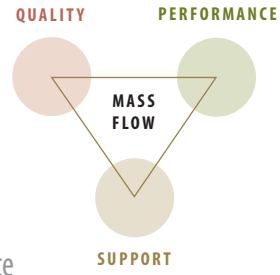
SAGE GAS MASS FLOW METERS
FOR INDUSTRIAL & ENVIRONMENTAL APPLICATIONS

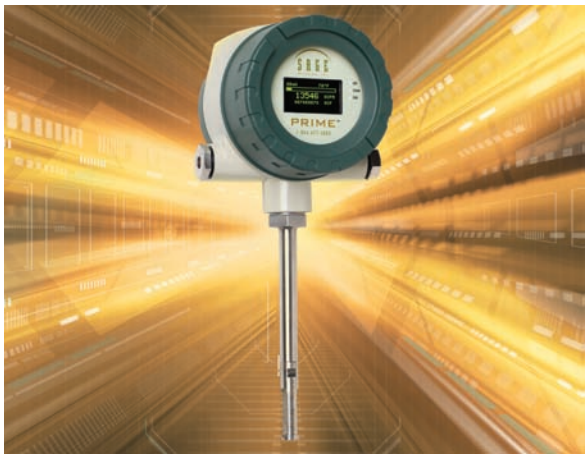
SAGE
METERING, INC.

DEDICATION

Sage Metering is your source for monitoring, measuring and controlling the gas mass flow in your industrial process, building management system or environmental application. Our high performance, NIST Traceable, Thermal Mass Flow Meters will help increase productivity, reduce energy costs, maximize product yields, and/ or help reduce environmental insult. Sage provides high quality In-Line and Insertion Thermal Mass Flow Meters for a wide variety of industrial, commercial, and environmental monitoring needs, including carbon credit verification for Greenhouse Gas reduction.



Our experienced application engineers, many of whom have worked in the Thermal Mass Flow marketplace since its inception, will assist you in choosing the proper gas flow meter for your application – and they will be pleased to offer installation guidance to assure that the meter(s) selected will perform as accurately as possible. Additionally, our Service Staff stand ready to support you with any after-sale assistance that you may require.



SIP–Integral Prime (Insertion Style shown)

SRG–Remote General Purpose (Insertion Style shown)

SIE–Integral Explosion Proof (In-Line Style – shown with optional Flanges)

HOW DOES THERMAL MASS FLOW MEASUREMENT BENEFIT YOU?

- Direct Mass Flow – No need for separate temperature or pressure transmitters
- High Accuracy and Repeatability – Precision measurement and optimal control of your process
- Turndown of 100 to 1 and resolution as much as 1000 to 1
- Low-End Sensitivity – Detects leaks, and measures as low as 5 SFPM!
- Negligible Pressure Drop – Will not impede the flow or waste energy
- No Moving Parts – Eliminates costly bearing replacements, and prevents undetected accuracy shifts
- Dirt Insensitive – Provides sustained performance
- Low cost of ownership
- Ease of installation and convenient mounting hardware

WHAT ARE THE BENEFITS THAT *SAGE* THERMAL MASS FLOW METERS OFFER YOU?

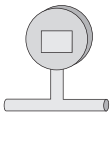
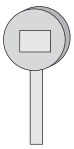
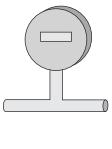
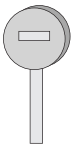
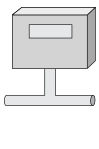
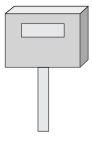
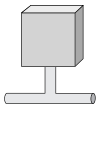
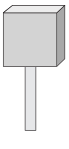
- Powerful state-of-the-art microprocessor technology designed for high performance mass flow measurement, at a low cost-of-ownership
- Rugged, user-friendly packaging with easy terminal access [SIP/SRP]
- Proprietary digital sensor drive circuit provides enhanced signal stability and is unaffected by process temperature and pressure changes
- Low power dissipation, under 2.5 Watts (e.g. under 100 ma at 24 VDC) [SIP/SRP]
- High contrast photo-emissive OLED display with numerical Flow Rate, Total and Temperature, as well as Graphical Flow Indicator [SIP/SRP]
- Displays calibration milliwatts (mw) for ongoing diagnostics [SIP/SRP]
- Remote Style has Lead-Length Compensation. Allows remote electronics up to 1000 ft from probe; Explosion Proof Junction Box has no circuitry, just terminals
- Modbus® compliant RS485 RTU communications [SIP/SRP]
- Flow conditioning built into In-Line flow meters (1/2" and up)
- Option for Solar Energy use (12VDC models) [SIP/SRP]
- Field reconfigurability via keypad [SIG/SRG/SIE/SRE]
- Field reconfigurability via Sage VIP [SIG/SRG/SIE/SRE]
- Field reconfigurability via Sage ADDRESSER or Sage Dongle [SIP/SRP]
- Multiple channels (up to four different calibrations in one meter) [SIG/SRG/SIE/SRE]
- Captive Flow Conditioners for Insertion Meter applications

VERSATILITY

Sage Metering manufactures award-winning Insertion and In-Line Thermal Mass Flow Meters for a variety of industrial, commercial, environmental, and municipal applications. Our high performance, NIST traceable Thermal Mass Flow Meters will help you increase productivity, reduce energy costs, and maximize product yields. A variety of configurations are available to help you monitor the flow rate and measure the consumption of various common gases such as natural gas, propane, digester gas, landfill gas, mixed gases, hydrogen, nitrogen, carbon dioxide, exhaust air, combustion air, and compressed air. Consider the popular Remote Flow Meter configuration, featuring an Explosion Proof Junction Box with convenient mounting terminals, ideal for any challenging environmental conditions (extreme heat, cold or vibration). The Remote Style Flow Meters are supplied with 25 feet of cable (other lengths optional) and feature a lead-length compensated circuit. This unique circuitry permits the cable to be shortened or lengthened in the field (up to 1000 feet) with out any loss in meter accuracy.

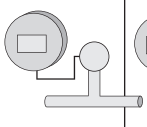
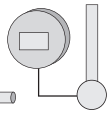
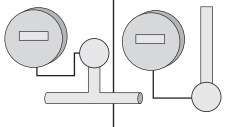
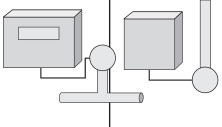
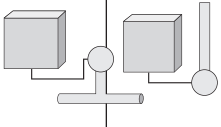
INTEGRAL FLOW METERS

Our award winning technology has many unique features, such as the ability to provide four totally independent calibrations or ranges in one meter, and the proprietary sensor circuitry provides extraordinary temperature compensation (even from large process temperature variations in excess of 200 degrees F). Furthermore, we can easily resolve velocities as low as 5 SFPM (i.e., less than 1/2 SCFM in a 4" pipe), or as high as 35,000 SFPM (over 3,000 SCFM in a 4" pipe). On most product configurations, our display is back-lit, and the menu items on the keypad (or via the laptop) are extremely easy to access. We also have a convenient "Sensor Functionality and Zero Calibration Self-Check" that is accessible via the Sage Prime display, or via the Keypad or navigational software on our other products. **This diagnostic procedure features a calibration routine that not only checks the sensor performance and the "live zero" calibration point, but it also verifies that the sensor is clean. It essentially provides a means to validate the meter's performance, verifies that there is no shift or drift, and eliminates the need for annual factory calibrations.**

PRIME		EXPLOSION PROOF		GENERAL PURPOSE		"LITE" (No Display)	
							
SIP Series		**SIE Series**		**SIG Series**		**SIL Series**	
IN-LINE	INSERTION	IN-LINE	INSERTION	IN-LINE	INSERTION	IN-LINE	INSERTION
							

REMOTE FLOW METERS*

Our most popular thermal mass flow meter configuration is our Remote Series. In this configuration, the Probe or the Flow Body Junction Box is Explosion Proof and it has no electronics, and thus is suitable for harsh environments (very hot or very cold ambient temperatures, or even vibrating pipes). A 6-conductor shielded interconnect cable (25 feet initially supplied) connects to the Remote Electronics Enclosure (Explosion Proof) which has a lead-length compensated circuit. The circuit compensates for cable lengths up to 1000 feet in length (10 ohms max loop resistance) without affecting the meter's accuracy or performance. The Remote Enclosure (whether mounted in a Control Room, or simply placed at eye-level near the process), is the heart of the instrument, and has a display of Flow Rate, Total and Temperature, as well as a 4-20 ma output of Flow Rate. Most products also have a 4-20mA output of Temperature. Pulsed outputs of Totalized Flow are also available. The electronics can be powered by 24 VDC or 115 VAC/230 VAC (Prime also has 12VDC option for Solar Power).

