

**wwwOverview**

MaxiFlo™ MST series Thermal Mass Flow Meter is the instrument of choice for reliable and accurate measurement of mass flows for various gases. It measures the mass flow of gas based on constant temperature differential technology and is able to measure gas flow in the range between 0 and 250 NMPS.

Because neither temperature nor pressure measurement is required, MST series reduces installation cost and vastly improves system accuracy.

The meter is easily installed or retrofitted with minimum downtime and provides superior, long-term process producibility and easy serviceability.

MST series can have either inline sensor or insertion sensor. The inline sensor size ranges from 1/4" (8mm) to 6" (150mm) with either NPT thread connection or flange connection. The insertion sensors are available from 2" (50 mm) and above with the sensor mounting option of either compression fitting or flange fitting.

The indicator/transmitter provides a 4-20 mA linear output signal and optionally an RS485/232 serial interface, Fieldbus, etc. And for models with totalizer function, the pulse output is also available.

**Main Features**

- Can measure gas/air flow without pressure or temperature compensation
- It can measure mass flow and also volume flow.
- No moving parts
- High accuracy of  $\pm 1.0\%$  of reading
- Wide turndown ratio of 100:1
- Field-programming capability available
- SUS 316 stainless steel material for sensor body and sensing elements
- Lightning protection

**Measuring Principle**

MST series Thermal Mass Flow Meter utilizes a constant temperature differential (dT) technology. The sensor has two elements. The reference RTD measures the gas temperature. The electronics heats the heated element above the gas temperature. It is the job of the electronics to maintain a constant dT between the gas temperature and the heated element. As the mass flow increases, the increased number of gas molecules removes more heat from the heated element. The electronics senses this temperature reduction and adds additional power in order to maintain a constant dT. The amount of power delivered to the heated element, therefore, is just proportional to the mass flow rate.

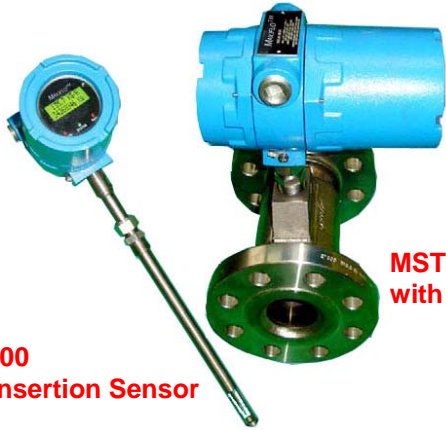
100% Customer Satisfaction

**MAXIFLO****Thermal Mass Flowmeter (Series MST)**

THERMAL MASS FLOWMETER

## INDICATORS AND SENSORS

MST Series Thermal Mass Flowmeter



**MST100  
with Inline Sensor**

**MST100  
with Insertion Sensor**



**MST200  
with Insertion Sensor**



**MST210  
with Insertion Sensor**



**MST250  
with Insertion Sensor**



**MST300**

### Indicator/Transmitter Models

Model	Description
<b>MST100</b>	Field-Programmable, Ex-Proof, Graphic Backlight LCD Indicator with Totalizer
<b>MST200</b>	Field-Programmable, Weather-Proof, Graphic Backlight LCD Indicator with Totalizer
<b>MST210</b>	Low-cost, Weather-Proof, FND Indicator with Totalizer
<b>MST250</b>	Low-cost, Weather-Proof, FND Indicator without Totalizer
<b>MST300</b>	Multi-Point Averaging Thermal Mass Flowmeter for CEMS (Continuous Emission Monitoring Systems)

The above model distinctions are based mainly on the configuration and capability of the indicator/converter. Except for MST-300, the same sensors whether inline (with threaded connection or with flanged connection) or insertion type can be used for any model.

The indicator/transmitter can be mounted integrated with the sensor or mounted separately by option.

### Sensors

Division	Description	
	Connection /Fitting	Pipe Size
<b>Inline</b>	NPT Thread	1/4" ~ 6" (8mm ~ 150mm)
	Flange	
<b>Insertion</b>	Compression Fitting	2" (50mm) or larger
	Flange Fitting	

For insertion type sensors, mounting accessories (such as compression fitting and flange fitting) are supplied upon request.

