Siargo Ltd.

Thermal - D®

Gas Mass Flow Meter VA.1

Model MF3000

iSweek
www.isweek.com
Add: 2301, Desai Technology Building, No. 9789 shennan avenue, nanshan district, shenzhen, Guangdong,China
Tel: +86-755-83289069 Fax: +86-755-83289052 E-mail: sales@isweek.com

3. Knowing the products

3.1. Product description

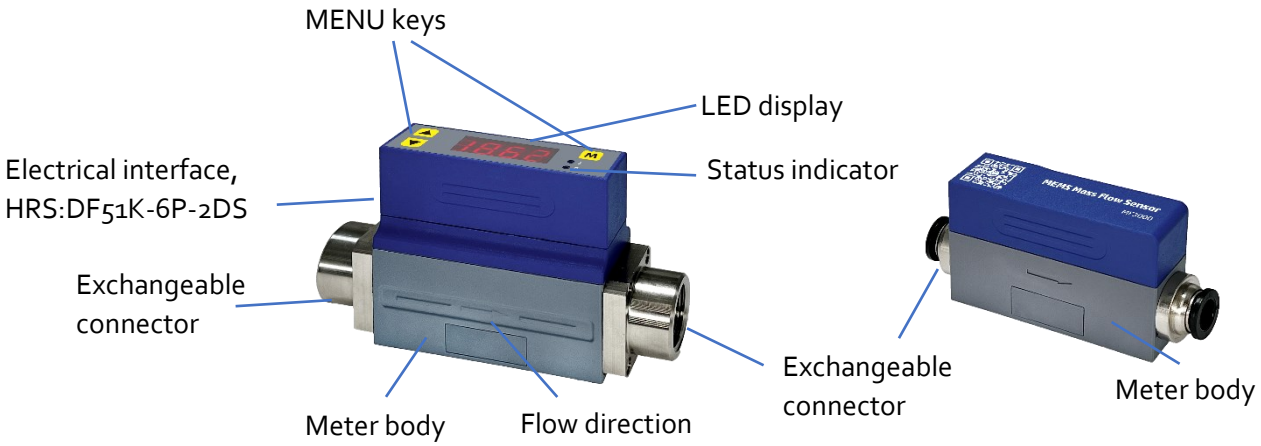


Figure 3.1: MF3000 parts description

3.2. Power and data cable description

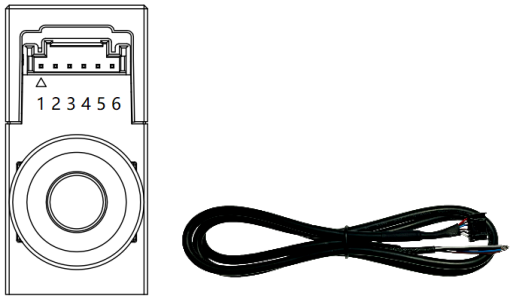


Figure 3.2: MF3000 connection and cable

(part number: DF51K6-100)
The connector is HRS:DF51K-6P-2DS.
The pin with triangle mark is pin 1.

Table 3.1: MF3000 pin/wire assignments.

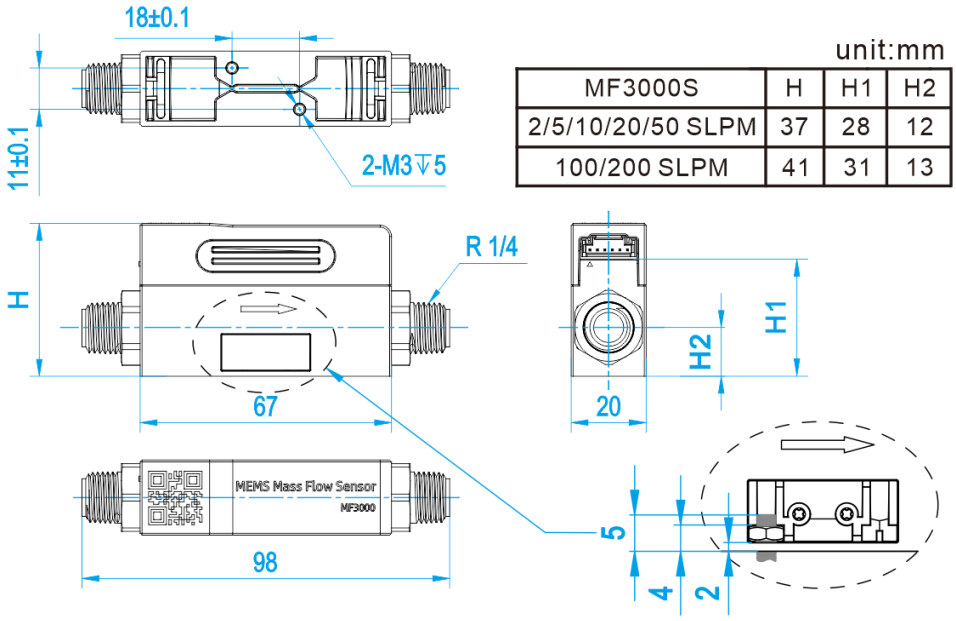
Wire	Color	Definition
1	Red	Output 3: NPN / PNP
2	Gray	Output 2: 4 ~ 20 mA / 1 ~ 5 Vdc / NPN / PNP
3	Blue	Ground
4	Brown	Power supply, 8 ~ 24 Vdc
5	Black	Output 1, digital: RS485A (+) / SCL, I²C clock
6	White	Output 1, digital: RS485B (-) / SDA, I²C data