PRIME		EXPLOSION PROOF		GENERAL PURPOSE		"LITE" (No Display)	
							
SRP Series**		**SRE** Series**		**SRG Series**		**SRL Series**	
IN-LINE	INSERTION	IN-LINE	INSERTION	IN-LINE	INSERTION	IN-LINE	INSERTION
							

**All four categories (Series) have Explosion Proof Junction Boxes (the enclosure at the probe or flow body)*
***Remote Mounting Hardware is provided with these models*

Flow Control Magazine
2006 Innovations Awards
WINNER

BENEFITS

SAGE THERMAL MASS FLOW METERS

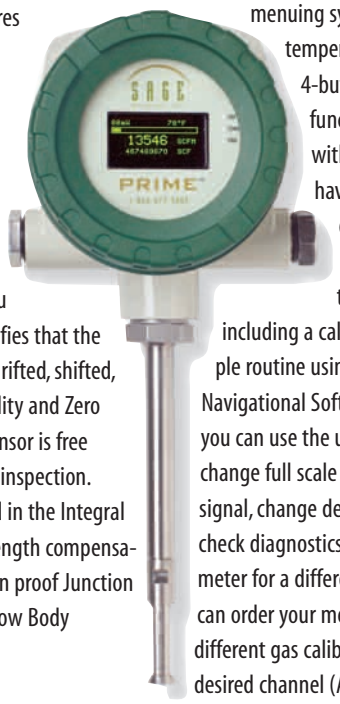
HIGH PERFORMANCE FEATURES

Sage Thermal Mass Flow Meters are designed for high performance mass flow measurement of flow rate and consumption of gases such as natural gas, air, oxygen, digester gas, landfill gas, biogas, gas mixes, flare gas, nitrogen, carbon dioxide, oxygen and hydrogen.

Sage Metering has distinguished itself by offering a higher standard – our mass flow meter output is unaffected by even large process temperature variations, and our digital electronics is impervious to external analog noise. Fast response, high resolution, and ultra sensitivity are features that are at the heart of every Sage Thermal Mass Flow Meter.

All Sage meters, depending on product style, can be reconfigured in the field *(contact Sage for details concerning software and related accessories)*. In addition, all meters have a convenient in-situ field diagnostic procedure that 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.

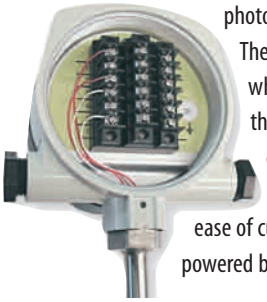
All Sage Flow Meters are offered in the Integral Style or Remote Style (with lead-length compensation up to 1000 feet) with explosion proof Junction Box with your choice of Probe or Flow Body depending on your pipe size.



SIP Series Integral Prime Mass Flow Meter (Insertion Style shown)

FEATURES AND BENEFITS OF PRIME (SIP/SRP) SERIES

Sage Prime is the latest addition to our family of high performance Thermal Mass Flow Meters. It features a bright new graphical display of Flow Rate, Total and Temperature, robust industrial enclosure, and easy to access power and output terminals. Sage Prime has a dual-compartment windowed enclosure featuring a very high contrast photo-emissive OLED display. The rear compartment, which is separated from the electronics, has large, easy-to-access and well marked terminals, for ease of customer wiring. It is powered by 24 VDC (12 VDC optional, or 115/230 VAC). The power dissipation is under 2.5 watts (e.g. under 100 ma at 24 VDC).



It has a 4-20 ma output as well as a Pulsed Output of Totalized Flow (solid state [sourcing] transistor drive). In addition, Sage Prime supports full Modbus® compliant RS485 RTU communications (IEEE 32 Bit Floating Point). See page 6 for additional information.

FEATURES AND BENEFITS OF EXPLOSION PROOF (SIE/SRE) SERIES

The innovative Sage design features an easy-to-use menuing system, a mass flow, total and temperature display, and convenient 4-button Keypad to integrate the functions of flow measurement with your specific needs. You will have the flexibility to use the local display/Keypad, or a computer, to change configurations or to conduct basic diagnostics, including a calibration self-check with a simple routine using the Keypad, or with the Sage Navigational Software (Sage VIP). At any time you can use the user-friendly menuing system to change full scale values, digitally filter the flow signal, change decimal points, set zero cutoffs, check diagnostics, or reconfigure an insertion meter for a different pipe size. In addition, you can order your meter configured for up to four different gas calibrations, and simply select the desired channel (A-D) at any time (e.g. four different gases, sensitivities, or configurations). Or you can order the meter calibrated for one gas (e.g. compressed air), but have it pre-configured for up to four different pipe sizes and full scales, so you can simply select the desired channel (A-D) based on the application. Channels are totally independent and each have their own full scale accuracy statement and settings. The SIE/SRE Explosion Proof Series has one 4-20 mA output of Flow Rate, and it has one relay that can be configured for pulsed output of Totalized Flow (or configured for other functions, if desired). It also has RS232 communications. The relay can be configured by computer using VIP software for a variety of settings, including trip-high, trip-low (with or without delays), window alarms, pulsed outputs, timer outputs, etc.

FEATURES AND BENEFITS OF GENERAL PURPOSE (SIG/SRG) SERIES

The SIG/SRG Series has similar features to the above mentioned SIE/SRE Series, except it has a large format Touch Screen display of mass flow, total and temperature. It too has an easy-to-use 4-button Keypad for viewing Menus or reconfigurability.

In addition, it has two 4-20 mA outputs, one for Flow Rate as well as one for Temperature. Two independent, 1 amp SPDT dry contact relays are standard on the SIG and SRG Series. They can be configured by the computer using VIP Software for a variety of settings, including trip-high, trip-low (with or without delays), window alarms, pulsed outputs, timer outputs, etc.

SIG Series Integral General Purpose Mass Flow Meter (In-Line Style shown)

FEATURES AND BENEFITS OF SAGE LITE (SIL/SRL) SERIES

"Sage Lite" has many features of the standard product line, but does not have a display, does not have a menuing Keypad, does not support multiple channels, and does not support relay outputs. However it has linear outputs of flow rate and temperature, or is optionally configurable to have one output that provides pulsed outputs of totalized flow. It is offered in a 5x5x4 NEMA 4X enclosure, or optional Explosion Proof Enclosure, or as a small circuit assembly for customized end-user packaging (OEM's).

CONTACT SAGE FOR APPLICATION ASSISTANCE

If there are any features that you require on any of these products, or if you need application assistance, feel free to contact our local factory trained Representative in your area. Visit us online at www.sagemetering.com, or phone the Sage Sales or Service Staff for assistance at 866-677-7243, our toll-free number.

