ACCU
Measurement & Control

ACU10FCH Series

HighTemperature Thermal Mass Flow Controllers&Meters







Introduction

ACU10FCH series high temperature type mass flow controller/flowmeter, is specially developed by ACCU for precision measurement of high pressure fluid precision instrument. Based on the principle of differential pressure, ACCU uses the exclusive research and development of internal compensation laminar flow differential pressure technology, so that the instrument can automatically adjust the conversion coefficient between differential pressure and flow rate, and realize internal compensation, so that the fluid can maintain measurement accuracy and accuracy under high temperature and large flow conditions. This core technology solves the problem that the measurement accuracy of the traditional laminar pressure differential pressure technology decreases in high temperature environment.

The high-temperature fluid passes through the fine pipe inside the sensor. Due to the geometry and fluid characteristics of the pipe, the fluid flow maintains a laminar flow state. Laminar flow creates pressure differentials due to limitations such as fluid viscosity and pipe size. In order to eliminate the problem of accuracy reduction caused by high temperature of fluid, the internal sensor of the instrument will automatically adjust the conversion coefficient between pressure difference (differential pressure) and flow rate according to the relationship between fluid temperature and viscosity, so as to realize internal compensation.

On this basis, the sensor converts the accurately measured pressure difference (differential pressure) into an electrical signal, and the controller calculates the pressure difference signal, and finally obtains the volume flow or mass flow of the high temperature fluid.

In the specific control operation, the operator sets the required flow value through the display screen or the communication interface, and the controller uses the PID control algorithm to adjust the opening of the control valve according to the deviation between the actual flow and the set value. Changes in the opening of the control valve will change the flow of fluid through the sensor, so that the actual flow gradually close to the set value. Through the continuous adjustment of the control valve, the actual flow is finally stabilized near the set value.

Applications

ACU10FCH series high temperature flow meter & flow controller is widely used in various industries, such as:

1. chemical industry: used to accurately control the flow of reactants or products.
2. Semiconductor: Used to measure and control the gas flow in the system.
3. Food and Beverage: Used to measure and control the flow of liquids during food processing.
4. Pharmaceutical: Used to measure and control the liquid flow in the pharmaceutical process.
5. Environmental monitoring: used to measure the concentration of gases in the atmosphere for environmental monitoring and protection.
6. Scientific research: for gas flow control in the laboratory.
7. Energy Petrochemical: Used to measure and control the flow of fuel gas.
8. Automotive industry: used to measure and control the gas flow in automobile exhaust, used for automobile exhaust emission detection.

Operation Status

	ACU10FCH Mass Flow Meter	ACU10FCH Mass Flow Controller
Maximum working pressure	1 MPa	
Requirements for installation method/direction	No valve	> 1L/min range, the valve must be installed vertically
Valve class	Valve normally closed	
Protection level	IP40	
Material	Stainless Steel	
measurable temperature	80~200 ℃;>200 ℃, depending on the situation	

Signal

	ACU10FCH Mass Flow Meter	ACU10FCH Mass Flow Controller
Monochrome LCD display	Simultaneous display of flow, setting	
Digital output signal	RS232/485，MODBUS protocol	
Analog input signal	0-5 Vdc / 4-20 mA	
Analog output signal	0-5 Vdc / 4-20 mA	
Electrical signal interface	DB15	
Supply voltage	±15VDC (15-30 Vdc when 4-20 mA output is selected)，24VDC	
Supply current	0.250 Amp	0.750 Amp

Specifications

	ACU10FCH Mass Flow Meter	ACU10FCH Mass Flow Controller
Range	Gas：0~(2SCCM...3000SLM) Liquid：0~(2SCCM...20SLM) Steam：0~(2SCCM...500SLM)	
Accuracy (under standard conditions after zeroing)	± 1% F.S.	
Repeatability	± 1% F.S.	
Zero Drift & Full Scale Drift	0.02% F.S./ °C/Atm	
ange adjustable ratio	100:1	50:1
Maximum measurable flow	100% F.S. (Controllable)	
Typical Response Time	200 ms(Adjustable)	
leakage rate	1×10^{-9} Pa m^3/S	