Note: 1. The standard cable (part number: DF51K6-100) has a HRS:DF51K-6S-2C (6 positions) compatible connector with a length of 1.0 meter.

2. The product offers two digital communications as options, RS485 or I²C that can be selected at the time of order. These two communication protocols share the ports as defined in Table 3.1. For the detailed protocols of the corresponding option, please refer to Section 5.

3. The RS485 Modbus is asynchronous, half-duplex communication. When the data are transmitted or received from the product, the other pin is serving as the ground.

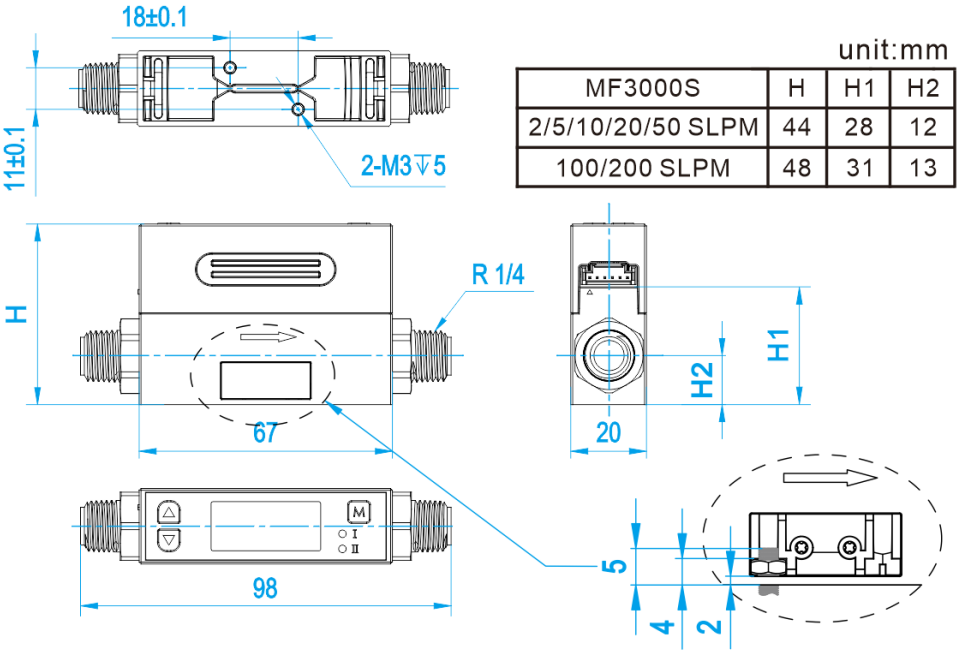
3.3. Mechanical dimensions



unit:mm

MF3000S	H	H1	H2
2/5/10/20/50 SLPM	37	28	12
100/200 SLPM	41	31	13

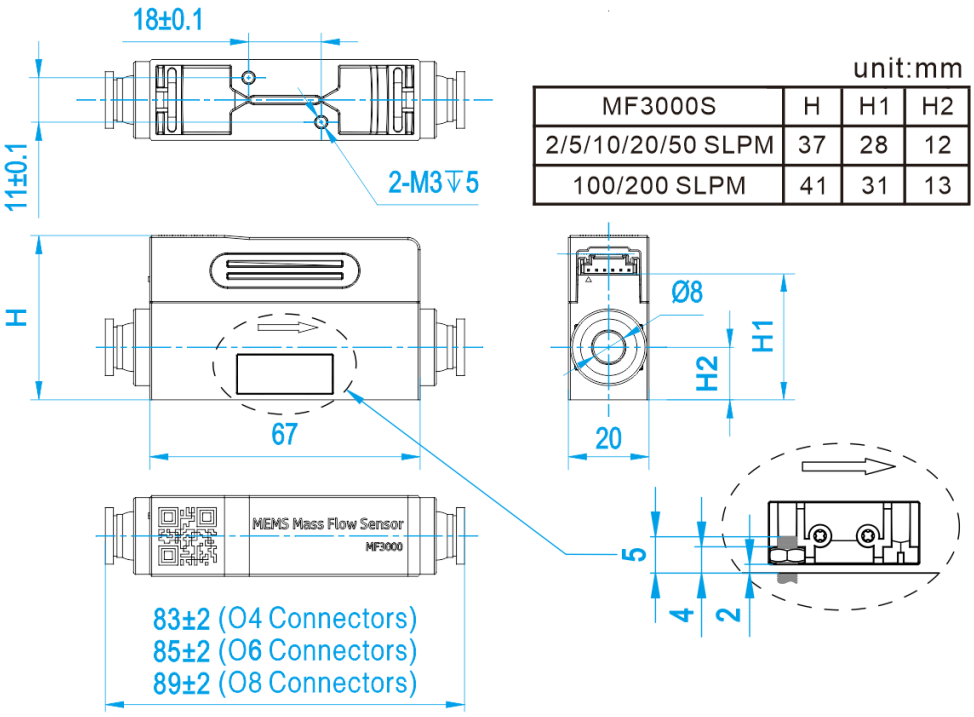
Figure 3.3: MF3000S (without display) dimensions
with R connectors, full scale 2, 5, 10, 20, 50, 100 and 200 SLPM



