

# 5000 SERIES MASS FLOW MULTI-METER

THERMAL MASS FLOW METERS DESIGNED  
FOR GAS FLOW MEASUREMENT

TSI thermal mass flow meters incorporate a proprietary platinum film sensor design for measuring gas flows in applications demanding fast response, low pressure drop, and high accuracy over a wide flow range.

The 5000 Series incorporates bidirectional flow sensing, color touchscreen display, configurable tube end adapters, and companion PC software for all models.

Advanced models can integrate mass flow, absolute pressure, temperature, volume, differential pressure, and humidity measurements into a single device as well as provide options for higher flow accuracy, data logging, or humidity compensated flow measurements.



## Features and Benefits

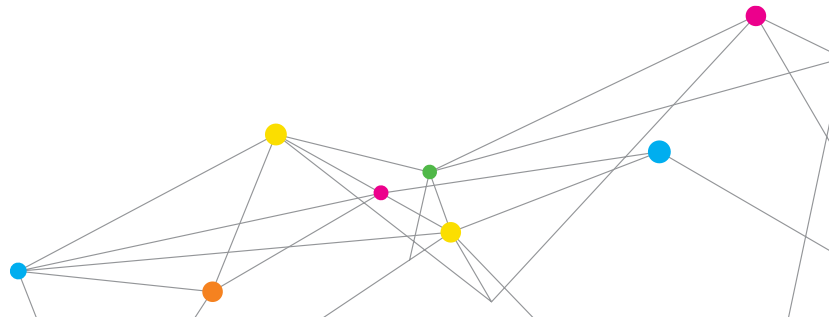
- + 4 millisecond bi-directional flow response
- + High accuracy ( $\pm 2\%$  of reading,  $\pm 1.7\%$  of reading optional)
- + Low pressure drop minimizes back pressure
- + Wide dynamic operating range (1000:1 turndown ratio)
- + Multiple gas calibrations available, user-selectable
- + Measure up to 6 parameters with a single instrument
- + Display four measurement parameters simultaneously
- + 2.8 inch color touchscreen operation
- + Configurable tube end connectors
- + Data logging options
- + USB power and data communications
- + 10 Point NIST-traceable Calibration Certificate included
- + Temperature and pressure compensated, optional humidity compensation
- + Comes with basic FLO-Sight™ PC software

## Applications

- + Researchers, engineers, designers, and scientists use TSI Gas Flow Meters in a variety of applications such as:
  - Product Development
  - Manufacturing
  - Quality Assurance
  - Research
  - Metrology
  - Field Service



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## 5300 Series High Flow

### Flow Measurement

Gas Calibrations Air, O<sub>2</sub>, CO<sub>2</sub>, N<sub>2</sub> (user selectable)

Range 0 to ±300 Std L/min  
0 to ±100 Std L/min (CO<sub>2</sub>)

Accuracy (by model number)  
5300, 5310, 2% of reading or 0.05 L/min, whichever is greater  
5320 0.05 L/min, whichever is greater  
5330 1.7% of reading or 0.05 L/min for forward flows, 2% of reading or 0.05 L/min for reverse flows  
5303 3% of reading or 0.1 L/min, whichever is greater  
(See notes 1 through 6 on back page)

Response 4 ms to 63% of full scale

Units L/min or ft<sup>3</sup>/min (Standard, Volumetric, Actual, or Remote)

