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ATMF-IS

Thermal Mass Flowmeter

ATMF Series

GENERAL

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.

FEATURES

- 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 diagonostics
- Standard software available multi-curve fit programs
- Low power dissipation under; 2W
- Available with FM/CSA approved or non-hazardous

SPECIFICATIONS

• **Process Connection:**	Threaded, Flanged, Ball valve
• **Process temperature:**	32 to 575°F (0 to 300°C)
• **Operating pressure:**	Up to 69 Bar (1000 PSIG)
• **Mass Velocity:**	0.025-203 m/s (5-40,000 FPM)
• **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
• **Accuracy (and linearity):**	1%RD +(0.5% FS)
• **Repeatability:**	± 0.25% of Full Scale
• **Turn down ratio:**	100:1, and up to 1200:1
• **Response time:**	Less than one second
• **Material:**	316SS as per DIN 1.4571 (AISI 316 Ti)
• **Display units:**	Flow, total flow, switch settings temperature, elapsed time
• **RAM Back-up:**	Lithium battery
• **Data storage:**	EPROM storage up to 10 years
• **Display units:**	Flow, total flow, switch settings
• **Housing protection:**	NEMA 4,Class 1, Div 1, Groups B, C, & D
• **NIST traceable calibration:**	Standard

• **Ex-protection:**	II 2 GD EEx d IIC T2 or T3
• **Cable (remote version):**	Up to 300m
• **Wetted materials:**	316 SSS (Hastelloy and Monel optional)
• **Weight:**	
Integral Ex proof:	9 lbs (4.0 kg)
Remote Ex proof:	15 lbs (7.0 kg)
Integral Non-Ex proof:	3 lbs (1.5 kg)
Remote Non Ex proof:	7 lbs (3.0 kg)
• **Linear signal output:**	0-5 V_{DC} & 4-20 mA
• **Pulse output:**	Scalable
• **Relays**	Two 1-amp, SPDT User-selectable alarm functions
• **Signal Interface**	RS232 & RS485, MODBUS,etc..
• **Power requirements:**	115V_{AC} @, ⅛ A 230V_{AC} @ 1/16 A 24 V_{DC} @ ¼A, 12 V_{DC}
• **Power Consumption:**	2.5 Watts (Standard), or less 6W other models
• **Self diagnostics functions:**	ADC, DAC Alarm relay for EMI impulse noise

ATMFIS-SP

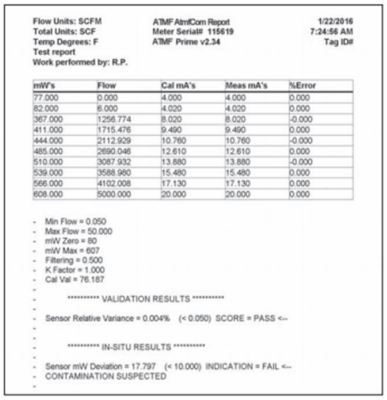
- FM/CSA Class1, Div2, Groups BCD T4
- Calibration milliwatt (mw) displayed for ongoing diagnostics
- Available in $12V_{DC}$, $24V_{DC}$, 115-$230V_{AC}$ (2.5W)
- Calibration self-check (built in diagnostics)
- Available with MODBUS RS485-RTU or HART or BACnet
- Accuracy (and linearity) : ±1%RD +(0.5% 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