Model chart

ACU10FCH- | **L** | **C** | **M** | **N** | **020L** | **007** | **A1** | **B1** | **5** | **8** | **V** | **B**

Serial number

Model

L	Low
M	Middle
B	Big

Product type

C	Mass flow controller
M	Mass flow meter

Pressurization

M	1MPa

Display

N	Without display
X	With display

Ranges

002C	2 SCCM	Gas
005C	5 SCCM	
010C	100 SCCM	
...	...	
2000L	2000 SLM	
3000L	3000 SLM	
002C	2 SCCM	Liquid
005C	5 SCCM	
010C	10 SCCM	
...	...	
010L	10 SLM	
020L	20 SLM	
002C	2 SCCM	Steam
005C	5SCCM	
010C	10 SCCM	
...	...	
500L	500SLM	
000L	User Specified	

Measured medium

Code	See Media Reference Table for details

Input signal

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

Output signal

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

Power supply

5	±15VCD
4	24VDC

Communication

8	RS485
2	RS232

Sealing material

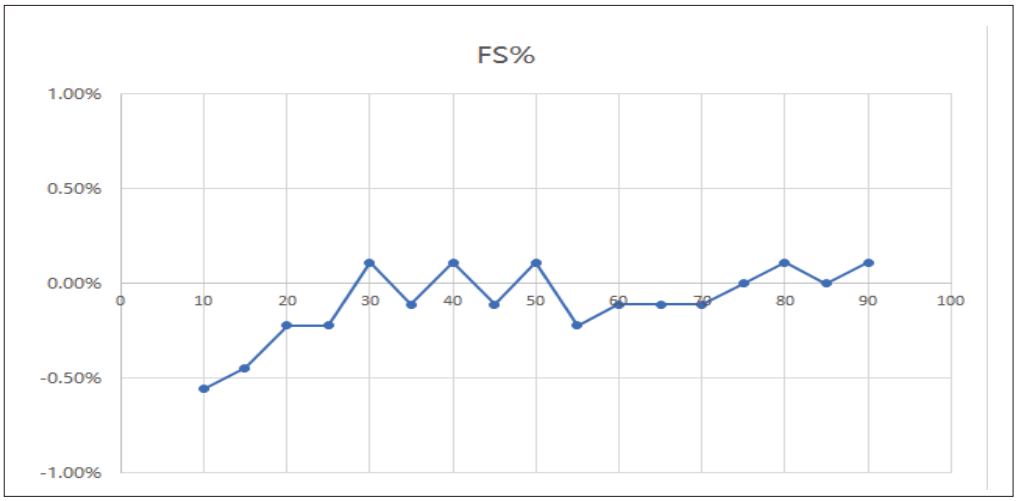
P	FFKM
V	Vilton
N	NBR
E	EPDM
Y	Others

Connectors

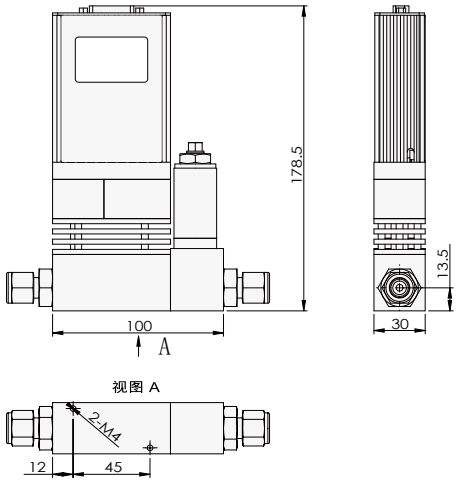
A	φ3
B	φ6
C	φ8
D	φ10
E	φ12
F	1/8″
G	1/4″
L	Flange connection
Y	others

Calibration data

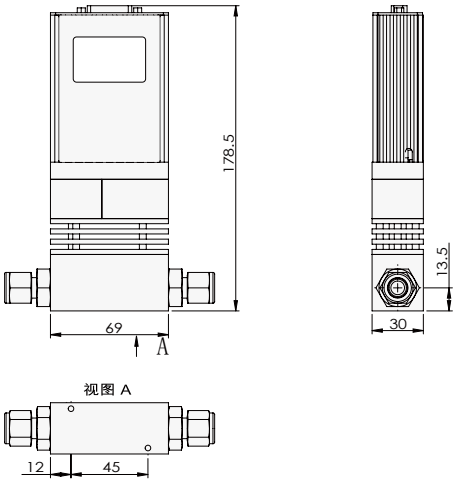
Qstd	Qv	FS%
10	9.5	-0.56%
15	14.6	-0.44%
20	19.8	-0.22%
25	24.8	-0.22%
30	30.1	0.11%
35	34.9	-0.11%
40	40.1	0.11%
45	44.9	-0.11%
50	50.1	0.11%
55	54.8	-0.22%
60	59.9	-0.11%
65	64.9	-0.11%
70	69.9	-0.11%
75	75	0.00%
80	80.1	0.11%
85	85	0.00%
90	90.1	0.11%