unit:mm

MF3000S	H	H1	H2
2/5/10/20/50 SLPM	44	28	12
100/200 SLPM	48	31	13

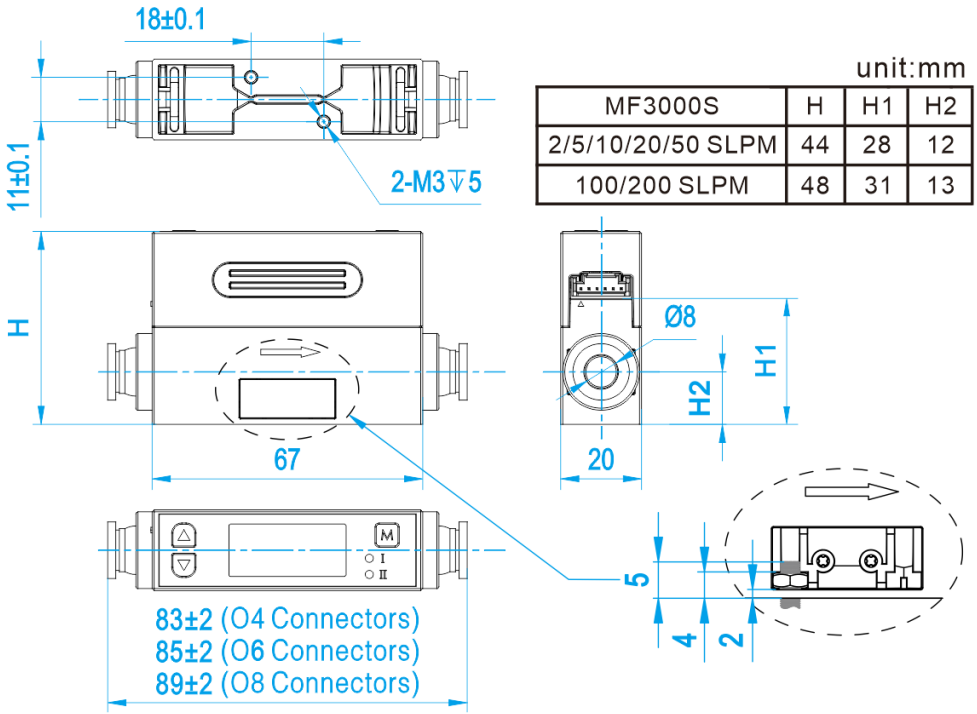
Figure 3.4: MF3000M (with display) dimensions
with R connectors, full scale 2, 5, 10, 20, 50, 100 and 200 SLPM



