

MEMS HANDHELD FLOW METER

HMF2000 series

User Manual

(VA.0)



Siargo Ltd.

HMF2000 series

User manual ■■■

RESTRICTION ON USE

1. This product is manufactured for onsite gas flow measurement or monitor in an instrumentation. It can be used for inline gas flow inspection. Do not alter any hardware and software of the product. Any modifications might cause damage and unexpected events.
2. All practices for electronic device safety should apply.

⚠ SAFETY PRECAUTION

1. The product can be utilized to measure and/or monitor gas flow for the stated gases and flow rates of instrumentation or inline gas delivery. It is particularly designed for the dynamic range of these applications. Please do not use for other purposes, such as corrosive gases. Otherwise the product may not function properly or even can be damaged. Please contact the manufacturer for further information.
2. The operational environments of the product are illustrated in the section of product.
3. Operation, storage, and maintenance of the product must strictly follow the instructions illustrated in this user manual. Otherwise, unpredicted damage and even injuries or other severe situations could be induced.
4. Before using the product, the user should read this user manual completely and in details so that the user can well understand all the important instructions.

Please read this manual for ensuring correct use of this product. Make the manual available for easy access.

The HMF2000 handheld mass flow meter is designed and manufactured for onsite measurement for gas flowrate with multiple gas options and large dynamic range using the proprietary MEMS mass flow sensing technology. The product is particularly suitable for applications in instrumentation and inline gas monitor where the multiple gas measurements specially the low flowrate measurement is required. This manual provides the instructions for proper use of the products, including operation, maintenance and storage. For further customization or other product related questions, please contact the manufacturer.

Features

- ◆ Multiple gas mass flow measurement a handheld form factor
- ◆ Gas selection with front key board for Air, O₂, Ar, H₂ and He
- ◆ Excellent for instrumentation testing and onsite gas flow rate monitor
- ◆ MEMS mass flow sensing technology with temperature and pressure compensation
- ◆ High sensitivity for low flow measurement, and models cover different flowrate applications
- ◆ Instant flowrate, totalizer, and via easily accessible interface
- ◆ Split gas ration for gas chromatography mass spectrometers
- ◆ Record, data access with front keyboard for data safety
- ◆ Portability design with battery operation

Applications



GC-MS



Air sampler



Pharmaceutic



Instrumentation



Chemical



Leak detection



HVAC



Research

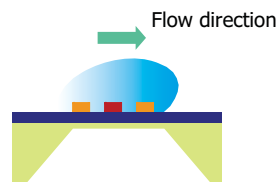


Process control



Laboratory

Working principle



HMF2000 series handheld mass flow meter measures gas mass flowrate with option for selectable gases using the proprietary MEMS calorimetric mass flow sensor that is installed in the flow channel forming a plate that serves as an additional flow conditioner from the boundary layer configuration resulting in a laminar flow. The mass flow measurement is established as the fluid carries heat away from the heater causing the redistribution of the temperature field. Accurate flow speed is obtained by calibration with the standard fluid at the preset conditions.

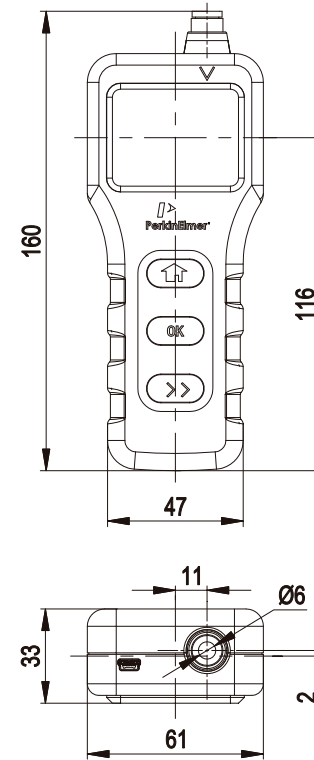
Specifications

Mass Flow Rate	0 ~ 1000	sccm
Accuracy	$\pm(2+0.5FS)$	%
Response time	8	msec
Turn-down ratio	>100:1	
Power supply	6F22 battery or External 6~12Vdc	
User interface	Front keyboard	
Operational temperature	0 ~ 50	°C
Storage temperature	-10 ~ 80	°C
Max. Working Pressure	0.4	MPa
Safety rating	IP40	
Mechanical Connection	4mm One-touch connector	
Dimension	160×61×33	mm ³
Weight	200	g

