

MF52 Series Manual

2023

MF52 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 suitable for 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.
- ★ Can display positive flow and reverse flow, positive accumulation and negative accumulation.

3. Technical Parameters

Measurement Accuracy	The flow rate is less than 100NL/min	$\pm(1.0 + 0.4FS)\%$	
	The flow rate is greater than 100NL/min	$\pm(1.5 + 0.2FS)\%$	
Working Power Supply	DC12-24V/100mA	Preheating Time	3-4 Minutes
Response Time	50ms	Output Mode	4-20mA\RS485
Zero Drift	$\pm 20\text{mV}$	Display Format	Instantaneous Flow, Cumulative Flow

Operating Temperature	-10~55℃	Working Humidity	<95%RH(no frost, no icing)
Storage Temperature	-10~65℃	Communication Mode	RS485(Modbus RTU Protocol)
Working Pressure	≤1.0MPa	Calibration Medium	Air (25℃, 101.325kPa)

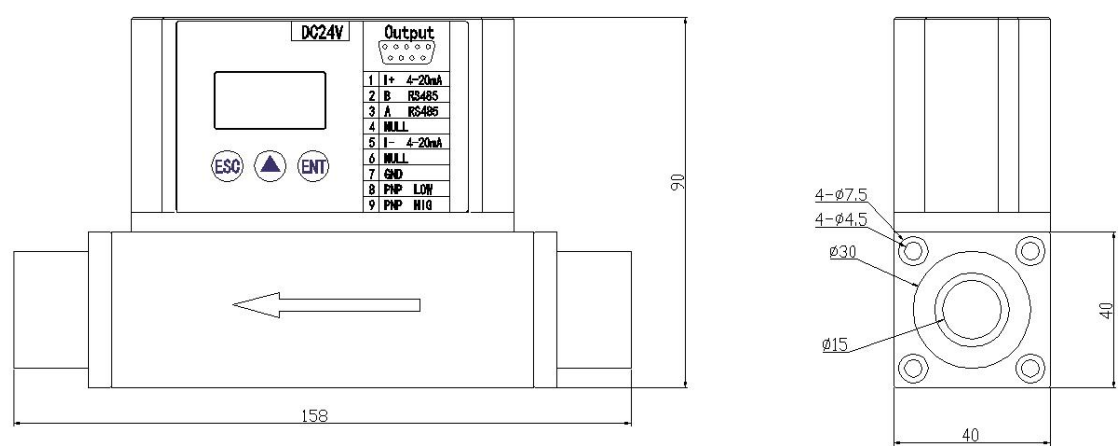
Note: The above data were measured at 25℃, 101.32kPa, dry air

Minimum measurable flow rate: 1NmL/ min (air)

Maximum measurable flow rate: 500NL/min (air)

Range ratio: 1:50 1:100

4. Mechanical Dimensions

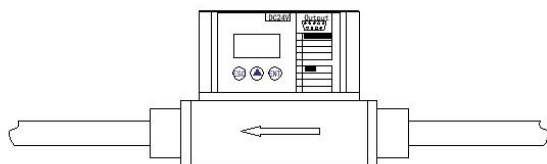


Mechanical Interface Connection Size Type		
NPT Internal Thread DN6-DN15	G Internal Thread DN6-DN15	PT Internal Thread DN6-DN15

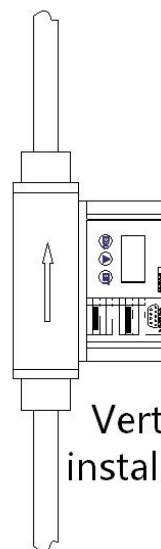
Standard connectors can be used for interface conversion as needed

