LP20L High precision
Liquid Mass Flow Controller

Introduction

"Lapiflow Messtechnik" 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.
ACCUinsists 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.

(▲LP20L-L)

Performance and Principle

The LP20L series is a high-precision line of liquid flow controllers and flowmeters. These products utilize differential pressure mass measurement elements that are free from thermal drift and response lag. They are capable of simultaneously displaying and outputting instantaneous flow rate, cumulative flow rate, and pressure data. Additionally, force and temperature measurements can also be obtained. When control functionality is required, an electromagnetic proportional regulating valve can be installed, such as one with built-in PID regulation capabilities.
Unlike thermal mass flowmeters, the ACU20L series mass flowmeters do not suffer from additional "specific heat capacity" errors. Therefore, even when different calibration liquids are used at various times, the measurement accuracy remains unaffected. Compared to traditional liquid flow controllers, the ACU20L series features a more responsive sensor and a large, user-friendly touchscreen display, resulting in significant improvements in both measurement accuracy and ease of operation.

Applied to laboratories and industrial environments

The ACU20L series high-precision liquid mass flowmeter/controller is designed for accurate measurement, with a precision of up to ±1%. This level of accuracy is generally sufficient to meet the requirements of most customers. The device is suitable for a wide range of applications, including various experimental settings in laboratories as well as complex industrial environments.
In order to adapt to complex industrial environments, we also have some models that support IP67 dust and waterproof rating, as well as IICT4 intrinsic safety explosion-proof. In addition to the standard analog input/output interface, it also supports the 485/232 interface, 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

ACU20L Features

- Accuracy can reach ± 0.5% F.S
- Repeatability can reach ± 0.2% F.S
- Fast response speed and adjustment speed
- Touchable display screen
- Directly measuring mass flow rate
- Simultaneously displaying instantaneous and cumulative flow rate, pressure, and temperature
- Integrated PID controller to regulate flow rate
- No preheating required, no response lag during measurement
- Differential pressure principle
- No thermal drift, negligible temperature and time drift
- Long term stability 0.1% F.S/year
- No heat capacity additional error, does not affect accuracy

Specifications

Technical specifications		High accuracy mass flow controller	High accuracy mass flow meter
	Range	2SCCM～20SLM	
	Measurement and control range	controller valve control range50:1	flow meter range ratio100:1
	Accuracy	±1%F.S（full scale）	
	Linearity	±0.5%F.S	
	Repeatability	±0.2%F.S	
	Responsetime	<0.2s	<0.1s
	Temperature coefficient	±0.025%F.S/°C	
	Working temperature	10～50°C	
	Working pressure	working differential pressure：0.1~0.5Mpa	working pressure drop<0.01Mpa
	Max. operating pressure	1MPa	
	Leakage rate	$1 X 10^{-9}$ $Pa m^3/S$	
Mechanical parts	Base material	stainless steel	
	Connector	ϕ8、ϕ10、ϕ12，LOK，VCR，flange installation，etc	
	Sealing material	Vilton，Neoprene，NBR，FFKM，Metal Seal，etc	
	Shell protection level	IP40	
	Installation position	>1L/min，the valve must be installed vertically	
Electrical properties	Monochrome LED display screen	simultaneously displaying flow, setting	
	Electrical connections	DB9hole, RJ11	
	Display status	with display, without display	
	Digital output	Modbus protocol（RS232/485），ProfiBus protocol，EtherCATprotocol、Profinetprotocol、FF protocol，etc	
	Analog output	0～5V、4-20mA、1-5V	
	Power supply	±15VDC，24VDC	

Model No.& Ranges

			
Model No.	ACU20L-LC	ACU20L-MC	ACU20L-BC
Ranges	2SCCM~1SLM	1SLM~5SLM	5SLM~20SLM
			
Model No.	ACU20L-LM	ACU20L-MM	ACU20L-BM
Ranges	2SCCM~1SLM	1SLM~5SLM	5SLM~20SLM

Model chart

ACU20L- | L | C | M | N | 020C | A1 | B1 | 5 | 8 | V | B

Serial number

Model
- L Low
- M Middle
- B Big

Producttype
- C Massflow controller
- M Massflow meter

Pressurization
- M 1MPa

Display
- N Without display
- X With display

Ranges

010C	10 SCCM
020C	20 SCCM
030c	30 SCCM
050C	50 SCCM
100C	100 SCCM
200C	200 SCCM
300C	300 SCCM
500C	500 SCCM
001L	1 SLM
002L	2 SLM
003L	3 SLM
005L	5 SLM
010L	10 SLM
020L	20 SLM
000L	User Specified

