

# Eldridge Products, Inc.

Gas Mass Flow Measurement & Control Instrumentation

## Master-Touch™

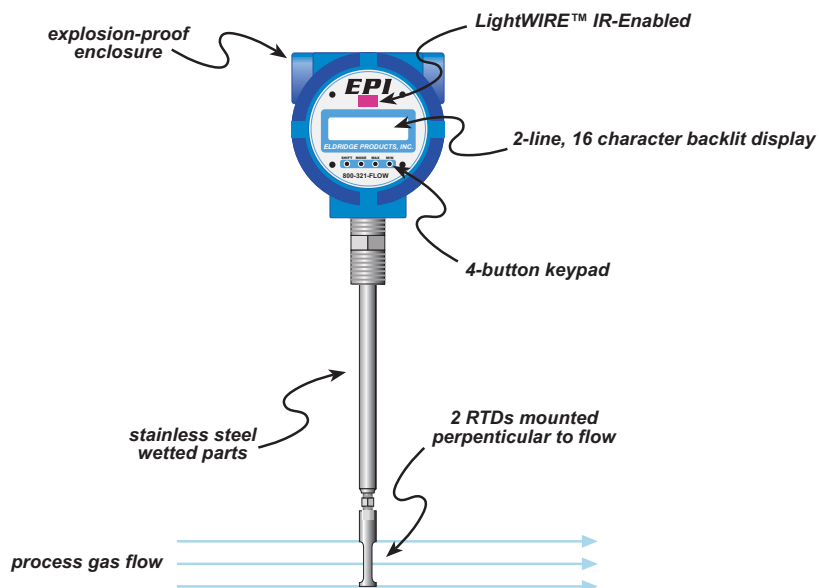


## Series 8800MP Flowmeters



Eldridge Products' proprietary thermal mass flow sensors use two ratiometrically-matched, reference-grade platinum Resistance Temperature Detectors (RTDs). The platinum sensing element wire is wound on a ceramic base, given a thin protective glass coating, and encapsulated in a 316 Stainless Steel sheath or, if specified, a Hastelloy C sheath. The sensor assembly is large, rugged, and relatively insensitive to dirt buildup.

A forced null Wheatstone Bridge preferentially heats one RTD. The second RTD acts as a temperature reference by taking on the temperature of the flowing gas. The resistance ratios are maintained through the Wheatstone Bridge to compensate for the dynamic changes in process temperature. By maintaining a constant temperature difference between the RTDs, EPI can measure the amount of heat dissipated by the flowing gas. As heat is dissipated, more power is used to maintain the constant temperature. The power demand is directly proportional to the gas mass flow rate, allowing our sensors to measure the gas molecular rate of flow without further compensation for outside effects. EPI's standard flow sensors can respond to flow velocities as low as 15 feet per minute and as high as 45,000 feet per minute for most gases. Consult our factory or a local sales representative for details.



**INSERTION** style thermal mass flowmeters include a sensor probe assembly that is inserted into the process gas flow conduit to allow the process gas to flow across the flow sensing elements. Our insertion style flowmeters are available with 1/2", 3/4", or 1" OD probes and may be installed with pipe fitting connections or user-supplied bored through tube fittings. Tube fittings and ball valve retractor assemblies, with or without a mounting flange, are also available from the factory as options. The tube length must be specified upon ordering. Standard lengths range from a minimum of 6" to a maximum of 36". For other probe diameters and lengths, please consult the factory.

**INTEGRAL** style thermal mass flowmeters have all of the electrical components and connections located within one enclosure. The enclosure is explosion-proof cast aluminum NEMA 4X. The enclosure is mounted directly to the inline flow section or to the insertion probe assembly at the point of measurement.



#### TYPICAL APPLICATIONS FOR MASTER-TOUCH™ FLOWMETERS:

**AUTOMOTIVE INDUSTRY** Compressed Air monitoring \* Natural Gas consumption \* Powder paint air flow \* Paint booth/paint oven ventilation