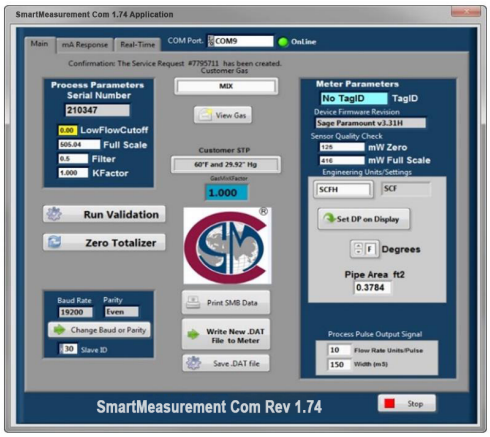
ATMFIS-NH

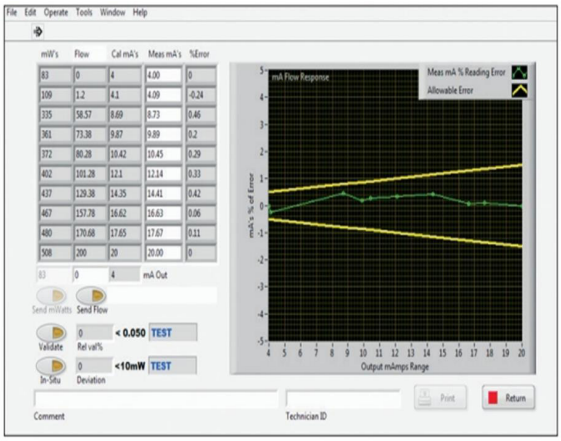
- Designed for inexpensive non-hazardous use with Exd enclosure
- Low power dissipation, under 2.5 Watts (e.g., under 100 mA at 24 V_{DC})
- Accuracy: ±1%RD +(0.5% FS)
- Modbus® compliant RS485 RTU communications
- 24 V_{DC} or 115V_{AC} / 230 V_{AC}
- Flow Rate, Totalizer
- Available with either high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

SMC Com ™

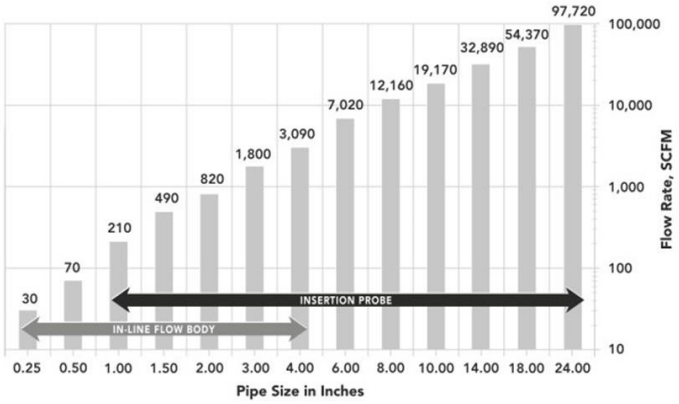
- Reconfiguration of full scale, pipe size, engineering units, factors, or decimal points
- Verify that the flow meter is within original calibration and that the sensors are clean
- Confirmation of original factory calibration and that the linear output signal is correct
- Reconfiguration for new gas 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



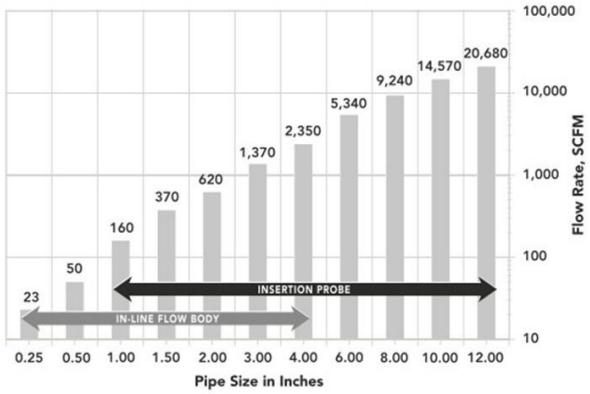




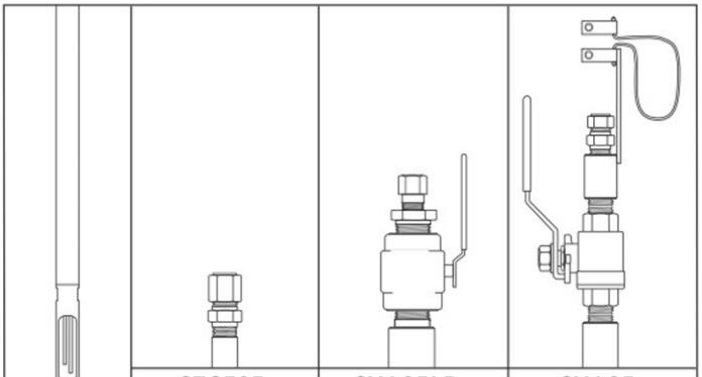
■ Air flow rate versus pipe size (note: 1 SCFM=1.7 NCMH)