SERVICE

PRINCIPLE OF OPERATION OF THE THERMAL MASS FLOW METER

Sage Thermal Mass Flow Meters have two sensors constructed of reference grade platinum windings (RTDs). The two RTDs are clad in a protective 316SS sheath and are driven by a proprietary sensor drive circuit. One sensor is self-heated (flow sensor), and the other (temperature/reference sensor) measures gas temperature. The pair is referred to as the sensing element, and is either installed in a probe as an Insertion Style, or inserted into a pipe section as an In-Line Style flow meter. As gas flows by the flow sensor, the gas molecules carry heat away from the surface, and the sensor cools down as it loses energy. The sensor drive circuit replenishes the lost energy by heating the flow sensor until it is a constant temperature differential above the reference sensor.

The electrical power required to maintain a constant temperature differential is directly proportional to the gas mass flow rate and is linearized to be the output signal of the meter.

It is essential that this constant temperature differential be maintained, even if there are wide fluctuations in gas temperature. It is the "job" of the Sage proprietary sensor drive circuit to maintain the differential, whether or not the gas temperature changes, or however quickly the flow of molecules cools off the flow sensor. It is also necessary to properly calibrate the meter with the actual gas (or close equivalent with certain gases), in the Sage NIST certified calibration facility (National Institute of Standards). By accomplishing these two critical objectives, the Sage Flow Meters provide an extremely repeatable (0.2% of full scale) and accurate output directly proportional to the mass flow rate of the gas being measured.

GENERAL SPECIFICATIONS FOR SAGE MASS FLOW METERS

PERFORMANCE

- **Accuracy**: +/- 0.5% of Full Scale +/- 1% of reading with a turn-down of 100 to 1 and resolution as much as 1000 to 1 (special accuracy with less turn-down, upon request)
- **Repeatability**: 0.2%
- **Calibration:** Sage Metering's NIST calibration facility (National Institute of Standards Traceable)
- **Gas Temperature[3]:** Std.: -40°F to 200°F (-40°C to 93°C); HTO1: 200°F to 300°F (93°C to 149°C); HTO2: 300˚F to 450˚F (149˚C to 232˚C); HTO3: 450˚F to 750˚F (232˚C to 399˚C)
- Standard Calibration Reference Conditions: 70˚F and 29.92" Hg (other Reference Conditions can be specified)
- **Integral or Remote Enclosure Temperature:** 0° to 150°F (-18°C to 65°C). Contact Sage for lower temperature ranges **Note:** Remote Enclosure can be mounted up to 1000 feet away from sensor and its Junction Box in order to be located in a suitable temperature environment
- **Pressure Rating:** 500 psig (1000 psig optional)
- **Response Time:** 1 second (each time constant) for flow change

FLOW RANGE / SIZES

- **Units of Measurement:** ***Flow***–SCFS, SCFM, SCFH, SCFD[1], SCCM, NCMM, NCMH, KG/S, KG/M, KG/H, KG/D[1], LBS/S, LBS/M, LBS/H, LBS/D[1], SLPM, SLPH; ***Velocity***–SFPS, SFPM, NMPS, NMPM, NMPH (other combinations available); ***Temperature*** –°C and °F
- **Insertion Meters:** Full Scale up to 35,000 SFPM (i.e., up to 12,000 SCFM in an 8" Sch. 40 Pipe). Higher velocities optionally available. Resolve as low as 5 SFPM[5]

GENERAL

- **Relays:** Two 1-amp relay channels (each SPDT) on SIG & SRG Series. One 1-amp relay on SIE & SRE Series. Menu configurable *(see description under **Features & Benefits** on page 4)*
- **Sensor Drive Circuit:** Proprietary Sensor Drive Circuit provides enhanced flow signal stability and insensitivity to process temperature changes[2]
- **Multiple Channel Capability:** Up to four totally independent calibrations available on SIG & SRG Series as well as SIE & SRE Series (for SIP & SRP Series, only feasible with Dongles[4]). Calibrate for four different gases, different sensitivities, and/or different configurations (Channels A–D). Channels can be keypad, computer or externally selectable (via contact closures)

WETTED PARTS

316L Stainless Steel for Flow Bodies, Sensor Flow Elements and Flow Conditioners. Hastelloy (recommended for Chlorine Gas) and other materials optional

FLOW CONDITIONING

All In-Line Style Flow Meters 1/2 inch and above include built-in flow conditioning. For Insertion Style Flow Meters, Captive Flow Conditions are optional.

ETHERNET COMPATIBILITY OR WIRELESS MODBUS

Contact Sage for information.

LIMITED WARRANTY

Sage Metering's Series of Thermal Mass Flow Meters are warranted against faulty materials or workmanship for one year from the date of delivery to the buyer. After issuance of a Return Meter Authorization (RMA) by Sage, and upon receipt of the defective meter, Sage will either repair or replace the defective meter at its sole option and at no cost to the purchaser

GENERAL TERMS AND CONDITIONS

See "General Terms" link on the Footer of the Homepage of Sage website (www.sagemetering.com)

PLEASE NOTE

Performance specifications are effective with date of issue and are subject to change without prior notice. The metering devices and other equipment pictured in this brochure are for identification and illustration purposes only. The appearance and dimensions of the actual products may differ slightly from those shown but will perform as represented. Sage Metering, Inc. reserves the right, at any time, to make such modifications and changes to the products shown herein as it deems appropriate, without prior notice to the customer.

1 *Not available on Prime (SIP/SRP)*
2 *Circuit will compensate for gradual temperature process changes over a very wide range. See Gas Temperature*
3 *HTO1, HTO2, HTO3 options apply to Remote Insertion Meters only*
4 *For SIP & SRP, each Dongle represents a different Channel. Upload the desired Dongle on the Modbus terminals*
5 *See "Minimum Resolution in SLPM" on table on page 10 (column is based on velocity of 5 SFPM)*

QUALITY

SAGE PRIME MASS FLOW METER

Sage Prime™ is a thermal dispersion type of Flow Meter, 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. It features direct Mass Flow for gases, wide rangeability, low pressure drop, very low end sensitivity, and no moving parts.

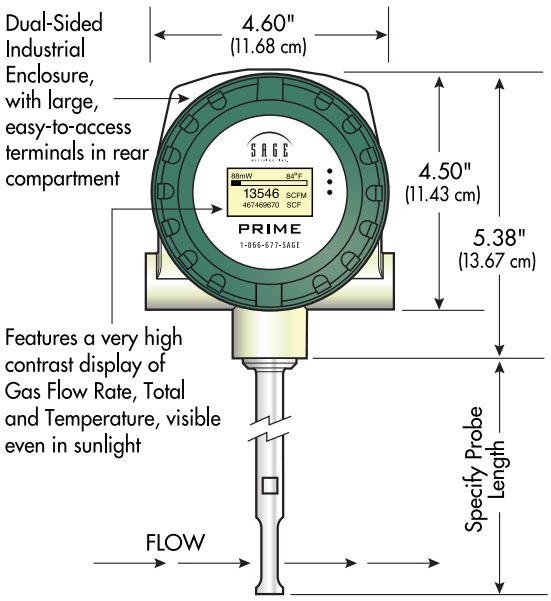
The Prime is microprocessor based, does not have any potentiometers, and has Modbus® RS485 RTU communications. It is powered by 24 VDC (12 VDC optional, or 115/230 VAC). The power dissipation is under 2.5 watts (e.g. under 100 ma at 24 VDC for the DC version). The power and output terminals are in a separate compartment for ease of installation. Sage Prime is CSA, UL, and ATEX approved for the 24VDC powered version and CE approved on all models, and Medically CE approved for AC models *(consult website, and select "Approvals" tab for most recent approvals)*.

