



**HORIBA METRON**

北京堀场汇博隆精密仪器有限公司



**Digital Mass Flow Controller**  
数字式气体质量流量控制器

# S48 300/HMT



\* 流量规格 Full-scale flow rate

(10,20,30,50,100,200,300,500)mL/min;  
(1,2,3,5,10,20,30,50)L/min



# S48 300/HMT 为数字式气体质量流量控制器，引进国外先进技术与精密元器件，提高了产品的准确度和响应时间，保证了产品的可靠性，降低了故障率。

S48 300/HMT is a digital mass flow controller which has introduced the advanced foreign technology and precision components. Thus it has improved its accuracy and response time and it can also ensure high reliability and low failure rate.

## S48 300/HMT数字式气体质量流量控制器产品特点

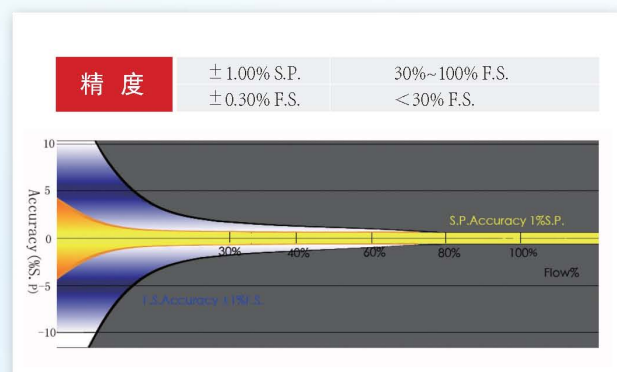
Characteristics of S48 300/HMT digital MFC

### ● 高精度

S48 300/HMT数字式气体质量流量控制器，通过先进的控制算法和补偿手段，实现了在控制范围内所有设定点的高精度实时流量控制，从而提高工艺与实验的水平。

#### High Accuracy

S48 300/HMT digital MFC achieves accurate real-time flow control and high set-point accuracy within the control range by means of advanced control algorithm and compensation technology. Thus the level and accuracy of users' progress and experiment is improved.

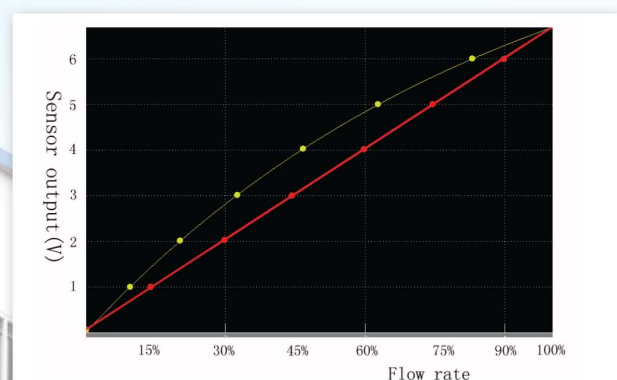


### ● 良好的线性

S48 300/HMT数字式气体质量流量控制器，与以往产品不同，采用了近似曲线特性的多项式 ( $y=ax^5+bx^4+cx^3+dx^2+ex+f$ ) 进行计算补偿，使流量控制精度更加精确，实现良好的量程比。

#### Fine Linearity

S48 300/HMT digital MFC, different from usual products, achieves high flow accuracy and fine turndown ratio by approximate curve polynomial ( $y=ax^5+bx^4+cx^3+dx^2+ex+f$ ) compensation.



