



ATMF-IS


Insertion Thermal Mass Flowmeter
ATMF Series

SmartMeasurement insertion 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 SS# 316 sheath. Features include direct mass flow measurement for gases, wide rangeability, low pressure drop, excellent 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 a rugged windowed dual compartment enclosure. Four models are available from the low cost blind meters to the more exotic featured SP models.

Calibration Self Check: The 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.



- Direct mass flow measurement of any gas
- Actual gas calibration
- Optically-isolated outputs, with graphic display
- Tracking of overall gas consumption over a turndown ratio of at least 100:1
- Isolated 4-20 mA output and pulse output for totalized flows
- 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 diagnostics
- Standard software available multi-curve fit programs
- Low power dissipation under; 2W
- Available with FM/CSA approved or non-hazardous

• Process Connection: Threaded, Flanged, Ball valve	• Ex-protection: II 2 GD EEx d IIC T2 or T3
• Process temperature: 32 to 575°F (0 to 300°C)	
• Operating pressure: Up to 69 Bar (1000 PSIG)	• Cable (remote version): Up to 300m
• Mass Velocity: 0.025-203 m/s (5-40,000 FPM)	• Wetted materials: 316 SSS (Hastelloy and Monel optional)
• 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	• Weight:
• Accuracy (and linearity): 1%RD +(0.5% FS)	Integral Ex proof: 9 lbs (4.0 kg)
• Repeatability: ± 0.25% of Full Scale	Remote Ex proof: 15 lbs (7.0 kg)
• Turn down ratio: 100:1, and up to 1200:1	Integral Non-Ex proof: 3 lbs (1.5 kg)
• Response time: Less than one second	Remote Non Ex proof: 7 lbs (3.0 kg)
• Material: 316SS as per DIN 1.4571 (AISI 316 Ti)	• Linear signal output: 0-5 V _{DC} & 4-20 mA
• Display units: Flow, total flow, switch settings temperature, elapsed time	• Pulse output: Scalable
• RAM Back-up: Lithium battery	• Relays Two 1-amp, SPDT
• Data storage: EPROM storage up to 10 years	User-selectable alarm functions
• Display units: Flow, total flow, switch settings	• Signal Interface RS232 & RS485, MODBUS, etc..
• Housing protection: NEMA 4, Class 1, Div 1, Groups B, C, & D	• Power requirements: 115V _{AC} @ ½ A 230V _{AC} @ ¼ A 24 V _{DC} @ ¼ A, 12 V _{DC}
• NIST traceable calibration: Standard	• Power Consumption: 2.5 Watts (Standard), or less 6W other models
	• Self diagnostics functions: ADC, DAC
	Alarm relay for EMI impulse noise

■ **ATMFIS-SP**



- FM/CSA Class1, Div2, Groups BCD T4
- Calibration milliwatt (mw) displayed for ongoing diagnostics
- Available in 12V_{DC}, 24V_{DC}, 115-230V_{AC} (2.5W)
- Calibration self-check (built in diagnostics)
- Available with MODBUS RS485-RTU or HART or BACnet
- Accuracy (and linearity) : ±1%RD +(0.5% FS)
- Separate power and output terminals
- Optional programable USB dongle to adjust electronics
- 4 line OLED displays rate, total, temperature and graphical flowrate,
- Available with either high or low pressure ball valve retractor
- Remote electronics for both SP and NH with dual compartment option
- 6-conductor max loop resistance 10 ohms, over 1000 ft (300M)
- 4 line OLED rate, total, temperature and graphical flowrate (SP version) and 2 line OLED displays rate, total, for NH versions

■ **ATMFIS-NH**

- Designed for inexpensive non-hazardous use with Exd enclosure
- Low power dissipation, under 2.5 Watts (e.g., under 100 mA at 24 V_{DC})
- Accuracy: ±1%RD +(0.5% FS)
- Modbus® compliant RS485 RTU communications
- 24 V_{DC} or 115V_{AC} / 230 V_{AC}
- Flow Rate, Totalizer
- Available with either high or low pressure ball valve retractor
- Field reconfigurability via optional software
- 2 line OLED displays rate, total
- Diagnostic & graphic display