The enclosure has a dual compartment for ease of wiring. The display is a high contrast photo-emissive OLED display, and it displays Mass Flow Rate, Totalized Flow and Temperature as well as a graphical representation of Flow Rate in a horizontal bar graph format. In addition, the calibration milliwatts (mw) is continuously displayed, providing ongoing diagnostics. Outputs include a 4-20 ma signal proportional to Mass Flow Rate, and Pulsed Outputs of Totalized Flow (12VDC solid state [sourcing] transistor drive), as well as Modbus® compliant RS485 RTU communications (IEEE 32 Bit Floating Point).

SAGE PRIME FEATURES

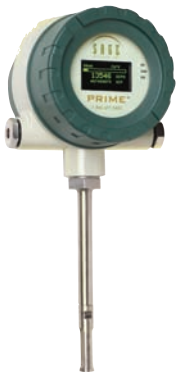
- Sage Prime is our latest addition to our family of high performance Thermal Mass Flow Meters, and is priced very attractively
- It features a bright new, high contrast, photo-emissive OLED display of Flow Rate, Total and Temperature in a robust, yet lightweight, dual compartment heavy duty enclosure. The flow rate is also displayed graphically in a horizontal bar graph format
- In addition, calibration milliwatts (mw) is continuously displayed providing ongoing diagnostics
- The rear compartment, is completely separated from the electronics, and has large, easy-to-access, well marked terminals, for ease of customer wiring (no longer does the user need to enter near any of the meter's circuitry during their installation)
- Available outputs include MODBUS (IEEE 32 Bit Floating Point), 4-20 ma of flow rate and pulsed outputs of totalized flow
- Powered by 24 VDC (12 VDC optional), with current dissipation of less than 100 ma, or 115 VAC/230 VAC
- Portable Rechargeable Battery Powered version (contact Sage)
- Offered in Integral or Remote Style (which has lead-length compensation up to 1000 feet as well as an Explosion Proof Junction Box). Specify any standard probe length or flow body size
- To simplify installation, all Sage Insertion Meters will be set up to simply go into the center of the pipe *(refer to Sage Probe Insertion Guidelines in the Manuals)*
- We use the same proven award winning digital technology to drive the sensor as our other products, so the accuracy, repeatability, temperature compensation and extraordinary low-end sensitivity have not been compromised in Sage Prime
- With Sage Prime, we keep it simple. Specify the gas flow rate, pipe size and units of measurement, and Prime will arrive configured as requested
- Sage Prime is CE approved, and CSA, UL and Atex approved for Hazardous Service *(see Approvals tab on the website)*
- Sage Prime can be reconfigured in the field with the Sage Prime ADDRESSER Software or the Sage Dongle

SIP Series Integral Prime Mass Flow Meter Insertion Style



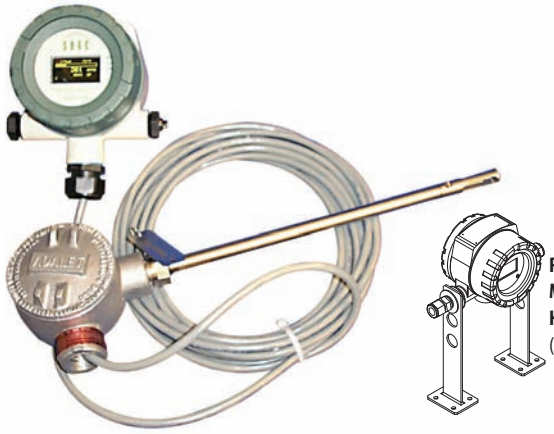
Note: DC Enclosure depth is 4.35" (11.05 cm)
AC Enclosure depth is 5.35" (13.59 cm)

SIP SERIES – INTEGRAL



Optional Programmable Dongle

SRP SERIES – REMOTE



Remote Mounting Hardware (included)

SPECIFICATIONS

PRIME SIP/SRP

Flow Meter is 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.

Flow Meter is microprocessor based, does not have any potentiometers, and has Modbus™ RS485 communication. Flow Meter is powered by 24 VDC (12 VDC optional or 115/230 VAC). The power dissipation is under 2.5 watts (e.g. under 100 ma at 24 VDC). Power and output terminals are in a separate compartment for ease of installation.

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.

Accuracy is +/– 0.5% of Full Scale +/– 1% of reading with a turn-down of 100 to 1 and resolution as much as 1000 to 1. Repeatability is 0.2%. The Flow Meter is Sage Metering, Inc. SIP Series, with the trade name Sage Prime™.

The electronics has a 4 to 20 ma output (ground based) proportional to Mass Flow Rate as well as pulsed outputs of Totalized Flow (12 VDC solid state transistor drive).

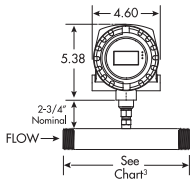
INTEGRAL STYLE ELECTRONICS

Electronics is Integral Style, with rugged windowed dual compartment enclosure with local display. The display is a high contrast photo-emissive OLED display, and it displays Mass Flow Rate, Totalized Flow and Temperature as well as a graphical representation of Flow Rate in a horizontal bar graph format. In addition, the calibration milliwatts (mw) is continuously displayed, providing ongoing diagnostics.

REMOTE STYLE ELECTRONICS

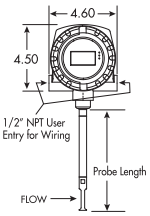
Electronics is Remote Style, with rugged windowed dual compartment enclosure with display. The display is a high contrast photo-emissive OLED display, and it displays Mass Flow Rate, Totalized Flow and Temperature as well as a graphical representation of Flow Rate in a horizontal bar graph format. In addition, the calibration milliwatts (mw) is continuously displayed, providing ongoing diagnostics. Includes Remote Mounting Hardware.

The Flow Element's Junction Box is Explosion Proof (Class 1, Div 1, Groups B, C, D), and does not have any electronics – only a wiring terminal block. The Junction Box is connected to the Remote Electronics by 25 feet of lead-length compensated cable. The cable (6-conductor) can be lengthened or shortened without affecting accuracy (max loop resistance 10 ohms, over 1000 feet).



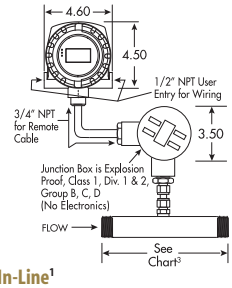
SIP In-Line[1]

Flow Element is In-Line Style consisting of a choice of 316 Stainless Steel Schedule 40 Flow Bodies sized from 1/4" x 6" long to 4" x 12" long.



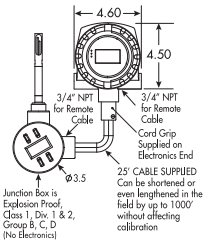
SIP Insertion[2]

Flow Element is Insertion Style, consisting of a 1/2" OD probe (3/4" optional) with lengths up to 36" long (typically 15" long) suitable for insertion into the center of a process pipe.



SRP In-Line[1]

Flow Element is In-Line Style consisting of a choice of 316 Stainless Steel Schedule 40 Flow Bodies sized from1/4" x 6" long to 4" x 12" long.



SRP Insertion[2]

Flow Element is Insertion Style, consisting of a 1/2" OD probe (3/4" optional) with lengths up to 36" long (typically 15" long) suitable for insertion into the center of a process pipe.

EXPLOSION PROOF SIE/SRE

Flow Meter is 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.

Flow Meter is microprocessor based, does not have any potentiometers, and has RS232 communications with accompanying menu driven software (Sage VIP). Flow Meter is powered by 24 VDC or 115 VAC/ 230 VAC. The power dissipation is under 6 watts (e.g. under 250 ma at 24 VDC).

Calibration Self Check: Flow Meter has built in diagnostics – the menuing system has provisions to check the sensor's operation by accessing the sensor's output, and comparing it to the original reported "zero flow" value noted on meter's Certificate of Conformance (last few lines).