Description



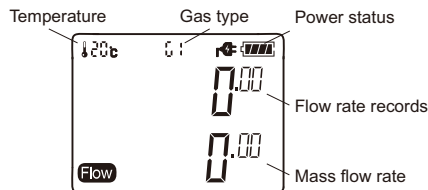
Dimensions



Menu operation

8.1 Interface illustration

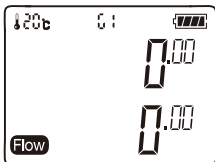
The display includes *mass flow rate, flow rate records, gas temperature, gas type and power status*. Mass flow rate can be recorded by pressing the “OK” key. The gas type can be selected via button operations.



8.2 Operation

The following contents describe the details for each steps. Please read carefully before process.

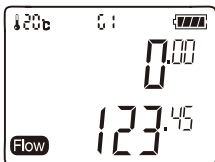
8.2.1 Power on and power off



Press the “Home” key for 2 seconds, the meter will be powered on and the display as shown will be on.

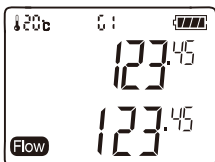
The meter can also be powered off by pressing the “Home” key for 2 seconds.

8.2.2 Mass flow rate measurement



The meter will show the instant mass flow rate in the display whenever the meter is connected to a flow channel and flow is present. The unit of mass flow rate is sccm.

8.2.3 Record current mass flow rate



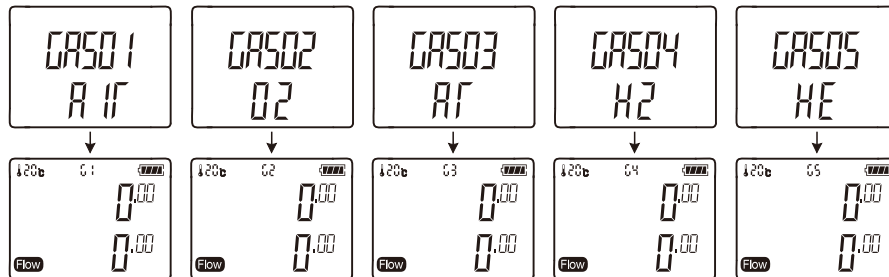
Press the “OK” key, the current flow rate will be recorded and displayed in the recorded line.

The recorded value will be refreshed when pressing the “Record” key again.

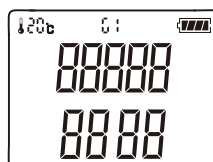
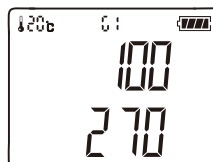
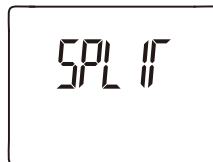
8.2.4 Gas selection



The desired measurement gas can be selected via button operations, see detailed in the *button operations flow chart*. The gases can be measured are Air, O₂, Ar, H₂ and He, see below for detailed.



8.2.5 Gas split ratio



a, Open the gas split ratio function;

b, Connect the meter to the GC gas column flow and when it stabilizes, press “OK” key;

c, Then re-connect the meter to the split vent and press “Shift” key, the gas split ratio will be shown, and you can dial the split vent until a desired ratio is reached.

For example, if the ratio is 1.00:2.70, the display will be 100:270.

If the split ratio is larger than 1:1, an error message of “88888:8888 will be displayed.

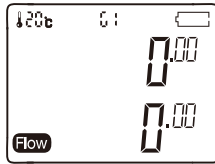
8.2.6 Offset calibration



Ensure there is no flow in the flow channel, then choose offset calibration to “Yes”, the offset will be measured and saved. You can calibrate the offset for each kind of gases.

Attention: Please ensure there is no flow in the flow channel when you calibrate the offset.

