



# ALMASS

## Insertion Thermal Mass Flowmeter

### Series ATMF 8000 IS

## GENERAL

The SMC insertion mass Flowmeters are thermal dispersion type, utilizing 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 direct Mass Flow for gases, wide rangeability, low pressure drop, very low end sensitivity, and no moving parts. The SMC ATMF series is microprocessor based, 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 available from the low cost blind meters to the more exotic featured SP models.


Calibration Self Check: Flow 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 in-situ 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
- ❑ Up to four in-dependent switch able flow curves
- ❑ high contrast photo-emissive OLED display with rate, total, temperature and graphic display
- ❑ 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 diagnosis
- ❑ Standard software available multi-curve fit programs
- ❑ Low power dissipation under 2W
- ❑ Low cost SA option for Air, O2 and N2 ONLY (0.3Nm/s~60Nm/s)



## SPECIFICATION

- |                              |  |                                |   |
|------------------------------|--|--------------------------------|---|
| ● Process Connection :       | Threaded, Flanged, Ball valve  | ● Housing protection :         | NEMA 4, Class 1, Div 1, Groups B, C, & D  |
| ● Process temperature :      | 0 to +300°C  | ● Ex-protection :              | II 2 GD EEx d IIC T2 or T3<br> |
| ● Operating pressure :       | 69 barg (1000 PSIG)  | ● Cable (remote version) :     | 300 meters  |
| ● Mass Velocity :            | 0.07 to 203 normal meters per second   | ● Wetted materials :           | 316 SSS (Hastelloy and Monel optional)  |
| ● Flow units :               | Kg/hr, Kg/mn, Kg/s Lb/hr, Lb/m Lb/s<br>NCMH, SCFM, NLPM, SLPM<br>Mt/s, F/mn, BTU/Hr, BTU/min | ● weight :                     |   |
| ● Gas pressure effect :      | Minor < ±20% of calibration pressure   | Integral Ex proof :            | 4.0 kg  |
| ● Gas temperature effect :   | 0.01%/°C   | Remote Ex proof :              | 7.0 kg  |
| ● Accuracy (and linearity) : | ±[1% of Reading +(0.5% FS)]  | Integral Non-Ex proof :        | 1.5 kg  |
|                              |  | Remote Non Ex proof :          | 3.0 kg  |
| Repeatability :              | ± 0.25% of Full Scale  | ● Linear signal output :       | 0-5 VDC & 4-20 mA   |
| ● Turn down ratio :          | Over 100:1   | ● Pulse output :               | scalable  |
| ● Response time :            | Less than one seconds  | ● Relays :                     | Two 1-amp, SPDT<br>User-selectable alarm functions  |
| ● Material :                 | 316SS as per DIN 1.4571 (AISI 316 Ti)  | ● Signal Interface :           | RS232 & RS485, MODBUS, etc..  |
| ● Display units :            | Flow, Total flow, Switch settings<br>Temperature, Elapsed time                               | ● Power requirements :         | 115VAC @, 1/8 A 230VAC @ 1/16 A<br>24 VDC @ 1/4A, 12 VDC  |
| ● RAM Back-up :              | Lithium Battery  | ● Power Consumption :          | 2.5 Watts (SP), or less 6W other models   |
| ● Data storage :             | EPROM storage up to 10 years   | ● NIST traceable calibration : | Standard  |
|                              |  | ● Self diagnostics functions : | ADC, DAC,<br>Alarm relay for EMI impulse noise  |

**ATMF8000IS-SIX**

Calibration milliwatt (mw) displayed for ongoing diagnostics  
 Available in 12VDC,24VDC, 115-230VAC (2.5W)  
 Calibration self-check (built in diagnostics)  
 Available with MODBUS (IEEE 32 Bit floating point) and RS485  
 Remote Windowed Enclosure - Dual compartment  
 with terminal access, and Explosion Proof Junction Box  
 Accuracy (and linearity) :  $\pm[1\% \text{ of Reading } + (.5\% \text{ FS})]$   
 ATEX Zone I,II 2 G Ex d IIB+H2 T6 Gb  
 Separate power and output terminals  
 Optional programmable USB dongle to adjust electronics  
 Displays rate, total, temperature and graphical Flowrate,  
 Portable rechargeable battery powered version available