## SPECIFICATIONS

## Technical Specifications (MST-100, MST-200, MST-210, MST-250)

	MST-100	MST-200	MST-210	MST-250
<b>Model Denominator</b>	Ex-Proof, Graphic Backlight LCD Indicator with Totalizer Field Programmable	Weather-Proof, Graphic Backlight LCD Indicator with Totalizer Field Programmable	Low-cost, Weather-Proof, FND Indicator with Totalizer	Low-cost, Weather-Proof, FND Indicator without Totalizer
<b>Indicator/Converter</b>	Flow Rate & Totalizer 16 x 2 Alphanumeric LCD	Flow Rate & Totalizer 16 x 2 Alphanumeric LCD	Flow Rate & Totalizer 3-1/2-digit (Flow Rate) 6-digit FND (Total)	Flow Rate only 3-1/2-digit FND
<b>Key</b>	4-keys	4-keys	None	None
<b>Output</b>	4-20mA, Pulse, RS-232, Fieldbus, Alarm	4-20mA, Pulse, RS-485 & Alarm (Fieldbus optional)	4-20mA, Pulse	4-20mA
<b>Flow Rate Units</b>	Nm <sup>3</sup> /h, Nm <sup>3</sup> /m, Kg/d, Kg/hr, Kg/m, Kg/s, SCFM, SCFH, Lb/d, Lb/h, Lb/m, Lb/s, NLPH, NLPM, SLPM, SMPS, NMPS, SFPM			
<b>Material</b>	Indicator Housing – Cast Aluminum Sensor – SUS316 (Optionally Hastelloy-C)			
<b>Max. Pressure based on 38°C (for Inline Type)</b>	Insertion Type: 360 psig (25 barg) Threaded Connection: 500 psig (34.5 barg) Flanged Connection: 230 psig (16 barg) – ANSI 150# Flange			
<b>Max. Temperature (for Indicator/Converter)</b>	-20~ 60°C			
<b>Max. Temperature (for Sensor)</b>	Standard: -40 ~ 121°C High-Temperature: 0 ~ 204°C Ultra-high Temperature: 0 ~ 370°C			
<b>Enclosure</b>	Ex-proof, weather proof (NEMA 4x), IP-65 Class I, II, III, Division 2, Group A, B, C, D, E, F, G, T4	Weather proof (NEMA 4x), IP-65		
<b>Power Supply</b>	Standard: 24VDC, ±0.75A, Optional: 85–250VAC, 50/60Hz, 20 watts			24VDC, ±0.75A
<b>Response Time</b>	0.9 sec			
<b>Accuracy</b>	±1.0% of Reading			
<b>Repeatability</b>	±0.2%, Full Scale			