unit:mm

MF3000S	H	H1	H2
2/5/10/20/50 SLPM	37	28	12
100/200 SLPM	41	31	13

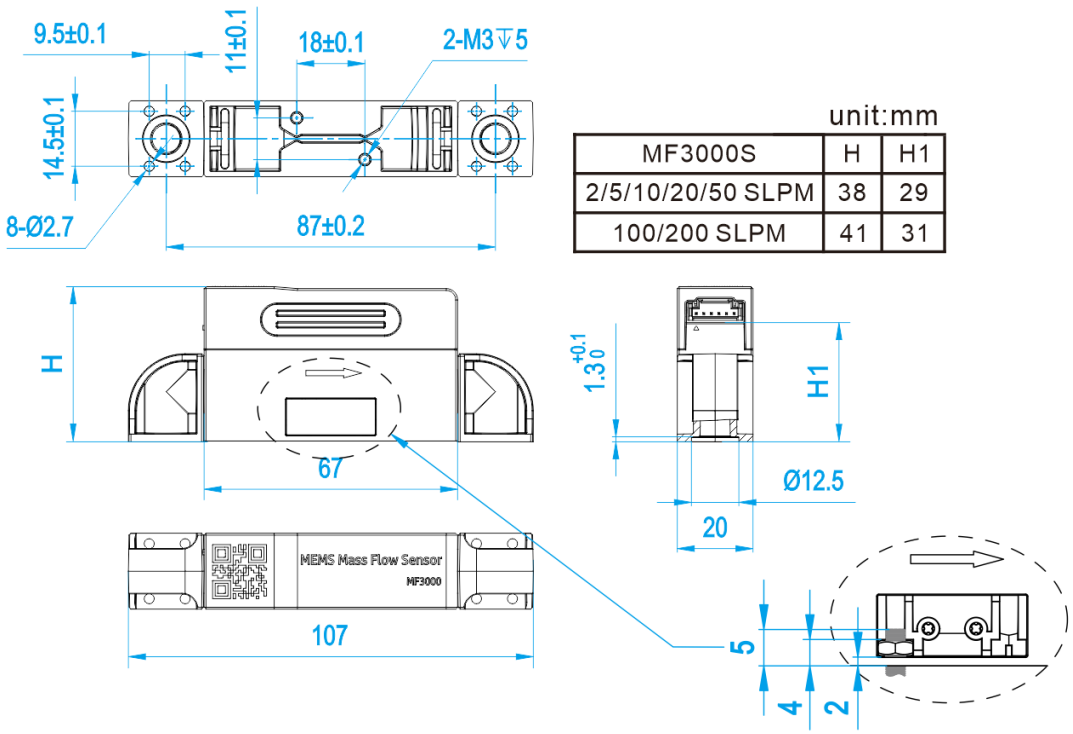
Figure 3.5: MF3000S (without display) dimensions
with 4mm/6mm/8mm One-touch connectors, full scale 2, 5, 10, 20 and 50 SLPM,
with 8mm One-touch connectors, full scale 100 and 200 SLPM



unit:mm

MF3000S	H	H1	H2
2/5/10/20/50 SLPM	44	28	12
100/200 SLPM	48	31	13

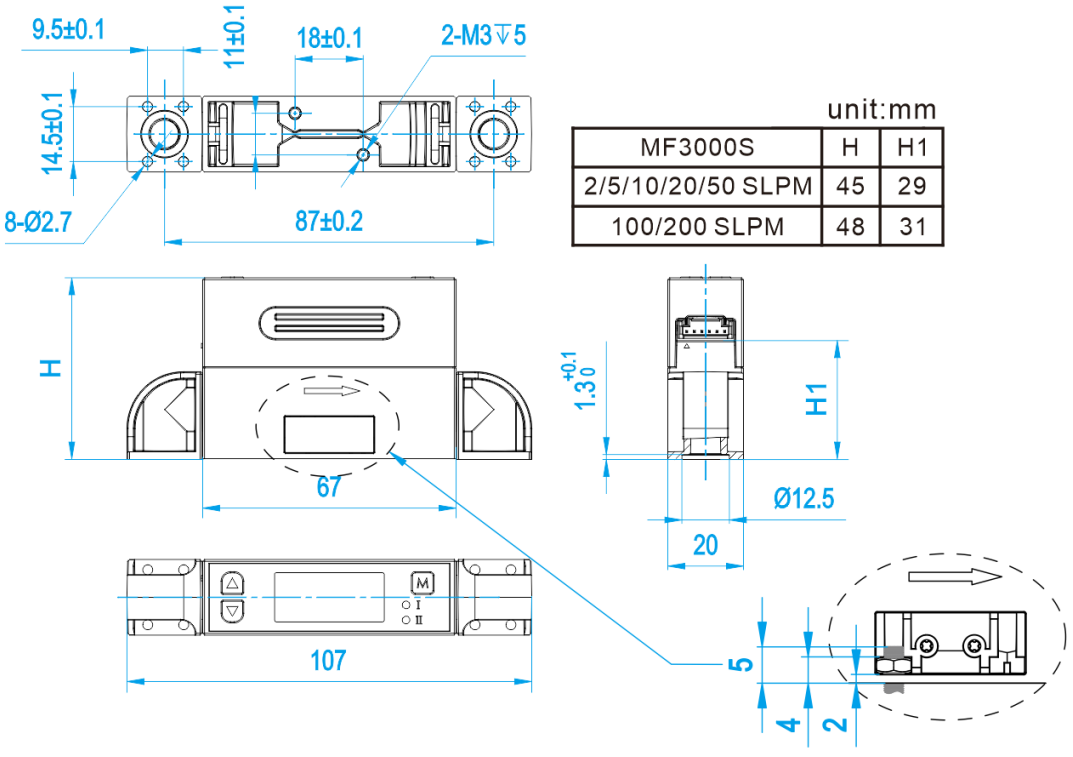
Figure 3.6: MF3000M (with display) dimensions
with 4mm/6mm/8mm One-touch connectors, full scale 2, 5, 10, 20 and 50 SLPM,
with 8mm One-touch connectors, full scale 100 and 200 SLPM



unit:mm

MF3000S	H	H1
2/5/10/20/50 SLPM	38	29
100/200 SLPM	41	31

Figure 3.7: MF3000S (without display) dimensions
with L connectors, full scale 2, 5, 10, 20, 50, 100 and 200 SLPM



unit:mm

MF3000S	H	H1
2/5/10/20/50 SLPM	45	29
100/200 SLPM	48	31

Figure 3.8: MF3000M (with display) dimensions
with L connectors, full scale 2, 5, 10, 20, 50, 100 and 200 SLPM