Input signals
- A1 0~5VDC
- A2 4~20mA
- A3 1~5VDC

Output signals
- B1 0~5VDC
- B2 4~20mA
- B3 1~5VDC

Power supply
- 5 ±15VCD
- 4 24VDC

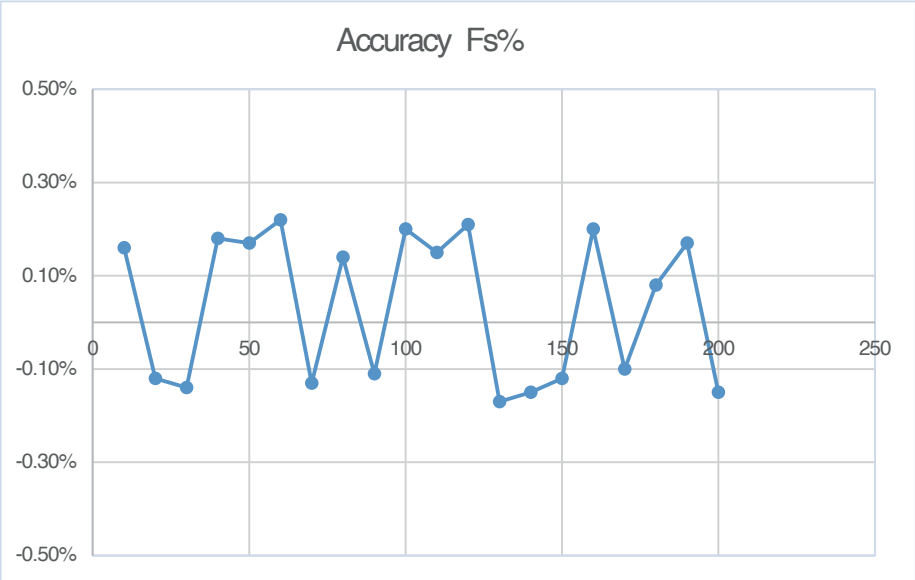
Communication
- 8 RS485
- 2 RS232

Sealing material
- V Vilton
- T NBR
- N Neoprene
- Y Other

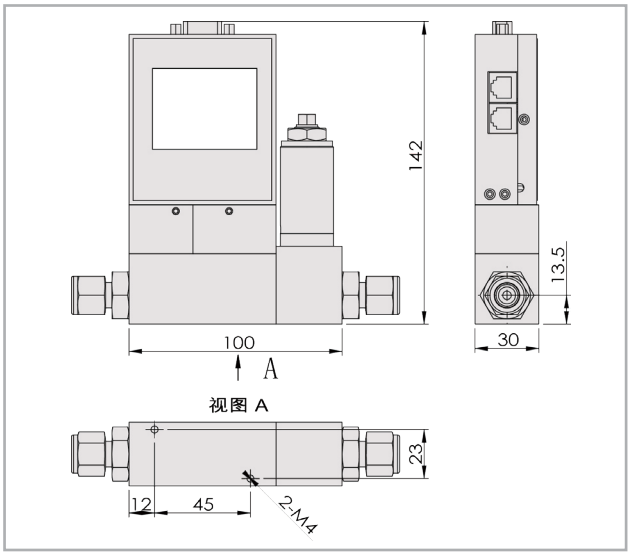
Connectors
- A φ3
- B φ6
- C φ8
- D φ10
- E φ12
- F 1/8″
- G 1/4″
- L Flange connection
- Y others, contact with manufacturer

Calibration test

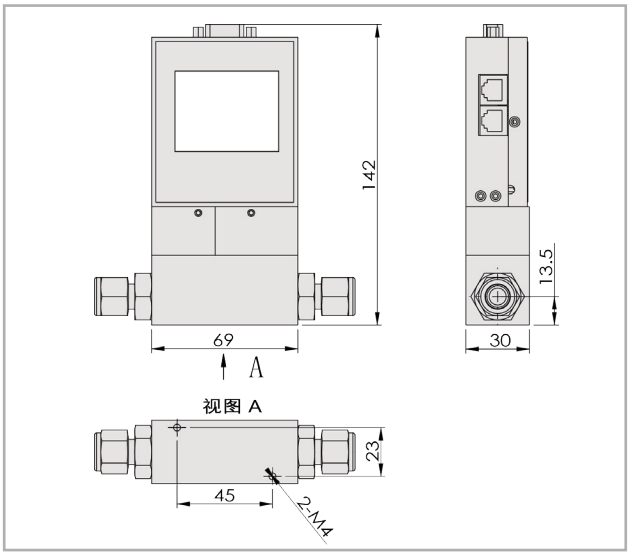
Qstd	Qv	Fs%
10	9.98	0.16%
20	20.02	-0.12%
30	30.04	-0.14%
40	39.93	0.18%
50	49.92	0.17%
60	59.87	0.22%
70	70.09	-0.13%
80	79.89	0.14%
90	90.10	-0.11%
100	99.80	0.20%
110	109.84	0.15%
120	119.75	0.21%
130	130.22	-0.17%
140	140.21	-0.15%
150	150.18	-0.12%
160	159.68	0.20%
170	170.17	-0.10%
180	179.86	0.08%
190	189.68	0.17%
200	200.30	-0.15%