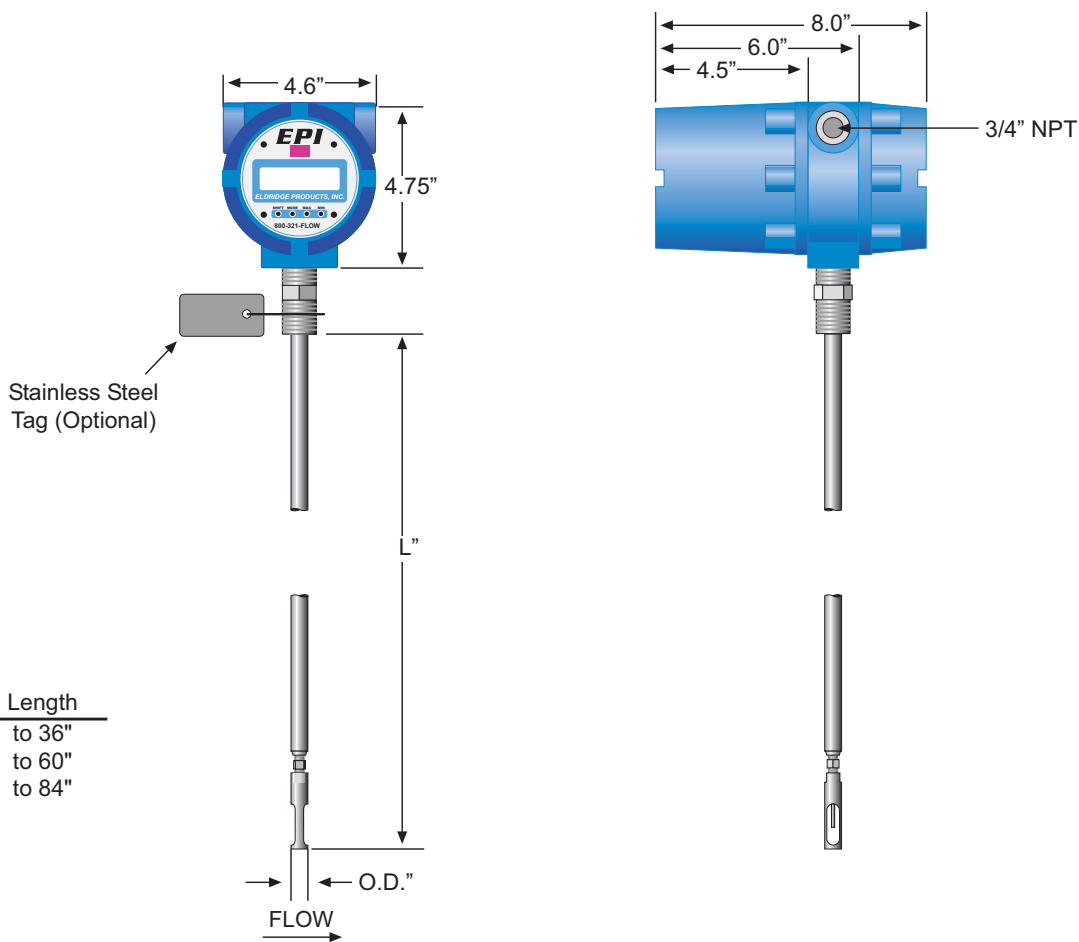
**UTILITY SERVICES** Stack or Flue Gas \* Wastewater aeration \* Ventilation systems \* Digester Gas \* Gas flows \* Nitrogen purge \* Combustion air \* Boiler inlet air

**FOOD PROCESSING** Drying air \* Ventilation systems \* Boiler inlet air \* Exhaust gas \* Process control \* Compressor lines \* HVAC Air balancing \* Duct flows \* Energy conservation \* Fume hoods \* Cleanrooms \* Laminar flow benches

**LABORATORY AND R & D** Flow research \* Biomedical studies \* University studies \* Toxicology studies \* Energy studies \* Industrial Hygiene \* Occupational Safety \* Experimentation

**PETROLEUM & GAS INDUSTRIES** Custody transfer \* Landfill Gas recovery \* Flare Gas measurement \* Gas mixing \* Gas quality studies \* Leak testing

**RAW MATERIALS INDUSTRIES** Pulp & Paper mills \* Mining \* Semiconductor manufacturing \* Chemical processing \* Primary metals \* Plastics & synthetics



Model Number	O.D.	Length
8840MP	1/2"	to 36"
8860MP	3/4"	to 60"
8880MP	1"	to 84"

## SPECIFICATIONS

Linear signal output  
 Signal Interface  
 Accuracy, including linearity (Ref.: 21°C)\*  
 Repeatability  
 Sensor response time  
 Turn down ratio  
 Electronics temperature range  
 Gas temperature range\*\*  
 Gas pressure effect  
 Pressure rating maximum  
 Input power requirement

Flow Transmitter power requirements  
 Wetted materials  
 Standard temperature & pressure (STP)  
 NIST traceable calibration

0-5 VDC & 4-20 mA  
 RS232 & RS485 Modbus RTU  
 $\pm [1\% \text{ of Reading} + (.5\% + .02\%/^{\circ}\text{C of Full Scale})]$   
 $\pm 0.2\% \text{ of Full Scale}$   
 1 second  
 100:1 minimum  
 $-40^{\circ}\text{--}85^{\circ}\text{C}$  ( $-40^{\circ}\text{--}185^{\circ}\text{F}$ )  
 $-40^{\circ}\text{--}200^{\circ}\text{C}$  ( $-40^{\circ}\text{--}392^{\circ}\text{F}$ ), extended range available  
 Negligible over  $\pm 20\%$  of absolute calibration pressure  
 500 PSI Std., > 500 PSI special  
 24VDC @ 250mA  
 115 VAC 50/60 Hz optional  
 230 VAC 50/60 Hz optional  
 5 watts maximum  
 316 Stainless Steel (Hastelloy optional)  
 $70^{\circ}\text{F}$  & 29.92" Hg (Air .075 lb./cubic foot)  
 Standard