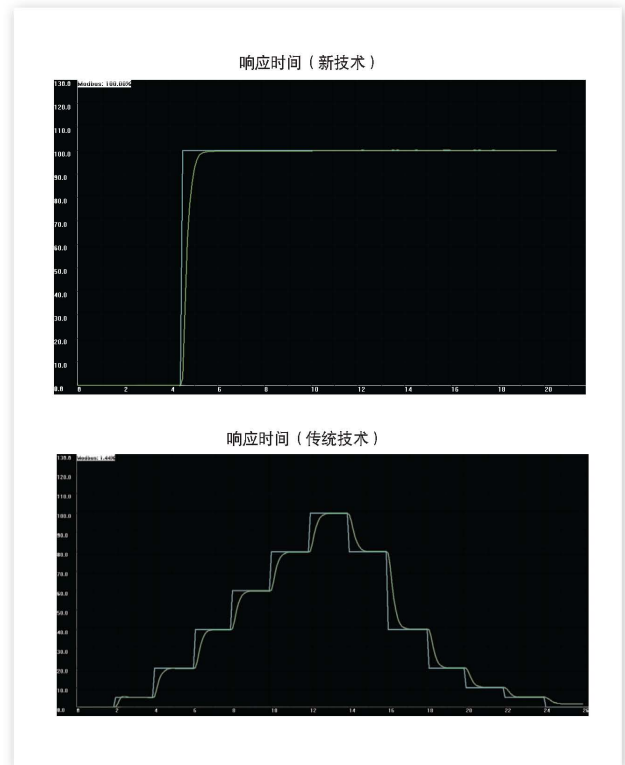
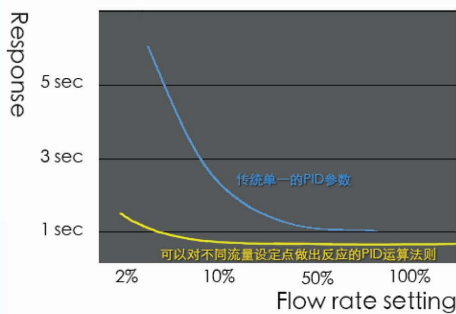
## ● 快速的响应

S48 300/HMT系列产品设置了一个新开发的“可变PID控制系统”，它可以对所有设定点实现1s的响应速度。可变PID可以根据不同的流量设定点进行不同的PID控制。

### Fast Response

A newly developed "Variable PID control system" is installed in S48 300/HMT which can reach the setpoint in 1s. Variable PID can constantly change depending on the flow setpoint.

\* 具备分段PID运算法则和不具备分段PID运算法则流量计的响应速度对比  
Response speed comparison (with segment PID algorithms and without segment PID algorithms)



## ● 对零点漂移有效的抑制

零点漂移无法避免，会影响到准确性。而S48 300/HMT采用先进技术，使零点漂移始终保持在0.06%F.S.(年漂移量)，提高了对目标气体的精密控制，减少误差、提高了产品质量。

### Low Zero Drift—effective suppression of the zero drift

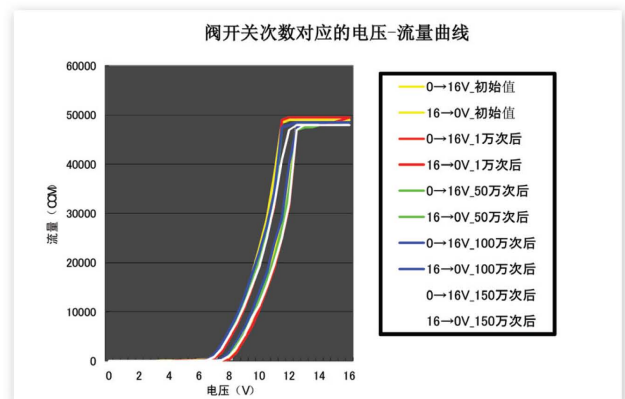
Zero drift affects the accuracy of the values, but it cannot be avoided. S48 300/HMT products have used advanced technology, so that the zero drift is always maintained at 0.06% F.S. (per year), improving the control precision of the target gas, reducing errors and improving the quality of products.

## ● 电磁阀使用寿命 $\geq 100$ 万次

S48 300/HMT产品的电磁比例阀通过耐久试验，可达到连续开启/关闭100万次以上，其电磁特性全部在规格范围内，充分确保了产品的耐久性和可靠性。

### The service life of solenoid valve $\geq 1,000,000$ times

The solenoid proportional valve of S48 300/HMT series has passed through the endurance test. It can be turned on/off more than 1,000,000 times repeatedly and all of the solenoid properties are within the specifications. It fully ensure the durability and reliability of the product.



## ● 全球化的零配件供应

——传感器、分流器、精密电阻等关键部件日本进口

引进分流器、精密电阻等部件，可以保证产品可靠性更高、极低的故障率。所采用的先进技术，使产品更加成熟、稳定。

### Global supply of spare parts

—— sensors, bypasses, precision resistors and other key components imported from Japan

To ensure high product reliability and low failure rate, we have introduced the bypasses, precision resistors and other components from Japan. Advanced technologies make our products more mature and stable.



