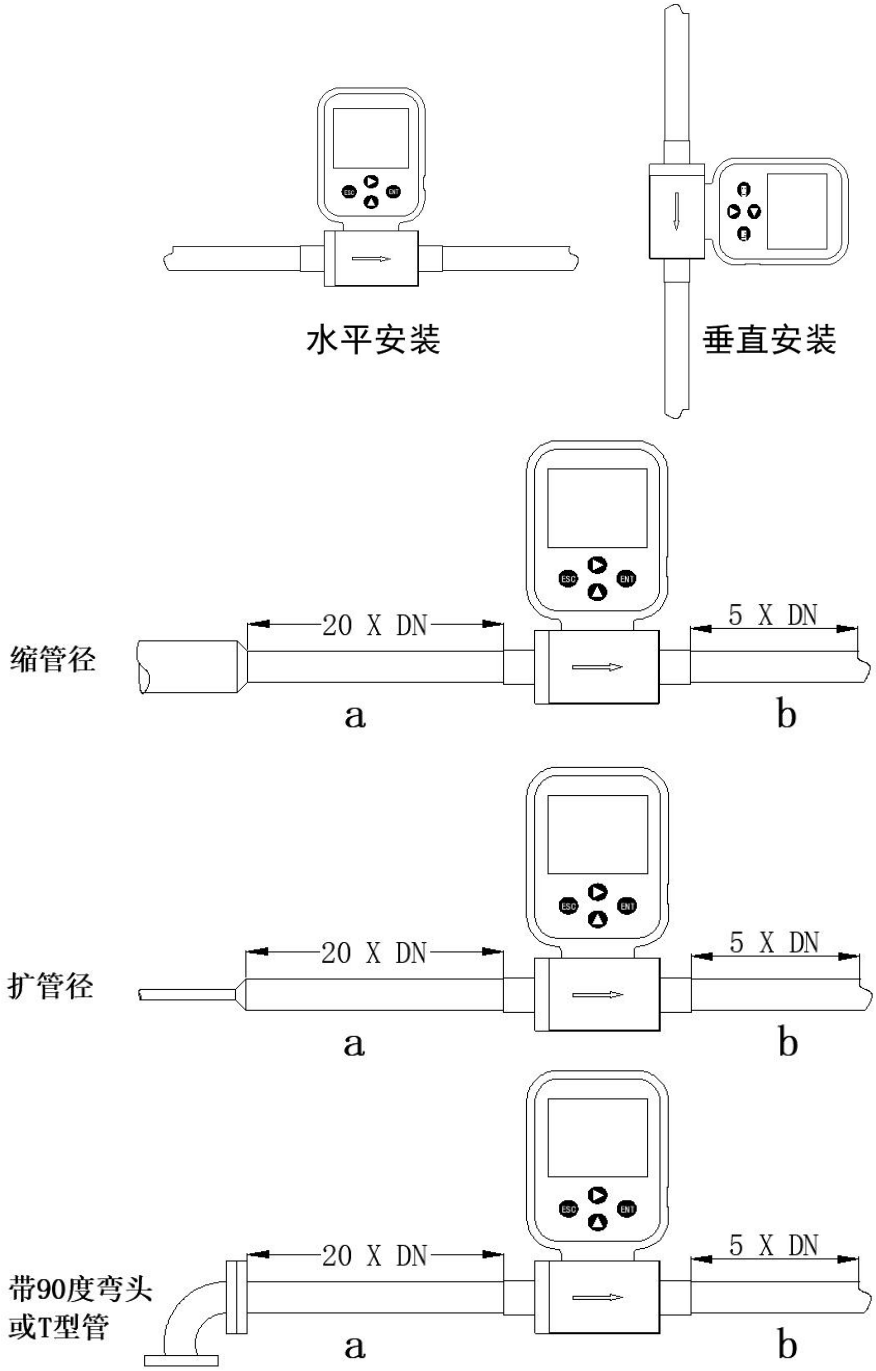


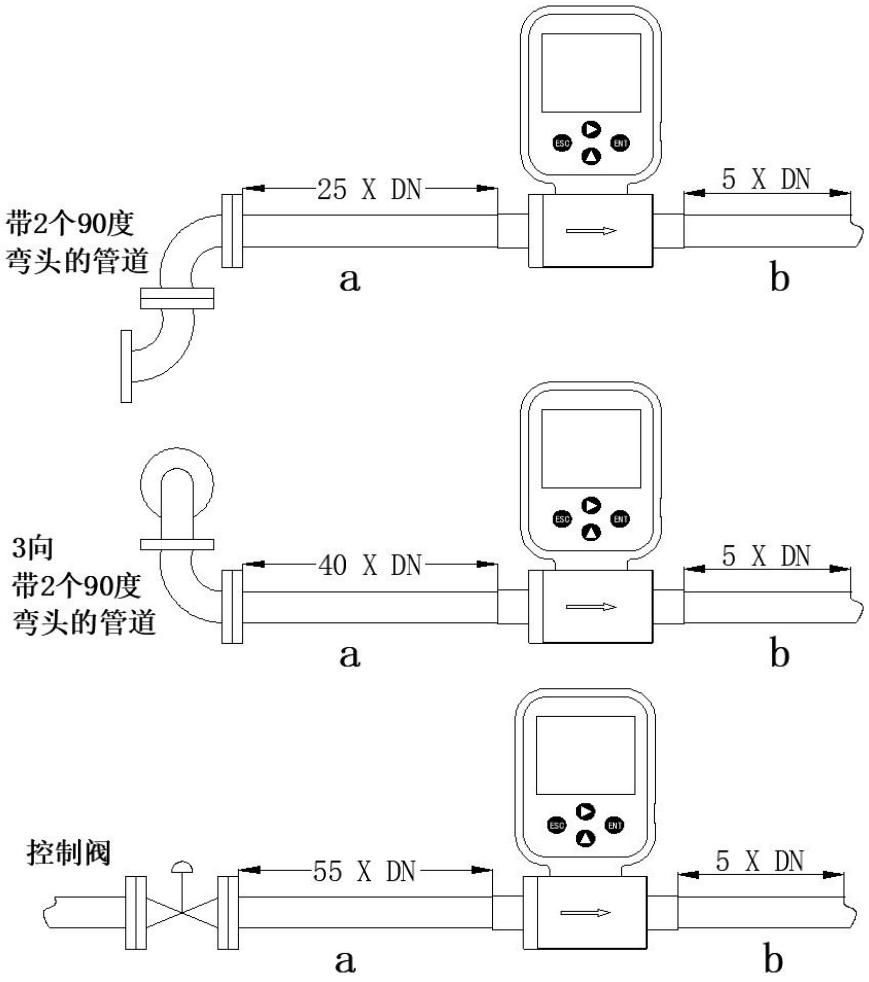
Standard connectors can be used for interface conversion as needed

Turn Sleeve Adapter	Turn The Quick Plug Connector	Turn The Pagoda Connector
		

Mechanical Interface Connection Dimensions	