## APPROVALS

MP Series Flow Transmitter — For use in hazardous area locations: Class I Division 1 Groups B, C and D; Class II E, F and G; Class III; Type 4X; Ex d IIB + H2; AEx d IIB + H2, IP66; EEx d IIB + H2, IP66; T2 (consult factory for T3 or T4).

Certified to US requirements; Certified to Canadian requirements

Certified to European ATEX requirements

\* The accuracy specification applies to the instrument only. EPI is not responsible for measurement errors due to flow profile irregularities caused by installation piping configurations, corrosion on inner pipe surfaces, valve placement, etc.

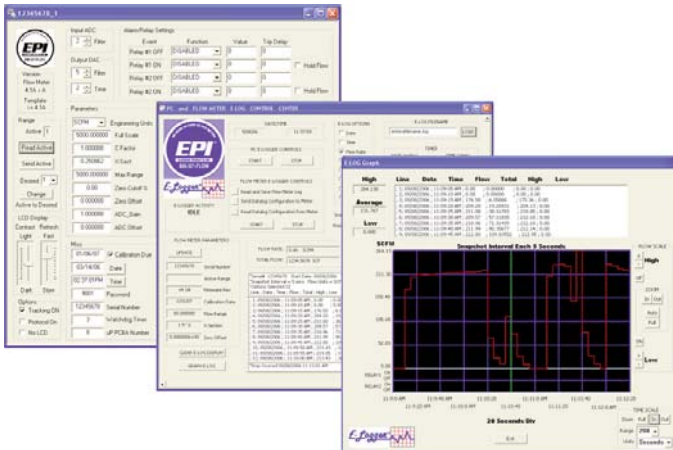
\*\* Consult factory for options required for  $66^{\circ}\text{--}200^{\circ}\text{C}$  ( $150^{\circ}\text{--}392^{\circ}\text{F}$ )

## ACCESSORIES



*Light*WIRE™

The LightWIRE™ Communicator I modules transmit and receive signals from LightWIREIR-Enabled flowmeters. When connected to a RS232 or USB port on a PC or laptop running EPI Communicator software, the LightWIRE Communicator I module replaces the three-wire cable for communications with an IR-Enabled Master-Touch™ flowmeter. The LightWIRE Communicator II hand-held module is a substitute for the keypad/display assembly of IR-Enabled Master-Touch™ flowmeters. Access all of the flowmeters functions without removing the flowmeter's enclosure cover with the Communicator II module.



*E-Logger*™

The E-Logger™ module of the free EPICommunicator™ software is a fully functional, PC-based data logger that works in conjunction with Master-Touch™ flowmeters which have v4.1A or higher software. The user can select from a set of categories for the data collection, the time interval for each data "snapshot" and, if necessary, programmed start and stop times. The data is stored on either the flowmeter or a PC. E-Logger will also graph the data, and it provides tools for analysis of the data. Data files stored on a PC can be accessed by most common spreadsheet applications.

## LIMITED WARRANTY

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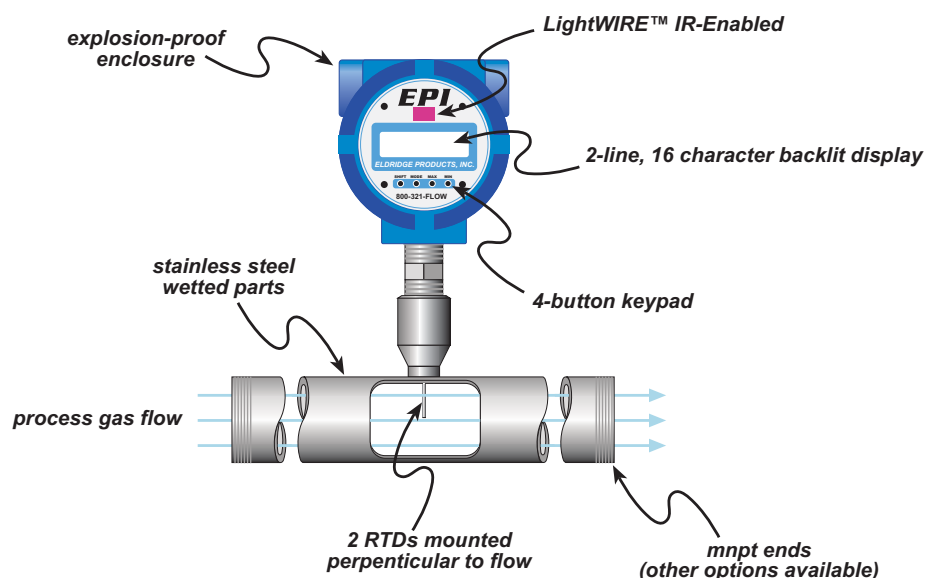


