ACU20FDR Digital Mass Flow Controller/Flowmeter

Introduction

ACCU(Beijing Accu Flow Technology Co., Ltd.) specializes in manufacturing gas/liquid mass flow meters and controllers. The instruments are designed according to the actual working conditions and needs of customers, and are widely used in various occasions such as industrial process control, gas and liquid analysis, and flow measurement. It plays an important role in scientific research and production in various fields such as semiconductor and integrated circuit industry, special materials discipline, chemical industry, petroleum industry, medicine, environmental protection, and vacuum.
ACCU insists on continuous innovation, keeping up with the times, developing new products, and obtaining multiple invention patents, which keeps us at an advanced level in core technology.



▲ ACU20FDR-LC Mass Flow Controller

Performance and Principle

The ACU20FDR is a high-precision, low-differential-pressure flowmeter and controller. Its measurement accuracy is ±0.5% of full scale. This exceptional accuracy is achieved through a proprietary dual-sensor probe design. The hermetically sealed probe integrates two precision sensing elements: a thermal anemometric velocity sensor and a platinum resistance temperature detector (RTD), both conforming to standard-grade specifications. The velocity sensor is actively heated to a fixed temperature differential above the process fluid temperature; the resulting convective cooling effect—proportional to mass flow rate—is measured electronically. Flow rate is thereby calculated based on the principle that the electrical power required to maintain this constant temperature differential is directly proportional to the mass flow of the gas or liquid. Both sensing elements are encapsulated within a corrosion-resistant 316 stainless steel housing.

Applications in laboratory and industrial environments

The ACU20FDR high-precision low differential series flowmeter/controller has a measurement error of ±0.5% of the full scale, which is sufficient to meet the needs of most customers. It can be applied in both laboratories for various experiments and in complex industrial environments.
To adapt to complex industrial environments, some models also supportIP67 level dustproof and waterproof, and IICT4 explosion-proof. Besides the standard analog input/output interfaces, it also supports 485/232 interfaces, and the communication protocol is the standard modbus RTU protocol.

Applications

vacuum	coating	solar energy
semiconductor coal metallurgy	petroleum and petrochemical	
gas production and distribution environment protection		various analyzers

ACU20FDR Features

- Accuracy up to ±0.5% F.S.
- Repeatability up to ±0.2%F.S.
- Fast response speed, fast adjustment speed
- Touch screen display
- Direct measurement of mass flow
- Automatic temperature compensation
- Integrated PID controller regulates the flow rate of the measured gas medium can be manually switched.
- The measured gas medium can be switched manually
- Thermal principle, fast response, high accuracy
- Tubular shunt, not easy to clog
- Suitable for all kinds of high and low pressure pipelines
- Short warm-up time, small zero drift, high reliability.

Specifications

	High accuracy mass flow controller	High accuracy mass flow meter
Technical Specifications		
Range	0~ (150SLM...6000SLM)	0~ (150SLM...6000SLM)
Measurement and control range	controller valve control range 50:1	flow meter range ratio 100:1
Accuracy	±0.5%F.S. (full scale)	
Linearity	±0.25%F.S.	
Repeatability	±0.2%F.S.	
Response time	<0.2s	<0.1s
Temperature coefficient	±0.025%F.S./℃	
Working temperature	0 ~ 50℃	
preheating time	30Savailable, 5Min to reach optimal condition	
Working pressure	working differential pressure:0.1~0.5MPa	working pressure drop： <0.01MPa
Max. operating pressure	3MPa/10MPa	
Leakage rate	1 X 10^{-9} Pa m^3/S	
Mechanical components		
Base material	stainless steel	
Connector	φ8,φ10,φ12,VCR, LOK, quick plug, pagodas, flange installation, etc	
Sealing material	FFKM, Vilton, NBR, EPDM, Others	
Shell protection level	IP40	
Installation position	horizontal installation	
Electrical properties		
Electrical connections	DB9hole,RJ11	
Display status	with display, without display	
Digital output	RS232/485 Modbus protocol,Profibus protocol,EtherCAT protocol, Profinet protocol,FF protocol,,etc	
Analog output	0 ~ 5V,4-20mA,1 ~ 5V	
Power supply	24VDC,±15VDC	

Model No.& Ranges

Controller				
Models	ACU20FDR-LC	ACU20FDR-MC	ACU20FDR-BC	ACU20FDR-HC
Ranges	0~(150SLM...600SLM)	0~(600SLM...1200SLM)	0~(1200SLM...4000SLM)	0~(4000SLM...6000SLM)

Model chart

ACU20FDR | L | C | M | N | 200L | A1 | B1 | 4 | 8 | V | C

Serial number

Range select

L	Low
M	Middle
B	Big
H	Huge

Product type

C	Mass flow controller
M	Mass flow meter

Pressurization

M	3MPa
Z	10MPa (Only for flow meters)