**ATMF8000IS-NH**

Designed for inexpensive Non-hazardous use  
 Low power dissipation, under 2.5 Watts (e.g., under 100 ma at 24 VDC)  
 Accuracy (and linearity) :  $\pm[1\% \text{ of Reading } + (.5\% \text{ FS})]$   
 Integral and remote styles  
 24 VDC or 115VAC/230 VAC  
 Flow Rate, Totalizer  
 4 to 20 mA for Rate; 24VDC pulse for Totalized value  
 RS232 Communication  
 Modbus® compliant RS485 RTU communications (optional)  
 Field reconfigurability via optional Addresser software

**ATMF8000IS-SP**

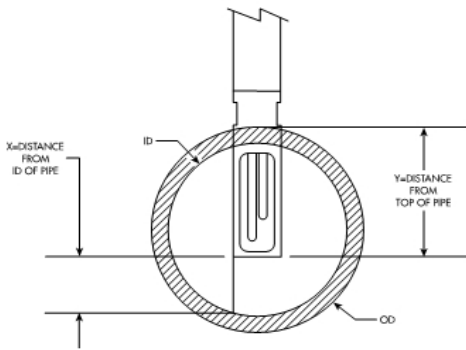
Calibration milliwatt (mw) displayed for ongoing diagnostics  
 Available in 12VDC,24VDC, 115-230VAC (2.5W)  
 Calibration self-check (built in diagnostics)  
 Available with MODBUS (IEEE 32 Bit floating point) and RS485  
 Remote Windowed Enclosure - Dual compartment  
 with terminal access, and Explosion Proof Junction Box  
 Accuracy (and linearity) :  $\pm[1\% \text{ of Reading } + (.5\% \text{ FS})]$   
 FM/CSA Class1, Div2, Groups BCD T4  
 Optional programmable USB dongle to adjust electronics  
 Displays rate, total, temperature and graphical Flowrate,  
 Portable rechargeable battery powered version available

**ATMF8000IS-SA**

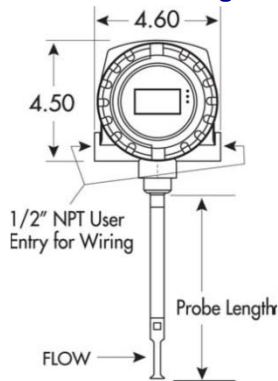
Low cost Air, O2 and N2 ONLY (0.3Nm/s~60Nm/s)  
 Accuracy (and linearity) :  $\pm[1\% \text{ of Reading } + (.5\% \text{ FS})]$   
 Integral windowed Nema 4X Enclosure  
 Remote Windowed Nema 4X  
 60mA 24 VDC or 115VAC/230 VAC  
 2-Line Backlit Touch Screen Display & 4 Button Menuing Keypad  
 Self-protection design of Zener safety barrier inside  
 RS232 Communication and Menuing Software  
 RamTron F-RAM for permanent storage of date