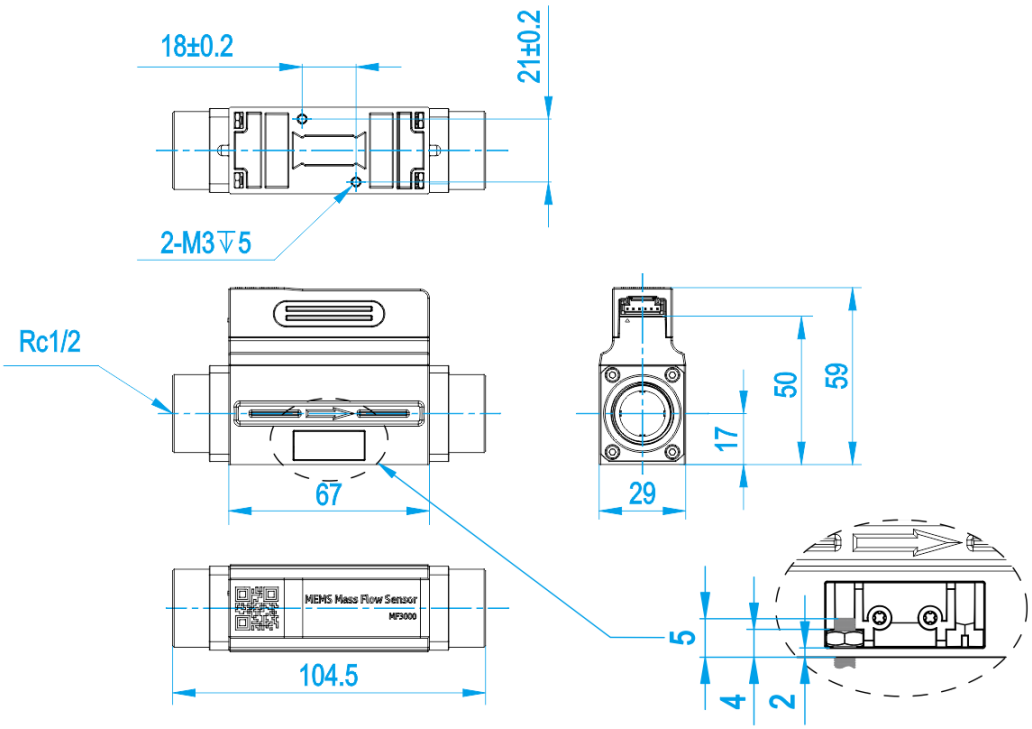


Figure 3.9: MF3000S (without display) dimensions, full scale 500, 1000 and 1500 SLPM

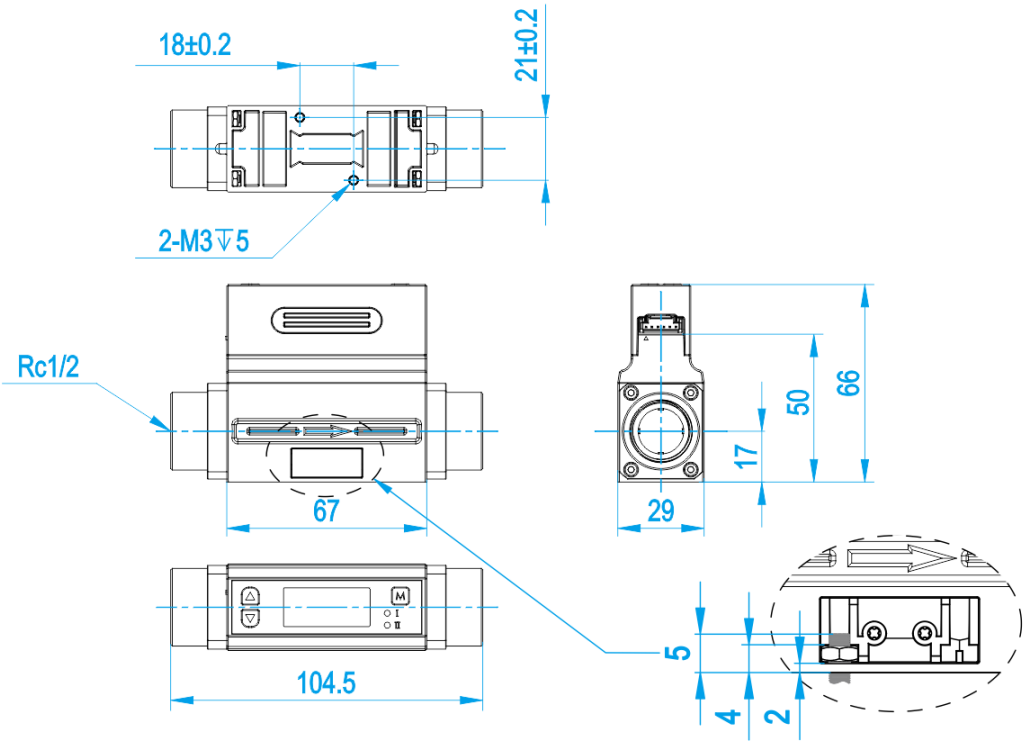


Figure 3.10: MF3000M (with display) dimensions, full scale 500, 1000 and 1500 SLPM

Note: * Other threads or compressive types can be customized.

