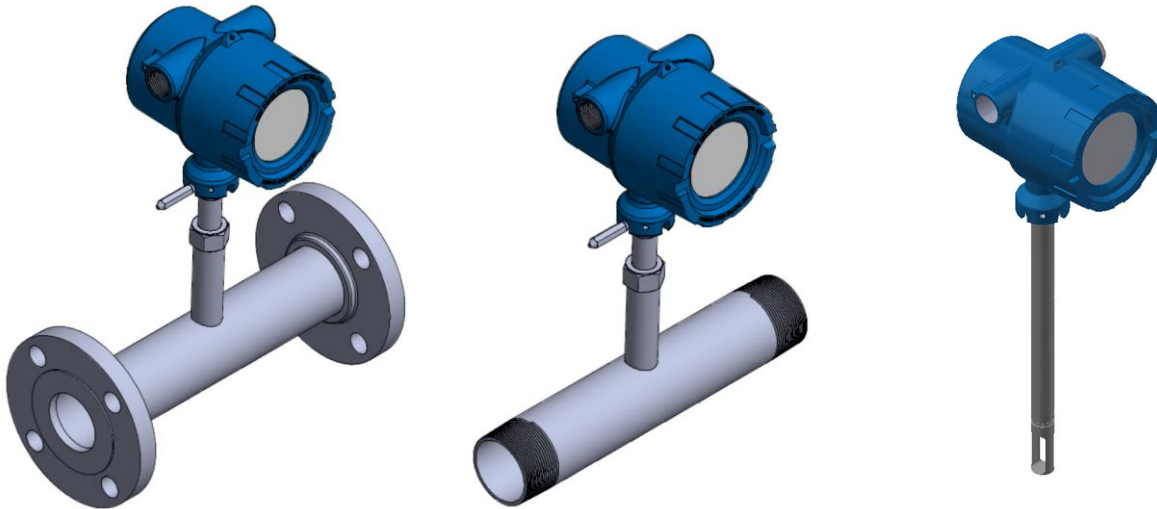


## FMP Series

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### Gas Flow Meters for Permanent Installation



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### Product Description

The FMP... series flow meters measure and display the pressure / temperature compensated instantaneous flow of common fuel gases. Both an insertion type meter and an inline type meter (with flow straightening) are available.

Calibration of the meter can be automatically checked. Yearly re-calibrations are typically not required.

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### Features

- Measures and displays the instantaneous flow of natural gas, propane, or biogas / digester gas
  - Automatically compensates for gas temperature and pressure
  - Insertion meter accommodates pipe sizes of 1-1/2" to 8"
  - Inline meter accommodates pipe sizes of 1" to 6"
  - Directly connects to external devices such as LMV5x, LMV3x, and PLC / touchscreen systems via 4-20mA or pulse output
-

## Product Part Numbers

For flow meter kit part number identification only. Not all possible part number combinations are available. See Table 1 and Table 2 on the following pages for available flow meter kit part number combinations.

# FMP 109 - B 200 - NG - A

### Flow Meter Kit Type

### Type of Meter

- 109 = FT1 with 9" Probe - Insertion Type
- 112 = FT1 with 12" Probe - Insertion Type
- 360 = FT1 in Carbon Steel NPT - Inline Type
- 365 = FT1 in Stainless Steel NPT - Inline Type
- 460 = FT1 in Carbon Steel Flanged - Inline Type
- 465 = FT1 in Stainless Steel Flanged - Inline Type

### Output Signals

- B = Both Analog 4-20 and Pulse

### Schedule 40 Pipe Size

- 150 = 1-1/2 inch
- 200 = 2 inch
- 250 = 2-1/2 inch
- 300 = 3 inch
- 400 = 4 inch
- 600 = 6 inch
- 800 = 8 inch

### Type of Gas

- NG = Natural Gas
- PG = Propane Gas
- WG = Biogas (Waste Gas)