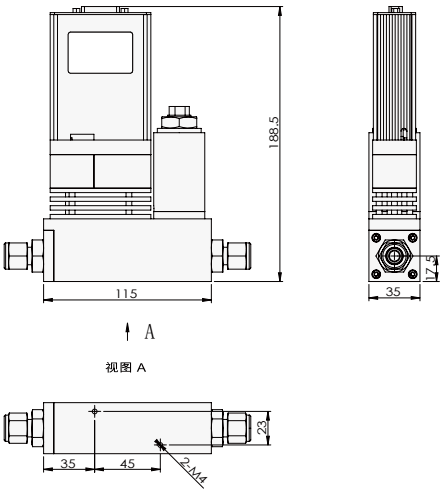
Dimensions (mm)



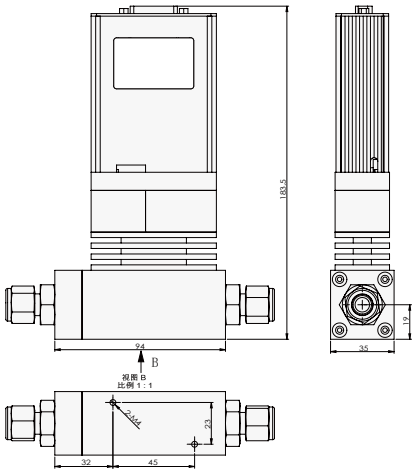
▲ACU10FCH-LC Mass Flow Meter（Uni-body）



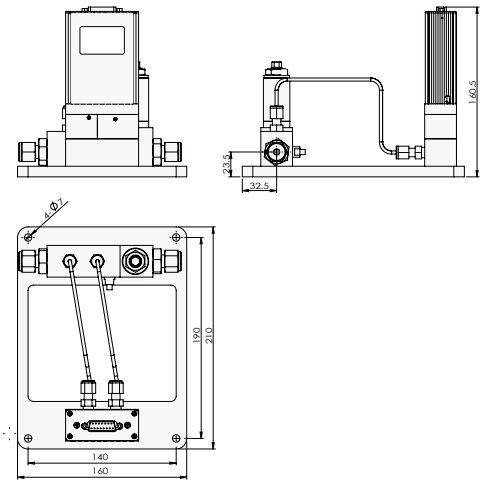
▲ACU10FCH-LM Mass Flow Controller（Uni-body）