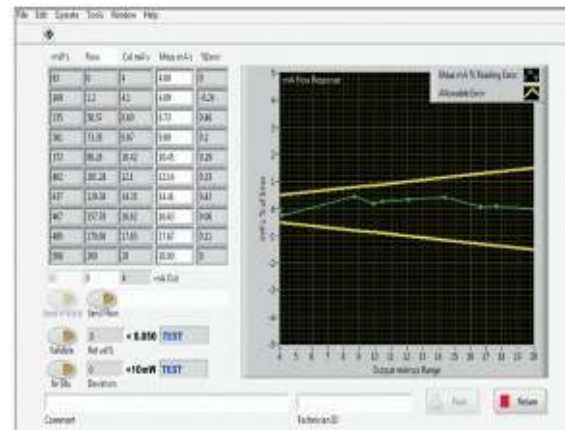


■ **SMC Com™**

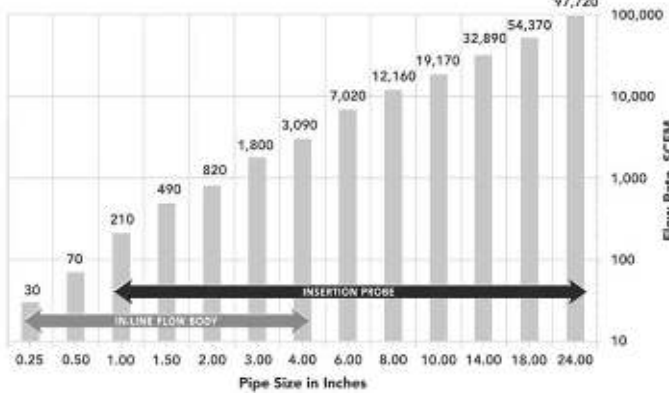
- Reconfiguration of full scale, pipe size, engineering units, factors, or decimal points
- Verify that the flow meter is within original calibration and that the sensors are clean
- Confirmation of original factory calibration and that the linear output signal is correct
- Reconfiguration for new gas mix constituents, which automatically corrects outputs
- Real-Time tab logs data which is easily exported to Excel and print a validation report
- Verify 4-20 mA out by generating user input flow rates
- Diagnostic features such as linearity of various user input up to 10 points max.
- Sensor drift validation with In-Situ calibration verification under a no flow condition
- Ability to check flow meter output versus expected value.
- Ability to do "loop check "by generating any desired 4-20 mA output to verify analog outputs
- And many more

Flow Rate	Flow	Cal mA's	Mass mA's	Temp
17.000	3.000	4.000	4.000	0.000
30.000	6.000	4.000	4.000	0.000
45.000	9.000	4.000	4.000	0.000
60.000	12.000	4.000	4.000	0.000
75.000	15.000	4.000	4.000	0.000
90.000	18.000	4.000	4.000	0.000
105.000	21.000	4.000	4.000	0.000
120.000	24.000	4.000	4.000	0.000
135.000	27.000	4.000	4.000	0.000
150.000	30.000	4.000	4.000	0.000
165.000	33.000	4.000	4.000	0.000
180.000	36.000	4.000	4.000	0.000
195.000	39.000	4.000	4.000	0.000
210.000	42.000	4.000	4.000	0.000
225.000	45.000	4.000	4.000	0.000
240.000	48.000	4.000	4.000	0.000
255.000	51.000	4.000	4.000	0.000
270.000	54.000	4.000	4.000	0.000
285.000	57.000	4.000	4.000	0.000
300.000	60.000	4.000	4.000	0.000

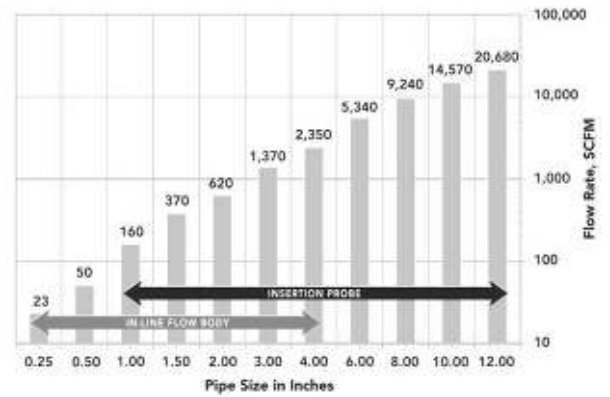
***** VALIDATION RESULTS *****
 Sensor Relative Variation = 0.004% +/- 0.000% SCDF = PASS !!
 ***** BATTERY RESULTS *****
 Sensor self Discharge = 17.757 +/- 0.000% BATTERY = FAIL !!
 CONFIRMATION SUSPECTED



■ Air flow rate versus pipe size
(note: 1 SCFM=1.7 NCMH)