G3/8 External Thread	NPT1/2 External Thread

5. Installation Method





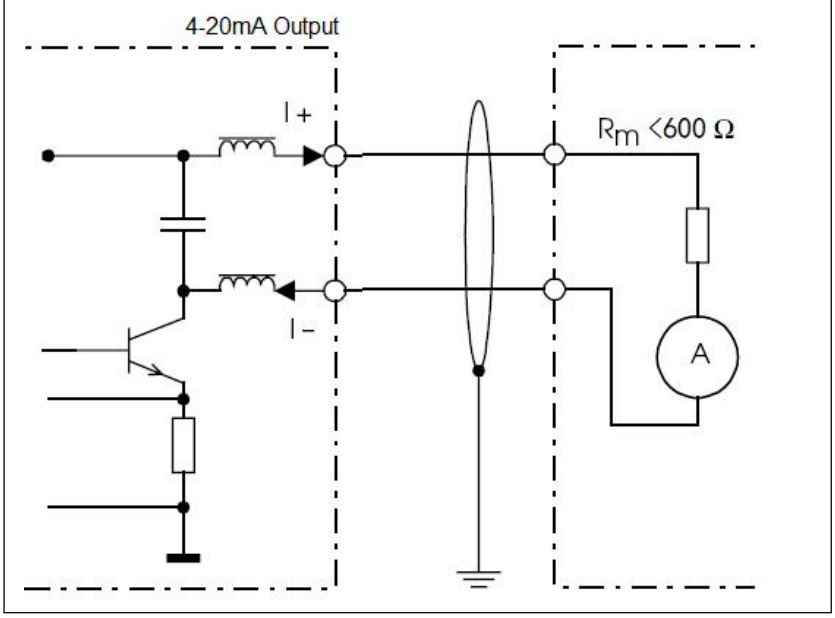
a = front straight pipe section b = rear straight pipe section

注意！ *Try to install the control valve and buffer cut-off valve behind the thermal gas mass flow meter.*

