YUA

Fast · Accurate · Managing

1:100

Ultra-wide
turndown ratio

MEMS

01010

Full-digital
Signal Processing



F235 Series

Compact Thermal Mass Flow Meter

MASS FLOW METER

Product Overview

The F235 series is used to accurately measure the gas mass flow. It is based on thermal measurement technology. It can measure the mass flow directly, pressure and temperature compensation is not required. It integrates MEMS (Micro-Electro-Mechanical Systems), signal processing, digital simulation and other technologies

Its principle and technical foundation ensure the outstanding performance of the F235 series in terms of sensitivity, pressure loss, turndown ratio, response time and micro flow measurement

The F235 series displays flow consumption via a local display. Additionally, analog and digital outputs support remote data access

Product Advantages



Ultra-wide turndown ratio

Ultra-wide 1:100 turndown ratio
Lower limit can reach 0.04 SLM (DN3)



MEMS

Micro-sensor based on CMOS semiconductor process



Full-digital Signal Processing

Adaptive signal processing to effectively suppress random errors

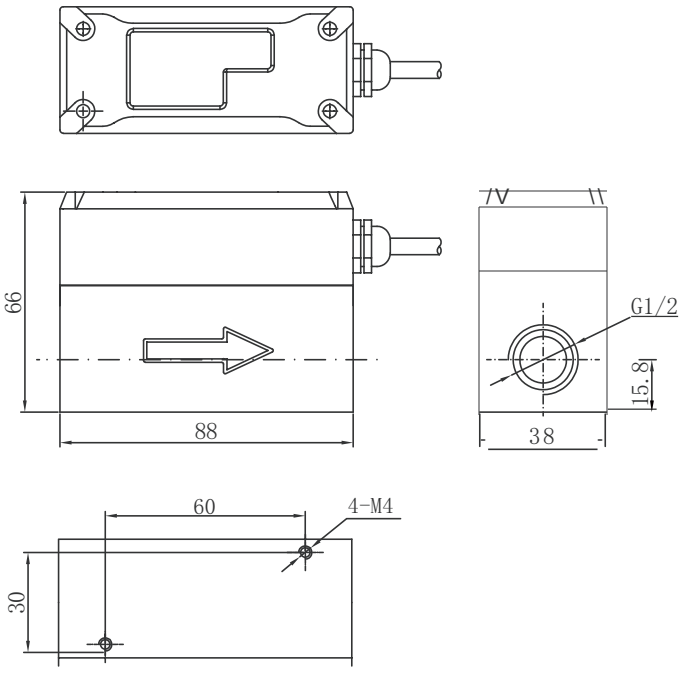


30+ Points of Calibration

Overcome the nonlinear defects which occur in thermal measurement

- Based on the thermal flow measurement principle, it's not required to compensate gas pressure and temperature, integrated temperature measurement
- Based on Micro-Electro-Mechanical Systems (MEMS) made with CMOS semiconductor processes, enabling high-precision measurements in millimeter dimension
- Ultra-wide turndown ratio, lower limit can reach 0.04 SLM (DN3)
- Integrates digital adaptive signal processing technology to effectively suppress random errors
- The fully isolated electrical structure can completely filter out field disturbance
- Standard Modbus RTU (RS485) interface and 4 to 20 current output

Product Dimensions



Product Applications

Thermal flow meters are widely used in industrial furnaces, medical and pharmaceutical gas equipment, laboratory micro-reactors, gas mixing systems, gas chromatograph equipment, semiconductor processing equipment, optical fiber processing and etc.



F235x Dimension & Flow Range

DN (mm)	Process Connection (Inch)	L (mm)	W (mm)	H (mm)	FLOW RANGE (SLM)
40	G1 1/2" female thread	133	58	90	30 ... 3000
32	G1 1/4" female thread	133	54	85	20 ... 2000
25	G1" female thread	133	49	78	15 ... 1500
20	G3/4" female thread	88	38	72	8 ... 800
15	G1/2" female thread	88	38	72	3 ... 300
10	G3/8" female thread	88	38	56	1 ... 100
10	NPT 3/8" female thread	88	38	56	1 ... 100
10	LOK 3/8" double ferrule male thread	124	38	56	1 ... 100
6	NPT 1/4" internal thread	88	38	56	0.5 ... 50
6	LOK 1/4" double ferrule male thread	124	38	56	0.5 ... 50
3	NPT 1/8" internal thread	88	38	56	0.02 ... 2
3	LOK 1/8" double ferrule male thread	124	38	56	0.02 ... 2

Technical Data

Measuring Medium

Medium	Compressed air, oxygen, nitrogen, hydrogen, laughing gas (nitrous oxide), carbon dioxide, natural gas, argon, helium, silane, ammonia, phosphorus oxychloride, nitrogen trifluoride and other non-condensable gases

Flow

Measuring Range	Refer to “Flow Range” table
Accuracy	±1.5% FS
Reference Condictions	20 °C, 1 bar(a) - ISO 1217
Repeatability	±0.25% FS
Zero Point Drift	<0.1% FS
Response Time	<20 ms
Operating Pressure	1.7 MPa(a)
Pressure Loss	3 kPa (full range)

Temperature

Medium Temperature	-20 … +60 °C

Power

Measuring Stage	24 VDC 0.5W @ 24VDC

Output

4 … 20 mA Output (Standard)	Flow rate
Digital Output	Modbus RTU RS485 (Standard)
Connector	Wiring terminal

Material

Flow Channel	SUS304 or SUS316L
Seal	Fluorine rubber, EPDM rubber, customized
Connector	SUS304 or SUS316L

Mechanical

Process Connection	Refer to “Flow Range” table
Dimension	Refer to “Flow Range” table
Weight	<1.0 kg
Protection Code	IP54

Order Information

Model	Pressure	Digital Output	Analog Output	Body Material	Process Connection	Gas Type	Accuracy	Description
F235								Compact Thermal Mass Flow Meter
	PN16							1.7 MPa(a)
		1						Modbus RTU (RS485)
			1					4 ... 20 mA output
				M0101 0001				SUS 304 stainless steel
				M0101 0002				SUS 316L stainless steel
				M0101 0003				Aluminum alloy
					LOK-3			Male thread, Double tube fittings LOK 1/8", DN3
					LOK-6			Male thread, Double tube fittings LOK 1/4", DN6
					LOK-10			Male thread, Double tube fittings LOK 3/8", DN10
					NPT-3			Female thread, NPT 1/8",DN3
					NPT-6			Female thread, NPT 1/4",DN6
					NPT-10			Female thread, NPT 3/8",DN10
					G-10			Female thread, G3/8",DN10
					G-15			Female thread, G1/2",DN15
					G-20			Female thread, G3/4",DN20
					G-25			Female thread, G1",DN25
					G-32			Female thread, G$1^{1/4}$",DN32
					G-40			Female thread, G$1^{1/2}$",DN40
						V0202 0001		Air
						V0202 0002		Oxygen (O_2)
						V0202 0003		Nitrogen (N_2)
						V0202 0004		Hydrogen (H_2), Real Gas Calibration
						V0202 0005		Nitrous Oxide (N_2O)
						V0202 0006		Carbon Dioxide (CO_2)
						V0202 0007		Natural Gas (NG)
						V0202 0008		Argon (Ar)
						V0202 0009		Helium (He), Real Gas Calibration
						V0202 0010		Other Specified Gases (Specify Gas or Gas Mix)
							V0204 0001	Standard Accuracy Calibration ±1.5% FS

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