## Flow Rates and Lengths of Inline Sensors (MST-100, MST-200, MST-210)

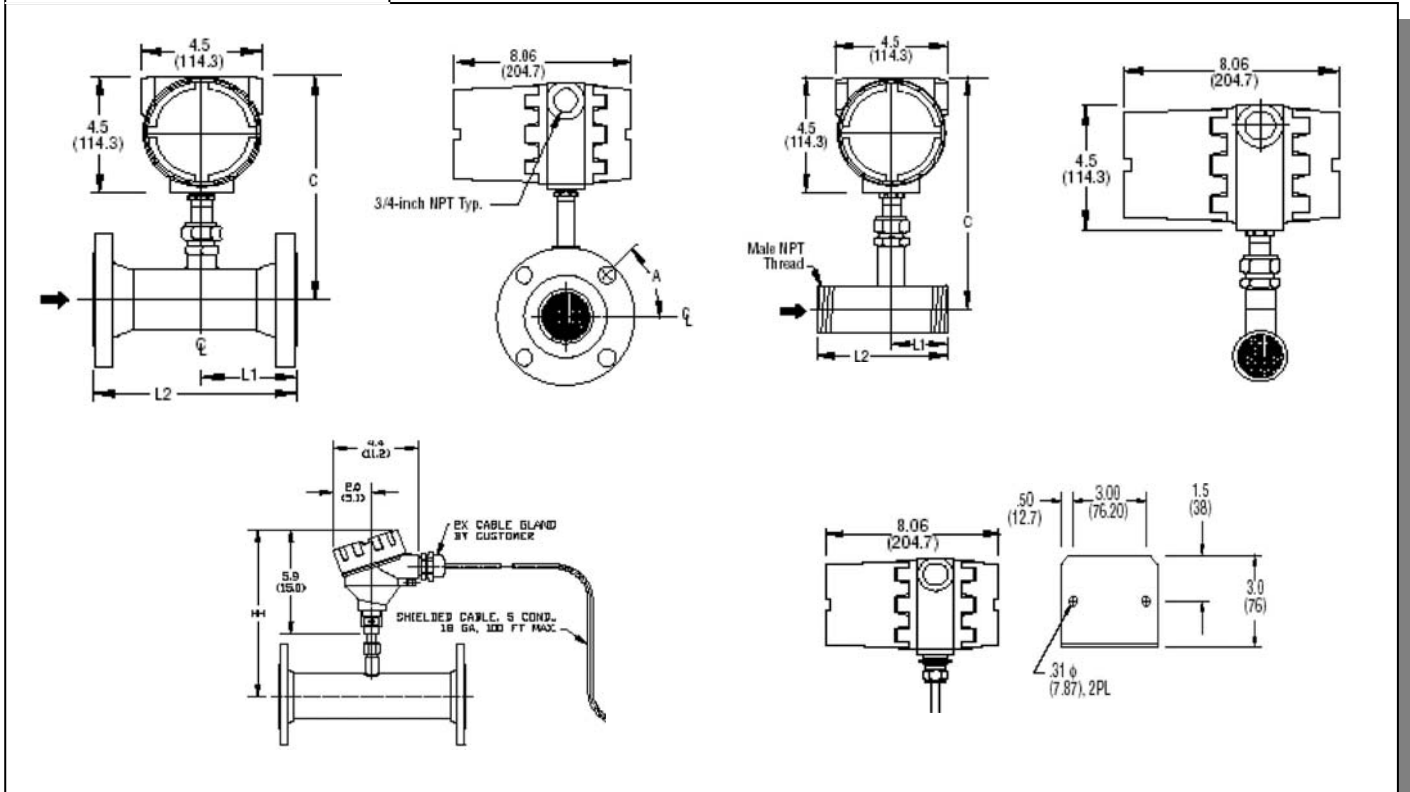
Pipe Size		Flow Rate		Length (L2) Inch (cm)
inch	mm	Nm <sup>3</sup> /h	SCFM	
1/4	8	0 ~ 27	0 ~ 16	5.8 (14.7)
1/2	15	0 ~ 82	0 ~ 48	12.0 (30.5)
3/4	20	0 ~ 204	0 ~ 120	12.0 (30.5)
1	25	0 ~ 326	0 ~ 192	12.0 (30.5)
1-1/4	32	0 ~ 564	0 ~ 332	12.0 (30.5)
1-1/2	40	0 ~ 760	0 ~ 450	12.0 (30.5)
2	50	0 ~ 1280	0 ~ 750	12.0 (30.5)
2-1/2	65	0 ~ 1855	0 ~ 1090	18.0 (45.7)
3	80	0 ~ 2720	0 ~ 1600	18.0 (45.7)
4	100	0 ~ 4893	0 ~ 2880	18.0 (45.7)
6	150	0 ~ 10870	0 ~ 6400	24.0 (61.0)

Standard Conditions: 0°C, 1 atm for Nm<sup>3</sup>/h, 70°F and 1 atm for SCFM (Gas: Air)