## Series 8600MP–8700MP Flowmeters



Eldridge Products' proprietary thermal mass flow sensors use two ratiometrically-matched, reference-grade platinum Resistance Temperature Detectors (RTDs). The platinum sensing element wire is wound on a ceramic base, given a thin protective glass coating, and encapsulated in a 316 Stainless Steel sheath or, if specified, a Hastelloy C sheath. The sensor assembly is large, rugged, and relatively insensitive to dirt buildup.

A forced null Wheatstone Bridge preferentially heats one RTD. The second RTD acts as a temperature reference by taking on the temperature of the flowing gas. The resistance ratios are maintained through the Wheatstone Bridge to compensate for the dynamic changes in process temperature. By maintaining a constant temperature difference between the RTDs, EPI can measure the amount of heat dissipated by the flowing gas. As heat is dissipated, more power is used to maintain the constant temperature. The power demand is directly proportional to the gas mass flow rate, allowing our sensors to measure the gas molecular rate of flow without further compensation for outside effects. EPI's standard flow sensors can respond to flow velocities as low as 15 feet per minute and as high as 45,000 feet per minute for most gases. Consult our factory or a local sales representative for details.



**INLINE** style thermal mass flowmeters include a flow section that is usually specified to match the user's flow conduit and is then plumbed directly into the process line. This design has the sensing elements mounted directly in the flow section for exposure to the process gas. Our Inline style thermal mass flowmeters are available in sizes from 1/4" pipe through 4" pipe and are provided with threaded male NPT ends as the standard mounting style. Optional end mounting styles may be specified, such as tube ends, tube end fittings, butt weld ends, flanged end configurations, etc. as required. Pipe sizes in excess of 4" require insertion style thermal mass flow meters.

**INTEGRAL** style thermal mass flowmeters have all of the electrical components and connections located within one enclosure. The enclosure is explosion-proof cast aluminum NEMA 4X. The enclosure is mounted directly to the inline flow section or to the insertion probe assembly at the point of measurement.



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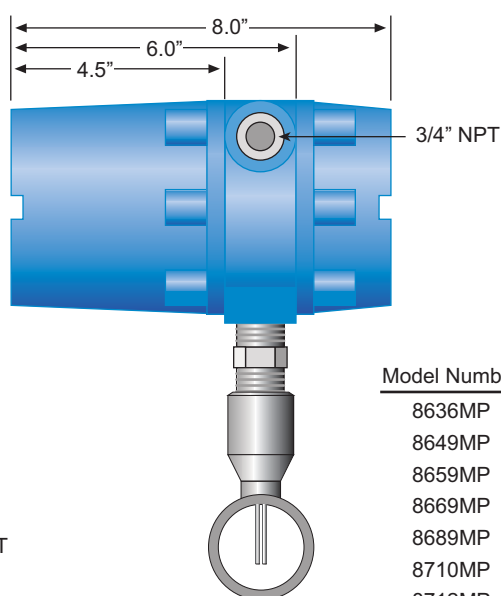
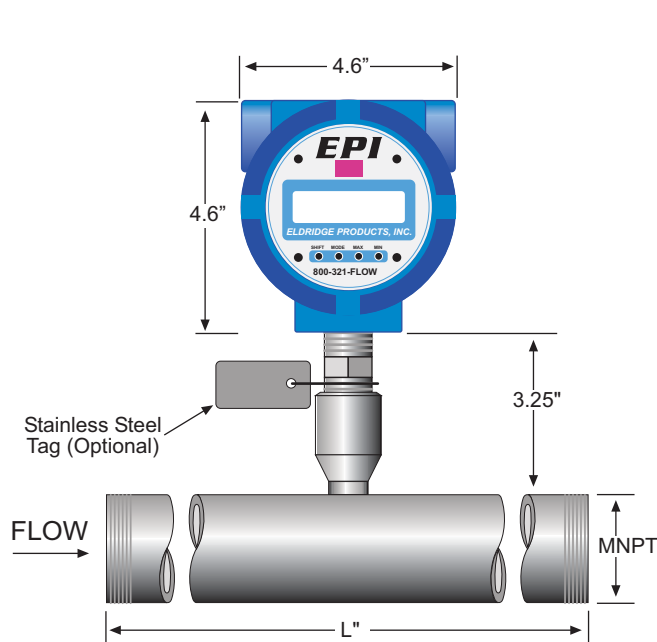
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**RAW MATERIALS INDUSTRIES** Pulp & Paper mills \* Mining \* Semiconductor manufacturing \* Chemical processing \* Primary metals \* Plastics & synthetics