Figure 5.1: MF3000 display and function keys

The meter has a front 3-key board for the user to set the desired functions, access data, and check the status. The Menu key (M) is at the upper right position which allows the user to select a function and confirmation or other related actions that will be detailed and described in the MENU key sequence graphic presentation. Two keys ("Up" and "Down") are used to select the functions. The two LED lights (I and II) are used for the indication of display contents. For the default instant flow rate display, both of these two LEDs will be off. Please refer to the detailed information below.

The default instant flow rate is SLPM with 4 digits, one of the digits is a decimal. When the flow rate is above the specified flow range, LED I will flash for the flow rates above the upper limit, and LED II will flash for the flow rates below the lower limit. If both LEDs are flashing, the displayed values are incorrect.

Once the power is supplied and no abnormal issues are observed, the meter is ready to perform the measurements. While the LED displays the instant mass flow rate, the accumulated or totalized flow rate can be accessed by pressing the "Up" or "Down" key. The accumulated flow rate is registered with "standard liter" (SL), and the maximum can be 99,999,999 SL. The first four digits of the accumulated flow rate are indicated by the "I" LED light, and the last four digits are represented when the "II" LED light is on. The "I" and "II" LED lights will be automatically switched when the accumulated flow rate is displayed. The accumulated flow rate will be automatically saved every three minutes. At the time of the power failure or cut-off, the value will be representing the latest saved ones.

5.4.2 MENU function input sequence

At the flow measurement (main) display, press the three MEMU keys, it will allow the user to perform a variety of settings of the product. The following graph details the key sequence for each function, and some detailed explanations are followed after the graphic presentation.