Transfer Ferrule Connector	Quick-Connect Fitting	Transfer Pagoda Connector
		

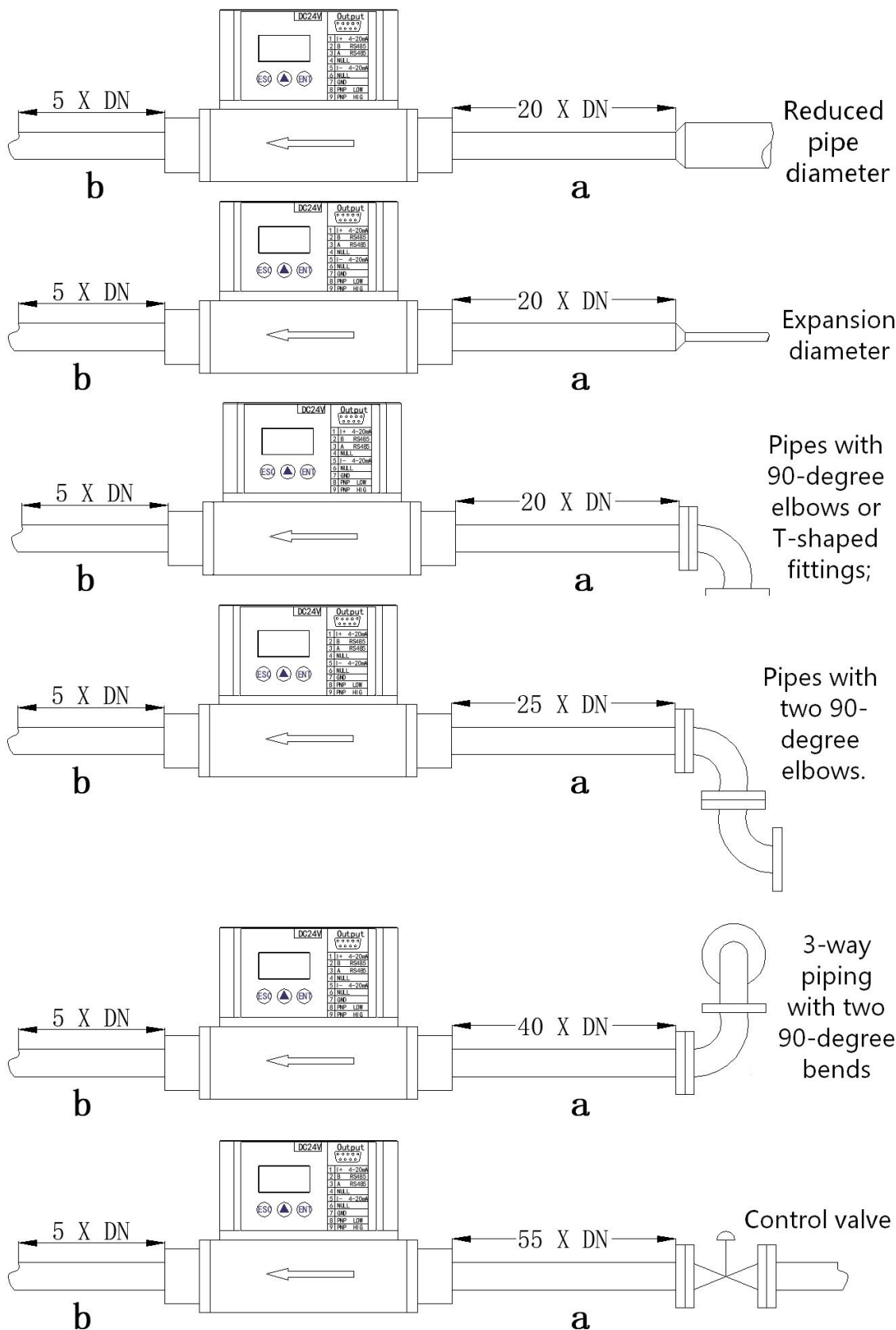
5. Installation Method



Horizontal installation



Vertical installation



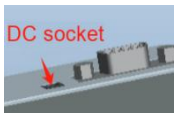
a = front straight pipe section b = rear straight pipe section

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

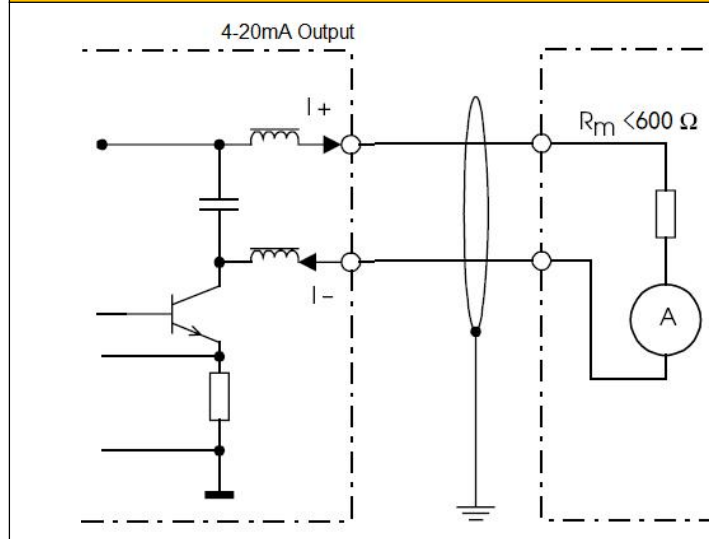
6. Wiring Instructions

DB9 Interface Definition	
PIN	Meaning
1	4 -20mA Current I +
2	RS485 communication Output B
3	RS485 Communication Output A
4	NULL
5	4 -20mA Current I-
6	DC24V Power Supply Positive
7	GND Negative Power Supply
8	PNP LOW (Optional)
9	PNP HIG (Optional)