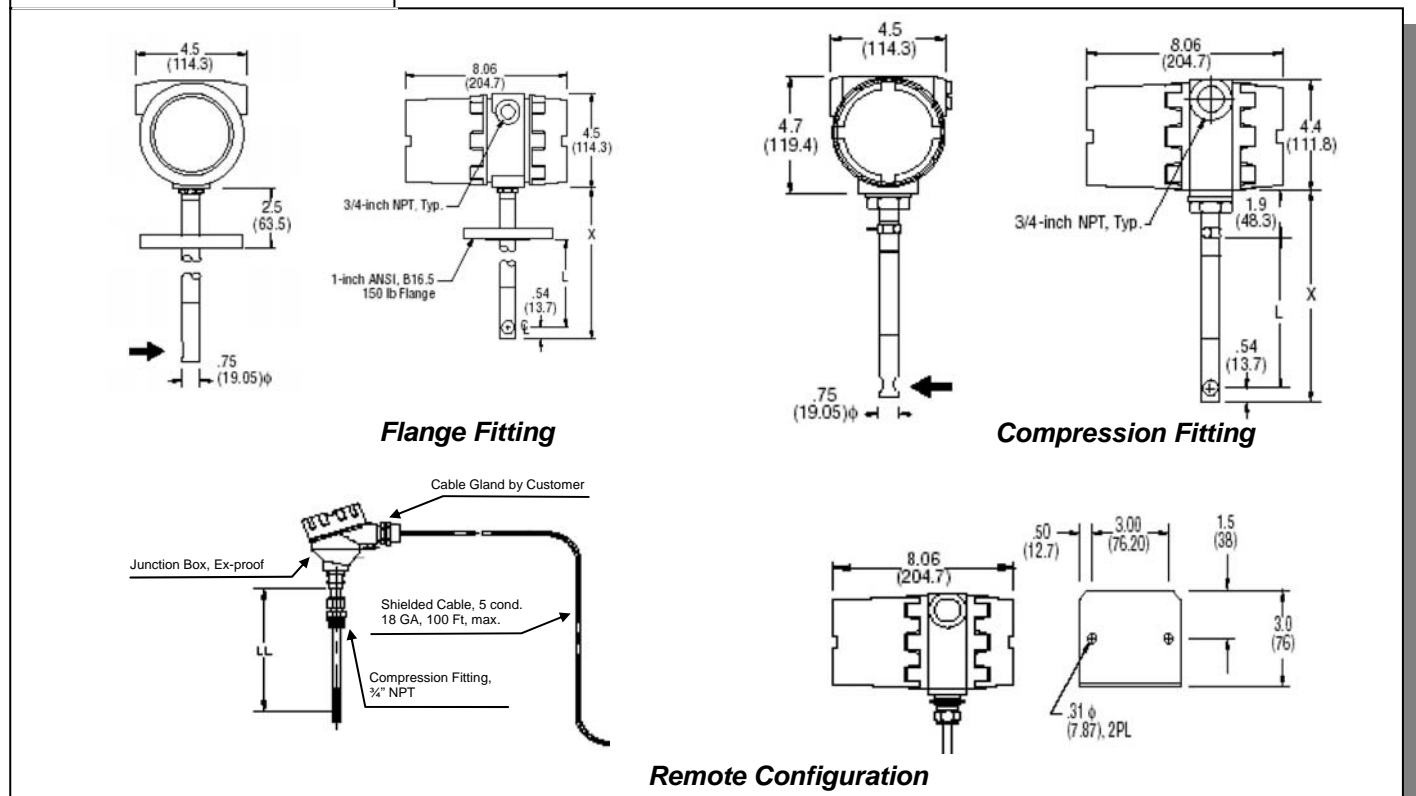
\* The above data is the same for threaded connection and flanged connection.