## ● 通讯接口优势

1, 可直接和上位机连接进行控制,只需要用户提供  $\pm 15V$  直流供电, 无需A/D,D/A 转换卡。

2, RS232/485串口, Modbus (RTU) 开放协议。协议简单可靠, 兼容性强, 易于组网。配合上位机, 可进行各种复杂的计量、控制操作及组态。

### Advantages of Communication Interface

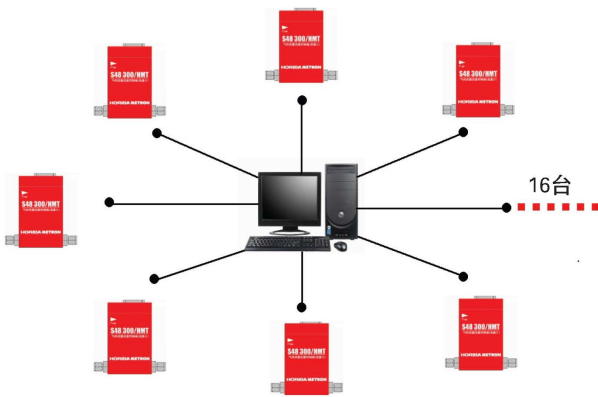
1. It can be directly controlled by the host computer. Users need to provide  $\pm 15VDC$  power supply only without a A / D or D / A converter.

2. RS232/485 Serial Ports Modbus (RTU) Open Protocol. The protocol is simple and reliable, compatible and easy networking. When connected with a host computer, it can conduct a variety of complex measurements, control operations and configuration.



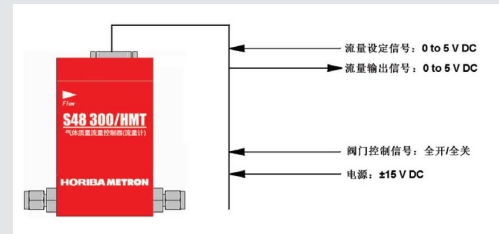
## ● 多台控制器可以同时运行

Multiple MFC can run at the same time



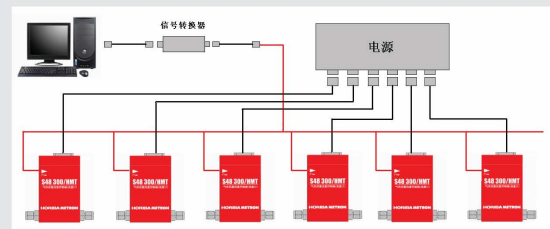
## ● 模拟信号通讯的连接示意

Connection schematic for analog signal communication



## ● 数字信号通讯的连接示意

Connection schematic for digital signal communication

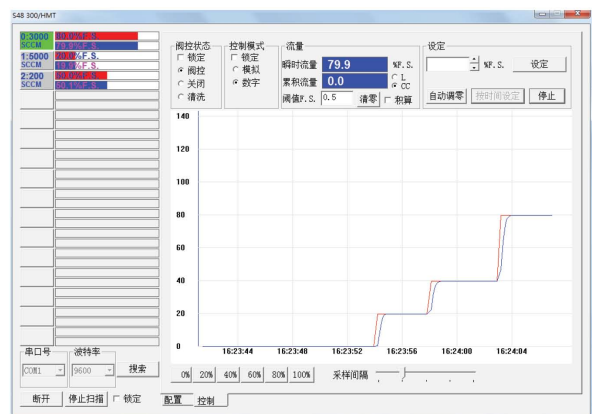


## S48 300/HMT 控制界面

### S48 300/HMT Software

1. 按时间设定功能能够同时控制多台控制器。
2. 能够观察多台控制器设定点流量曲线。
3. 能够记录多台控制器设定点流量数据到CSV格式文件。
4. 能够配置多台控制器的参数(设置自动调零、波特率等)。

1. Simultaneously control multiple MFC(the function of "Set By Time")
2. Observe the set point flow curve of multiple MFC
3. Record set point flow data of multiple MFC to CSV file
4. Configure parameters of multiple MFC (set automatic zero, the baud rate...)