### Additional Descriptor

- A = Standard

**Product Part Numbers (continued)****Table 1: Insertion Type Gas Flow Meters**

Part #	SCH 40 Pipe Size (in)	Gas Type	Probe Length (in)	Min Flow (SCFH)	SCH 40 Max Flow (SCFH)	Max Boiler Output (BHP) <sup>1</sup>	Max Boiler Output (LB/HR) <sup>2</sup>
FMP109-B150-NG-A	1-1/2	Natural Gas	9	48	21207	538	18195
FMP109-B200-NG-A	2			79	34954	888	29990
FMP109-B250-NG-A	2-1/2			113	49872	1266	42789
FMP109-B300-NG-A	3			174	77007	1955	66070
FMP109-B400-NG-A	4			300	132607	3367	113774
FMP109-B600-NG-A	6			681	300940	7641	258200
FMP112-B300-NG-A	3		12	174	77007	1955	66070
FMP112-B400-NG-A	4			300	132607	3367	113774
FMP112-B600-NG-A	6			681	300940	7641	258200
FMP112-B800-NG-A	8			1179	520984	13229	446993
FMP109-B150-PG-A	1-1/2	Propane	9	48	21207	1346	45488
FMP109-B200-PG-A	2			79	34954	2219	74975
FMP109-B250-PG-A	2 1/2			113	49872	3166	106973
FMP109-B300-PG-A	3			174	77007	4888	165176
FMP109-B400-PG-A	4			300	132607	8418	284435
FMP109-B600-PG-A	6			681	300940	19104	645501
FMP112-B300-PG-A	3		12	174	77007	4888	165176
FMP112-B400-PG-A	4			300	132607	8418	284435
FMP112-B600-PG-A	6			681	300940	19104	645501
FMP112-B800-PG-A	8			1179	520984	33072	1117484

**Notes:**

1. Boiler Horsepower numbers assume the following:
  - a. Natural gas heating value of 1000 BTU / SCF
  - b. Propane heating value of 2500 BTU / SCF
  - c. Biogas heating value of 550 BTU / SCF
  - d. Boiler efficiency of 85%
2. Steam flow numbers assume 230°F feedwater and 100 PSIG steam.

## Product Part Numbers (continued)

**Table 1: Insertion Type Gas Flow Meters (continued)**

Part #	SCH 40 Pipe Size (in)	Gas Type	Probe Length (in)	Min Flow (SCFH)	SCH 40 Max Flow (SCFH)	Max Boiler Output (BHP) <sup>1</sup>	Max Boiler Output (LB/HR) <sup>2</sup>
FMP109-B150-WG-A	1-1/2	Biogas / Digester Gas	9	48	21207	296	10007
FMP109-B200-WG-A	2			79	34954	488	16494
FMP109-B250-WG-A	2-1/2			113	49872	696	23534
FMP109-B300-WG-A	3			174	77007	1075	36339
FMP109-B400-WG-A	4			300	132607	1852	62576
FMP109-B600-WG-A	6			681	300940	4203	142010
FMP112-B300-WG-A	3		12	174	77007	1075	36339
FMP112-B400-WG-A	4			300	132607	1852	62576
FMP112-B600-WG-A	6			681	300940	4203	142010
FMP112-B800-WG-A	8			1179	520984	7276	245846

**Notes:**

1. Boiler Horsepower numbers assume the following:
  - a. Natural gas heating value of 1000 BTU / SCF
  - b. Propane heating value of 2500 BTU / SCF
  - c. Biogas heating value of 550 BTU / SCF
  - d. Boiler efficiency of 85%
2. Steam flow numbers assume 230°F feedwater and 100 PSIG steam.

## Product Part Numbers (continued)

**Table 2: Inline Type Gas Flow Meters with Integral Flow Straightener**

Part #	SCH 40 Pipe Size (in)	Gas Type	Spool Piece w / integral flow straightener	Min Flow (SCFH)	Max Flow (SCFH)	Max Boiler Output (BHP) <sup>1</sup>	Max Boiler Output (LB/HR) <sup>2</sup>
FMP365-B100-NG-A	1	Natural Gas	Stainless Steel / NPT	20	9003	229	7724
FMP365-B125-NG-A	1 1/4			35	15580	396	13367
FMP365-B150-NG-A	1 1/2			48	21207	538	18195
FMP360-B200-NG-A	2		Carbon Steel / NPT	79	34954	888	29990
FMP360-B250-NG-A	2 1/2			113	49872	1266	42789
FMP360-B300-NG-A	3			174	77007	1955	66070
FMP460-B200-NG-A	2		Carbon Steel / ANSI 150# Flanged	79	34954	888	29990
FMP460-B250-NG-A	2 1/2			113	49872	1266	42789
FMP460-B300-NG-A	3			174	77007	1955	66070
FMP460-B400-NG-A	4			300	132607	3367	113774
FMP460-B600-NG-A	6	681		300940	7641	258200	
FMP365-B100-PG-A	1	Propane	Stainless Steel / NPT	20	9003	572	19311
FMP365-B125-PG-A	1 1/4			35	15580	989	33418
FMP365-B150-PG-A	1 1/2			48	21207	1346	45488
FMP360-B200-PG-A	2		Carbon Steel / NPT	79	34954	2219	74975
FMP360-B250-PG-A	2 1/2			113	49872	3166	106973
FMP360-B300-PG-A	3			174	77007	4888	165176
FMP460-B200-PG-A	2		Carbon Steel / ANSI 150# Flanged	79	34954	2219	74975
FMP460-B250-PG-A	2 1/2			113	49872	3166	106973
FMP460-B300-PG-A	3			174	77007	4888	165176
FMP460-B400-PG-A	4			300	132607	8418	284435
FMP460-B600-PG-A	6	681		300940	19104	645501	