### Volume Measurement

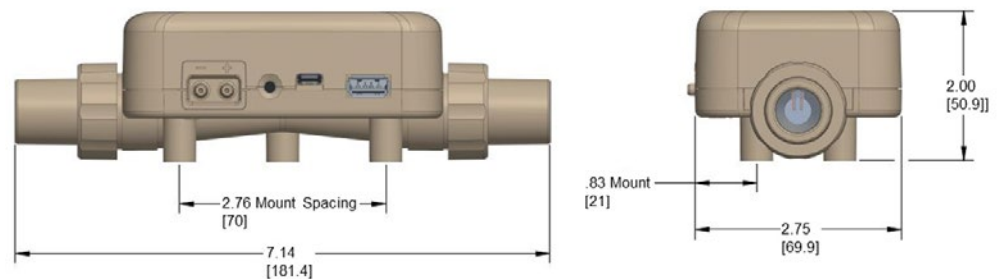
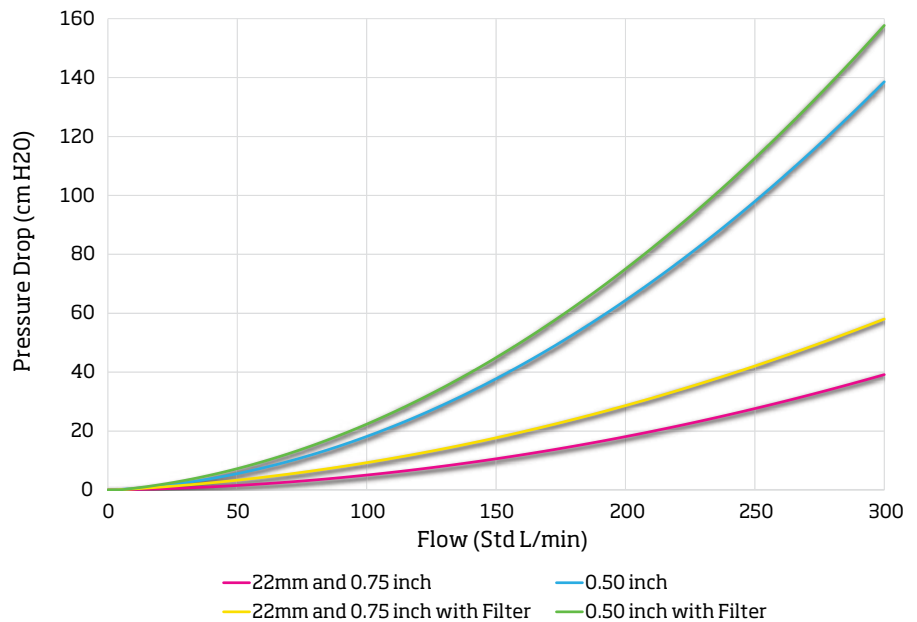
Range 0.004 to 99 L

Accuracy 2% of reading or 1 mL, whichever is greater, at peak flows greater than 2.5 Std L/min  
(See notes 1 through 6 on back page)

Units L, mL, ft<sup>3</sup>

The 5300 Series is TSI's high flow thermal mass flow meter. The 5300 Series provides the ability to measure high flows with an ultra low pressure drop, measuring up to 300 l/min while minimizing flow back pressures and their impact on your system. These flow meters also have a lightweight, compact form factor when compared to other instruments that measure at similar flow rates. The 5300 Series is designed as a general purpose flow meter and is optimized for applications within the respiratory equipment market.

5300 Series Pressure Drop



Mounting threads: M3



The 5200 Series is TSI's low flow thermal mass flow meter. These flow meters provide increased resolution and accuracy at flow rates under 1 L/min. The 5200 Series flow body is designed with a reduced internal volume to minimize circuit dead space and provide highly accurate volume measurements. Low flow meters from TSI are used as a flow reference for the calibration of sampling instrumentation as well as many other low flow applications.

## 5200 Series Low Flow

### Flow Measurement

Gas Air, O<sub>2</sub>, CO<sub>2</sub>, N<sub>2</sub>  
 Calibrations (user selectable)

Range 0 to ±30 Std L/min

Accuracy (by model number)  
 5200, 5210, 5220 2% of reading or 0.005 L/min, whichever is greater  
 5230 1.7% of reading or 0.005 L/min for forward flows, 2% of reading or 0.05 L/min for reverse flows  
 5203 3% of reading or 0.01 L/min, whichever is greater  
 (See notes 1 through 6 on back page)

Response 4 ms to 63% of full scale

Units L/min or ft<sup>3</sup>/min  
 (Standard, Volumetric, Actual, or Remote)

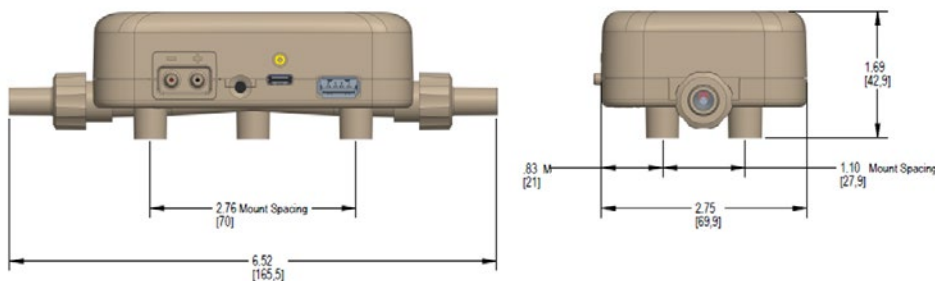
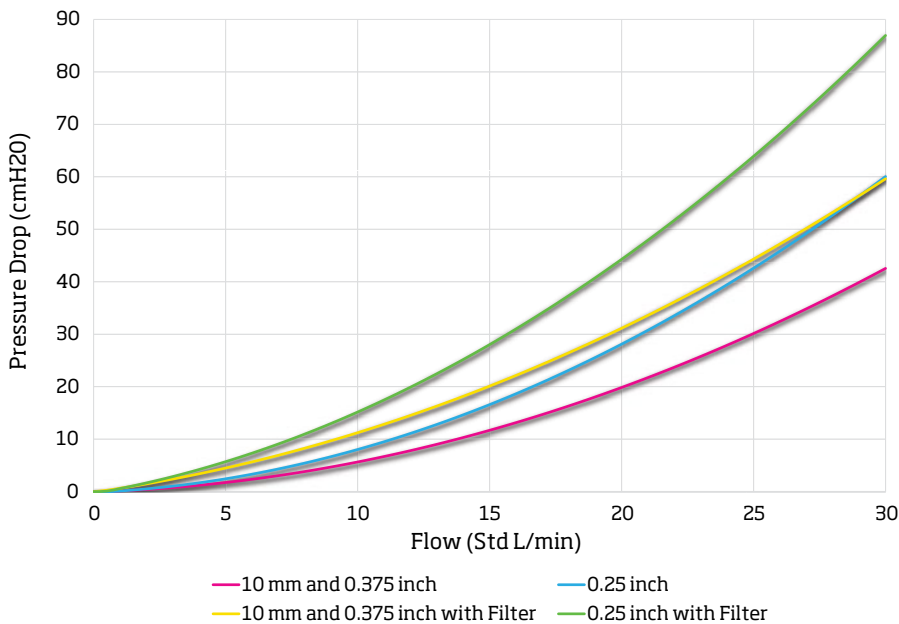
### Volume Measurement