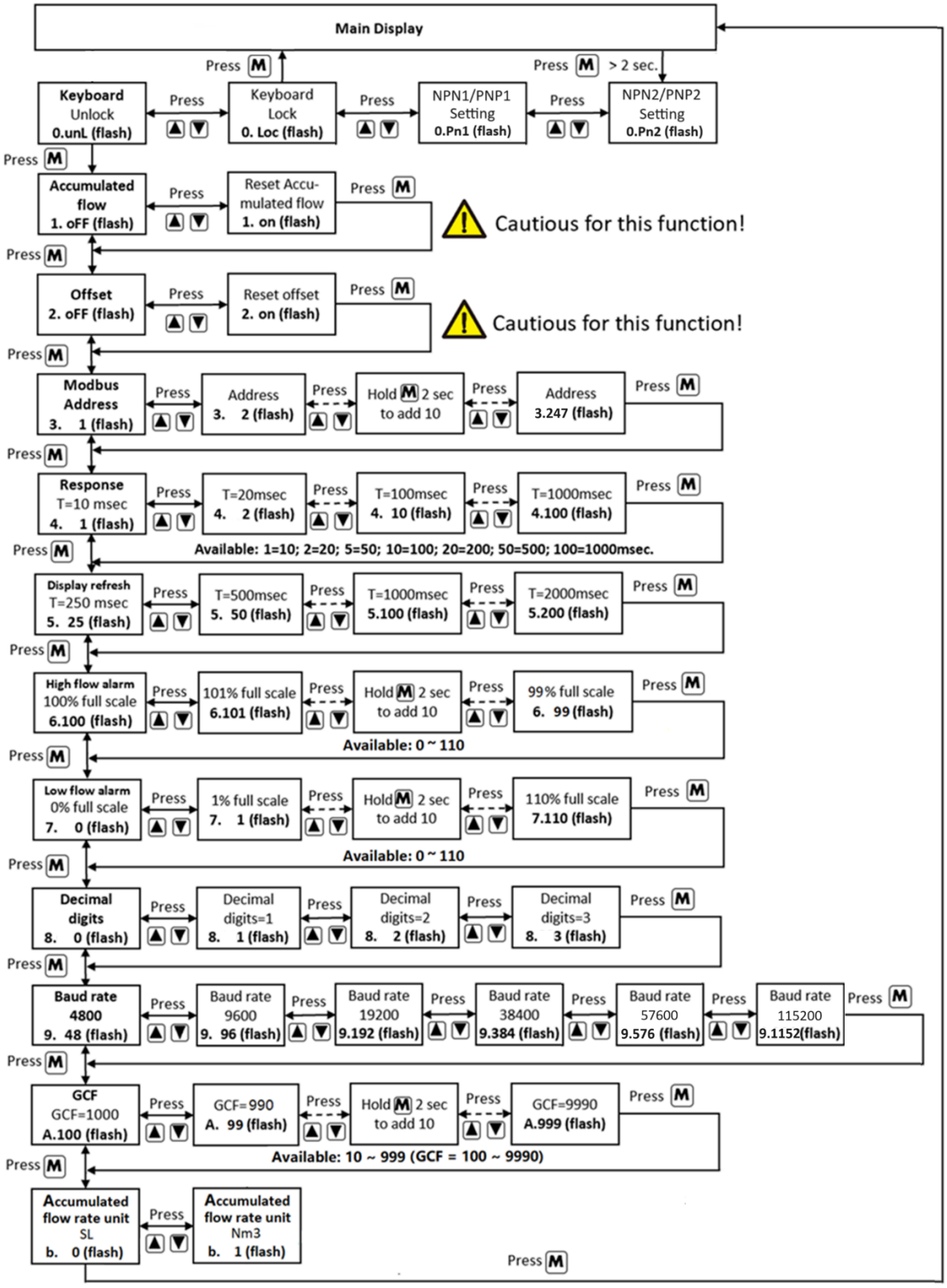
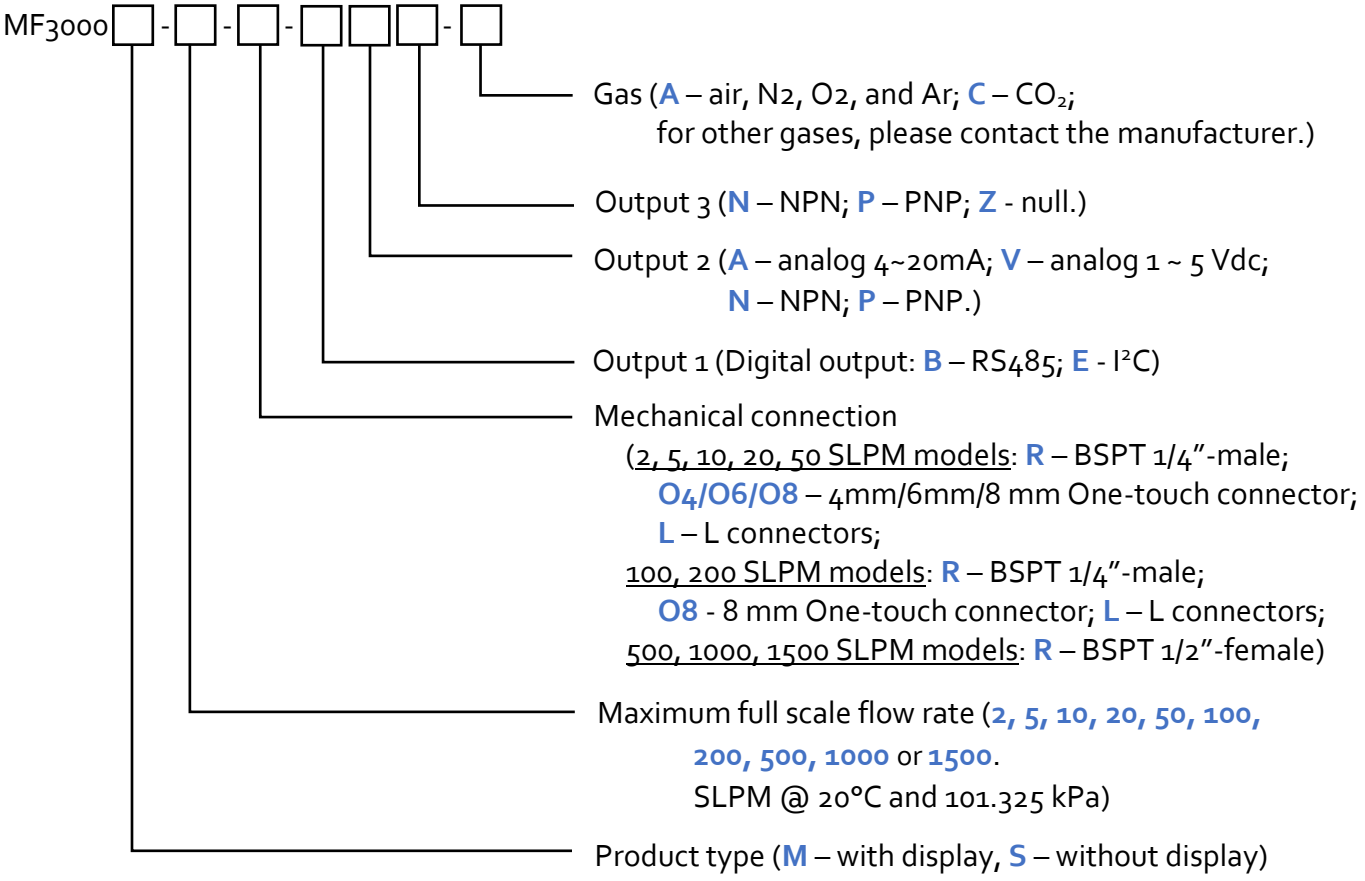


Figure 5.2: MF3000 menu flow chart

6. Product selection

The product part number is composed of the product model number and suffixes indicating the full-scale flow rate, as well as the other parameters. Refer to the following for details.