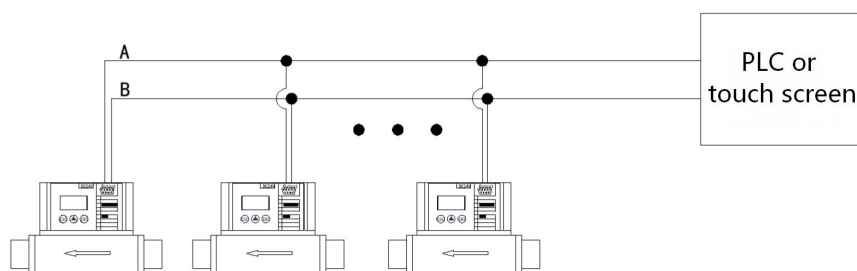
DB9 Pinout Description	
Color	Meaning
Black	4 -20mA Current I +
Yellow	4 -20mA Current I-
Red	RS485 Communication Output A
Brown	RS485 Communication Output B
Green	Power Supply Positive DC24V
Blue	Negative Pole of Power Supply

DC Plug Description	
	The working power supply is DC24V /2.5W , with supporting power adapter

4 -20mA Current Output Wiring Instructions



RS485 Bus Wiring Instructions



485 bus communication is configured for 32 units by default.

VII. Operation Instructions

Key Description		
Logo	Meaning	
	Short Press (Press And Release Immediately)	Long Press (More Than 1.2 Seconds)
ESC	Quit	Enter System Configuration
	Shift/Select	Enter Communication Configuration
E NT	Adjust upward	Confirm the configuration

Show Menu	
	The First Line: Displays instantaneous flow and unit Second Line: Displays the cumulative flow and unit

System Configuration Menu (press and hold the ESC key for more than 1.2 seconds to enter)

Instrument Coefficient > 1.0 Lower Range Limit 0.0 Upper Range Limit 14.0 Damping Coefficient 0.0 Upper Alarm Limit 10.0 Lower Alarm Limit 0.0 Small Signal Cut-off 0.05 Backlight On Version 1.2.0V	Instrument coefficient: The calibration correction coefficient can be changed to compensate for the disturbance of fluid cross-sectional velocity distribution and the influence of specific application environment. The instrument factor is a multiplication factor of the linear flow signal. Display value = instrument factor x actual measured value
	The lower limit of the range corresponds to a current output of 4 mA
	The upper limit of the range corresponds to a current output of 20mA
	Damping coefficient: default 0 , range 0-20 Reducing the damping coefficient can quickly detect the jump in flow rate.

	Increasing the damping factor can smooth the current flow display value.
	Small signal cutoff: percentage value, default 0.05 , range 0-100 Flow values that are less than the maximum range percentage are cut off.
	Alarm upper limit Reserve
	Lower alarm limit reserve
	Display backlight on or off
	Current software version

Communications Menu	
Device ID > 001 Baud Rate 9600 Parity None Stop Bits 1 bit	Device ID for MODBUS Communication, 0-255
	Baud Rate Selection 4800/9600/19200
	Check Digit: None/Odd/Even
	Stop Bits: 1 bit / 2 bit

8. Quality Assurance and After-Sales Service

In accordance 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, there may be 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;

★ When the products sent by the user are confirmed by us to be free of defects or damage, the relevant shipping and insurance costs incurred 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 Register Address Table

Communication baud rate: 9600,8,1,NONE, floating point data arrangement: 2143

Read data function code: 03 (HOLDING REGISTER)

Instrument address: can be set through the menu, 0-255

Register Address	Register Name	Number of Registers	Data Types	Data Format
4x0001-4x0002	Instantaneous Flow	2	float	IEEE754
	Send	01 03 00 00 00 02 C4 0B		
	Take Over	01 03 04 00 00 00 00 FA 33		
4x0003-4x0004	Instantaneous Flow Rate	2	float	IEEE754
	Send	01 03 00 02 00 02 65 CB		
	Take Over	01 03 04 00 00 00 00 FA 33		
4x0005-4x0006	Current Value	2	float	IEEE754
	Send	01 03 00 04 00 02 85 CA		
	Take Over	01 03 04 00 00 00 00 FA 33		
4x0007-4x0008	Accumulating Integers	2	Unsigned long	Unsigned long integer
	Send	01 03 00 06 00 02 24 0A		
	Take Over	01 03 04 00 00 00 00 FA 33		
4x0009-4x0010	Cumulative Decimals	2	float	IEEE754
	Send	01 03 00 08 00 02 45 C9		
	Take Over	01 03 04 00 00 00 00 FA 33		
4x0011-4x0012	Cumulative Floating Point Number	2	float	IEEE754
	Send	01 03 00 0A 00 02 E4 09		
	Take Over	01 03 04 00 00 00 00 FA 33		
4x0013-4x0014	Unused	2	float	IEEE754
4x0015-4x0016	Current Acquisition Signal Value	2	float	IEEE754
	Send	01 03 00 0E 00 02 A5 C8		
	Take Over	01 03 04 82 1F 40 36 52 5B		
4x0017-4x0018	Flow Rate Lower Limit	2	float	IEEE754
4x0019-4x0020	Flow Rate Upper	2	float	IEEE754

	Limit			
4x0021	Lower Limit Alarm Output Status	1	Unsigned int	Unsigned integer
4x0022	Upper Limit Alarm Output Status	1	Unsigned int	Unsigned integer