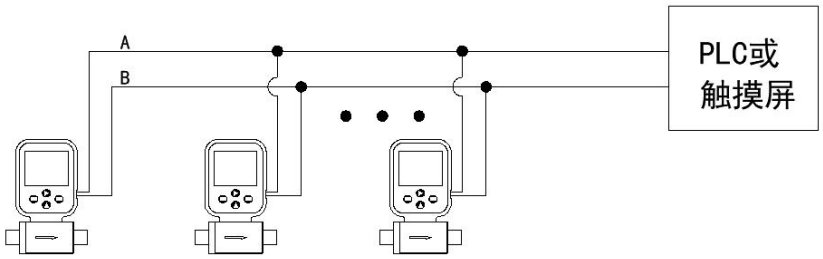
6. Wiring Instructions

4 -Core Aviation Cable Description	
Logo	**Meaning**
1-red	24V+
2- black	24V-
3-white	I+/RS485 Communication Output A
4-green	I-/RS485 Communication Output B
Note: 4-20mA and RS485 Output Optional	

4 -20mA Current Output Wiring Instructions



RS485 Bus Wiring Instructions

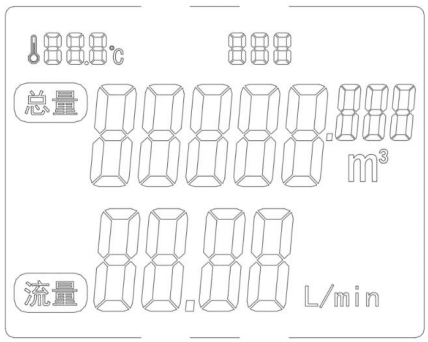


485总线通讯默认配置为32台

7. Operation Instructions

Key Description	
Logo	**Meaning**
E SC	Cancel or Exit the Interface
▶	Shift Key
▲	Edit/Page Key
E NT	Confirm/Enter Key

In different working conditions, the flow meter displays different contents and the corresponding functions of the buttons are also slightly different.The user's operation purpose, detailed description of the flow meter interface content and operation process

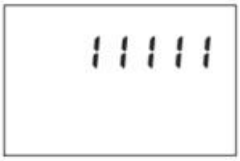
Display Menu Interface	
	Total Amount: Displays the accumulated total amount of gas in m³ (Standard Conditions). Flow Rate: Displays the instantaneous flow rate of the current gas in L /min (Standard Conditions). Temperature: Displays the current ambient temperature (Optional). Address: Displays the current MODBUS address.

Password Verification Interface	
	Press ENT to enter the password verification interface. At this point, the user needs to enter a specific password to enter the meter's setup menu. If the password is incorrect, the flow meter will return to metering mode. The default password is 1 1111. When entering a password, the current input digit is flashing. Press the shift key to move to the next digit, press the modify

	key to modify the value of the current digit, and press the E NT key to confirm. If the password is correct, you can enter the setup menu, and press the modify/page key to switch between menus.

Settings Interface		
Settings	**Interface**	**Sub-Interface**
Modbus Address		
	When entering a value, the current input digit is flashing. Press **the shift key** to move to the next digit, press **the modify key** to modify the value of the current digit, and press the **E NT** key to confirm the modification. Range: 1 -255	
Baud Rate		
	Press the **Modify/Page** key to select the current baud rate, which can be 4 800 , 9 600 , 1 9200 , 3 8400 , 5 7600 , 1 15200 , and press the **ENT** key to confirm.	
Calibration Zero Point		
	Press the ENTER key to calibrate the current zero point.	
Gas Correction Factor		
	When inputting a value, the current input digit is in a flashing state. Press **the shift key** to move to the next digit, press **the modify key** to modify the value of the current digit, and press the **ENT** key to confirm the modification. The default is 1 000 , which means 1.0 .	

<table>
<tr><td rowspan="2">Response Time Settings</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">Press the Modify/Page key to select the current response time. You can choose 1 25ms, 250ms, 500ms , or 1 000ms and press the E NT key to confirm.</td></tr>
<tr><td rowspan="2">High Flow Alarm Value Setting</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">When inputting a value, the current input position is flashing. Press the shift key to move to the next position, press the modify key to modify the value of the current position, and press the ENT key to confirm the modification. When the instantaneous flow rate is higher than the preset high flow alarm value, the flow meter will sound an alarm. The alarm signal is the flashing instantaneous flow rate and alarm icon.
Adjustable range: 0.00~999.99 L/min.</td></tr>
<tr><td rowspan="2">Low Flow Alarm Setting</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">When inputting a value, the current input position is flashing. Press the shift key to move to the next position, press the modify key to modify the value of the current position, and press the ENT key to confirm the modification. When the instantaneous flow rate is lower than the preset low flow alarm value, the flow meter will sound an alarm. The alarm signal is the flashing instantaneous flow rate and alarm icon.
Adjustable range: 0.00~999.99 L/min.</td></tr>
<tr><td rowspan="2">Total Amount Alarm Value Setting</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">When entering a value, the current input digit is flashing. Press the shift key to move to the next digit, press the modify key to modify the value of the current digit, and</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">press the ENT key to confirm the modification. After the total amount exceeds the alarm value, if the flow is zero, the alarm will be suspended; when the flow is not zero, the alarm will restart. When the administrator clears the total flow or resets the total amount alarm value, the alarm will be released . The alarm and total amount values will flash.
Adjustable range: 0~9999999 L/min</td></tr>
<tr><td rowspan="2">Password Settings</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">When entering a value, the current input digit is flashing. Press the shift key to move to the next digit, press the modify key to modify the value of the current digit, and press the ENT key to confirm the modification.
The default value is 11111</td></tr>
<tr><td rowspan="2">Clear The Cumulative Total</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">Press the ENT key to clear the current cumulative total.</td></tr>
</table>