Model Number	MNPT	Length
8636MP	1/4"	6"
8649MP	3/8"	6"
8659MP	1/2"	7"
8669MP	3/4"	7"
8689MP	1"	8"
8710MP	1 1/4"	10"
8712MP	1 1/2"	14"
8716MP	2"	14"
8720MP	2 1/2"	14"
8724MP	3" Flanged	14"
8732MP	4" Flanged	14"

## SPECIFICATIONS

Linear signal output  
Signal Interface  
Accuracy, including linearity (Ref.: 21°C)\*  
Repeatability  
Sensor response time  
Turn down ratio  
Electronics temperature range  
Gas temperature range\*\*  
Gas pressure effect  
Pressure rating maximum  
Input power requirement

Flow Transmitter power requirements  
Flow Transmitter enclosure

Wetted materials  
Standard temperature & pressure (STP)  
NIST traceable calibration

0–5 VDC & 4–20 mA  
RS232 & RS485 Modbus RTU  
±[1% of Reading + (.5% + .02%/°C of Full Scale)]  
±0.2% of Full Scale  
1 second  
100:1 minimum  
-40°–85°C (-40°–185°F)  
-40°–200°C (-40°–392°F), extended range available  
Negligible over ± 20% of absolute calibration pressure  
500 PSI Std., > 500 PSI special  
24VDC @ 250mA  
115 VAC 50/60 Hz optional  
230 VAC 50/60 Hz optional  
5 watts maximum  
NEMA 4X, ABS plastic with clear polycarbonate cover,  
5" x 5" x 4"  
316 Stainless Steel (Hastelloy optional)  
70°F & 29.92" Hg (Air .075 lb./cubic foot)  
Standard

## APPROVALS

MP Series Flow Transmitter — For use in hazardous area locations: Class I Division 1 Groups B, C and D; Class II E, F and G; Class III; Type 4X; Ex d IIB + H2; AEx d IIB + H2, IP66; EEx d IIB + H2, IP66; T2 (consult factory for T3 or T4).

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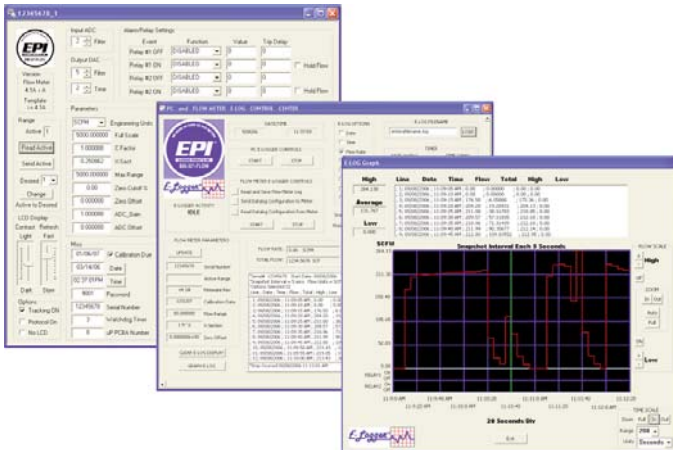
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## ACCESSORIES



*Light* **WIRE™**

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*E-Logger™*

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Gas Mass Flow Measurement & Control Instrumentation

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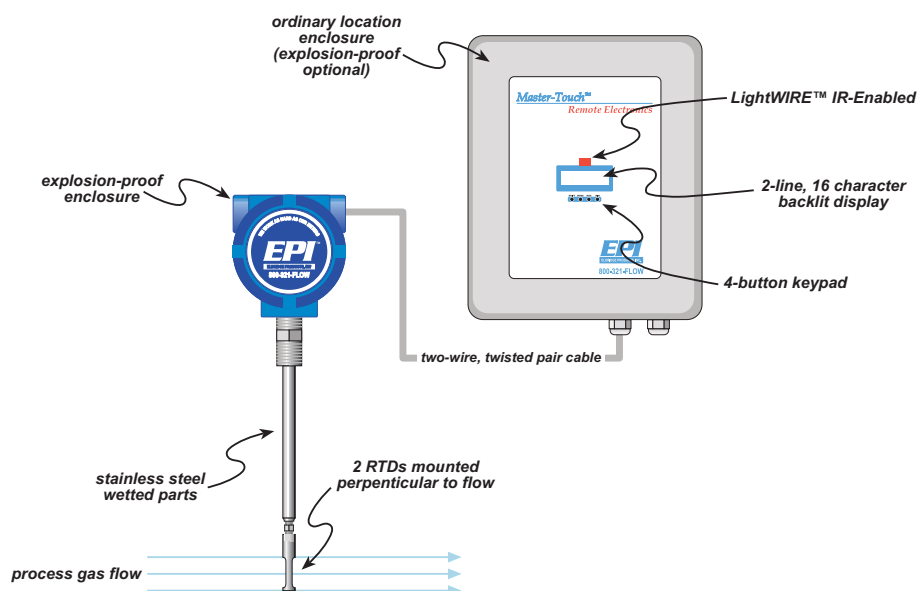