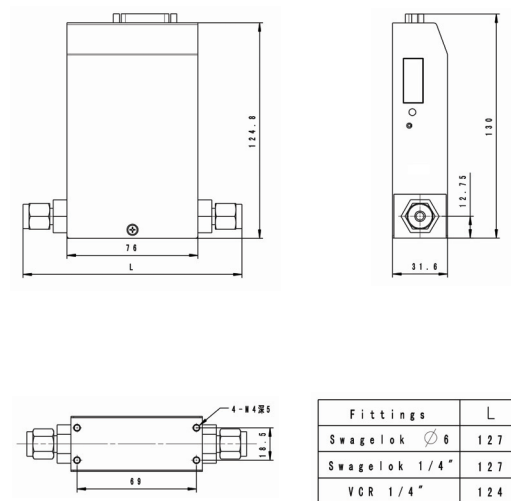
# S48 300/HMT数字式气体质量流量控制器技术指标和规格

## S48 300/HMT digital MFC technical specifications

编号number	项目item	S48 300/HMT
1	流量规格Full-scale flow rate	(10,20,30,50,100,200,300,500)mL/min; (1,2,3,5,10,20,30,50)L/min
2	调节阀类型Valve type	调节阀类型Valve type
3	调节阀静止状态Valve rest position	常闭Normally close
4	安装角度Mounting orientation	任意Free
5	流量控制范围Flow rate control range	2%~100%
6	准确度Accuracy	±1.0% S.P.(≥30% F.S.) ±0.30% F.S.( <30% F.S.)
7	线性Linearity	±0.5%F.S.
8	重复精度Repeatability	±0.2%F.S.
9	响应时间Response time	≤ 1 s
10	工作压差范围Differential pressure	(0.05~0.3)MPa(<10L/min); (0.1~0.3)MPa(10~30)L/min; (0.15~0.3)MPa (30~50)L/min
11	耐压Pressure resistance	3MPa
12	工作环境温度Operation temperature	5 C~45 C
13	精度保证温度 Accuracy guaranteed temperature range	15 C~35 C
14	接触气体材料 Wetted materials	316L,Viton <sup>®</sup> ,PTFE,或其他or other
15	漏率Leak integrity	<1×10 <sup>-8</sup> Pa·m <sup>3</sup> /s
16	接头Fittings	Swagelok: Φ6mm,1/4" VCR:1/4" 或其他or other
17	输入信号Input signal	数字Digital:RS485/RS232 模拟Analog:(0~+5.00)V
18	输出信号Output signal	数字Digital:RS485/RS232 模拟Analog:(0~+5.00)V
19	通讯接口Communication interface	数字Digital RS232/RS485 波特率Baud rate:4800/9600/19200Bps Modbus RTU协议从机Protocol slave 设备号可选范围Selectable range of the device number0~15
20	供电电源Power supply	±15V(±2%) (+15V,150mA;-15V,200mA)
21	重量Weight(kg)	0.9

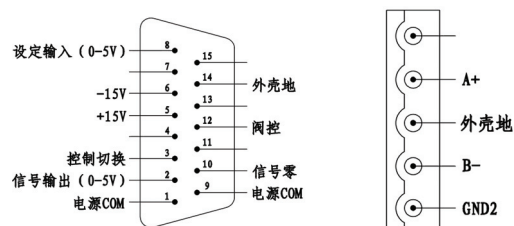
## S48 300/HMT数字式气体质量流量控制器产品尺寸

### S48 300/HMT digital MFC external dimentions



## S48 300/HMT数字式气体质量流量控制器管脚定义

### S48 300/HMT digital MFC Pin Assignment





北京堀场汇博隆精密仪器有限公司由全球顶级热式质量流量控制器制造商——HORIBA STEC、与中国知名热式质量流量控制器制造商——北京汇博隆仪器有限公司共同出资成立,是以研发、生产、销售热式质量流量控制器为主业的高新技术企业。

Beijing HORIBA METRON Instruments Co., Ltd is co-founded by the world's top mass flow controller manufacturer - HORIBA STEC, and Chinese well-known mass flow controller manufacturer - Beijing METRON Instrument Co., Ltd. Beijing HORIBA METRON is a high-tech enterprise based on R & D, production, marketing of thermal mass flow controller.

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