8. Quality Assurance and After-Sales Service

In compliance with ISO9001 quality management and control system, this product is produced with brand new raw materials and components and has undergone strict factory testing, product quality and product performance meet the relevant standards and technical documents. However, due to transportation or use, etc.

In the face of uncertainties, we promise the following service guarantee terms:

★ Within two weeks from the date of delivery, if the product you purchased has a recognized quality defect, we will replace it free of charge;

★ Within one year from the date of delivery of the product, if the product you purchased has any problem during normal use that is not caused by improper use or human error, If the product is damaged due to any factors, we will repair it free of charge;

★ Equipment damage caused by the following reasons during use is not within the scope of free replacement or repair:

- Installation or use conditions that violate the relevant requirements and regulations of this manual;
- Incorrect or violation of relevant instrument installation, wiring or usage regulations of the country;
- Use with other products that are electrically incompatible with this product or have no definite quality assurance and valid certification;
- Dismantle or repair by yourself;
- Natural aging or loss of equipment that is more than one year old;
- Force majeure as defined by applicable law

★ For products within the warranty period, the user shall bear the shipping cost of the product, and we shall bear the replacement or repair and return costs of the product;

★ If the product sent by the user is confirmed by us to be free of defects or damage, the relevant shipping and insurance costs shall be borne by the user;

★ Once the product is confirmed, we will send the new or used product within 48 hours or two working days unless there are special circumstances.
Repaired products;

★ If you find any defective or damaged product, please contact your local supplier or us.

Appendix 1: MODBUS Protocol

Flow	0x003A ~0x003B	Revise	Not Allowed
		Read	Allow
Parameter Description	The instantaneous flow rate of the current gas		
Data Types	UINT 32		
Data Representation	0x003A~0x003B form a UINT32 unsigned integer, representing the current gas flow rate; Flow rate F = value (0x003A) * 65536 + value (0x003B); The value of F is flow rate (L/min) * 1000. For example: if the flow rate value is 20.34L/min, the value obtained through Modbus is 2 0.34*1000=20340 .		
Total	0x003C ~0x003E	Revise	Allow
		Read	Allow
Parameter Description	The total amount of gas flowing through		
Data Types	UINT 32+ UINT 16		
Data Representation	V1 = value(0x003C)* 65536 +value(0x003D); V2 = value (0x003E); Total V = V1 *1000 + V2; V1 is 32 bits, representing the integer part of the current total; V2 is 16 bits, representing the decimal part of the current total. For example: the current total amount is 3452.245m, then the value obtained through Modbus is 3452*1000+245=3452245 .		
Automatic Zero Calibration	0x 00f0 (write only)	Revise	Allow
		Read	Not Allowed
Parameter Description	Force automatic zeroing operation. Note: Make sure the airflow in the flow meter pipe is at rest before performing this operation.		
Data Types	Specify data 0x AA55		
Data Representation	Example: Write the specified data 0xAA55 into register 0x00F0 to complete the automatic zero calibration.		
Total Clearance	0x 00F2	Revise	Allow
		Read	Not Allowed
Parameter Description	Clear cumulative total		
Data Types	Specified data 0x 0001		
Data Representation	Example: Write the specified data 0x0001 to register 0x00F2 to clear the total amount.		

Write Protection	0x 00FF	Revise	Allow
		Read	Not Allowed
Parameter Description	Open the register write protection function, valid once. Note: Before setting GCF, automatic zero calibration and clearing the total, you need to open the write protection function first.		
Data Types	Specify data 0x AA55		
Data Representation	When modifying GCF, you must first write 0xAA55 into the write protection register 0x00FF for the modification to be successful.		