



ATMASS

Thermal Mass Flowmeter

ATMF Inline Series

GENERAL

SmartMeasurement inline mass Flowmeters are thermal dispersion type, utilizing the constant temperature difference method of measuring Gas Mass Flow Rate. It contains two reference grade platinum RTD sensors clad in a protective 316 SS sheath. Features include direct mass flow for gases, wide rangeability, low pressure drop, very low end sensitivity, and no moving parts. The SmartMeasurement ATMF series is microprocessor based and does not have any potentiometers. Electronics can be Integral Style, or remote mount with rugged windowed dual compartment enclosure with local or remote display. Four models are available ranging from the low cost blind meters to the more advanced SP models. Calibration Self Check: Each meter has built in diagnostics - a display of the calibration milliwatts (mw) can be used to check the sensor's operation by being compared to the original reported "zero flow" value noted on meter's Certificate of Conformance (last few lines) and metallic tag. This convenient field diagnostic procedure verifies that the original factory calibration hasn't drifted, shifted, or changed. This "Sensor Functionality and Zero Self Check" also verifies that the sensor is free from contamination, even without inspection.



FEATURES

- Direct mass flow measurement of any gas with actual gas calibration
- Opto-isolated outputs, with graphic display
- Tracking of overall gas consumption over a turndown ratio of at least 100:1
- Available in SIX (ATEX), SP (CSA, UL) and NH (Non-Hazardous) configuration
- High contrast photo-emissive OLED display with rate, total, temperature and graphic display
- User-selectable engineering units, dynamically converts the flow rate and total flow
- Can measure higher velocity than any other thermal mass meter - up to 203 m/s
- Display calibration milliwatt (mw) for ongoing diagnostics
- Standard software available with multi-curve fit programs
- Low power dissipation; under 2W
- Flow conditioners included with all meters

SPECIFICATIONS

• Process Connection: Threaded, Flanged • Process temperature: 149°C (300°F) • Operating pressure: 69 Barg (1000 PSIG) • Mass Flow rate: See model selection guide section • Flow units: Kg/hr, Kg/mn, Kg/s Lb/hr, Lb/m Lb/s NCMH, SCFM, NLPM, SLPM Mt/s, F/mn, BTU/Hr, BTU/min • Gas temperature effect: 0.01% /°C • Accuracy (and linearity): ±[1% of Reading + (.5% FS)] ± 0.2% of Full Scale • Repeatability: ± 0.25% of Full Scale • Turn down ratio: Over 100:1 • Response time: Less than one second • Material: 316SS as per DIN 1.4571 (AISI 316 Ti) • Linear signal output: 0-5 Vdc & 4-20 mA • Pulse output: scalable • Relays: Two 1-amp, SPDT User-selectable alarm functions • Display units: Flow, Total flow, Switch settings Temperature, Elapsed time • RAM Back-up: Lithium Battery	• Housing protection: NEMA 4, Class 1, Div 1, Groups B, C, & D • Ex-protection: II 2 GD EEx d IIC T2 or T3   • Cable (remote version): up to 300 meters • Wetted materials: 316 SSS (Hastelloy, etc..) • Weight (approximate): <table> <tr> <td>Integral Type:</td><td></td></tr> <tr> <td>¼" to 1"</td><td>1 to 4 Kg (2.2 - 8.8Lb)</td></tr> <tr> <td>1¼" to 2½"</td><td>2-3 Kg (4.4 - 6.6Lb)</td></tr> <tr> <td>3 and 4"</td><td>4-5 KG (8.81 - 22Lb)</td></tr> <tr> <td>Remote Type:</td><td></td></tr> <tr> <td>¼" to 1"</td><td>3 to 6 Kg (6.6 - 13.2 Lb)</td></tr> <tr> <td>1¼" to 2½"</td><td>6-8 Kg (13.2 - 17.6 Lb)</td></tr> <tr> <td>3" and 4"</td><td>8-10 KG (17.6-22 Lb)</td></tr> </table> • Notes: -weight +0.5 kg (1 Lb) for 150# flanges + 1kg (2.2Lb) for 300# • Power requirements: 115VAC @, 1/8 A 230VAC @ 1/16 A 24 VDC @ 1/4A • Power Consumption: 2 Watts or less • NIST traceable Standard for all calibration • Signal Interface RS232 & RS485, MODBUS, etc.. • Data storage EPROM storage up to 10 years	Integral Type:		¼" to 1"	1 to 4 Kg (2.2 - 8.8Lb)	1¼" to 2½"	2-3 Kg (4.4 - 6.6Lb)	3 and 4"	4-5 KG (8.81 - 22Lb)	Remote Type:		¼" to 1"	3 to 6 Kg (6.6 - 13.2 Lb)	1¼" to 2½"	6-8 Kg (13.2 - 17.6 Lb)	3" and 4"	8-10 KG (17.6-22 Lb)
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■ ATMF-IL-SIX