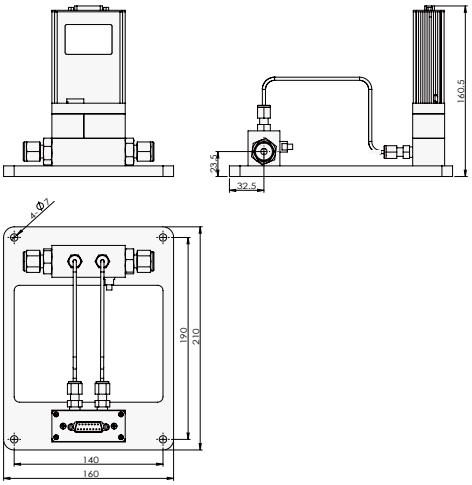
▲ACU10FCH-MC Mass Flow Meter（Uni-body）



▲ACU10FCH-MM Mass Flow Controller（Uni-body）

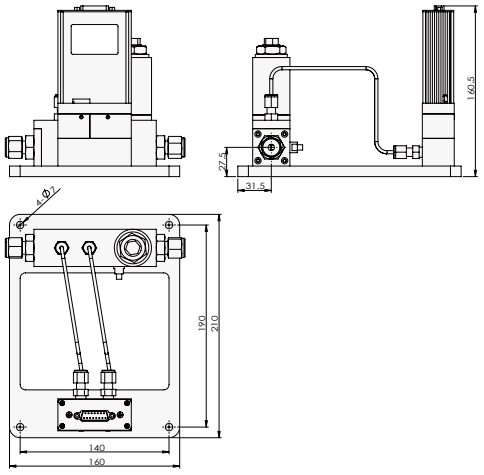


▲ACU10FCH-LC Mass Flow Meter（Split body ）

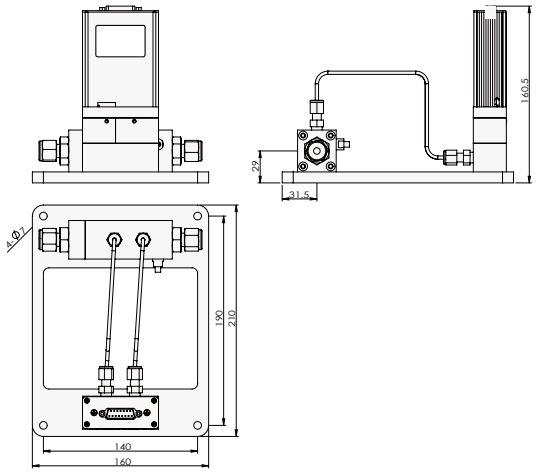


▲ACU10FCH-LM Mass Flow Controller（Split body ）

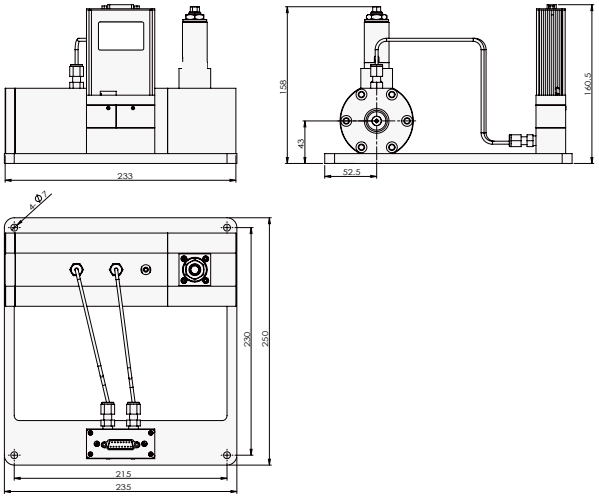
Dimensions (mm)