### Notes:

1. Boiler Horsepower numbers assume the following:
  - a. Natural gas heating value of 1000 BTU / SCF
  - b. Propane heating value of 2500 BTU / SCF
  - c. Biogas heating value of 550 BTU / SCF
  - d. Boiler efficiency of 85%
2. Steam flow numbers assume 230°F feedwater and 100 PSIG steam.

## Product Part Numbers (continued)

**Table 2: Inline Type Gas Flow Meters with Integral Flow Straightener (continued)**

Part #	SCH 40 Pipe Size (in)	Gas Type	Spool Piece w / integral flow straightener	Min Flow (SCFH)	Max Flow (SCFH)	Max Boiler Output (BHP) <sup>1</sup>	Max Boiler Output (LB/HR) <sup>2</sup>
FMP365-B100-WG-A	1	Biogas / Digester Gas	Stainless Steel / NPT	20	9003	126	4248
FMP365-B125-WG-A	1 1/4			35	15580	218	7352
FMP365-B150-WG-A	1 1/2			48	21207	296	10007
FMP365-B200-WG-A	2			79	34954	488	16494
FMP365-B250-WG-A	2 1/2			113	49872	696	23534
FMP365-B300-WG-A	3			174	77007	1075	36339
FMP465-B200-WG-A	2		Stainless Steel / ANSI 150# Flanged	79	34954	488	16494
FMP465-B250-WG-A	2 1/2			113	49872	696	23534
FMP465-B300-WG-A	3			174	77007	1075	36339
FMP465-B400-WG-A	4			300	132607	1852	62576
FMP465-B600-WG-A	6			681	300940	4203	142010

**Notes:**

1. Boiler Horsepower numbers assume the following:
  - a. Natural gas heating value of 1000 BTU / SCF
  - b. Propane heating value of 2500 BTU / SCF
  - c. Biogas heating value of 550 BTU / SCFH
  - d. Boiler efficiency of 85%
2. Steam flow numbers assume 230°F feedwater and 100 PSIG steam.

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## Specifications

<b>Operating characteristics</b>	Media to be measured	Natural gas, propane, biogas, air, and others
	Units for flow	SCFH and others
	Maximum flow	See Table 1 and Table 2
	Maximum pressure (at 100° F)	
	Insertion	740 PSIG [51 bar] – SS Ferrule <sup>1</sup>
	Inline NPT	300 PSIG [20.6 bar]
	Inline #150 Flanged CS	285 PSIG [20.3 bar]
	Inline #150 Flanged SS	230 PSIG [15.8 bar]
	Ambient temperature range	-40 to 158°F [-40 to 70°C]
	Media temperature range	-40 to 250°F [-40 to 121°C]
	Accuracy	+/- 1.5% of reading +/- 0.5% of full scale
	Straight length pipe requirements	
	Insertion upstream	15 x pipe ID min.
	Insertion downstream	10 x pipe ID min.
	Inline upstream	8 x pipe ID min.
	Inline downstream	4 x pipe ID min.
	Repeatability	+/- 0.20% of full scale
	Maximum medium humidity	90% (non-condensing)
	Meter turndown	1000 to 1 max. 100 to 1 Typical
	Power requirements	12 to 28 VDC 20 watts max.
	Standard output signals	4-20mA analog 0 to 100 Hz pulse
Enclosure ratings	NEMA 4x (IP66/67) <sup>4</sup> FM Class 1 Division 1 Groups B,C,D	

**Notes:**

1. The insertion type meters must be used with Stainless Steel (SS) ferrules for the 740 PSIG rating. If the non-swaging PTFE (Teflon) ferrules are used, max pressure is 60 PSIG. Stainless steel ferrules are recommended for permanent installations.
2. Meter automatically compensates for the pressure and temperature of the gas
3. SI units for flow are possible by changing the configuration of the meter.
4. Proper liquid tight fittings are required to maintain NEMA 4X ratings.