Mechanical connection selection:

Full scale	Mechanical connection code	Mechanical connection
➢ Air, N2, O2 and Ar: 2, 5, 10, 20, 50 SLPM ➢ CO2: 2, 5, 10, 20, 50 SLPM **with real gas calibration**	R	BSPT 1/4"-male
	O4	4mm One-touch connector
	O6	6mm One-touch connector
	O8	8 mm One-touch connector
	L	L connectors
➢ Air, N2, O2 and Ar: 100, 200 SLPM ➢ CO2: 100 SLPM **with real gas calibration**	R	BSPT 1/4"-male
	O8	8 mm One-touch connector
	L	L connectors

➢ Air, N2, O2 and Ar: 500, 1000, 1500 SLPM ➢ CO2: 200, 500, 800 SLPM	R	BSPT 1/2"-female

Output signals selection:

NPN/PNP signals	Output signals code	Descriptions Output 1, Output 2, Output 3
No NPN/PNP	BAZ	RS485, 4 ~ 20 mA
	BVZ	RS485, 1 ~ 5 Vdc
	EAZ	I²C, 4 ~ 20 mA
	EVZ	I²C, 1 ~ 5 Vdc
Single NPN/PNP	BAN	RS485, 4 ~ 20 mA, NPN
	BAP	RS485, 4 ~ 20 mA, PNP
	BVN	RS485, 1 ~ 5 Vdc, NPN
	BVP	RS485, 1 ~ 5 Vdc, PNP
	EAN	I²C, 4 ~ 20 mA, NPN
	EAP	I²C, 4 ~ 20 mA, PNP
	EVN	I²C, 1 ~ 5 Vdc, NPN
	EVP	I²C, 1 ~ 5 Vdc, PNP
Dual NPN/PNP	BNN	RS485, NPN, NPN
	BNP	RS485, NPN, PNP
	BPN	RS485, PNP, NPN
	BPP	RS485, PNP, PNP
	ENN	I²C, NPN, NPN
	ENP	I²C, NPN, PNP
	EPN	I²C, PNP, NPN
	EPP	I²C, PNP, PNP

For example, MF3000M-200-O8-BVN-A is a model with display, 0 ~ 200 SLPM, with 8mm One-touch connector, output digital RS485 Modbus, analog 1 ~ 5 Vdc and NPN, and applicable for air, nitrogen, oxygen, and argon.

MF3000S-500-R-EPP-C is a model without display, 0 ~ 500 SLPM, with BSPT 1/2"- female connector, output digital I²C and dual PNP, and applicable for CO2.

7. Technical specifications

All specifications listed in the following table unless otherwise noted apply for calibration conditions at 20°C and 101.325 kPa absolute pressure with air. The product is horizontally mounted at the time of calibration.

	Value					Unit
Full-scale flow range (air, N_2, O_2 and Ar)	2, 5	10, 20	50	100, 200	500, 1000, 1500	SLPM
(CO_2)	2, 5	10, 20	50	100	200, 500, 800	SLPM
	Real CO_2 gas calibration for the models <= 100 SLPM.					
Accuracy	±(2.5 + 0.5FS)					%
Repeatability	(0.8+0.15FS)					%
Turn-down ratio	50:1					
Working temperature	-10 ~ +55					°C
Temperature coefficient	±0.12					%/°C
Working pressure	0.8					MPa.g
Response time	10					msec
Filter depth	3 (default, 0 ... 9 programmable)					
Humidity	<95, no condensation					%RH
Power supply	8 ~ 24 (50 mA)					Vdc
Output 1 (Digital output)	RS485 Modbus or I^2C					
Output 2	Analog 4 ~ 20 mA, 1 ~ 5 Vdc, NPN, PNP					
Output 3	NPN, PNP					
Null shift (Analog 1 ~ 5 Vdc output)	±30					mVdc
Max. overflow	30	100	200	500	2000	SLPM
Max. flow change	4	15	30	100	400	SLPM/sec
Electrical connector	HRS:DF51K-6P-2DS					
Mechanical connection	**2, 5, 10, 20, 50 SLPM:** BSPT 1/4"-male, 4mm / 6mm / 8mm One-touch connector, or L connector **100, 200 SLPM:** BSPT 1/4"-male, 8 mm One-touch connector or L connector **500, 1000, 1500SLPM:** BSPT 1/2"-female					
Protection	IP40					
Storage temperature	-20 ~ 70					°C
Fluid compatibility	Non-corrosive					
CE	EN61000-2; -3; -4					
RoHS/REACH	Certified					