Accuracy is +/- 0.5% of Full Scale +/- 1% of Reading with a turn-down of 100 to 1 and resolution as much as 1000 to 1. Repeatability is 0.2%. The Flow Meter is Sage Metering, Inc. SIE Series.

The electronics has a 4 to 20 ma output proportional to Mass Flow Rate or the output can be factory or field configured to Temperature. Output is opto-isolated. In addition, one dry contact relay is provided that can be configured for pulsed outputs of Totalized Flow, or Trip High, Trip Low, and other functions.

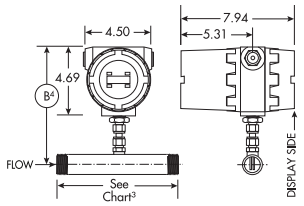
INTEGRAL STYLE ELECTRONICS

Electronics is Integral Style, with Explosion Proof, Class 1, Div 1, Groups B, C, D, NEMA 4X windowed enclosure, local display and Keypad. The display is a back-lit LCD with two lines of information: Mass Flow Rate on top line; and Totalized Flow and Temperature on bottom line. The Keypad has 4-buttons and provides a convenient means to interface with an extensive menuing system.

REMOTE STYLE ELECTRONICS

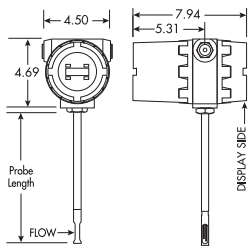
In the Remote Style the electronics is remote with Explosion Proof, Class 1, Div 1, Groups B, C, D, NEMA 4X windowed enclosure, display and Keypad. The display is a back-lit LCD with two lines of information: Mass Flow Rate on top line; and Totalized Flow and Temperature on bottom line. The Keypad has 4-buttons and provides a convenient means to interface with an extensive menuing system. Includes Remote Mounting Hardware.

The Flow Element's Junction Box is Explosion Proof (Class 1, Div 1, Groups B, C, D), and does not have any electronics – only a wiring terminal block. The Junction Box is connected to the Remote Electronics by 25 feet of lead-length compensated cable. The cable (6-conductor) can be lengthened or shortened without affecting accuracy (max loop resistance 10 ohms, up to 1000 feet).



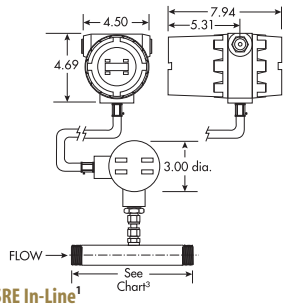
SIE In-Line[1]

Flow Element is In-Line Style consisting of a choice of 316 Stainless Steel Schedule 40 Flow Bodies sized from 1/4"x 6" long to 4" x 12" long.



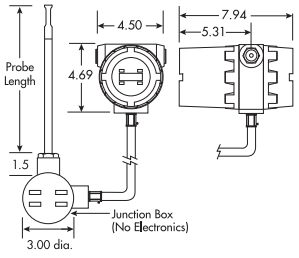
SIE Insertion[2]

Flow Element is Insertion Style, consisting of a 1/2" OD probe (3/4" optional) with lengths up to 36" long (typically 15" long) suitable for insertion into the center of a process pipe.



SRE In-Line[1]

Flow Element is In-Line Style consisting of a choice of 316 Stainless Steel Schedule 40 Flow Bodies sized from 1/4" x 6" long to 4" x 12" long.



SRE Insertion[2]

Flow Element is Insertion Style, consisting of a 1/2" OD probe (3/4" optional) with lengths up to 36" long (typically 15" long) suitable for insertion into the center of a process pipe.

1 *Male NPT ends are standard, with flanged ends, tube, or butt weld optionally available*
2 *Mounting hardware choices (such as Isolation Valve Assemblies, Compression Fittings, and Flange Mounts) are optionally available*
3 *Chart of Flow Body length is on page 10 (see "In-Line Flow Meters")*
4 *B dimension is on Chart on page 10 (see "In-Line Meter Dimensions")*

SPECIFICATIONS

GENERAL PURPOSE SIG/SRG

Flow Meter is 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.

Flow Meter is microprocessor based, does not have any potentiometers, and has RS232 communications with accompanying menu driven software (Sage VIP). Flow Meter is powered by 24 VDC or 115 VAC/ 230 VAC. The power dissipation is under 8 watts (e.g. under 350 ma at 24 VDC).

Calibration Self Check: Flow Meter has built in diagnostics – the menuing system has provisions to check the sensor's operation by accessing the sensor's output, and comparing it to the original reported "zero flow" value noted on meter's Certificate of Conformance (last few lines).

Accuracy is +/- 0.5% of Full Scale +/- 1% of Reading with a turn-down of 100 to 1 and resolution as much as 1000 to 1. Repeatability is 0.2%. The Flow Meter is Sage Metering, Inc. SIG Series.

The electronics has a 4 to 20 ma output proportional to Mass Flow Rate as well as a 4 to 20 ma output proportional to Temperature. Outputs are opto-isolated. In addition, two dry contact relays are provided that can be configured for pulsed outputs of Totalized Flow, or Trip High, Trip Low, and other functions.

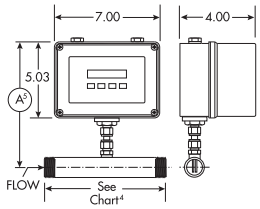
INTEGRAL STYLE ELECTRONICS

Electronics is Integral Style, with NEMA 4X windowed enclosure, local display and Touch Screen display Keypad. The display is a large-format, back-lit LCD with two lines of information: Mass Flow Rate on top line; and Totalized Flow and Temperature on bottom line. The Touch Screen Keypad has 4-buttons (accessible without needing to remove the cover) and provides a convenient means to interface with an extensive menuing system.

REMOTE STYLE ELECTRONICS

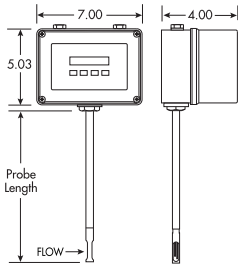
Electronics is Remote Style, with 9" x 7" Fiberglass NEMA 4X windowed enclosure (with latch), display and Touch Screen Keypad. The display is a large-format, back-lit LCD with two lines of information: Mass Flow Rate on top line; and Totalized Flow and Temperature on bottom line. The Touch Screen Keypad has 4-buttons (accessible without needing to remove the cover) and provides a convenient means to interface with an extensive menuing system.

Flow Element's Junction Box is Explosion Proof (Class 1, Div 1, Groups B, C, D), and does not have any electronics – only a wiring terminal block. The Junction Box is connected to the Remote Electronics by 25 feet of lead-length compensated cable. The cable (6-conductor) can be lengthened or shortened without affecting accuracy (max loop resistance 10 ohms, over 1000 feet).



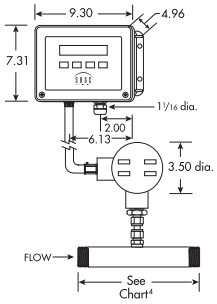
SIG In-Line[1]

Flow Element is In-Line Style consisting of a choice of 316 Stainless Steel Schedule 40 Flow Bodies sized from 1/4" x 6" long to 4" x 12" long.



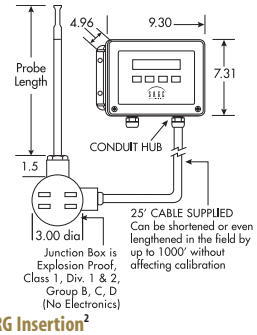
SIG Insertion[2]

Flow Element is Insertion Style, consisting of a 1/2" OD probe (3/4" optional) with lengths up to 36" long (typically 15" long) suitable for insertion into the center of a process pipe.



