

# Eldridge Products, Inc.

Gas Mass Flow Measurement & Control Instrumentation

## Master-Touch™



## Series 9200MPNH Flow Averaging Tubes

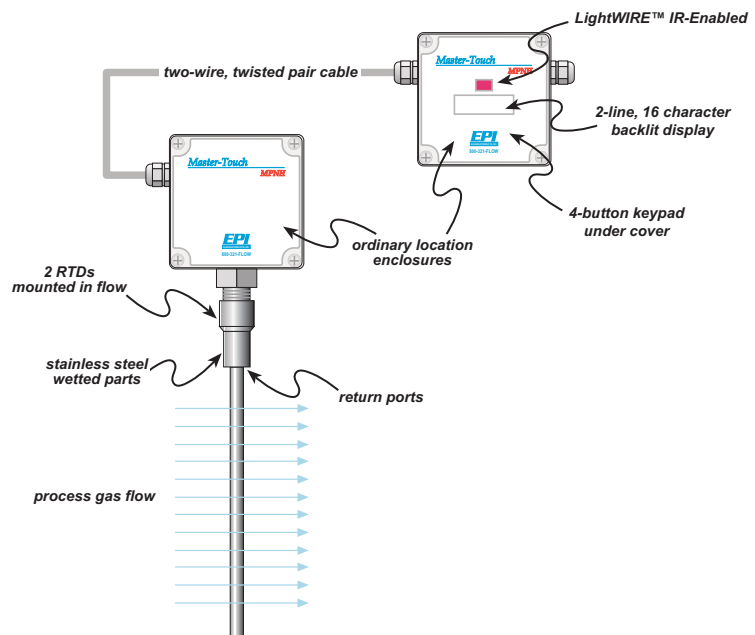
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Eldridge Products, Inc.'s patented\* Flow Averaging Tubes (FAT™) provide accurate flow measurement in large pipes and ducts without the expense and complexity of traditional multipoint systems, and are well suited to most applications with limited available straight run.

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. In most installations, the upstream straight run can be as short as three diameters. The FAT™ probe 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 flow sensor. The gas returns to the main flow stream through the ports located near the sensing elements.

Anomalies in the actual flow profile or installations in non-circular ducts may require minor adjustments for the best accuracy. The velocity impact pressure follows a square root function. Therefore, the average velocity pressure in the FAT™ probe may vary slightly from the average of the velocities at each inlet port. The Master-Touch software supports three methods of flow signal adjustments for superior accuracy.



**INSERTION** style Flow Averaging Tubes include an inlet probe assembly which is inserted into the process gas flow conduit to allow the gas to flow into the tube and up across the flow sensing elements before returning to the process line. Our insertion style flowmeters are available with 1/2", 3/4" or 1" OD inlet tubes (the flow return port is 1/2" larger for each size). Installation requires a properly-sized bored through tube fitting. Tube fittings and ball valve retractor assemblies, with or without a mounting flange, are also available from the factory as options. The tube length is determined by the pipe or duct ID upon ordering.

**REMOTE** style thermal mass flowmeters utilize two enclosures. One enclosure is mounted at the point of measurement — on the flow section or on the probe assembly. This enclosure is rated for ordinary, non-hazardous environments. The second (remote) enclosure is usually placed in a readily accessible location rated for non-hazardous conditions. 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

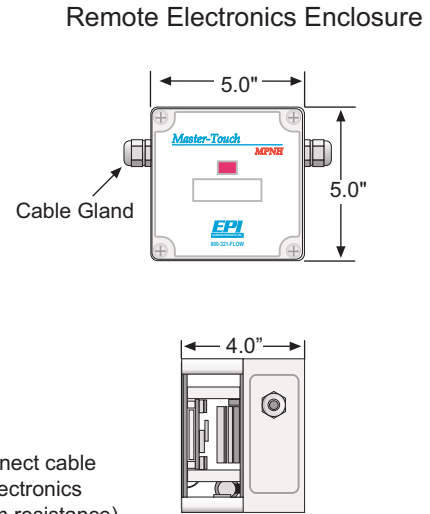
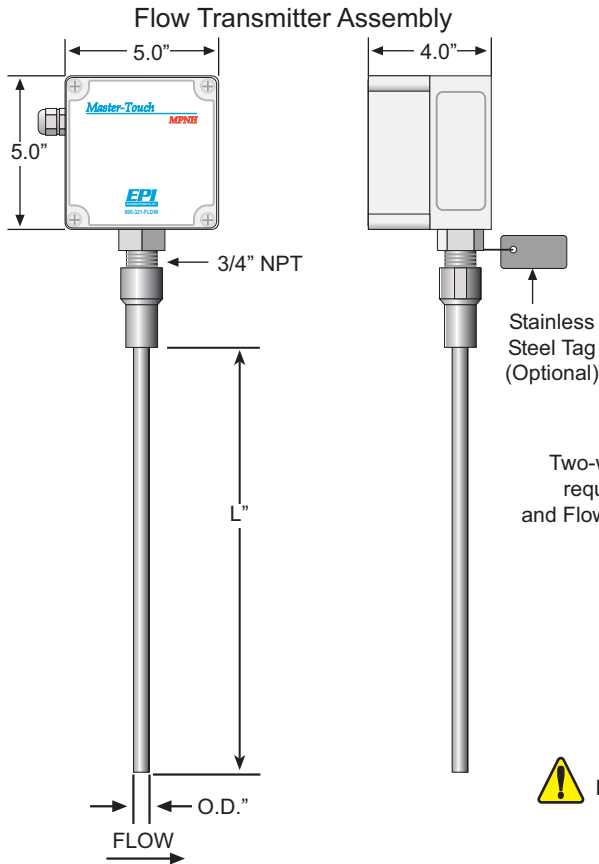
**FOOD PROCESSING** Drying air \* Ventilation systems \* Boiler inlet air \* Exhaust gas \* Process control \* Compressor lines \* HVAC Air balancing \* Duct flows \* Energy conservation \* Fume hoods \* Cleanrooms \* Laminar flow benches