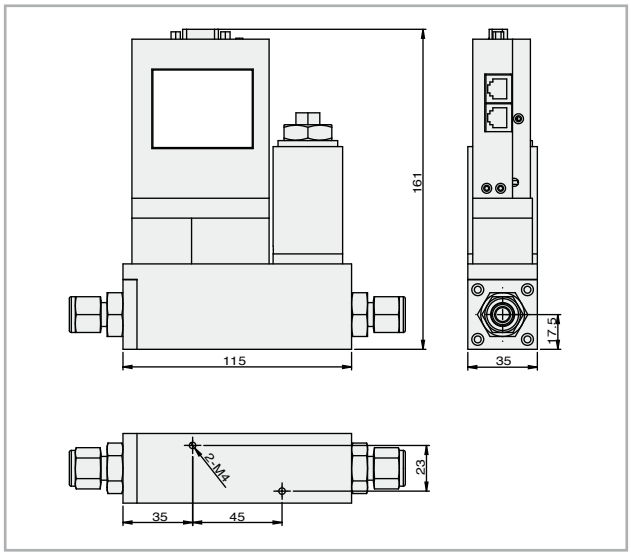
Dimensions (mm)



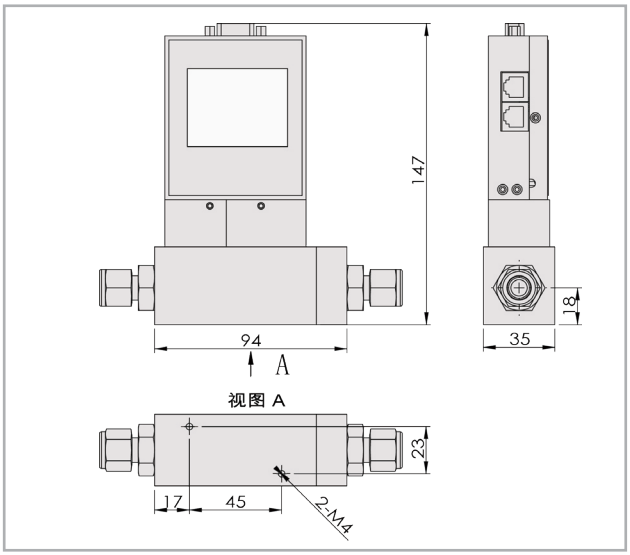
▲ACU20L-LC Differential pressure mass flow controller(low range)



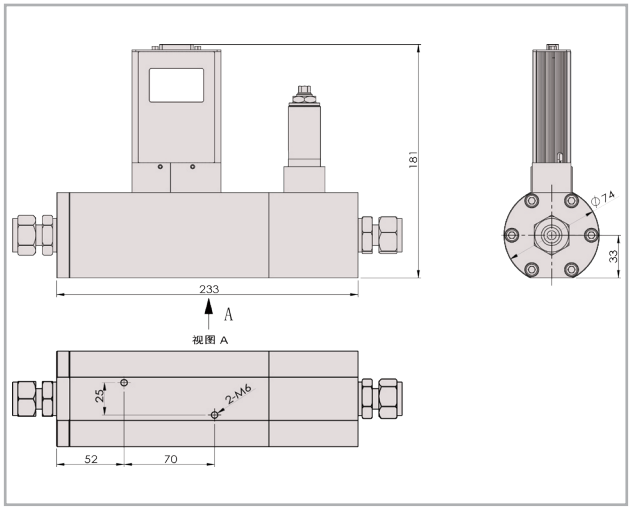
▲ACU20L-LM Differential pressure mass flow meter(low range)



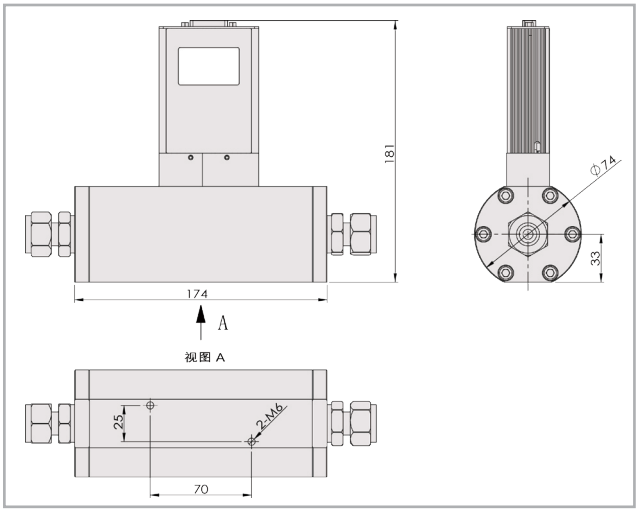
▲ACU20L-MC Differential pressure mass flow controller(middle range)



▲ACU20L-MM Differential pressure mass flow meter(middle range)



▲ACU20L-BC Gas mass flow controller(big range)



▲ACU20L-BM Gas mass flow meter(big range)