



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

SmartMeasurement

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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-SC

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
 Digital system allows raw signal validation (milli-watts)
 24 VDC or 115VAC/230 VAC
 Photo-emissive OLED graphical display (Flow Rate, Totalizer, Temperature)
 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
 Proprietary digital sensor drive circuit provides enhanced signal stability and is unaffected by process temperature & pressure changes

ATMF8000IS-SP

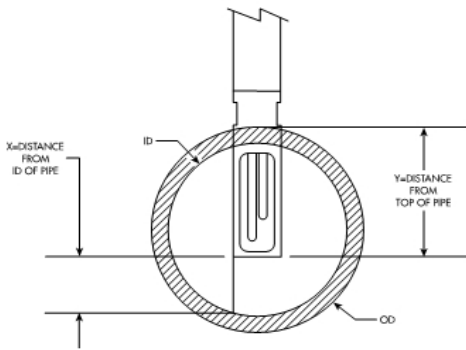
Calibration milliwatt (mw) displayed for ongoing diagnostics
 Available in 12VDC, 24VDC, 115-230VAC (2.5W)
 Calibration self-check (built in diagnostics)
 Available with MODBUS (IEEE 32 Bit floating point) and RS485
 Remote Windowed Enclosure - Dual compartment
 with terminal access, and Explosion Proof 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

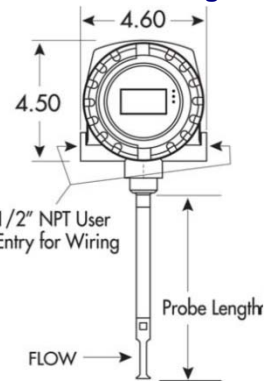
Low cost Air, O2 and N2 ONLY (0.3Nm/s~60Nm/s)
 Accuracy (and linearity) : $\pm[1\% \text{ of Reading } + (.5\% \text{ FS})]$
 Integral windowed Nema 4X Enclosure
 Remote Windowed Nema 4X
 60mA 24 VDC or 115VAC/230 VAC
 2-Line Backlit Touch Screen Display & 4 Button Menuing Keypad
 Self-protection design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

Instrument Drawings

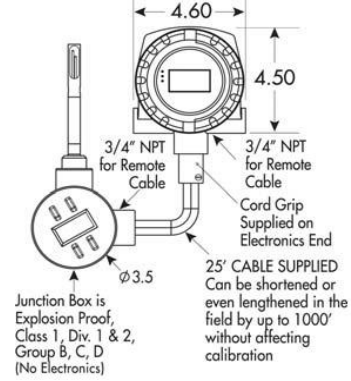
Installation in a pipe



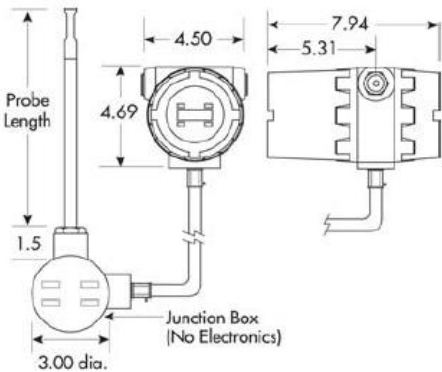
ATMF8000IS-SP-Integral



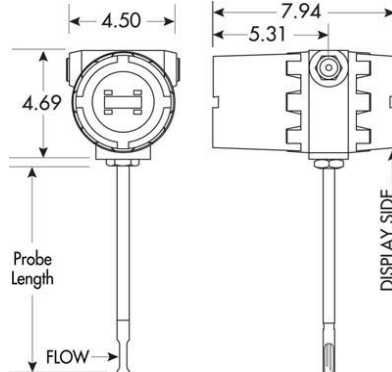
ATMF8000IS-SP-Remote



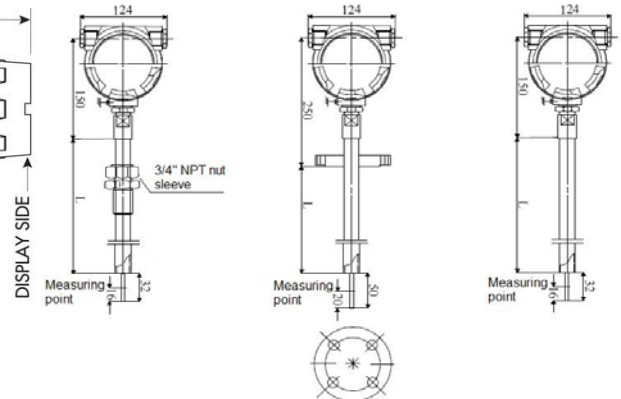
ATMF8000IS-SIX- Remote



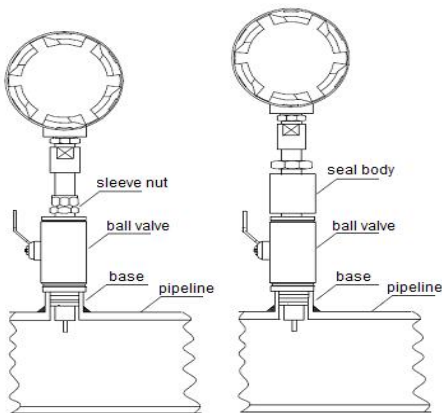
ATMF8000IS-SIX- Integral



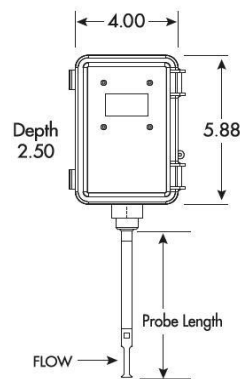
ATMF8000IS-SA - Integral



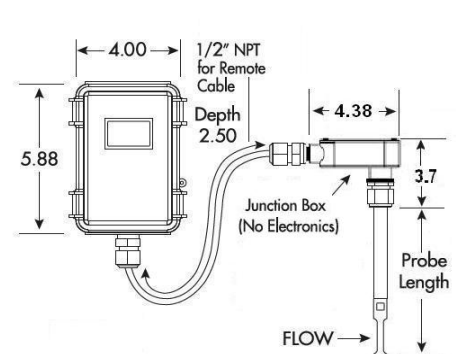
ATMF8000IS-SA - Mounting



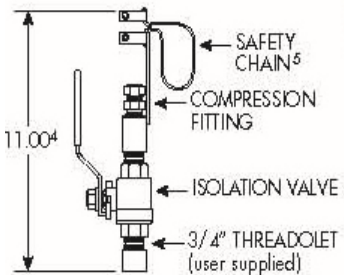
ATMF8000IS-SC-Integral



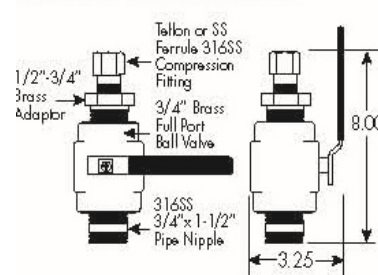
ATMF8000IS-SC-Remote



Installation Options

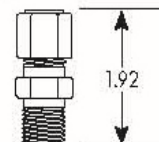


(Maximum 650 psig¹³)



(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:

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 VDC or 115 VAC or 230 VAC
Configuration	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)	SC											
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	
Process Gas (Please indicate, gas type, flow rate, line size, pressure and temperature)										Process Data (T,P flow, etc)		
For larger flanges sizes, probe material (Hasteloy C, Monel) and other options contact SMC												