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## Components

Figure 1 shows the components included with a FMP109... or a FMP112... insertion flow meter for permanent installation. Please see Installation Instructions FMP-1100 for additional information.



**Figure 1: Components Included with the FMP109... or a FMP112... Insertion flow meter**

1. Insertion flow meter FMP109... (9" probe) or FMP112... (12" probe)
2. Tube to pipe adapter - 3/4" tube to 1" NPT
3. Tube to pipe adapter - 3/4" tube to 3/4" NPT
4. Not Shown – PTFE (Teflon) ferrule kit
5. Not Shown – FT1 meter manual
6. Not Shown – Two spare meter fuses

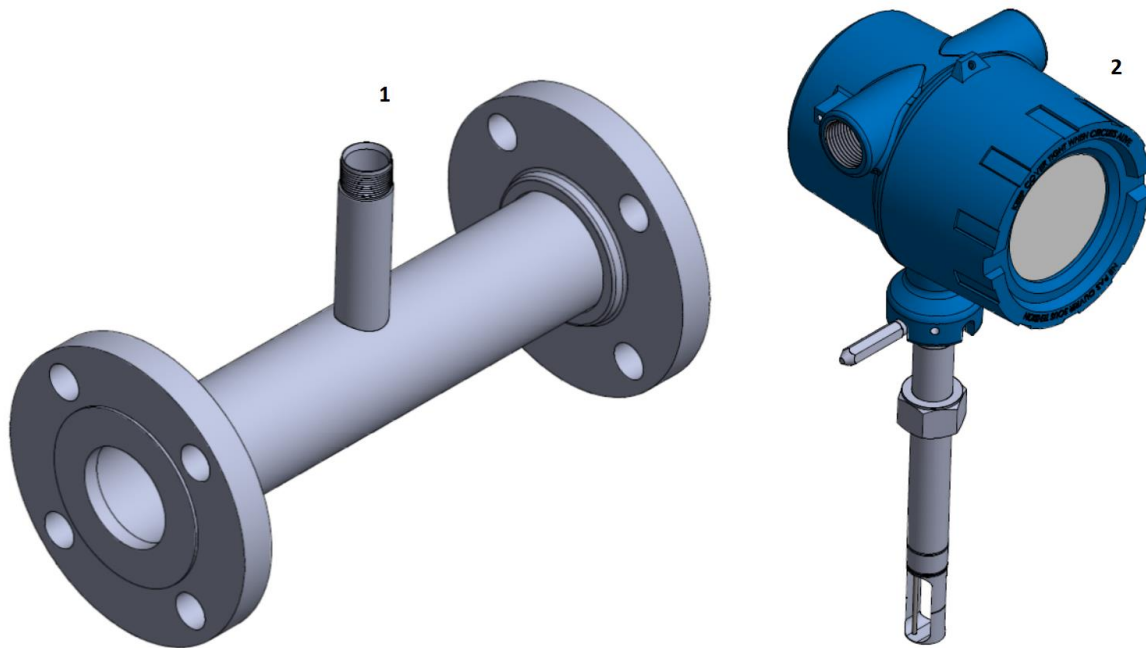
**Note: Meter requires an external DC power source (typically 24 VDC) for operation**



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## Components (continued)

Figure 2 shows the components included with a FMP36... or a FMP46... inline flow meter for permanent installation. Please see Installation Instructions FMP-1100 for additional information.