Display

N	Without display
X	With display

Ranges

150L	150 SLM	L
300L	300 SLM	
600L	600 SLM	
800L	800 SLM	M
1000L	1000 SLM	
1200L	1200 SLM	
2000L	2000 SLM	B
3000L	3000 SLM	
4000L	4000 SLM	
4500L	4500 SLM	H
5000L	5000 SLM	
6000L	6000 SLM	
0000L	User Specified	

Input signal

A1	0~5VDC
A2	4~20mA
A3	1~5VDC

Output signal

B1	0~5VDC
B2	4~20mA
B3	1~5VDC

Power supply

4	24VDC
5	±15VDC

Communication

8	RS485
2	RS232
P	Profibus

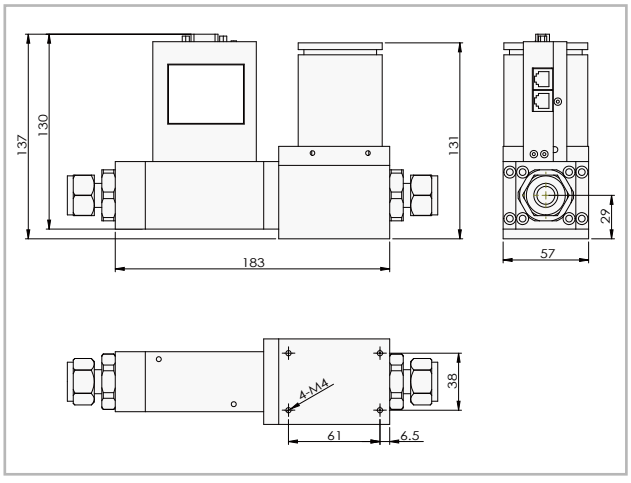
Sealing material

P	FFKM
V	Vilton
N	NBR
E	EPDM
Y	Others

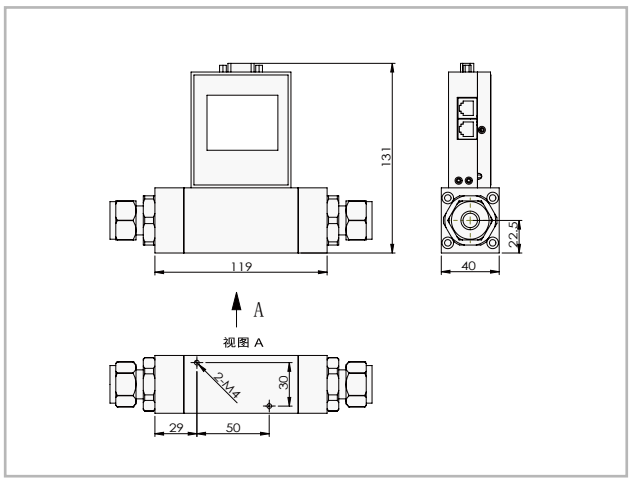
Connectors

C	φ8
D	φ10
E	φ12
Y	Others

Dimensions (mm)

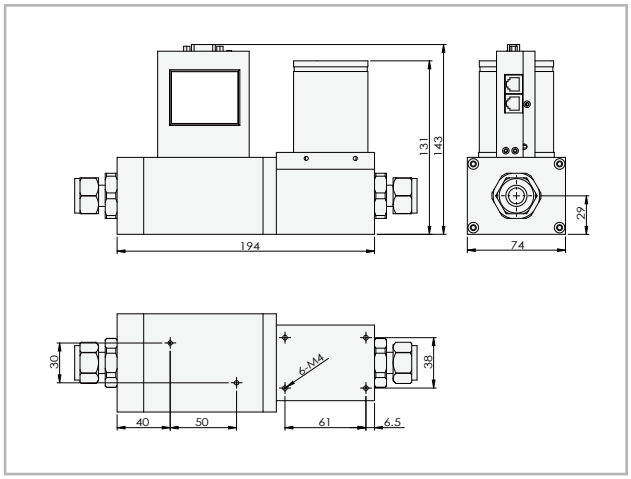


▲ ACU20FDR-LC Gas Mass Flow Controller (Low)

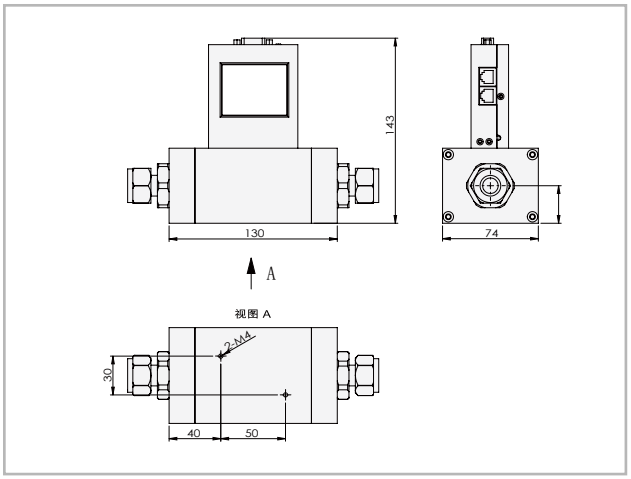


▲ ACU20FDR-LM Gas Mass Flow Meter (Low)