SRG In-Line[1]

Flow Element is In-Line Style consisting of a choice of 316 Stainless Steel Schedule 40 Flow Bodies sized from 1/4" x 6" long to 4" x 12" long.



SRG Insertion[2]

Flow Element is Insertion Style, consisting of a 1/2" OD probe (3/4" optional) with lengths up to 36" long (typically 15" long) suitable for insertion into the center of a process pipe.

"LITE" SIL/SRL (No Display)

Flow Meter is 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.

Flow Meter is microprocessor based, does not have any potentiometers, and has RS232 communications that is accessible with optional cable assembly (SILCOM). Flow Meter is powered by 24 VDC or 115 VAC/ 230 VAC. The power dissipation is under 6 watts (e.g. under 250 ma at 24 VDC).

Accuracy is +/- 0.5% of Full Scale +/- 1% of Reading with a turn-down of 100 to 1 and resolution as much as 1000 to 1. Repeatability is 0.2%. The Flow Meter is Sage Metering, Inc. SIL Series.

See below for outputs.

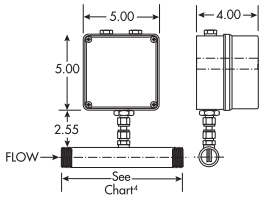
INTEGRAL STYLE ELECTRONICS[3]

Electronics is Integral Style, with NEMA 4X Blind Enclosure (no display). The electronics has a 4 to 20 ma opto-isolated output proportional to Mass Flow Rate as well as a 0 to 5 VDC output proportional to Temperature. Optionally, the 0-5 VDC output can be configured to provide pulsed outputs of Totalized Flow (other output will be disabled).

REMOTE STYLE ELECTRONICS

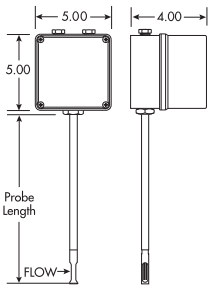
Electronics is Remote Style, with NEMA 4X Blind Enclosure (No Display). The electronics has a 4 to 20 ma opto-isolated output proportional to Mass Flow Rate as well as a 0 to 5 VDC output proportional to Temperature. Optionally, the 0 -5 VDC output can be configured to provide pulsed outputs of Totalized Flow (other output will be disabled).

Flow Element's Junction Box is Explosion Proof (Class 1, Div 1, Groups B, C, D), and does not have any electronics – only a wiring terminal block. The Junction Box is connected to the Remote Electronics by 25 feet of lead-length compensated cable. The cable (6-conductor) can be lengthened or shortened without affecting accuracy (max loop resistance 10 ohms, over 1000 feet).



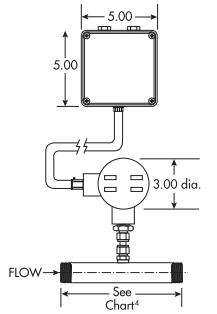
SIL Blind In-Line[1]

Flow Element is In-Line Style consisting of a choice of 316 Stainless Steel Schedule 40 Flow Bodies sized from 1/4" x 6" long to 4" x 12" long.



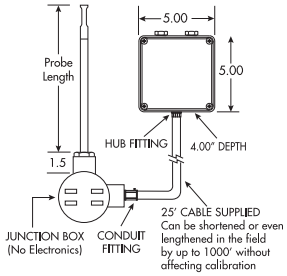
SIL Blind Insertion[2]

The Flow Element is an Insertion Style, consisting of a 1/2" OD probe (3/4" optional) with lengths up to 36" long (typically 15" long) suitable for insertion into the center of a process pipe.



SRL Blind In-Line[1]

Flow Element is In-Line Style consisting of a choice of 316 Stainless Steel Schedule 40 Flow Bodies sized from 1/4" x 6" long to 4" x 12" long.



SRL Blind Insertion[2]

Flow Element is Insertion Style, consisting of a 1/2" OD probe (3/4" optional) with lengths up to 36" long (typically 15" long) suitable for insertion into the center of a process pipe.

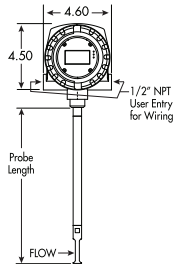
1 *Male NPT ends are standard, with flanged ends, tube, or butt weld optionally available.*
2 *Mounting hardware choices (such as Isolation Valve Assemblies, Compression Fittings, and Flange Mounts) are optionally available*
3 *Optionally available with Integral (round) Explosion Proof enclosure (XP2)*
4 *Chart of Flow Body length is on page 10 (see "In-Line Flow Meters")*
5 *"A" dimension is on Chart on page 10 (see "In-Line Meter Dimensions")*

DIMENSIONS

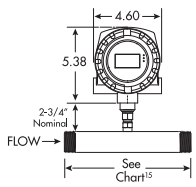
DIMENSIONAL DRAWINGS FOR SAGE MASS FLOW METERS (Partial Listing)

Note: Flanged Flow Bodies Optional[10] *(All Dimensions in Inches)*

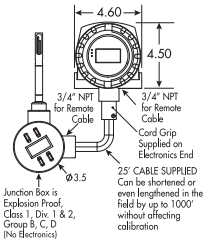
PRIME



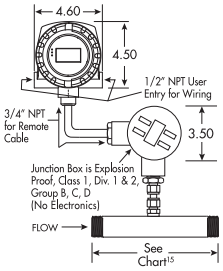
SIP SERIES INTEGRAL
Insertion Style[2]



SIP SERIES INTEGRAL
In-Line Style[1,3,15]

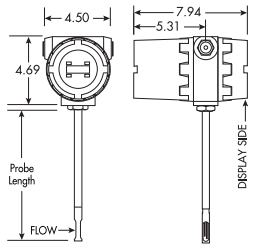


SRP SERIES REMOTE
Insertion Style[2]

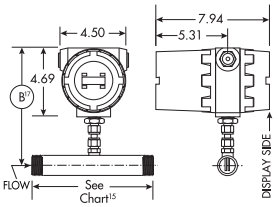


SRP SERIES REMOTE[16]
In-Line Style[1,3]

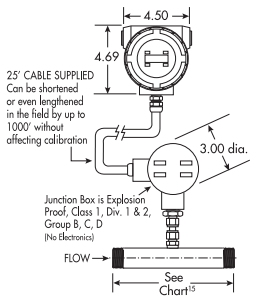
EXPLOSION PROOF



SIE SERIES INTEGRAL[6,11]
Insertion Style[2, 6]

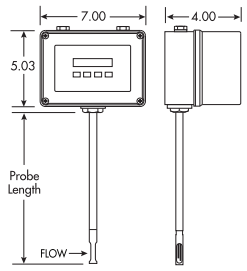


SIE SERIES INTEGRAL[6,11]
In-Line Style[1, 3]

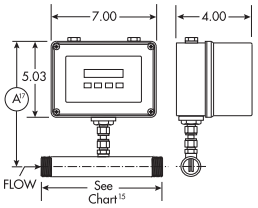


SRE SERIES REMOTE[11,16]
In-Line Style[1, 3]
Also available as Insertion Style ***(not shown)***

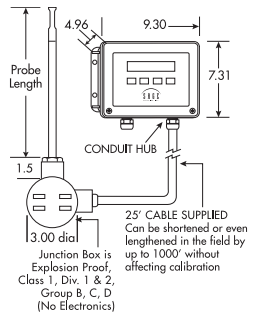
GENERAL PURPOSE



SIG SERIES INTEGRAL
Insertion Style[2, 7,8]

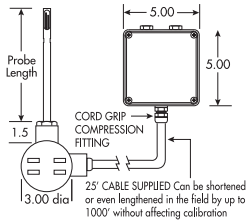


SIG SERIES INTEGRAL
In-Line Style[1,3,7,8,15]
(1" Flow Body shown)

