MASS FLOWMETERS
FOR GASES

UNDERSTANDING, ACCELERATED

1.800.561.8187 www.itm.com information@itm.com

MEASURE FLOW, PRESSURE, AND TEMPERATURE... ALL IN ONE INSTRUMENT!

Designed for Performance

TSI thermal mass flowmeters incorporate a proprietary platinum film sensor design for measuring gas flows in applications demanding fast response and high accuracy over a wide flow range. TSI flowmeters have turn-down ratios greater than 1000:1 due to our thermal flow sensing technology and extensive gas calibration process. The TSI 4000 Series was designed for ultra-low pressure loss to minimize any undesirable effects the flowmeter can have on the readings when installed in-circuit.

Industries

+ Medical
  - Ventilators
  - Anesthesia
  - CPAP
+ Environmental
+ Analytical
+ Aerosol Science

Applications

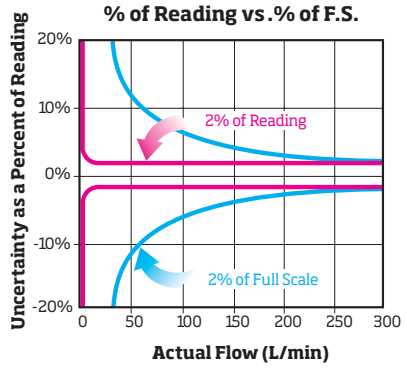
+ Product Development
+ Manufacturing
+ Research
+ Field Service
+ Quality Assurance

Features

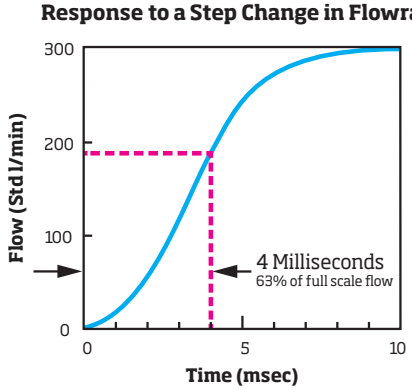
+ 4 millisecond flow response
+ High accuracy ±2% of reading
+ High turndown ratio
+ Low pressure drop
+ Convenient analog output of flow rate
+ Versatile digital output of flow rate, volume, pressure, temperature
+ Built-in temperature and pressure compensation
+ NIST-traceable calibration certificate included at no additional cost

RS232 Interface For Digital Outputs and Configurable Device Options

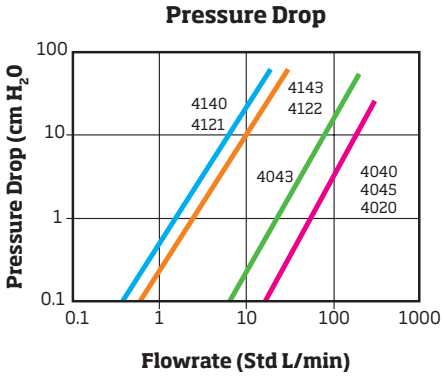
+ Set analog output zero and scaling
+ Specify start/stop trigger levels for volume measurement
+ Set update rate for LCD display
+ Set sampling rate for analog and digital outputs
+ Select gas calibration
+ Select either standard or volumetric flow measurement
+ Set display units for Model 4140/4143 to L/min or cm³/min
+ Compute volume



Accurate
A flowmeter specified as ±2% of full scale is most accurate at full scale. If full scale is 300 L/min, then the uncertainty for all readings is ±6 L/min. TSI flowmeters are specified as ±2% of reading and have an uncertainty of ±2% of the actual reading from full scale all the way down to a specified lower limit. TSI flowmeters, therefore, provide dependable accuracy over a wide range of flow rates. One TSI flowmeter covers the same range as three or more "percent of full scale" devices...with better accuracy at all points!



Fast
Fast 4 millisecond response ensures accuracy in fluctuating flows. This fast response is ideal for closed-loop control systems and integrated volume measurements. Pressure and temperature measurements are also extremely fast.



Low Pressure Drop
Low pressure drop minimizes flow circuit back pressure and its impact on the system under test.