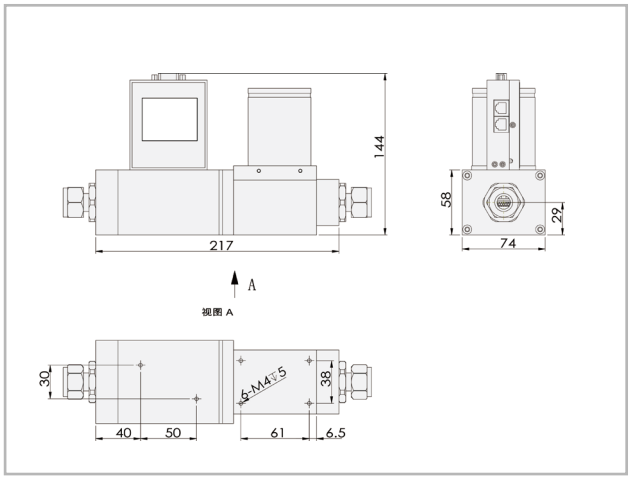
Dimensions（mm）



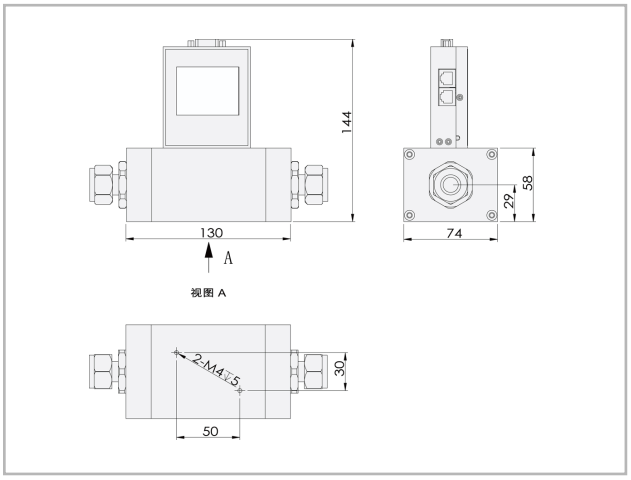
▲ ACU20FDR-MC Gas Mass Flow Controller（Middle）



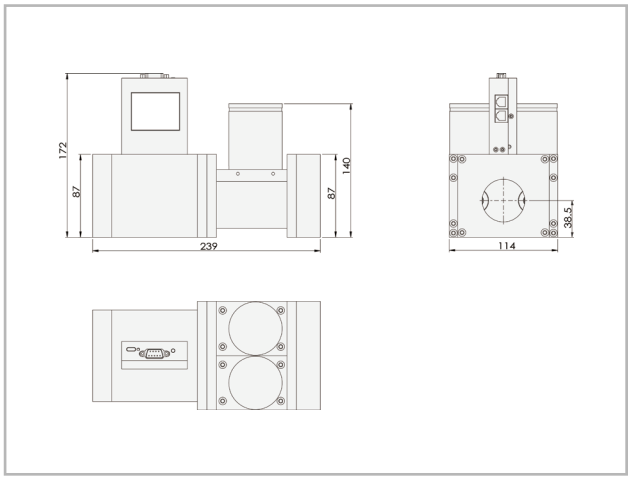
▲ ACU20FDR-MM Gas Mass Flow Meter（Middle）



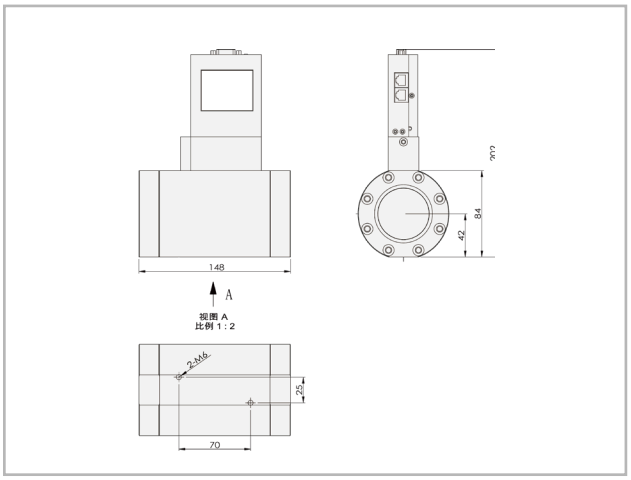
▲ ACU20FDR-BC Gas Mass Flow Controller（Big）



▲ ACU20FDR-BM Gas Mass Flow Meter（Big）



▲ ACU20FDR-HC Dual-Valve Gas Mass Flow Controller（Huge）



▲ ACU20FDR-HM Gas Mass Flow Meter（Huge）