ATEX Zone I, II 2 G Ex d IIB+H2 T6 Gb
 4 line OLED displays rate, total, temperature and graphical Flowrate
 Available in 12V_{DC}, 24V_{DC}, 115-230V_{AC} (under 6W)
 Accuracy (and linearity) : $\pm[1\% \text{ of Reading} + (.5\% \text{ FS})]$
 HART and 4-20 mA isolated output
 One dry contact relay (Pulsed Output, or Trip High or Trip Low)
 MODBUS RTU or RS232 communication and menuing software
 Zero Calibration Self Check Diagnostics
 Calibration milliwatt (mw) displayed for ongoing diagnostics
 Flanged and NPT connection available

■ ATMF-IL-SP

CE, UL, CSA Ex proof Class1, Div1, Group B,C,D
 4 line OLED displays rate, total, temperature and graphical Flowrate,
 Calibration self-check (built in diagnostics)
 Accuracy (and linearity) : $\pm[1\% \text{ of Reading} + (.5\% \text{ FS})]$
 MODBUS RTU or RS232 communication and menuing software
 Calibration milliwatt (mw) displayed for ongoing diagnostics
 MODBUS RTU or RS232 communication and menuing software
 Calibration milliwatt (mw) displayed for ongoing diagnostics
 HART option available
 Flanged and NPT connection available

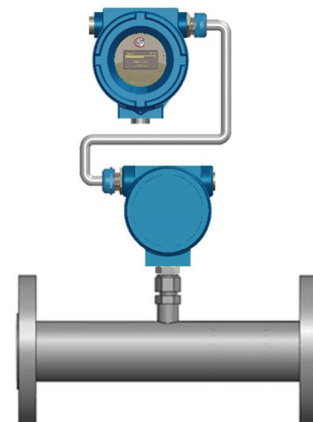


■ ATMF-IL-NH

Designed for inexpensive Non-hazardous use with Exd Enclosure
 2 line OLED displays rate, total
 Low power dissipation, under 2.5 Watts (e.g., under 100 ma at 24 VDC)
 Accuracy (and linearity) : $\pm[1\% \text{ of Reading} + (.5\% \text{ FS})]$
 24 VDC or 115VAC/230 VAC
 Modbus® compliant RS485 RTU communications
 Field reconfigurability via optional software
 Diagnostic & graphic display and/or HART see SIX or SP style
 Flanged and NPT connection available

■ ATMF-IL-Remote Electronics

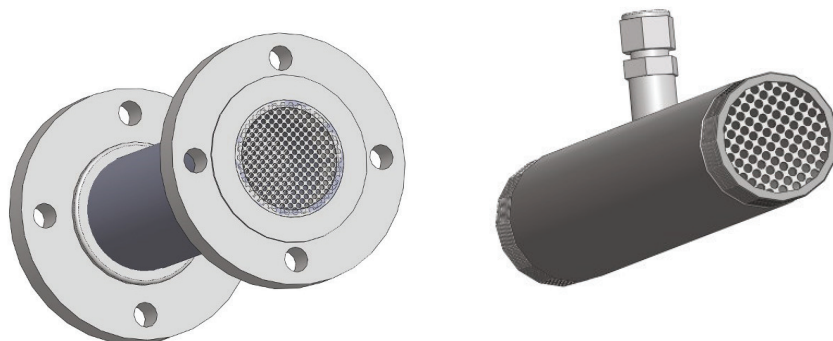
Remote dual compartment (IP67) NEMA 4 line with OLED display
 4 line rate, total, temperature and graphical Flowrate (SIX and SP)
 2 line displays rate, total, for NH versions
 Integral junction box connected to remote electronics 25ft (7.6M)
 6-conductor can be lengthened or shortened without affecting accuracy
 max loop resistance 10 ohms, over 1000 ft (300M)
 Must be grounded at transmitter
 Integral explosion proof Junction Box has no circuitry, only terminal wires
 Integral Junction box terminals are suitable for harsh environments
 Integral Ex proof Junction Box (Class 1, Div 1, Groups B, C, D)