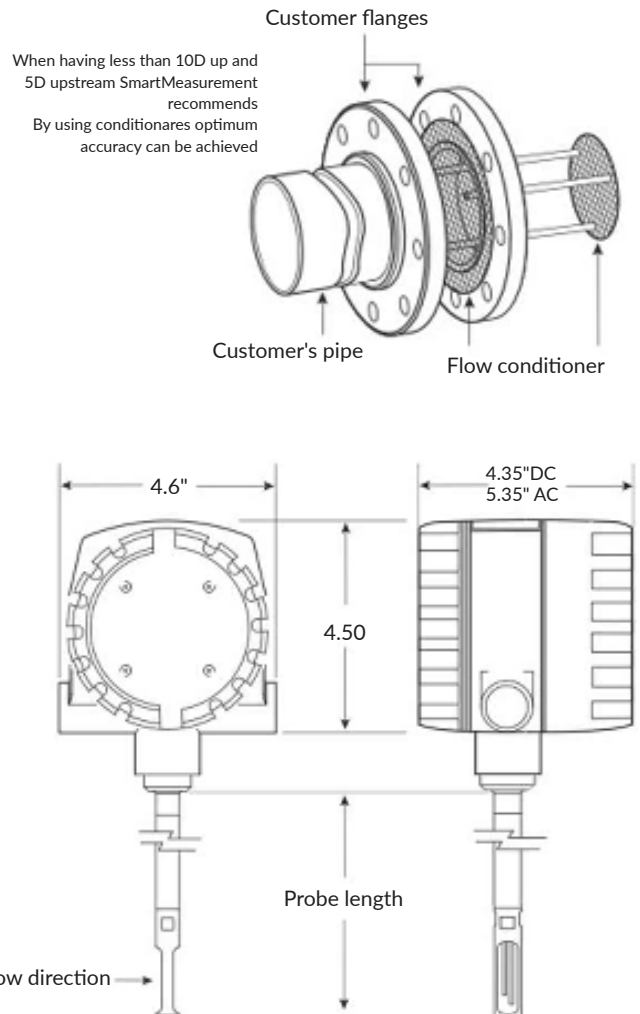
■ Natural flow rate versus pipe size
(note: 1 SCFM=1.7 NCMH)



■ Connections options versus pipe size and probe Length

	STCF05 Compression Fitting	SVA05LP Isolation Valve Low Pressure	SVA05 Isolation Valve High Pressure
PIPE SIZE	<125 PSIG	<50 PSIG	<250 PSIG
1" - 3.5"	6"	12"	15"
4" - 12"	12"	15"	18"
14" - 24"	15"	18"	24"
30"	18"	24"	30"
36"	24"	30"	36"

■ Flow Conditioner option for ATMF-IS



Procedures to specify our inline mass meters
**** Please contact your local SmartMeasurement application engineer****
 You also need to provide the following information:

- NIST certified calibration is done with actual or equivalent gas - gas type or mixture **MUST** be given
- Maximum and minimum flow rates and units **MUST** be provided
- Line size and connection **MUST** be provided (see selection guide below for options)
- Calibration is done at operating or maximum pressure and temperature
- Temperature of the environment surrounding the Flow meter's electronics.
- Specify requirements such as 12-24 V_{DC} or 115 V_{AC} or 230 V_{AC}
- See below transmitter styles

ATMF SERIES INSERTION METERS										
EXAMPLE ATMFIS-SP-I-05-15"-TFC05-DC24-O2 (40 NMPS, 40C AND 12 BARG)										
ATMFIS-		**	**	**	**	**	**			
Integral industrial mass flow meter (includes graphical display) (CSA Exd-Approved)	SP							Transmitter		
Integral industrial mass flow meter (includes graphical display) (CSA Exd-Approved)	NH									
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
1/2" ANSI 150 #					15A150					
2" ANSI 150 #					20A150					
1" ANSI 300 #					10A300					
1/2" ANSI 300 #					15A300					
2" ANSI 300 #					20A300					
1/2" Tube X 1/2" compression fitting - SS ferrule (>650 psi or 45 bar)					SSCF05					
3/4" Tube X 3/4" compression fitting - SS ferrule (>650 psi or 45 bar)					SCF07					
1/2" Tube X 1/2" compression fitting - teflon ferrule (>125 psi or 9 bar)					STCF05					
3/4" Tube X 3/4" compression fitting - teflon ferrule (>125 psi or 9 bar)					STCF07					
1/2" Tube X 3/4" isolation valve assembly (650 psi or 45 bar)					SVL05					
1/2" Tube X 3/4" isolation valve assembly (50 psi or 3.5 bar)					SVA05LP					
3/4" Tube X 1" isolation valve assembly (350 psi or 24 bar)					SVA07					
12 V _{DC}						12VDC				Power Supply
24V _{DC}						24VDC				
110-115 V _{AC}						115VAC				
220-240V _{AC}						230VAC				
Specify 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 (Hastelloy C, Monel) and other options contact SmartMeasurement										