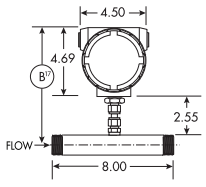


SRG SERIES REMOTE[14]
Insertion Style[2,7,8,16]
Also available as In-Line Style ***(not shown)***

"LITE" (No Display)

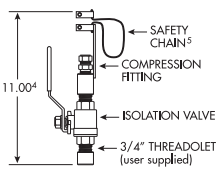


SRL SERIES REMOTE[16]
Insertion Style[2, 8, 9]
Also available as In-Line Style ***(not shown)***



SIL SERIES INTEGRAL[6,18]
In-Line Style[1, 3]
Optional Explosion Proof (XP2) Enclosure shown. Also available as Insertion Style ***(not shown)***

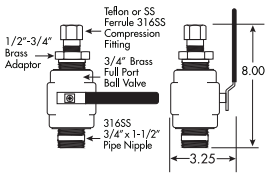
INSERTION MOUNTING HARDWARE[19]



SVA05 SERIES ISOLATION VALVE ASSEMBLY[12,13]
The Isolation Valve Assembly permits insertion or removal of probe without shutting down the gas line.

(Maximum 650 psig[13])

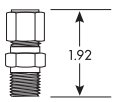
SVA05LP LOW PRESSURE ISOLATION VALVE ASSEMBLY



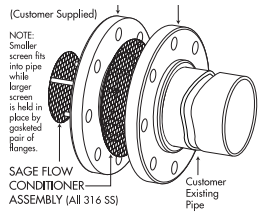
(Maximum 50 psig)

(STCF05 TEFLON FERRULE COMPRESSION FITTING[20]

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.**



CAPTIVE FLOW CONDITIONERS[19]



1 *NPT Fittings standard (150# or 300# flanges optional)*
2 *Flanged Mounting available for high pressure operation*
3 *Flow Conditioning built in to Flow Meter Pipe Sizes 1/2" and up. Contact Sage for optional 1/4" tube flow body*
4 *10" nominal when collar clamps are together*
5 *Safety chain is sized depending on probe length to prevent probe from escaping above compression fitting*
6 *3/4" Female NPT access holes for wiring (conduit compatible)*
7 *Access holes are 1/2" NPT (supplied capped)*
8 *All NEMA 4X Enclosures have 4" depth*
9 *Circuit board available separately, 3" diameter*
10 *When flanges specified, face-to-face dimensions same as length on Table on page 10*
11 *All Explosion Proof Meters are Class I, Group B, C, D, Class II Group E, F, G and Class IV and have Cenelec, EExd Enclosure IIC, IP66 ratings and are NEMA 4X, 7BCD and 9EFG rated*
12 *Used for pressures to 650 psig (drawing shown is for use 1/2" probe and 3/4" threadolet. Optionally available for 3/4" probe and 1" threadolet)*
13 *At 650 psig, force exerted on 1/2 diameter probe is approx. 125 psig*
14 ***NOTE:** Only one Conduit Hub is supplied, and one Cord Grip is supplied with SRG Series*
15 *See Chart on page 10 (see "In-Line Flow Meters")*
16 *Junction Box on Remote Style Meters are Class I, Groups B, C, D; Class II, Groups E, F, G; Class III; 4X, 7BCD, 9EFG; FM Standard 3615; UL Standard 1203; CSA Standard C22.2 No. 30; and NEMA Compliance*
17 *A & B Dimensions shown on page 10*
18 *Optional Explosion Proof Enclosure, Class I, Div 1, Group C,D*
19 *Sage also can provide Captive Flow Conditioners along with Flow Meter, for user to install in their pipe one diameter upstream of Insertion Probe location, if there is insufficient straight run. Contact Sage for details*
20 *Stainless Steel Ferrule optional for higher pressure applications – up to 650 psig[13]*

MODEL NUMBERS

SAGE GAS MASS FLOW METERS – CONFIGURED FOR ANY APPLICATION

Your Pipe Size	SAGE IN-LINE METERS	SAGE INSERTION METERS Length Depends on Mounting Hardware		
		STCF05	SVA05LP	SVA05
1/4"	S(__)-025	N/A	N/A	N/A
3/8"	S(__)-030	N/A	N/A	N/A
1/2"	S(__)-050	N/A	N/A	N/A
3/4"	S(__)-075	N/A	N/A	N/A
1"	S(__)-100	S(__)-05-06	S(__)-05-12	S(__)-05-15
1-1/4"	S(__)-125	S(__)-05-06	S(__)-05-12	S(__)-05-15
1-1/2"	S(__)-150	S(__)-05-06	S(__)-05-12	S(__)-05-15
2"	S(__)-200	S(__)-05-06	S(__)-05-12	S(__)-05-15
2-1/2"	S(__)-250	S(__)-05-06	S(__)-05-12	S(__)-05-15
3"	S(__)-300	S(__)-05-06	S(__)-05-12	S(__)-05-15
4"	S(__)-400	S(__)-05-06	S(__)-05-15	S(__)-05-15
6"-12"	N/A	S(__)-05-12	S(__)-05-15	S(__)-05-18
14"-24"	N/A	S(__)-05-15	S(__)-05-24	S(__)-05-24
26"-36"	N/A	S(__)-05-24	S(__)-05-30	S(__)-05-30
>36"	N/A	Consult Factory	Consult Factory	Consult Factory

BUILDING A MODEL NUMBER

1. Select Style
   - Integral (I) or Remote (R)
   - Prime (P), Explosion Proof (E), General Purpose (G), or Lite (L)
2. If In-Line, select pipe size (*see table below [Column 1] for Flow Body Sizes and Lengths*)
3. If Insertion, select probe diameter, and length
   - -05 = 1/2" tube (standard); -07 = 3/4" tube (optional)
4. If Insertion, select mounting hardware (Isolation Valve or Compression Fitting)[10]
   - SVA05 = Sage Isolation Valve Assembly for 1/2" probe (Maximum 650 PSIG[7])
   - SVA05LP = Low Pressure Sage Isolation Valve Assembly (Maximum 50 PSIG)
   - SVA07 = Sage Isolation Valve Assembly for optional 3/4" probe (Maximum 350 PSIG)
   - STCF05 = Sage Teflon Compression Fitting for 1/2" probe (Maximum 125 PSIG)
   - SSCF05 = Sage Stainless Steel Compression Fitting for 1/2" probe (Maximum 650 PSIG)
   - STCF07 = Sage Teflon Compression Fitting for optional 3/4" probe (Maximum 125 PSIG)
5. If Insertion, select probe length based on mounting hardware choice (see Table on left)
   - -06 = 6" length
   - -12 = 12" length; -15 = 15" length; -18 = 18" length
   - -24 = 24" length; -30 = 30" length; -36 = 36" length
6. Select operating voltage: -DC12[8] = 12VDC; -DC24 = 24VDC; -AC115 = 115VAC; -AC230 = 230VAC
7. Add symbol of gas being measured at end of part number followed by any Options
8. Include Full Scale Flow Rate and operating Temperature and Pressure as well as Pipe Size (with Schedule or ID) in description

EXAMPLE OF A MODEL NUMBER FOR INTEGRAL INSERTION METER WITH 15" PROBE (1/2") AND ISOLATION VALVE ASSEMBLY

SIP-05-15-SVA05-AC115-NG

- SIP: Base Model (i.e., **I**=Integral, **P**=Prime)
- 05: Probe Diameter
- 15: Probe Length
- SVA05: Mounting Hardware
- AC115: Power
- NG: Gas