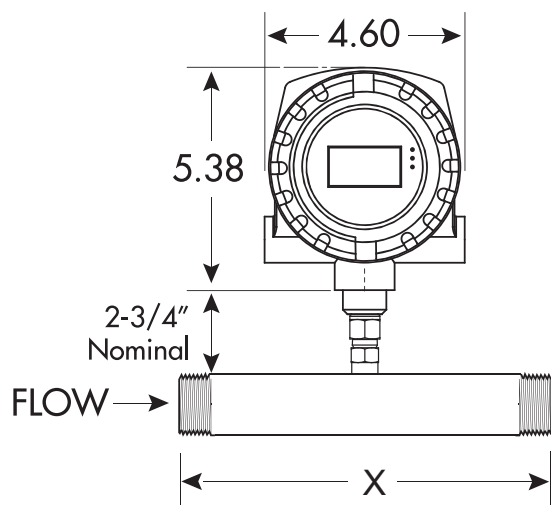
■ ATMF-IL "X" Dimensions

SIZE	X Dimension (length)
1/4" (6.35MM)	6 (152.4mm)
3/8" (9.53MM)	6 (152.4mm)
1/2" (12.7MM)	7 (177.8mm)
3/4" (19.05MM)	7 (177.8mm)
1" (25MM)	8 (203.2mm)
1 1/4" (31.75MM)	10 (254mm)
1 1/2" (38.1MM)	12 (304.8mm)
2" (50MM)	12 (304.8mm)
2 1/2" (63.5MM)	12 (304.8mm)
3" (80MM)	12 (304.8mm)
4" (100MM)	12 (304.8mm)

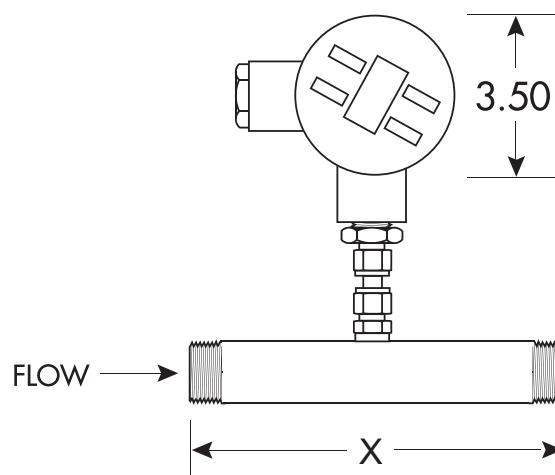
■ Flow conditioner



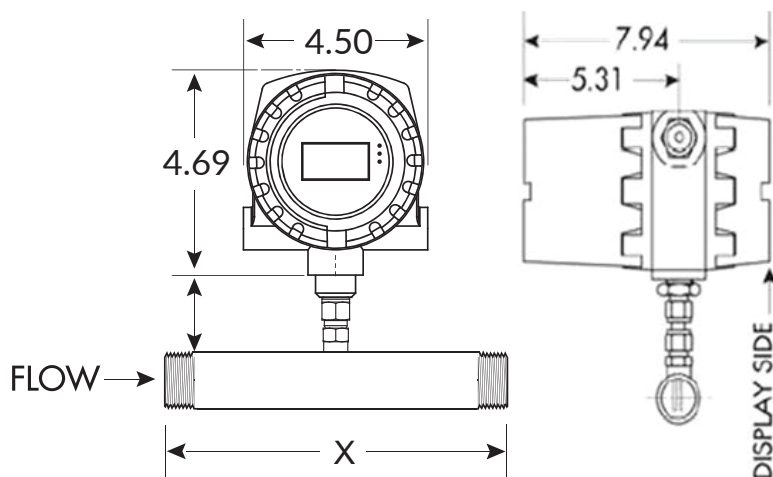
■ ATMF-IL-SP/NH (Integral)