## Series 8200MP Flowmeters



Eldridge Products' proprietary thermal mass flow sensors use two ratiometrically-matched, reference-grade platinum Resistance Temperature Detectors (RTDs). The platinum sensing element wire is wound on a ceramic base, given a thin protective glass coating, and encapsulated in a 316 Stainless Steel sheath or, if specified, a Hastelloy C sheath. The sensor assembly is large, rugged, and relatively insensitive to dirt buildup.

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**REMOTE** style thermal mass flowmeters utilize two enclosures. One enclosure mounted at the point of measurement - on the flow section or on the probe assembly. This enclosure may be rated for either hazardous environments or for ordinary non-hazardous environments, as necessary. The second (remote) enclosure usually placed in a readily accessible location rated for non-hazardous condition (Contact the factory for information concerning remote explosion-proof enclosure). The remote enclosure includes all of the electrical connections as well as the linearizing electronics and the display/keypad assembly. Only a two-wire twisted-pair cable is required to carry the input power and flow signal between the two enclosures.



#### TYPICAL APPLICATIONS FOR MASTER-TOUCH™ FLOWMETERS:

**AUTOMOTIVE INDUSTRY** Compressed Air monitoring \* Natural Gas consumption \* Powder paint air flow \* Paint booth/paint oven ventilation

**UTILITY SERVICES** Stack or Flue Gas \* Wastewater aeration \* Ventilation systems \* Digester Gas \* Gas flows \* Nitrogen purge \* Combustion air \* Boiler inlet air

**FOOD PROCESSING** Drying air \* Ventilation systems \* Boiler inlet air \* Exhaust gas \* Process control \* Compressor lines \* HVAC Air balancing \* Duct flows \* Energy conservation \* Fume hoods \* Cleanrooms \* Laminar flow benches

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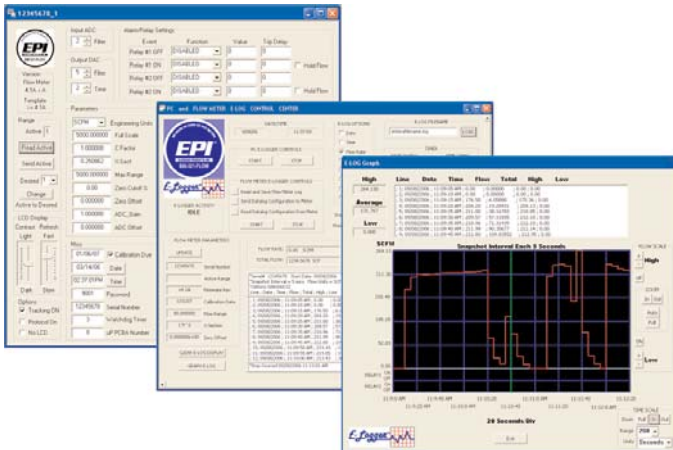


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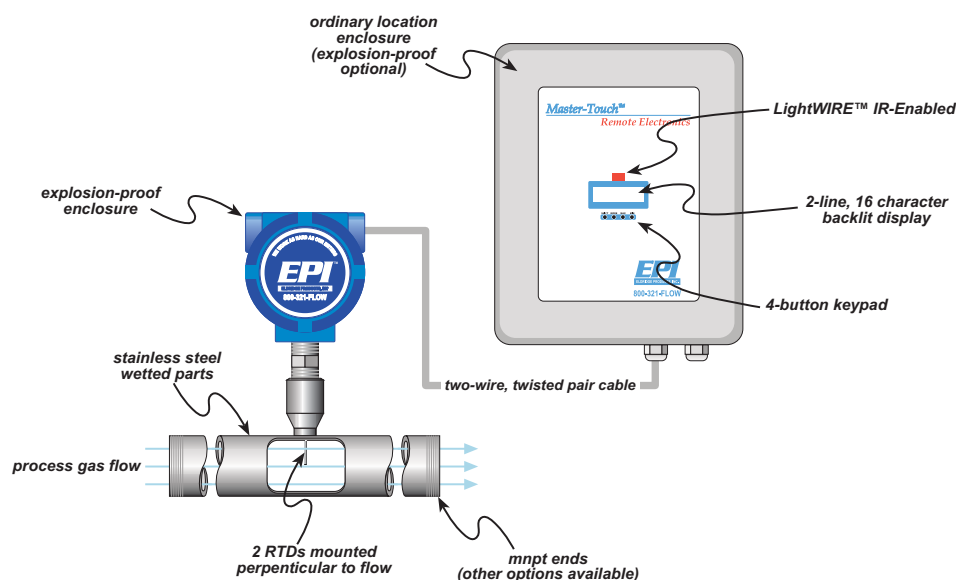