**Figure 2: Components Included with the FMP36... or FMP46... Inline flow meter**

1. Spool piece with integral flow straightener – ANSI #150 shown
2. Flow meter matched to flow straightener
3. Not Shown – FT1 meter manual
4. Not Shown – Two spare meter fuses

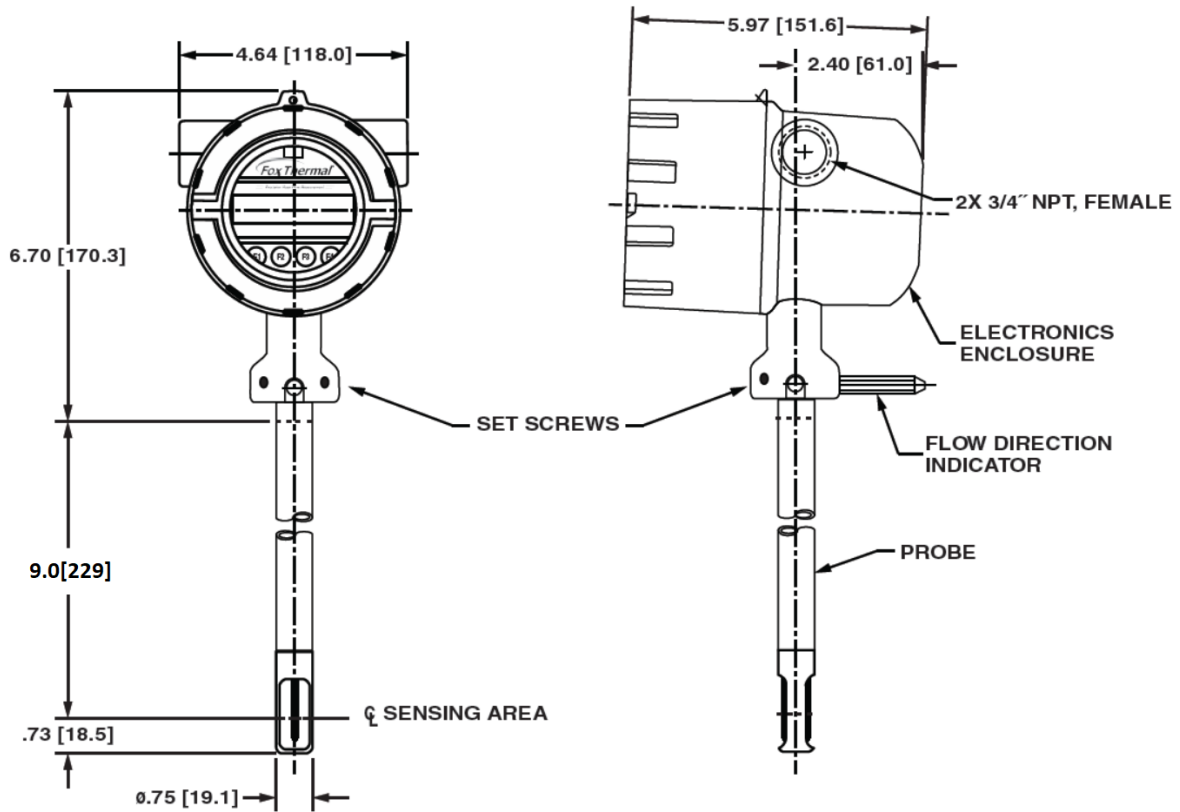
**Note: Meter requires an external DC power source (typically 24 VDC) for operation.**

**Note: Some inline meters ship in two pieces, as shown above. Both the meter and the spool piece are labeled with a matching serial number. Ensure that the serial number on the meter matches the serial number on the flow section when assembled especially when multiple, identical meters are ordered and installed.**

