

Thermal Flow Averaging Tubes

Patent Pending

EPI's new thermal Flow Averaging Tubes (FAT™) provide accurate flow measurement in large pipes and ducts, offering a cost-effective solution for Heating, Ventilation, and Air Conditioning (HVAC) and Variable Air Volume (VAV) applications. The Master-Touch FAT™ probes utilize a flow averaging tube to give a stable flow signal in applications where the flow profile is less than ideal, such as downstream of a bend, valve, tee or obstruction.

Technology

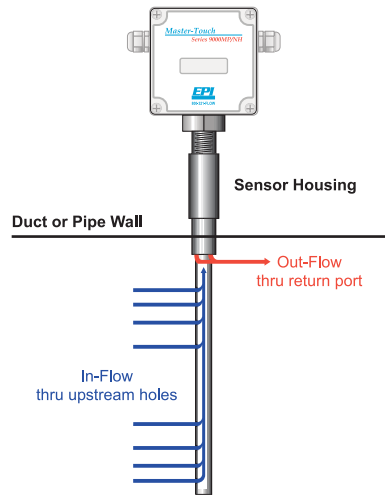
The flow averaging tube has a number of large diameter (0.125") inlet ports along the length of the upstream impact surface.



The impact pressure at each inlet port is averaged inside the tube to create the axial flow through the tube and across our thermal flow sensor. The gas flow then passes back into the main flow stream through the gas return ports located near the flow sensing elements.



Because the velocity impact pressure follows a square root function, the average velocity pressure in



the FAT™ probe may vary slightly from the average of the velocities at each inlet port. Accuracy shifts due to anomalies in the actual flow profile or installations in non-circular ducts may be corrected with a local C-Factor adjustment.

Configurations

As with our other product lines, the MP Series Flow Averaging Tubes have an explosion-proof enclosure mounted on the probe assembly. The MPNH Series Flow Averaging Tubes are intended for use in Ordinary, or non-hazardous, area locations and have ABS plastic enclosures mounted on the probe assembly. Series 9200MP and 9200MPNH instruments have the

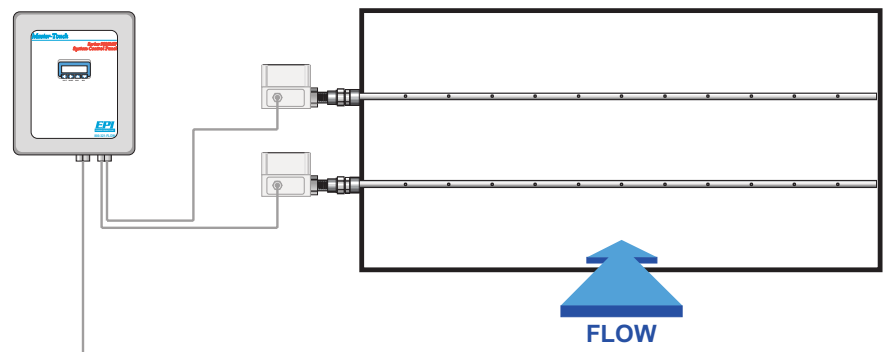
flow transmitter enclosure mounted on the probe assembly, with the signal processor electronics remotely mounted in a separate enclosure. The Series 9800MP and 9800MPNH instruments have all electronics mounted on the probe assembly.

The connections for input power and output signals for the Series 9200MP and 9200MPNH are located in the remote electronics. This configuration uses only a two-wire connection between the flow transmitter and the signal processor. All input and output connections for the Series 9800MP and 9800MPNH are accessed in the integral electronics enclosure.

The installation of the tubes in the pipe or duct typically uses tube to pipe compression fittings. Multiple tubes can be used with a Model 9601MP System Control Panel for an averaged output.



9601MP System Control Panel





EPI's new thermal Flow Averaging Tubes (FAT™) are now adapted to inline applications for installations with extremely short straight runs such as retrofits for existing facilities or as replacements for other metering devices.

Installation

By itself, EPI's Flow Averaging Tube technology significantly reduces the traditional requirements for straight, unobstructed upstream piping. Depending upon the piping configuration, the traditionally required upstream straight run can be 10, 20, even 50 diameters. By measuring the cumulative flow velocities across one or more inside diameters, the Flow Averaging Tubes are far more tolerant of flow profile problems than other instrument technologies. This allows the required straight run to be greatly reduced. And, when coupled with our Flow Straightening Plates, the upstream requirement can be reduced to as little as three diameters.

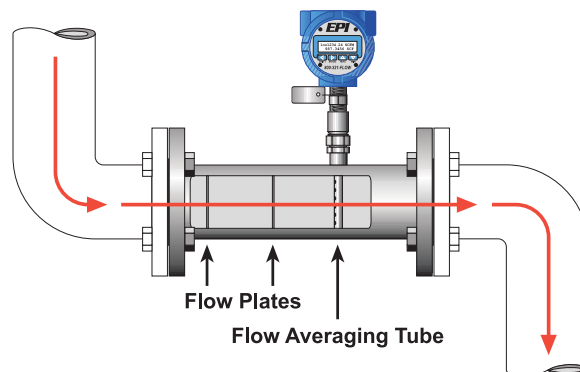


Series 9100MP-9100MPNH

The Series 9100MP flow averaging tubes have an explosion-proof flow transmitter mounted on the flow section and the signal processor electronics remotely mounted in a separate, NEMA 4X enclosure. The Series 9100MPNH flow averaging tubes have a NEMA 4X flow transmitter mounted on the flow section and the signal processor electronics remotely mounted in a separate, NEMA 4X enclosure. Input power for both series is supplied to the remote electronics. This configuration uses only a two-wire connection between the flow transmitter and the signal processor. The flow sections have flow straightening screens as standard. Flow sections include ANSI 150# flanges as standard. For other mounting options, please consult the factory.