8.2.7 Power Status

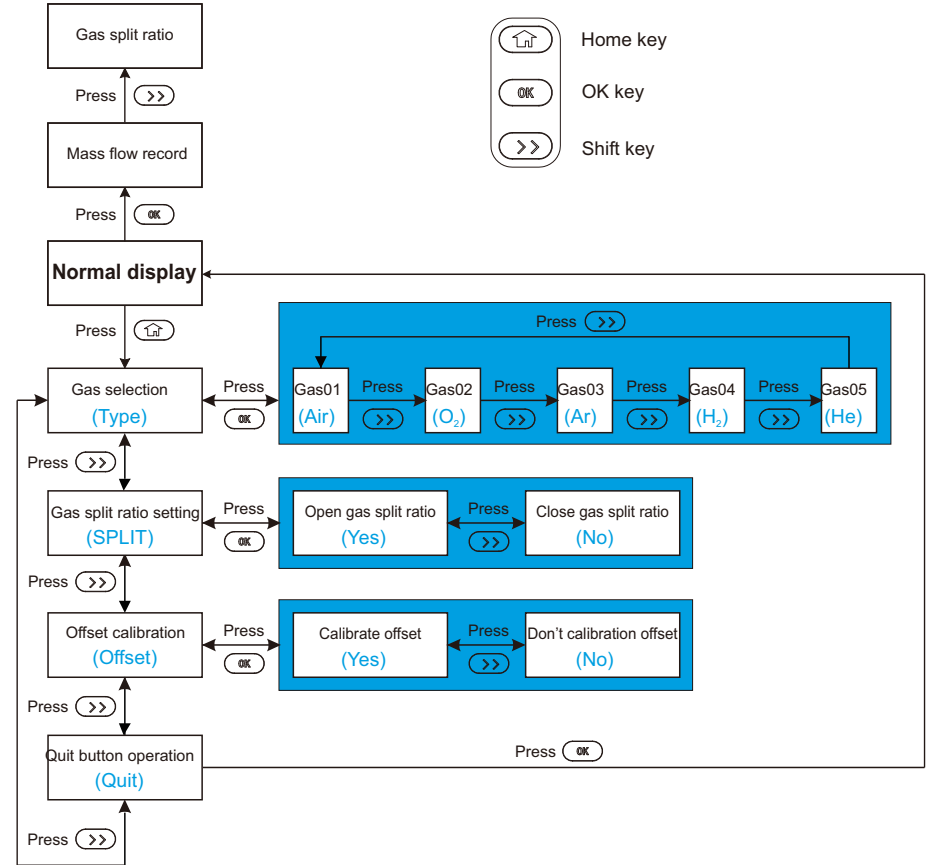


There will be external power or battery shown on the LCD. When the “battery status” shows blank on the display, please switch to external power mode or exchange a new battery as soon as possible.

8.2.8 Sleep mode

When there is no flow and the meter is idled for more than 5 minutes, the meter will be automatically turned into a sleep mode.

You can turn it on by pressing the “Home” key for 2 seconds.



Button operations flow chart

Parts in Package

HMF2000 handheld mass flow meter	1
User manual	1
QC certificate	1

Safety and Maintenance

10.1 Safety Precautions

The product is designed for use for air speed measurement. For updates of the product certification information, please contact manufacturer. Use for other gases such as extreme corrosive and toxic agents may cause the product malfunctioning or even severe damages. The product sealing is ensured to work under working pressure of 0.4MPa. The power supply for this product is 6F22 battery or 6~12V external power, all precautions and measures for electrical voltage handling should apply.

Attention: any alternation and/or improper use of the product without the permission of the manufacturer can cause unpredicted damages and even injuries or other severe situations. Manufacturer or any of its employees, subsidiaries shall not be hold and indemnified against such consequences due to such circumstances via improper use of the product.

10.2 Maintenance

Attention: without prior permission of the manufacturer, please do not attempt to alter any parts of the product as it may cause unrecoverable damages. If there are questions or doubts, please contact manufacturer immediately before further actions.

All maintenance of the sensor should be performed by trained and certified personnel by manufacturer.

Customer Service and Order

In case of questions, and or product supports, please contact customer service at the address listed below. We will respond your request in a timely fashion and will work with you toward your complete satisfaction.

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