## Dimensions

Dimensions in inches; millimeters in brackets

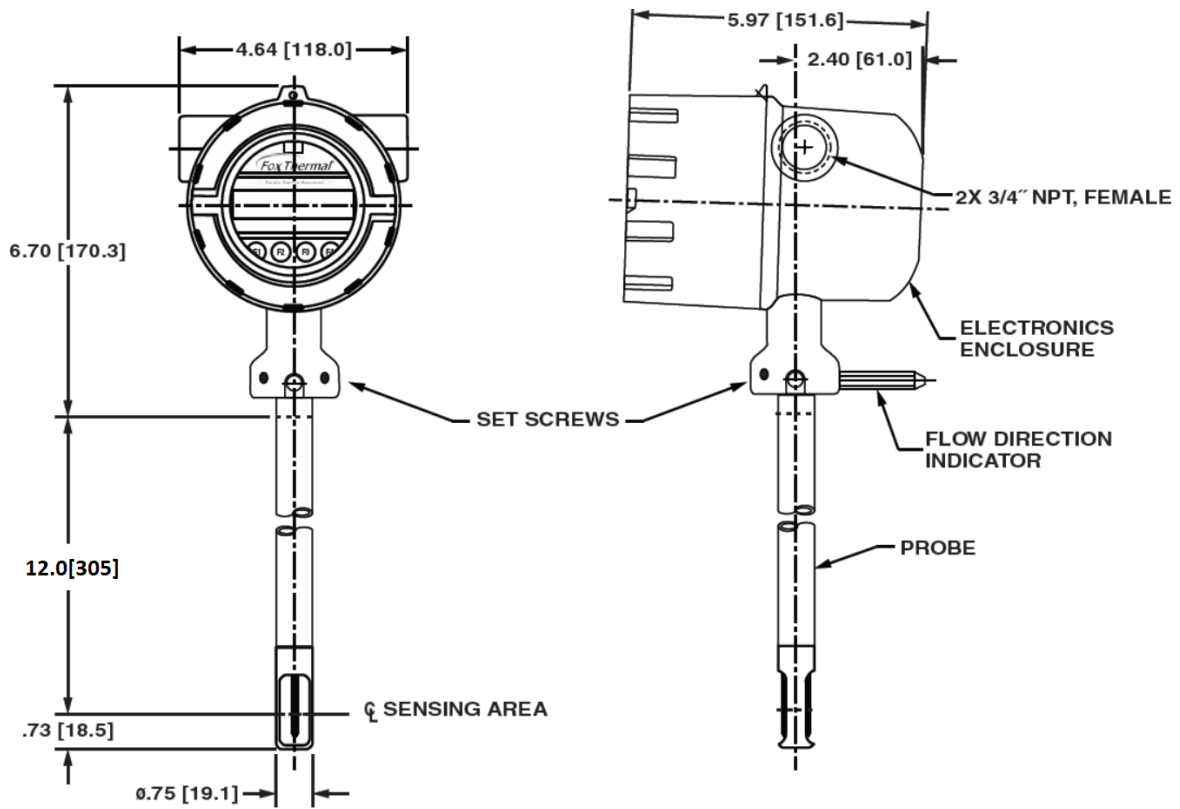
### Insertion Type – FMP109...



## Dimensions (continued)

Dimensions in inches; millimeters in brackets

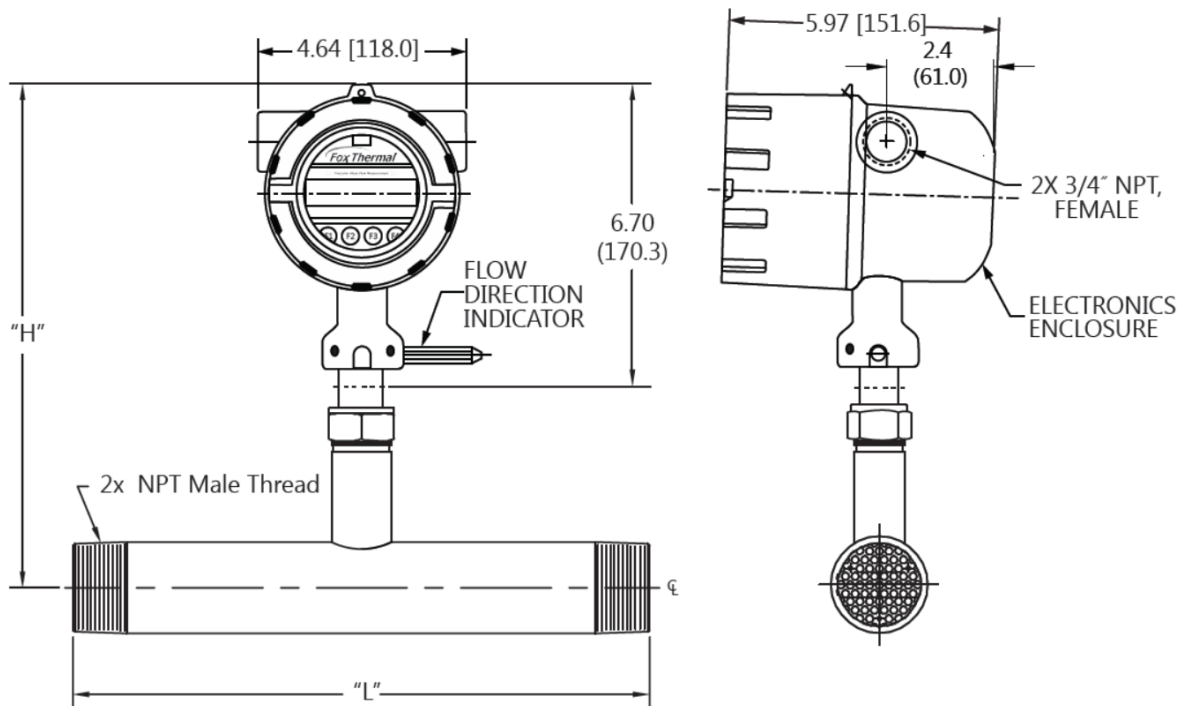
### Insertion Type – FMP112...