SPECIFICATIONS – DIGITAL DISPLAY MODELS

		Low Flow - 4140 Series					High Flow - 4040 Series		
Model		4140	41401	41403	4143	41433	4040	4043	4045
Gas Calibration		Air, O_2, N_2	Air	Air, O_2, N_2, N_2O	Air, O_2, N_2	Air, O_2, N_2, N_2O	Air, O_2, N_2, Air/O_2 Mixture		
Inlet/Outlet Diameter		0.25" (6.4 mm)			0.375" (9.53 mm)		22 mm ISO tapered	0.50" (12.7 mm)	0.75" (19.1 mm)
Flow Measurement	Range	0.01-20 Std L/min					0-300 Std L/min	0-200 Std L/min	0-300 Std L/min
	Accuracy – Air and O_2	±2% of reading or 0.005 Std L/min, whichever is greater	N/A	±2% of reading or 0.005 Std L/min, whichever is greater			±2% of reading or 0.05 Std L/min, whichever is greater		
	Accuracy – N_2	±3% of reading or 0.010 Std L/min, whichever is greater					±3% of reading or 0.1 Std L/min, whichever is greater		
	Accuracy – Air and O_2 mixture	N/A					±3% of reading or 0.1 Std L/min, whichever is greater		
	Accuracy – N_2O	N/A	N/A	±3% of reading or 0.010 Std L/min, whichever is greater	N/A	±3% of reading or 0.010 Std L/min, whichever is greater	N/A		
	Response	4 ms to 63% of full scale flow					4 ms to 63% of full scale flow		
LCD Display Units		L/min, Std L/min, cm^3/min, Std cm^3/min					L/min, Std L/min		
Overall Dimensions		5" x 2" x 1.25" (127 mm x 49 mm x 32 mm)					7.2" x 2.5" x 2.1" (182 x 63 x 53 mm)		
Volume* Measurement	Range	0.01 - 99.9 liters					0.01 - 99.9 liters		
	Accuracy	±2% of reading (see Operator's Manual for additional details)					±2% of reading (see Operator's Manual for additional details)		
Pressure Measurement	Range	50-199 kPa absolute					50-199 kPa absolute		
	Accuracy	±1 kPa					±1 kPa		
	Response	<4 ms to 63% of final value for step charge					<4 ms to 63% of final value for step charge		
Temperature Measurement	Range	0-50°C					0-50°C		
	Accuracy	±1°C at flow greater than 1 Std L/min					±1°C at flow greater than 1 Std L/min		
	Response	<75 ms to 63% of final value for step change					<75 ms to 63% of final value for step change		
Outputs	Analog	0-10 VDC flow only, zero and span adjustable via RS232					0-10 VDC flow only, zero and span adjustable via RS232		
	Digital	RS232					RS232		
DC Power Input		7.5 VDC ±1.5 V, 300 mA max					7.5 VDC ±1.5 V, 300 mA max		

ACCESSORIES

Shown with optional Carrying Case

Shown with Optional Battery Pack/Stand

Accessories	Description	TSI Part Number
Supplied	Power Supply	P/N 8918-NA (North America)
		P/N 8918-EC (Continental Europe)
		P/N 8918-GB (United Kingdom)
		P/N 8918-AT (Australia)
	Computer Cable (mini-DIN to 9-Pin D-Sub)	P/N 1303583
	Analog Cable (mini-Din to tinned-wire)	P/N 1303584
	RS232 Serial Command Set Manual	P/N 1980340
	Operator's Manual	P/N 1980339 (404x Series)
		P/N 1980383 (414x Series)
	Calibration Certificate	No P/N assigned
	Inlet Filter	P/N 1602292 [Model 4040 (22mm ISO-Taper)]
		P/N 1602300 [Models 4043, 4045 (0.375" FNPT, HEPA)]
		P/N 1602317 [Models 4140, 41403 (0.25" tube, 6mm)]
		P/N 1602342 [Models 4143, 41433 (0.375" tube, 9mm)]
Optional	Battery Pack/Stand for all Models	P/N 4199 (includes six AA-size batteries)
	Hard-side Carrying Case	P/N 1319176 (404x Series)
		P/N 1319201 (414x Series)
	Filter, Low Pressure Drop, 0.375" FNPT, HEPA Grade	P/N 1602345 (Models 4043, 4045)

*Supplied through RS232 port only.
Specifications subject to change without notice.
See Operator's Manual for full listing.

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