EXAMPLE OF A MODEL NUMBER FOR REMOTE IN-LINE METER WITH 2"x12" FLOW BODY WITH NPT FITTINGS

SRP-200-DC24-AIR

- SRP: Base Model (i.e., **R**=Remote, **P**=Prime)
- 200: Flow Body Size (Nominal)
- DC24: Power
- AIR: Gas

In-Line Flow Meters Sizes[1] and Lengths (NPT Threads standard, Flanged Ends optional)	Corresponding Model Numbers	Minimum Resolution in SCFM[2,3] when Flow Meter is Calibrated to its Minimum Full Scale (See Next Column)	Minimum[4,5] Full Scale for Air and Other Gases (SCFM)	Maximum[6] Full Scale for Air and Other Gases (SCFM)	In-Line Meter Dimensions (See Drawing on Pages 7, 8, and 9)		
					Pipe Size	Gen. Purpose (A)	Expl. Proof (B)
1/4" x 6"	S(__)-025	.004	2	25	1/4"	8.03"	7.33"
3/8" x 6"	S(__)-030	.007	4	45	3/8"	8.09"	7.39"
1/2" x 7"	S(__)-050	.01	6	75	1/2"	8.15"	7.45"
3/4" x 7"	S(__)-075	.02	11	130	3/4"	8.28"	7.58"
1" x 8"	S(__)-100	.03	18	200	1"	8.40"	7.70"
1-1/4" x 10"	S(__)-125	.05	30	350	1-1/4"	8.53"	7.83"
1-1/2" x 12"	S(__)-150	.07	40	500	1-1/2"	8.65"	7.95"
2" x 12"	S(__)-200	.12	70	820	2"	8.90"	8.20"
2-1/2" x 12"	S(__)-250	.17	100	1100	2-1/2"	9.15"	8.45"
3" x 12"	S(__)-300	.25	150	1800	3"	9.40"	8.70"
4" x 12"	S(__)-400	.44	265	3150	4"	9.90"	9.20"

1 *Flow Conditioning built in to Flow Meter Pipe Sizes 1/2"and up. Contact Sage for optional tube flow bodies*
2 *SCFM = Standard Cubic Feet per Minute*
3 *1 SCFM = 1.7 NCMH. Sage standard conditions for calibration are 70°F and 29.92"Hg*
4 *100:1 turn-down is still maintained*
5 *Contact Sage if you require a lower Full Scale range with less turn-down*
6 *Max Full Scale available for many gases, such as pressurized Air or Nitrogen. Some gases such as Hydrogen may be limited. Calibrations above 500 SCFM may be extrapolated*
7 *Typically used for pressure <150 PSIG, but can be used up to 650 PSIG*
8 *–DC12=12VDC. Only available in Prime (contact Sage for other voltages, 5VDC, etc.)*
9 *Minimum Resolution based on velocity of 5 SFPM*
10 *Sage also can provide Captive Flow Conditioners along with Flow Meter, for user to install in their pipe one diameter upstream of Insertion Probe location, if there is insufficient straight run. Contact Sage for details*

APPLICATIONS

COMMON APPLICATIONS FOR SAGE THERMAL MASS FLOW METERS

1	**Natural Gas**	Industrial Plant	Monitor main header to track billing, assess daily flow peaks, determine shift demand
			Sub-meter branches to monitor department usage, analyze cost, promote conservation
2	**Natural Gas**	Building Automation	Monitor natural gas demand and consumption for entire building to reduce energy
			Monitor natural gas at individual zones to help promote energy conservation
3	**Natural Gas**	Commercial	Monitor natural gas usage for individual tenants
			Encourage conservation by monitoring individual branches
4	**Natural Gas**	Schools and Colleges	Monitor usage in dorms and residence halls
			Check boilers and furnaces for efficiency
5	**Natural Gas**	Boilers, Furnaces	Check industrial boiler and furnace efficiency
			Monitor natural gas (along with air) for optimal air/fuel ratio for combustion control
6	**Natural Gas**	Federal Government	Monitor natural gas at federal buildings to comply with energy reduction initiatives
			Federal Building initiative is based on Sec. 434 of National Conservation Policy Act
7	**Natural Gas**	Federal Government	Monitor natural gas to assess whether government heating systems need replacement
			Common government facilities to be monitored include the VA Hospitals and Post Offices
8	**Natural Gas**	Transmission	Thermal MFMs *not* appropriate, except as "check meters" downstream of check valves
			Check for leaks in the low pressure natural gas to compressor stations (also for "upset" conditions)
9	**Natural Gas**	LEED Buildings	Obtain LEED points in new construction or renovation of "Green" buildings
			Install natural gas meters to measure energy usage in zones (1 LEED point)
10	**Natural Gas**	Regulatory	Measure natural gas to industrial boilers and process heaters for municipal compliance
			Reduce emissions from large industrial boilers and furnaces by adjusting air/ fuel ratio
11	**Digester Gas**	Livestock	Measure the digester gas off of livestock waste (pig farms, dairies) for Carbon Credits
			The digester gas contains ~65% CH4/ 35% CO2. Destroy the CH4 by flaring or Co-gen
12	**Digester Gas**	Kyoto Accord	Reduce collective greenhouse gas emissions (GHG) through methane destruction
			Monitor the digester gas on large projects, such as digesters on pig farms for credits
13	**Digester Gas**	CCX Credits	The Chicago Climate Exchange (CCX) offers mechanism to reduce global warming
			Eligible projects for the above include livestock operations. Digester gas is measured
14	**Digester Gas**	Municipal	Monitor the flow of digester gas to facilitate sewage treatment
			Measure the flow of digester gas to engines or flares, or totalized flow for storage
15	**Landfill Gas**	Municipal	Measure landfill gas (LFG) (~ 55% CH4/ 45% CO2) after the moisture knock-out
			The measurement provides a means to balance the well heads & optimize effectiveness
16	**Landfill Gas**	Municipal	Measure landfill gas flow to the flare for reporting to environmental agencies
			Measure landfill gas to engines in Co-generation and/ or for Carbon Credit programs
17	**Biogas**	Organic Wastes	Organic industrial waste from food processing can be broken down to produce energy
			Organic wastes from livestock, energy crops. Sensitive flow metering required
18	**Flare Gas**	Petrochemical	Waste gas from petrochemical and chemical processes needs to be burned off
			Sensitive flow measurement needed to detect normal leaks, as well as high flow upsets
19	**Flare Gas**	Combustion Process	Measure the byproducts of combustion in pipes, stacks, ducts or chimneys
			Venting from boilers, furnaces, steam generators & ovens require sensitive measurement
20	**Methane**	Coal Mines	Methane (mixed with air/ CO2) that is recovered from coal mines can be measured
			Methane can also be measured in gas fields (as long as the fields are dry)
21	**Air/ Fuel**	Ethanol Distillation	The air and fuel going into ethanol distillation tanks needs to be measured
			In addition, the CO2 leaving the fermentation process, also needs to be monitored
22	**Air/ Fuel**	Combustion Control	Monitoring and controlling of combustion air or oxygen and natural gas is critical
			By maintaining the proper air/ fuel ratio, optimized combustion control is attained
23	**Air**	Compressed Air	Monitor compressed air lines to detect leaks, improve efficiency, reduce energy costs
			Also, assess when new compressors are required, or when excessive air is being wasted
24	**Air**	Vent Air/ Other	Measure supply air & exhaust air in incineration, vent air for environmental compliance
			Exhaust flow in stacks, test pumps for leaks, air flow to heat treating furnaces, drying
25	**Other Gases**	Various	CO2 for beer production, N2 for purging, blanketing & food preservation, H2 (cooling)
			AR for steel purification and heat treating & plastics, CL2 or 03 for water treatment

Make the Wise Choice.
Choose Sage Flow Meters.

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