## Dimensions (continued)

Dimensions in inches; millimeters in brackets

### Inline Type (NPT) – FMP36....

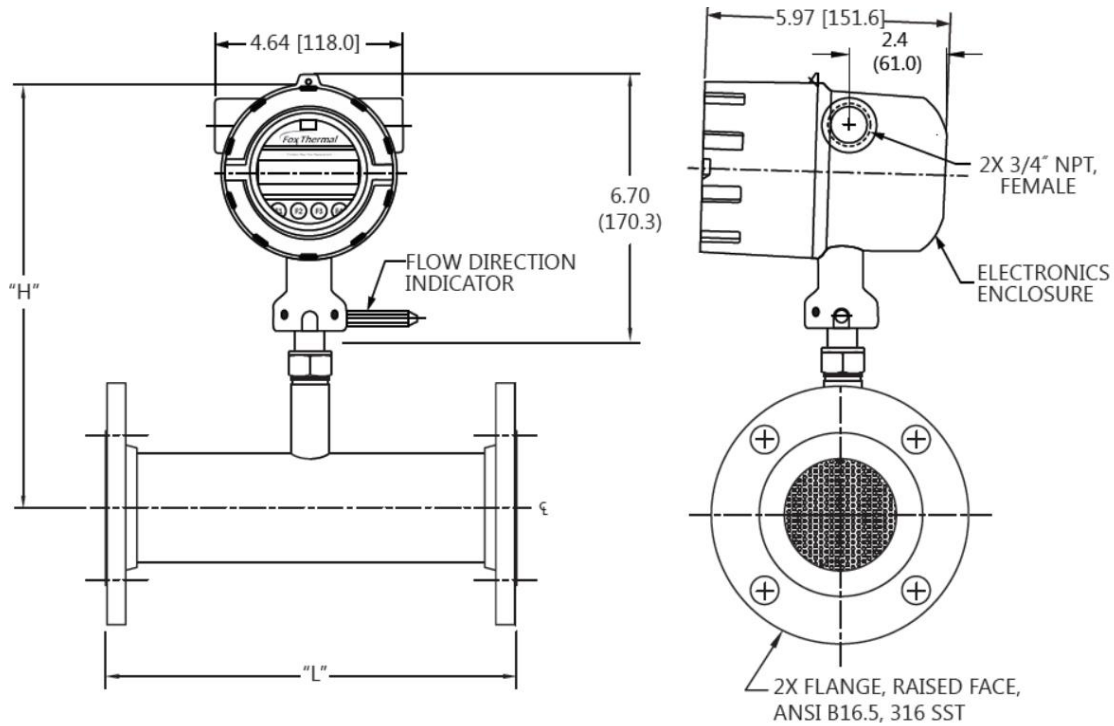


FMP36... Dimensions			
Part #	SCH 40 Pipe Size - in	Dimension "L"	Dimension "H"
FMP36x-B100...	1	12 (305)	10.7 (272)
FMP36x-B125...	1 1/4	12 (305)	10.7 (272)
FMP36x-B150...	1 1/2	12 (305)	12.7 (323)
FMP36x-B200...	2	12 (305)	12.7 (323)
FMP36x-B250...	2 1/2	18 (458)	12.7 (323)
FMP36x-B300...	3	18 (458)	12.7 (323)

## Dimensions (continued)

Dimensions in inches; millimeters in brackets

### Inline Type (ANSI #150) – FMP46....



FMP46... Dimensions			
PART#	SCH 40 Pipe Size - in	Dimension "L"	Dimension "H"
FMP46x-B200...	2	12 (305)	12.7 (323)
FMP46x-B250...	2 1/2	18 (458)	12.7 (323)
FMP46x-B300...	3	18 (458)	12.7 (323)
FMP46x-B400...	4	18 (458)	12.7 (323)
FMP46x-B600...	6	24 (611)	12.7 (323)

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