## DIMENSIONS – MST100

### In-Line Type

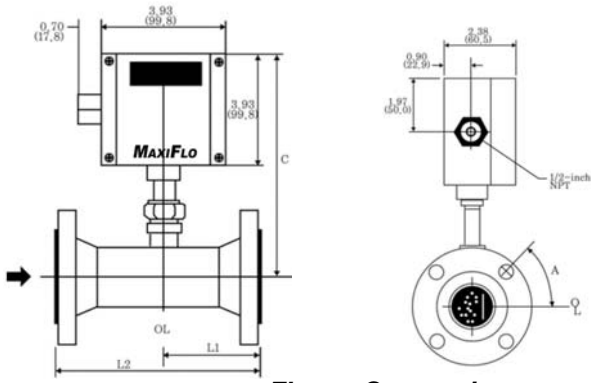


### Insertion Type



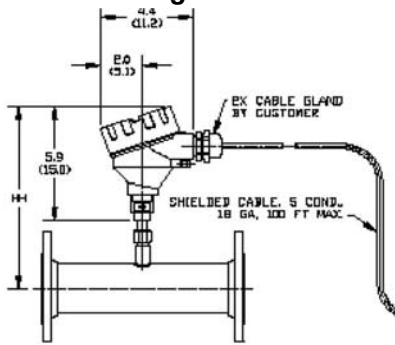
**DIMENSIONS – MST200 & MST210**

**In-Line Type**

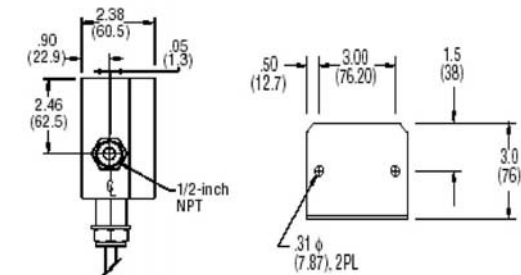


**Flange Connection**

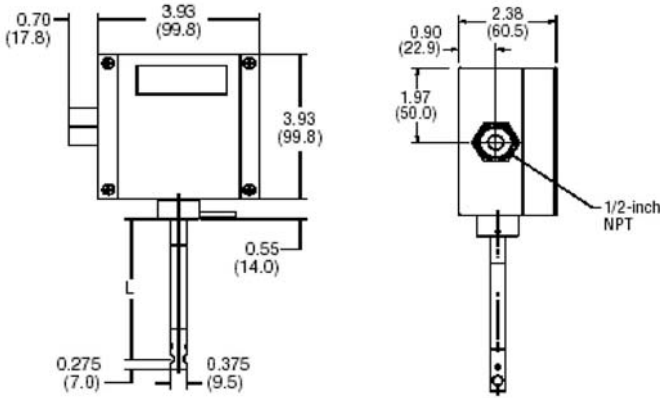
**Screw Connection**



**Remote Configuration**

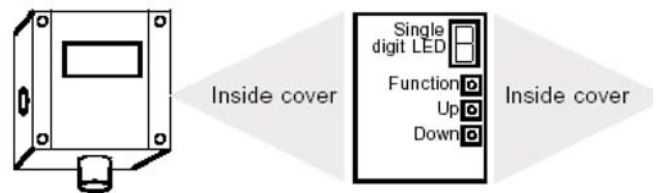


**Insertion Type**

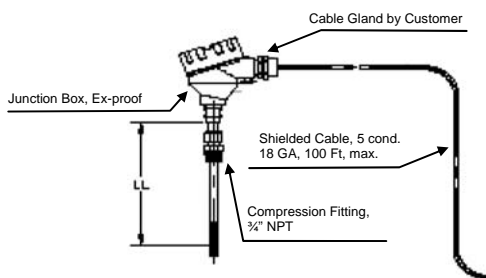


**Compression Fitting**

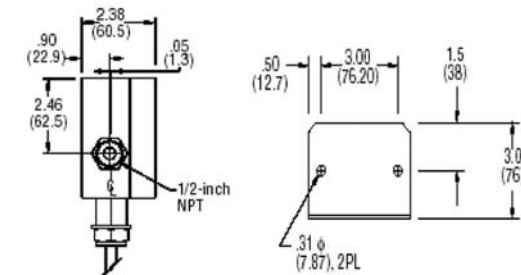
**Smart Electronics Device**



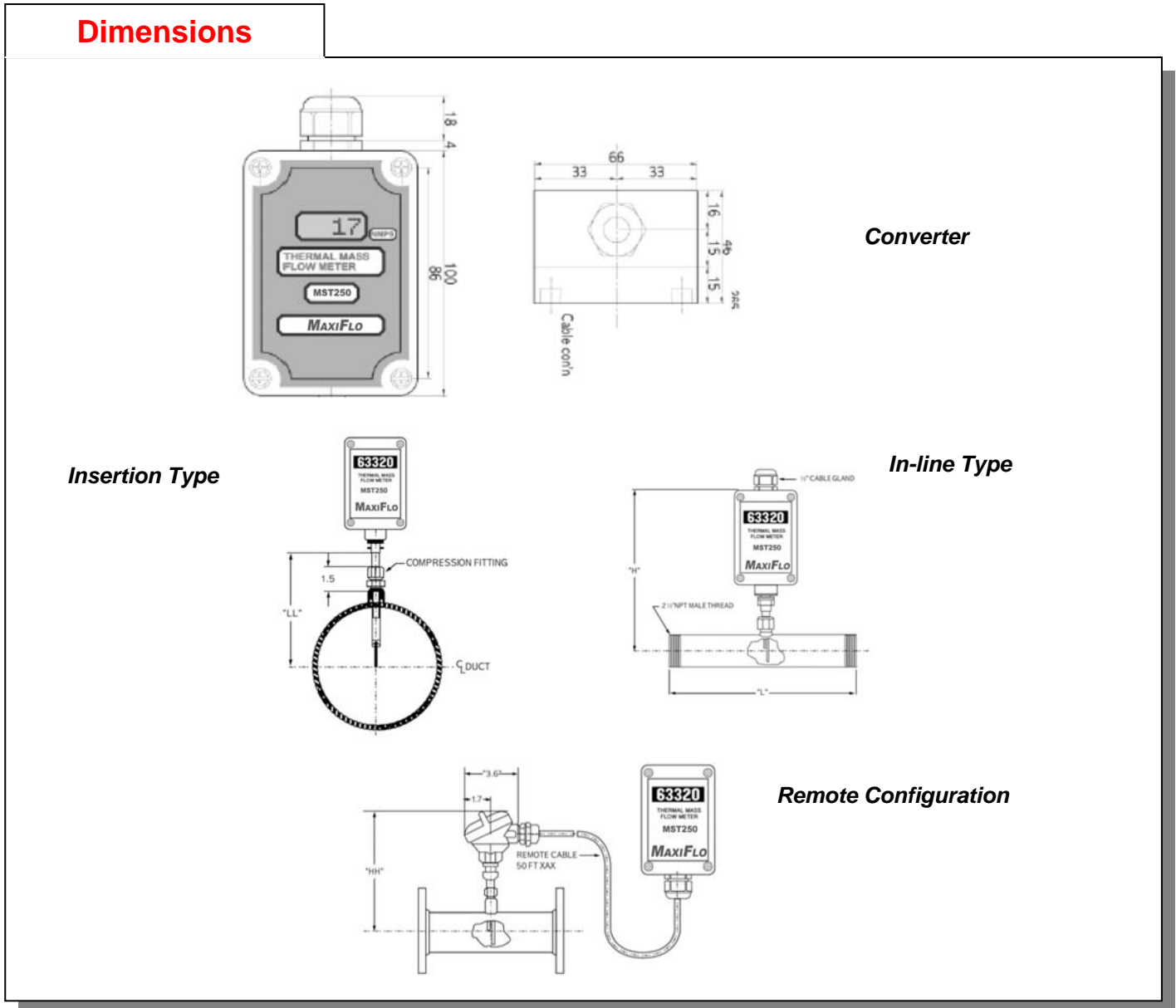
**Smart Electronics**



**Remote Configuration**



## DIMENSIONS – MST250



### Flow Rates and Lengths of Inline Sensors (MST250)

Pipe Size		Flow Rate		Length (L2) Inch (cm)
inch	mm	Nm <sup>3</sup> /h	SCFM	
1/4	8	0 ~ 27	0 ~ 16	7.9 (20.0)
1/2	15	0 ~ 82	0 ~ 48	12.9 (30.5)
3/4	20	0 ~ 204	0 ~ 120	12.9 (30.5)
1	25	0 ~ 326	0 ~ 192	15.0 (38.1)
1-1/4	32	0 ~ 564	0 ~ 332	18.0 (45.7)
1-1/2	40	0 ~ 760	0 ~ 450	18.0 (45.7)
2	50	0 ~ 1280	0 ~ 750	18.0 (45.7)
2-1/2	65	0 ~ 1855	0 ~ 1090	18.0 (45.7)
3	80	0 ~ 2720	0 ~ 1600	18.0 (45.7)
4	100	0 ~ 4893	0 ~ 2880	18.0 (45.7)
6	150	0 ~ 10870	0 ~ 6400	24.0 (61.0)