Instrument Drawings

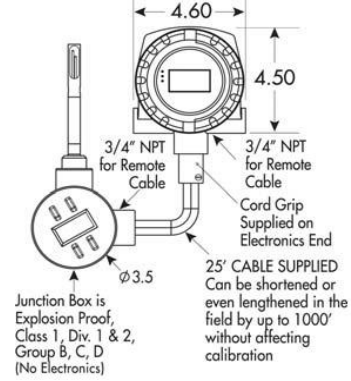
Installation in a pipe



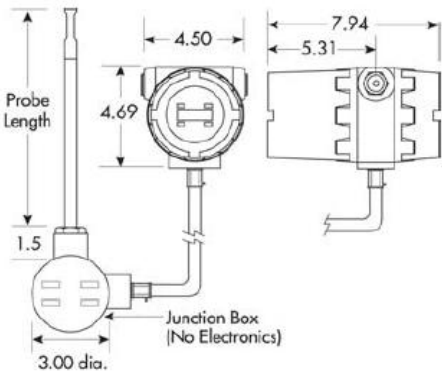
ATMF8000IS-SP-Integral



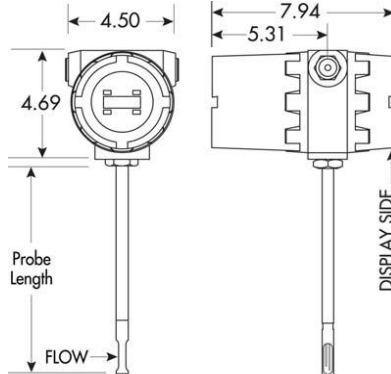
ATMF8000IS-SP-Remote



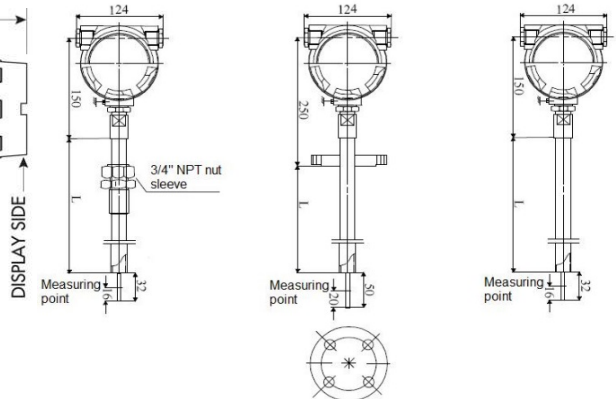
ATMF8000IS-SIX- Remote



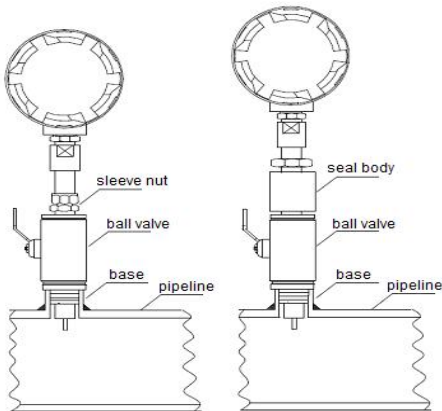
ATMF8000IS-SIX- Integral



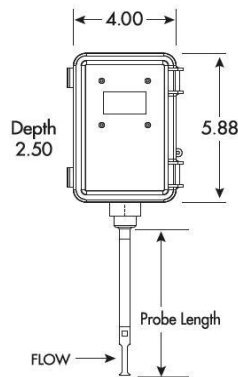
ATMF8000IS-SA - Integral



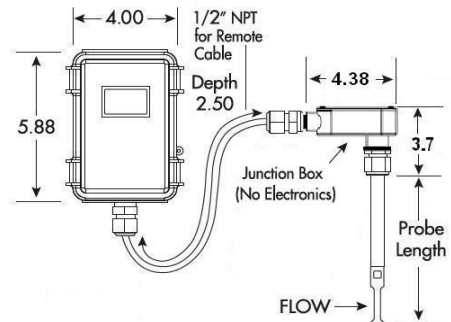
ATMF8000IS-SA - Mounting



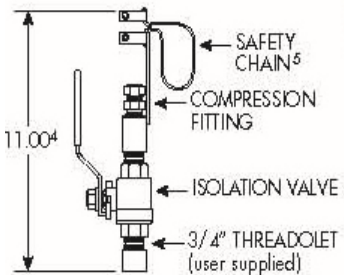
ATMF8000IS-SC-Integral



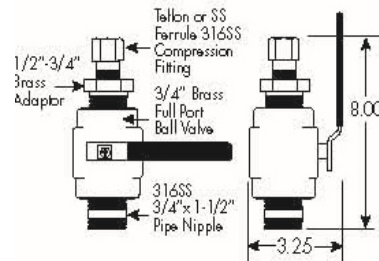
ATMF8000IS-SC-Remote



Installation Options

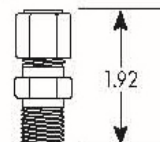


(Maximum 650 psig<sup>13</sup>)



(Maximum 50 psig)

1/2" tube x 1/2" pipe fitting (shown, not to scale), is used for low pressure insertion applications to 125 psig. Also available in 3/4" tube x 3/4" pipe size.