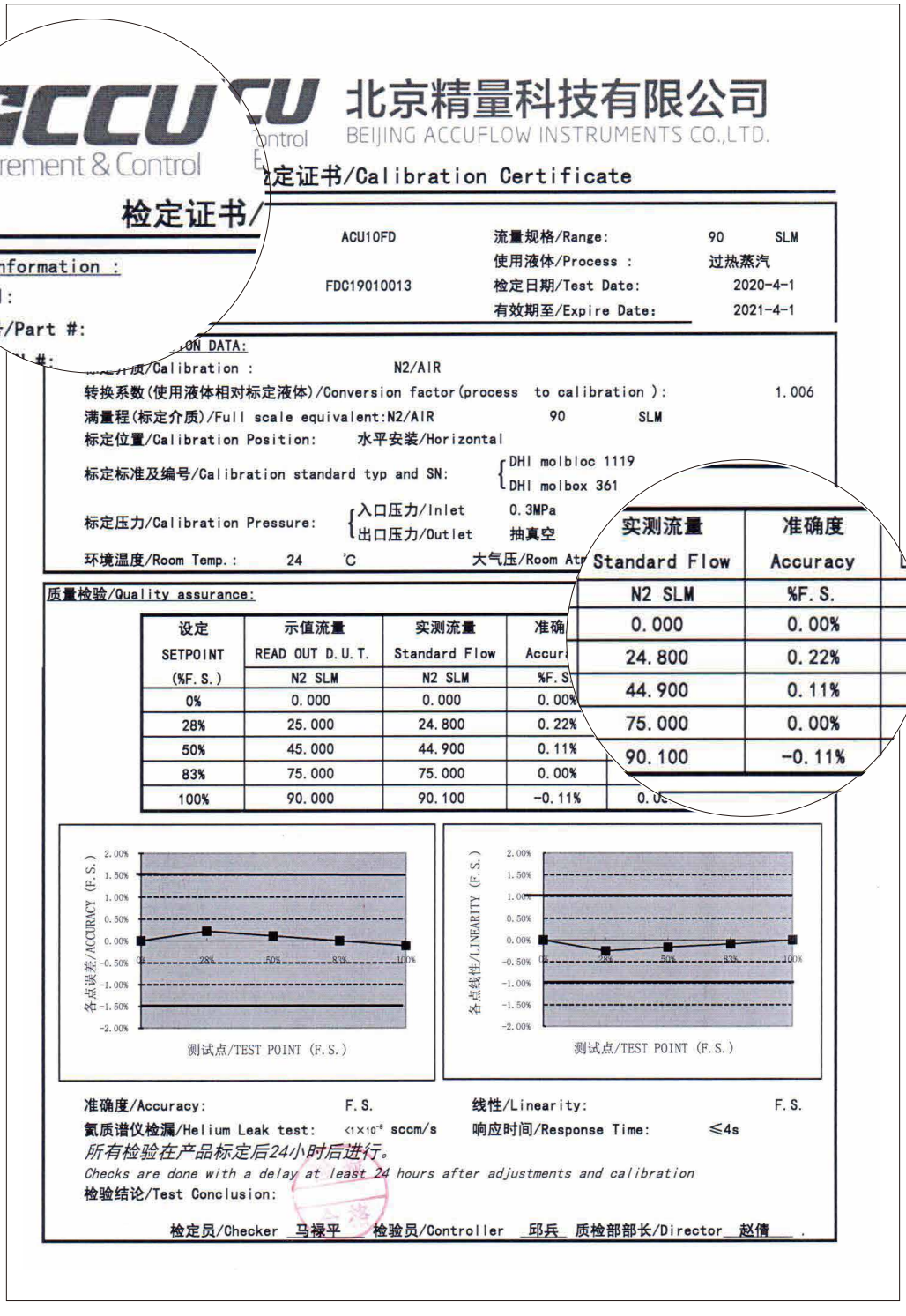
▲ACU10FCH-MC Mass Flow Meter（Split body）



▲ACU10FCH-MM Mass Flow Controller（Split body）



▲ACU10FCH-BC Mass Flow Meter（Split body）



北京精量科技有限公司
BEIJING ACCUFLOW INSTRUMENTS CO.,LTD.

检定证书/Calibration Certificate

	ACU10FD	流量规格/Range:	90 SLM
		使用液体/Process :	过热蒸汽
	FDC19010013	检定日期/Test Date:	2020-4-1
		有效期至/Expire Date:	2021-4-1

/DUT information :
/Model:
号/Part #:

ON DATA:
介质/Calibration : N2/AIR
转换系数(使用液体相对标定液体)/Conversion factor(process to calibration): 1.006
满量程(标定介质)/Full scale equivalent:N2/AIR 90 SLM
标定位置/Calibration Position: 水平安装/Horizontal
标定标准及编号/Calibration standard typ and SN: DHI molbloc 1119; DHI molbox 361
标定压力/Calibration Pressure: 入口压力/Inlet 0.3MPa; 出口压力/Outlet 抽真空
环境温度/Room Temp.: 24 ℃ 大气压/Room Atm

质量检验/Quality assurance:

设定 SETPOINT (%F.S.)	示值流量 READ OUT D.U.T. N2 SLM	实测流量 Standard Flow N2 SLM	准确 Accur %F.S
0%	0.000	0.000	0.00%
28%	25.000	24.800	0.22%
50%	45.000	44.900	0.11%
83%	75.000	75.000	0.00%
100%	90.000	90.100	-0.11%

实测流量 Standard Flow N2 SLM	准确度 Accuracy %F.S.
0.000	0.00%
24.800	0.22%
44.900	0.11%
75.000	0.00%
90.100	-0.11%

准确度/Accuracy: F.S. 线性/Linearity: F.S.
氦质谱仪检漏/Helium Leak test: <1×10⁻⁸ sccm/s 响应时间/Response Time: ≤4s
所有检验在产品标定后24小时后进行。
Checks are done with a delay at least 24 hours after adjustments and calibration
检验结论/Test Conclusion:

检定员/Checker 马禄平 检验员/Controller 邱兵 质检部部长/Director 赵倩