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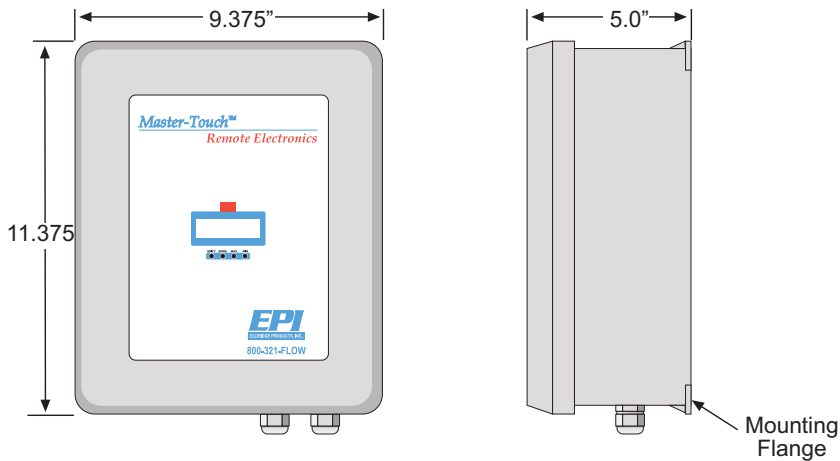
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## Remote Electronics Enclosure

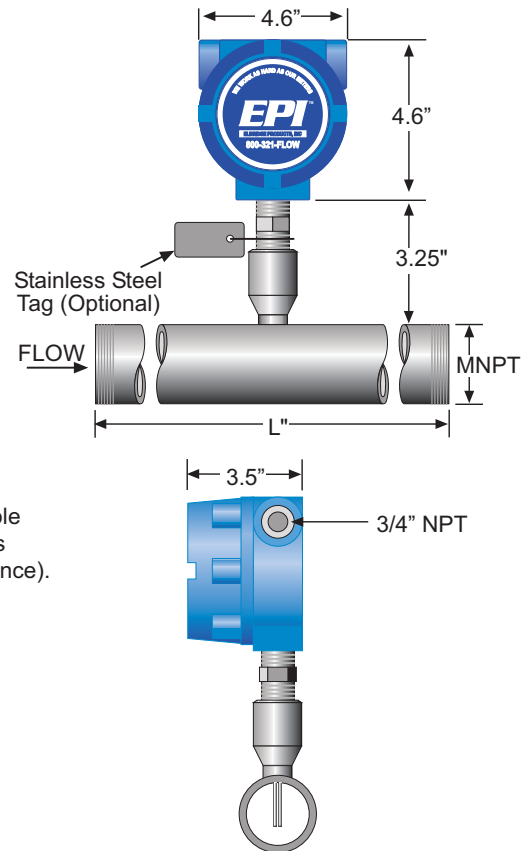


Model Number	MNPT	Length
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8049MP	3/8"	6"
8059MP	1/2"	7"
8069MP	3/4"	7"
8089MP	1"	8"
8110MP	1 1/4"	10"
8112MP	1 1/2"	14"
8116MP	2"	14"
8120MP	2 1/2"	14"
8124MP	Flanged	14"
8132MP	Flanged	14"
8148MP	Flanged	14"

Two-wire, twisted pair interconnect cable required between Remote Electronics and Flow Transmitter (max. 5 ohm resistance).

AWG	Wire Length
20	200'
18	300'
16	500'
14	800'
12	1250'

## Flow Transmitter Assembly



## SPECIFICATIONS

Linear signal output  
Signal Interface  
Accuracy, including linearity (Ref.: 21°C)\*  
Repeatability  
Sensor response time  
Turn down ratio  
Electronics temperature range  
Gas temperature range\*\*  
Gas pressure effect  
Pressure rating maximum  
Input power requirement

Flow Transmitter power requirements  
RAM Back-up  
Wetted materials  
Standard temperature & pressure (STP)  
NIST traceable calibration

0–5 VDC & 4–20 mA  
RS232 & RS485 Modbus RTU  
±[1% of Reading + (.5% + .02%/°C of Full Scale)]  
±0.2% of Full Scale  
1 second  
100:1 minimum  
-40°–85°C (-40°–185°F)  
-40°–200°C (-40°–392°F), extended range available  
Negligible over ± 20% of absolute calibration pressure  
500 PSI Std., > 500 PSI special  
24VDC @ 250mA  
115 VAC 50/60 Hz optional  
230 VAC 50/60 Hz optional  
5 watts maximum  
Lithium Battery  
316 Stainless Steel (Hastelloy optional)  
70°F & 29.92" Hg (Air .075 lb./cubic foot)  
Standard

## APPROVALS

MP Series Flow Transmitter — For use in hazardous area locations: Class I Division 1 Groups B, C and D; Class II E, F and G; Class III; Type 4X; Ex d IIB + H2; AEx d IIB + H2, IP66; EEx d IIB + H2, IP66; T2 (consult factory for T3 or T4).