**Procedures to specify our insertion mass meters**

**\*\* Please contact your local SMC application engineer\*\***

**You also need to provide the following information:**

<b>Gas Composition</b>	NIST certified calibration is done with actual or equivalent gas - gas type or mixture <b>MUST</b> be given
<b>Full Scale Flow</b>	Maximum and minimum flow rates and units <b>MUST</b> be provided
<b>Line Size</b>	Line size and connection <b>MUST</b> be provided (see selection guide below for options)
<b>Gas Pressure and Temperature</b>	Calibration is done at operating or maximum pressure and temperature
<b>Electronics Temperature</b>	Temperature of the environment surrounding the Flowmeters electronics.
<b>Power Requirements</b>	Specify requirements such as 12, 24 VDC or 115 VAC or 230 VAC
<b>Configuration</b>	See below transmitter styles

**➔ Model Selection Guide**

ATMF Series Insertion meters												
Example ATMF-8000IS-SP-I-05-15"-TFC05-DC24-O2 (40 nmps, 40C and 12 Barg)												
AMF 8000 IS-		X	XXX	XXX	XXXXx	XXXXX"	XXXX	XXXXXXXX	XXX	XXXX		Description
INTEGRAL INDUSTRIAL MASS FLOW METER (includes graphical display) (ATEX/CSA Exd)	SIX										Transmitter	
LOW COST MASS FLOW METER ( Air, O2 and N2 ONLY (0.3Nm/s~60Nm/s)	SA											
Non-Hazardous MASS FLOW METER (includes graphical display)	NH											
INTEGRAL INDUSTRIAL MASS FLOW METER (includes graphical display) (CSA Exd)	SP											
1/2" PROBE DIAMETER		050										Probe-Diameter
3/4" PROBE DIAMETER		075										
Integral			I									Style
Remote			R									
Put insertion length in inches			##"									Insertion length
1" ANSI 150 #				10A150								Connection
1.5" ANSI 150 #				15A150								
2" ANSI 150 #				20A150								
1" ANSI 300 #				10A300								
1.5" ANSI 300 #				15A300								
2" ANSI 300 #				20A300								
1/2" TUBE X 1/2" COMPRESSION FITTING - SS FERRULE (>650 PSIG or 45BARG)				SSCF05								
3/4" TUBE X 3/4" COMPRESSION FITTING - SS FERRULE (>650 PSIG or 45BARG)				SCF07								
1/2" TUBE X 1/2" COMPRESSION FITTING - TEFLON FERRULE (>125 PSIG or 9 BARG)				STCF05								
3/4" TUBE X 3/4" COMPRESSION FITTING - TEFLON FERRULE (>125 PSIG or 9 BARG)				STCF07								
1/2" TUBE X 3/4" ISOLATION VALVE ASSEMBLY (650 PSIG or 45 barg)				SVL05								
1/2" TUBE X 3/4" ISOLATION VALVE ASSEMBLY (50 PSIG or 3.5 barg)				SVA05LP								
3/4" TUBE X 1" ISOLATION VALVE ASSEMBLY (350PSIG or 24 Barg)				SVA07								
12 VDC				12VDC								Power Supply
24VDC				24VDC								
110-115 VAC				115VAC								
220=240VAC				230VAC								
Put gas type and max velocity					Gas?						Gas	
<b>Process Gas (Please indicate, gas type, flow rate, line size, pressure and temperature)</b>										Process Data (T,P flow, etc)		
<b>For larger flanges sizes, probe material (Hasteloy C, Monel) and other options contact SMC</b>												