**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

\*U. S. Patent No. 6,883,389 Other U.S. & foreign patents pending



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'       |

**Warning:** Not available for Oxygen service.

| Model Number | O.D. | Length |
|--------------|------|--------|
| 9240MPNH     | 1/2" | to 36" |
| 9260MPNH     | 3/4" | to 60" |
| 9280MPNH     | 1"   | to 84" |

### SPECIFICATIONS

|   |  |
|---|--|
| Linear signal output  | 0-5 VDC & 4-20 mA  |
| Relay Output  | Two 1-amp, user-selectable alarm functions               |
| Signal Interface  | RS232 & RS485  |
| Accuracy including linearity (Ref.: 21°C):  | ± (1% of Reading + [0.5% + .05%/°C of Full Scale])       |
| Repeatability   | ± 0.2% of Full Scale                                     |
| Sensor response time  | 1 second (time constant per step change)                 |
| Turn down ratio   | 100:1 (50 SCFM/FT2 minimum Reading)                      |
| Electronics temperature range   | -40°-85°C (-40°-185°F)                                   |
| Gas temperature range   | 0°-66°C (32°-150°F)                                      |
| Gas temperature effect  | 0.02% /°C  |
| Gas pressure effect   | Negligible over +/- 20% of absolute calibration pressure |
| Pressure rating maximum:  |  |
| Insertion flowmeters (See note below)   | 225 PSI Std., >225 special                               |
| <small>Insertion probe PSI assumes proper installation with stainless steel ferrule. Teflon ferrules are not acceptable. Above the listed pressure, flange-mounting is required to eliminate the potential of the probe being forced out of the line during installation or removal under pressure.</small> |  |
| Transmitter power requirements  | 5 Watts or less  |
| RAM Back-up   | Lithium Battery  |
| Wetted materials:   | 316SS, including sensor                                  |
| Standard temperature & pressure (STP)   | 70° F & 29.92" Hg  |
| (Air .075 lb/cubic foot)  |  |
| NIST traceable calibration  | Standard   |

### APPROVALS

MPNH Series for use in Ordinary (Non-Hazardous) area locations: Type 4X, IP66

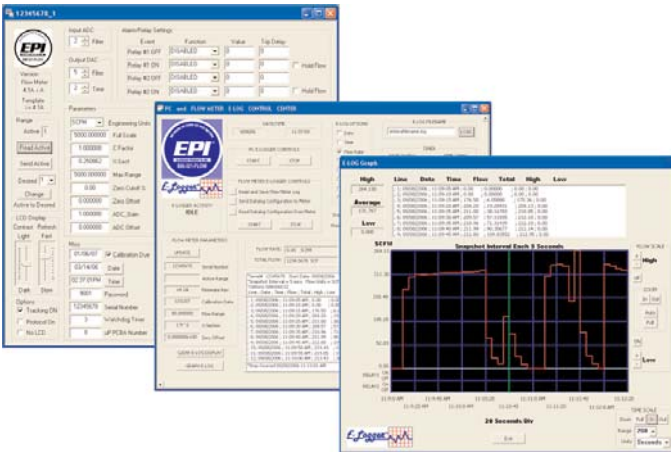
\* The accuracy specification applies to the instrument only. EPI is not responsible for measurement errors due to flow profile irregularities caused by installation piping configurations, corrosion on inner pipe surfaces, valve placement, etc.

## 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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