MP Series Remote Enclosure — For use in Ordinary (Non-Hazardous) area locations: Type 4X, IP66

Certified to US requirements; Certified to Canadian requirements

Certified to European ATEX requirements

\* The accuracy specification applies to the instrument only. EPI is not responsible for measurement errors due to flow profile irregularities caused by installation piping configurations, corrosion on inner pipe surfaces, valve placement, etc.

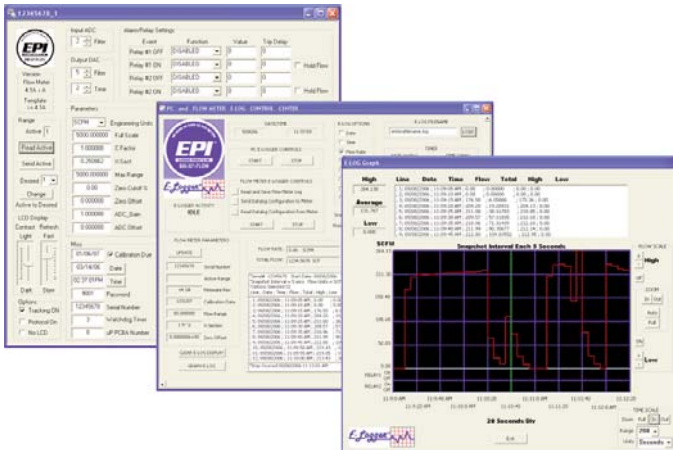
\*\* Consult factory for options required for 66°–200°C (150°–392°F)

## ACCESSORIES



*Light* **WIRE™**

The LightWIRE™ Communicator I modules transmit and receive signals from LightWIREIR-Enabled flowmeters. When connected to a RS232 or USB port on a PC or laptop running EPI Communicator software, the LightWIRE Communicator I module replaces the three-wire cable for communications with an IR-Enabled Master-Touch™ flowmeter. The LightWIRE Communicator II hand-held module is a substitute for the keypad/display assembly of IR-Enabled Master-Touch™ flowmeters. Access all of the flowmeters functions without removing the flowmeter's enclosure cover with the Communicator II module.



*E-logger™*

The E-Logger™ module of the free EPICommunicator™ software is a fully functional, PC-based data logger that works in conjunction with Master-Touch™ flowmeters which have v4.1A or higher software. The user can select from a set of categories for the data collection, the time interval for each data "snapshot" and, if necessary, programmed start and stop times. The data is stored on either the flowmeter or a PC. E-Logger will also graph the data, and it provides tools for analysis of the data. Data files stored on a PC can be accessed by most common spreadsheet applications.

## LIMITED WARRANTY

Eldridge Products, Inc. (EPI) warrants its products to be free from defects in materials and workmanship for one year from the date of factory shipment. If there is a defect, the purchaser must notify EPI of the defect within the warranty period. Upon receipt of the defective product, EPI will either repair or replace the defective product at its sole option and at no cost to the purchaser. EPI MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AS TO THE PRODUCTS. EPI MAKES NO WARRANTY THAT THE GOODS SOLD TO ANY PURCHASER ARE FIT FOR ANY PARTICULAR PURPOSE. FURTHERMORE, EPI MAKES NO WARRANTY OF MERCHANTABILITY WITH RESPECT TO ANY PRODUCTS SOLD TO ANY PURCHASERS. There are no other warranties that extend beyond the description on any brochure or price quote.

## LIMITED ACCEPTANCE

Acceptance of any offer is limited to its terms. Acceptances or confirmations that state additional or differing terms from this price quote shall be operative as acceptances, but all additional or differing terms shall be deemed material alterations within the meaning of Commercial Code Section 2207(2)(b), and notice of objection to them pursuant to Commercial Code Section 2207(2)(c) is hereby given. The laws of the State of California govern this contract and venue is Monterey County. Risk of loss passes F.O.B. EPI factory. Payment due in full in US Dollars within credit terms granted from factory shipment. Additional fees shall include interest on unpaid balances that are outstanding for more than granted credit terms, plus all collection costs and attorneys' fees incurred in collecting any outstanding balance. Any and all additional or differing terms do not become part of the contract between EPI and any purchaser. The terms of any offer are expressly limited to the terms detailed in any product brochure or price quote. Any modification to any of the terms of this offer must be in writing and must be signed by an officer of EPI.



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