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



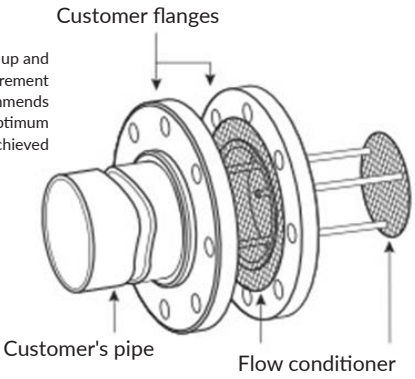
■ Connections options versus pipe size and probe Length

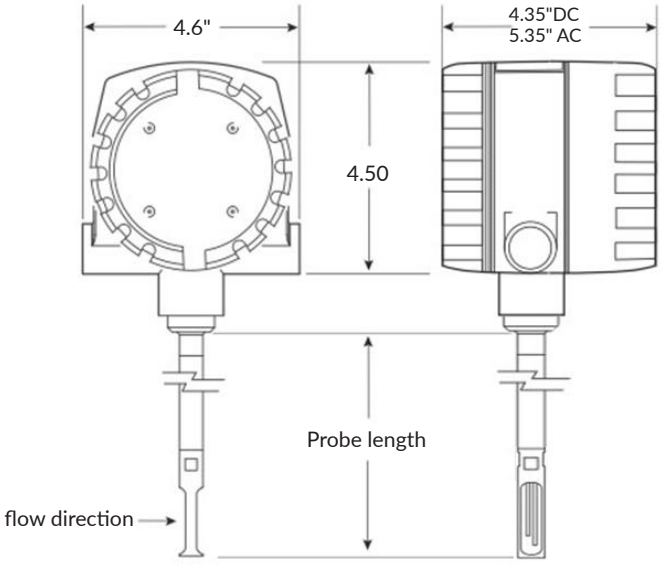


PIPE SIZE	STCF05 Compression Fitting <125 PSIG	SVA05LP Isolation Valve Low Pressure <50 PSIG	SVA05 Isolation Valve High Pressure <250 PSIG
1"– 3.5"	6"	12"	15"
4"– 12"	12"	15"	18"
14"– 24"	15"	18"	24"
30"	18"	24"	30"
36"	24"	30"	36"

■ Flow Conditioner option for ATMF-IS

When having less than 10D up and 5D upstream SmartMeasurement recommends
By using conditionares optimum accuracy can be achieved





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

GAS COMPOSITION	NIST certified calibration is done with actual or equivalant 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 Flow meter's 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 INSERTION METERS

EXAMPLE ATMFIS-SP-I-05-15"-TFC05-DC24-O2 (40 NMPS, 40C AND 12 BARG)

ATMFIS-	**	**	**	**	**	**	DESCRIPTION
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						
½" probe diameter	050						Probe-Diameter
¾" probe diameter	075						
Integral		I					Style
Remote		R					
Put insertion length in inches			##"				Insertion length
1" ANSI 150 #				10A150			Connection
½" ANSI 150 #				15A150			
2" ANSI 150 #				20A150			
1" ANSI 300 #				10A300			
½" ANSI 300 #				15A300			
2" ANSI 300 #				20A300			
½" Tube X ½" compression fitting - SS ferrule (>650 psi or 45 bar)				SSCF05			
¾" Tube X ¾" compression fitting - SS ferrule (>650 psi or 45 bar)				SCF07			
½" Tube X ½" compression fitting - teflon ferrule (>125 psi or 9 bar)				STCF05			
¾" Tube X ¾" compression fitting - teflon ferrule (>125 psi or 9 bar)				STCF07			
½" Tube X ¾" isolation valve assembly (650 psi or 45 bar)				SVL05			
½" Tube X ¾" isolation valve assembly (50 psi or 3.5 bar)				SVA05LP			
¾" 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							