Series 9700MP-9700MPNH

The Series 9700MP flow averaging tubes have all electronics mounted on the flow section in an explosion-proof enclosure. The Series 9700MPNH flow averaging tubes have all electronics mounted on the flow section in a NEMA 4X enclosure. Input power for both series is supplied to the remote electronics. This configuration uses only a two-wire connection between the flow transmitter and the signal processor. The flow sections have flow straightening screens as standard. Flow sections include ANSI 150# flanges as standard. For other mounting options, please consult the factory.

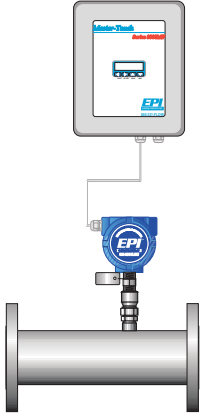


Thermal Flow Averaging Tubes

continued

Patent Pending

Series 9100MP



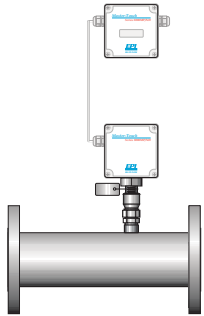
Series 9200MP



Specifications

Linear signal output	0-5 VDC & 4-20 mA
Relay Output	Two 1-amp, user-selectable alarms
Signal Interface	RS232 & RS485
Accuracy, including linearity (Ref.: 21°C) with ideal flow profile	±[1% of Reading + (0.5% + .02%/°C of Full Scale)]
Repeatability	±0.2% of Full Scale
Sensor response time	1 second (time constant per step change)
Turn down ratio	1000:1 minimum (but not less than 50 SFPM)
Electronics temperature range	0°-50°C (32°-122°F); extended temperature optional
Gas temperature range	-40°-66°C (-40°-150°F); extended range available, consult factory
Gas pressure effect	Negligible over ± 10% of absolute calibration pressure
Pressure rating maximum	Ambient to 150 PSIG standard; higher pressures, consult factory
Input power requirement	24VDC @ 250mA 115 VAC 50/60 Hz optional 230 VAC 50/60 Hz optional
Flow Transmitter power requirements	5 watts or less
Wetted materials	316 Stainless Steel
Standard temperature & pressure (STP)	70°F & 29.92" Hg (Air .075 lb./cubic foot)
NIST traceable calibration	Standard

Series 9100MPNH



Series 9200MPNH



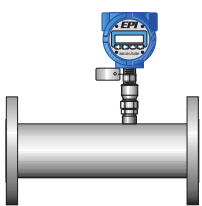
MP Series:
Class I Division 1 Groups B, C and D; Class II E, F and G; Class III; Type 4X, 7; Ex d IIC; AEx d IIC, IP66; EEx d IIC, IP66; T2 (consult factory for T3 or T4).

Certified to US requirements; Certified to Canadian requirements 

Certified to European ATEX requirements   KEMA 04 ATEX 2276

Remote Enclosure (Series 8000MP- 8200MP) and MPNH Series for use in Ordinary (Non-Hazardous) area locations: Type 4X, IP66

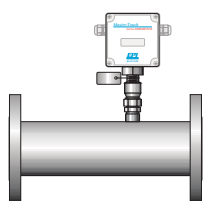
Series 9700MP



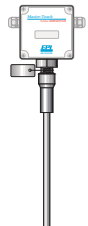
Series 9800MP



Series 9700MPNH



Series 9800MPNH



Series 9100MP			Series 9100MPNH		
Model	Pipe OD" x L"	Max SCFM	Model	Pipe OD" x L"	Max SCFM
9116MP-SSS-133	2 x 14	1400	9116MPNH-SSS-133	2 x 14	1400
9120MP-SSS-133	2½ x 14	2000	9120MPNH-SSS-133	2½ x 14	2000
9124MP-SSS-133	3 x 14	3000	9124MPNH-SSS-133	3 x 14	3000
9132MP-SSS-133	4 x 14	5400	9132MPNH-SSS-133	4 x 14	5400
9148MP-SSS-133	6 x 14	12000	9148MPNH-SSS-133	6 x 14	12000
Series 9200MP			Series 9200MPNH		
Model	Probe OD"	Max L"	Model	Probe OD"	Max L"
9240MP-SSS-133	1/2	36	9240MPNH-SSS-133	1/2	36
9260MP-SSS-133	3/4	60	9260MPNH-SSS-133	3/4	60
9280MP-SSS-133	1	84	9280MPNH-SSS-133	1	84
Series 9700MP			Series 9700MPNH		
Model	Pipe OD" x L"	Max SCFM	Model	Pipe OD" x L"	Max SCFM
9716MP-SSS-133	2 x 14	1400	9716MPNH-SSS-133	2 x 14	1400
9720MP-SSS-133	2½ x 14	2000	9720MPNH-SSS-133	2½ x 14	2000
9724MP-SSS-133	3 x 14	3000	9724MPNH-SSS-133	3 x 14	3000
9732MP-SSS-133	4 x 14	5400	9732MPNH-SSS-133	4 x 14	5400
9748MP-SSS-133	6 x 14	12000	9748MPNH-SSS-133	6 x 14	12000
Series 9800MP			Series 9800MPNH		
Model	Probe OD"	Max L"	Model	Probe OD"	Max L"
9840MP-SSS-133	1/2	36	9840MPNH-SSS-133	1/2	36
9860MP-SSS-133	3/4	60	9860MPNH-SSS-133	3/4	60
9880MP-SSS-133	1	84	9880MPNH-SSS-133	1	84