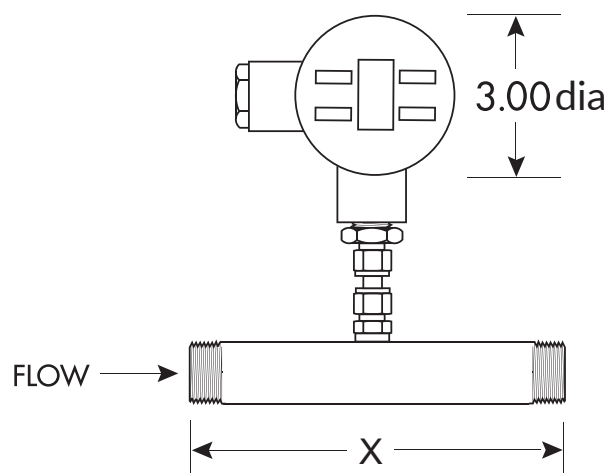
■ ATMF-IL-SP/NH (Remote)



■ ATMF-IL-SIX (Integral)



■ ATMF-IL-SIX (Remote)



Procedures to specify our inline mass meters
You also need to provide the following information:

GAS COMPOSITION	NIST certified calibration is done with actual or equivalent gas - gas type or mixture MUST be given
FULL SCALE FLOW	Maximum and minimum flow rates and units MUST be provided
LINE SIZE	Line size and connection MUST be provided (see selection guide below for options)
GAS PRESSURE AND TEMPERATURE	Calibration is done at operating or maximum pressure and temperature
ELECTRONICS TEMPERATURE	Temperature of the environment surrounding the Flowmeters electronics.
POWER REQUIREMENTS	Specify requirements such as 12, 24 V _{DC} or 115 V _{AC} or 230 V _{AC}
CONFIGURATION	See below transmitter styles

ATMF SERIES INLINE METERS**EXAMPLE ATMFIL-SP-I-05-15"-TFC05-DC24-O2 (40 NMPS, 40C AND 12 BARG)**

ATMF-IL		**	**	**	**	**	**	**	**	DESCRIPTION
ATEX/CSA Exd type	SIX									Transmitter
NON-HAZORDOUS TYPE	NH									
CSA EXD TYPE	SP									
Integral	I									Style
Remote	R									
¼" X 6"L inline flowbody**			025							Connection
⅝" X 6"L inline flowbody			030							
½" X 7"L inline flowbody			050							
¾" X 7"L inline flowbody w/ Flow Conditioners			075							
1" X 8"L inline flowbody w/ Flow Conditioners			100							
1¼" X 10"L inline flowbody w/ Flow Conditioners			125							
1½" X 12"L inline flowbody w/ Flow Conditioners			150							
2" X 12"L inline flowbody w/ Flow Conditioners			200							
2½" X 12"L inline flowbody w/ Flow Conditioners			250							
3" X 12"L inline flowbody w/ Flow Conditioners			300							
4" X 12"L inline flowbody w/ Flow Conditioners			400							
TUBE VERSUS PIPE (To Advise)			TUBE							
150LB ANSI RAISED FLANGED ENDS			S150FLG							
300LB ANSI RAISED FLANGED ENDS			S300FLG							
12 V _{DC}					12V _{DC}					Power Supply
24V _{DC}					24V _{DC}					
110-115 V _{AC}					115 V _{AC}					
220-240V _{AC}					230V _{AC}					
Put gas type and max velocity						Gas				Gas
OPTIONS (please contact SmartMeasurement for others not included here)										
BASIC ADDRESSER SOFTWARE AND U _L INX (RS485 TO USB) FOR SP models								ADDRESSER		Options
ADVANCED RECONFIGURATION SOFTWARE FOR SP models (DOWNLOAD)								ADDRESSER PLU		
DONGLE ASSEMBLY W/ CABLE FOR SP model								DONGLEWCBL		
NON-STD CABLE LENGTH FOR REMOTE METERS -								CBL xxx		
AFTER-CAL DATA AND CERTIFICATE								CACERT		
HASTELLOY SENSOR								HSILS		
HIGH TEMP OPERATION (GAS FROM 200 - 350° F- 93°C to 177°C)								HTO1		
VERY HIGH TEMPERATURE OPERATION (GAS FROM 350 - 450°F 177°C to 232°C)								HTO2		
Extra RANGEs (up to four)only for SE and SG models								RG2		
OXYGEN FINAL CLEAN (with Certificate)								OFC		