Standard Conditions: 0°C, 1 atm for Nm<sup>3</sup>/h, 70°F and 1 atm for SCFM (Gas: Air)  
 \* The above data is the same for threaded connection and flanged connection.

# Model Selection Guide

MST###-###-#####-Options			Code		
<b>Model Designator</b>	Ex-Proof, Graphic Backlight LCD Indicator with Totalizer		<b>MST100</b>		
	Weather-Proof, Graphic Backlight LCD Indicator with Totalizer		<b>MST200</b>		
	Low-cost, Weather-Proof, FND Indicator with Totalizer		<b>MST210</b>		
	Low-cost, Weather-Proof, FND Indicator without Totalizer		<b>MST250</b>		
<b>Pipe Size in mm</b>			<b>###</b>		
<b>Indicator/Converter</b>	None		<b>D0</b>		
	Integral		<b>D1</b>		
	Remote		<b>D2</b>		
<b>Sensor</b>	Inline Type	Threaded (NPT Male)	<b>FT</b>		
		Flanged (ANSI 150#)	<b>FF</b>		
	Insertion Type	Compression Fitting (1/2" or 3/4" NPT)	<b>IC</b>		
		Flanged Fitting	<b>IF</b>		
<b>Power Supply</b>		85~250VAC, 50/60Hz, 20 watts	<b>P1</b>		
		24VDC, ±0.75A	<b>P2</b>		
<b>Options</b>			Output	RS-232	<b>232</b>
				RS-485	<b>485</b>
				Fieldbus	<b>FF</b>
			Sensor Material	Hastelloy-C	<b>HC</b>
			Remote Cable		<b>C_</b>
			Flow Meter Cleaning for Oxygen		<b>CL</b>

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