Range 0.002 to 99 L

Accuracy 2% of reading or 1 mL, whichever is greater, at peak flows greater than 0.25 Std L/min  
 (See notes 1 through 6 on back page)

Units L, mL, ft<sup>3</sup>

5200 Series Pressure Drop



Mounting threads: M3

# SPECIFICATIONS

## 5000 SERIES FLOW MULTI-METER

### Temperature Measurement

Range	-10 to 50°C
Accuracy	±1°C at flows > 1 Std L/min (in forward direction only)
Response	<= 75 ms to 63% of final value for step change
Units	°C, °F

### Absolute Pressure Measurement

Range	50 to 200 kPa
Accuracy	±1 kPa
Response	<= 4 ms to 63% of final value for step change
Units	Pa, hPa, kPa, mbar, PSI, mmHG, cmH <sub>2</sub> O, inH <sub>2</sub> O

### Low Differential /Breathing Circuit Pressure Measurement

Range	±150 cmH <sub>2</sub> O
Accuracy	±0.5% of reading or 0.15 cmH <sub>2</sub> O, whichever is greater
Response	<= 4 ms to 63% of final value for step change
Units	Pa, hPa, kPa, mbar, PSI, mmHG, cmH <sub>2</sub> O, inH <sub>2</sub> O

### Relative Humidity Measurement

Range	10-90% RH
Accuracy	±3% of RH
Response	<= 3 seconds to 63% of final value for step change
Units	% RH, Dew Point (°C, °F)

### Totalizer Measurement

Range	0.05 to 400,000 L
Accuracy	±5% of reading
Units	L, mL, ft <sup>3</sup>

### Instrument Temperature Range

Operation	-10 to 50°C (ambient)
Storage	-20 to 70°C (ambient)

### Instrument Pressure Range

Operation	50 to 200 kPa
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### Power

Supplied through USB-C port  
5.0 VDC ±5%, 500 mA maximum

### Burst Pressure

Tested to 690 kPa without rupture. DO NOT exceed 690 kPa.

### Digital Output

USB, RS-232 Serial using an optional USB-A to RS232 converter cable

### Display

2.8 inch Color LCD Touchscreen

### Internal Storage

1 GB storage, max 20 datalog files

### Physical Dimensions

Weight	230 grams including protective end caps
Material	Polycarbonate (Flow body)

### NOTES

- Flow accuracy stated between 15 and 25 °C and 101.3 kPa.
  - + Add an additional 0.085% of reading per 1°C away from the base operating range of 15 to 25 °C.
  - + Add an additional 0.01% of reading per 1 kPa above 101.3 kPa or
  - + Add an additional 0.02% of reading per 1 kPa below 101.3 kPa when operating within the pressure range of 50 kPa to 200 kPa.
- Flow accuracy stated with gas temperature and flow body temperature within ±10°C of one another.
- Flow accuracy stated measuring dry gas (less than 10% R.H.). Add an additional ±0.01% of reading per 10% of RH away from 0% for models without humidity compensation.
- Abrupt changes from high to low reverse flow may require additional stabilization time to achieve full accuracy. Please contact TSI for more information.
- Includes ±0.5% of reading repeatability.
- Volumetric flow rate is calculated from the mass flow measurement. Add an additional 0.25% of reading to the flow accuracy to account for the uncertainty in measuring gas temperature and pressure.

Specifications subject to change without notice.

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