



SAGE RIO (SIX Series) INDUSTRIAL THERMAL MASS FLOW METER FOR GASES

SAGE RIO THERMAL MASS FLOW METER FOR GASES

The Sage Rio Thermal Mass Flow Meter provides the same levels of performance found in the popular Sage Prime with additional approvals for use in hazardous areas. The Rio features a bright, high contrast, photo-emissive OLED (Organic LED) display of Flow Rate, Total and Temperature in an explosion proof, dual-sided NEMA 4X enclosure. The Flow Rate is also displayed graphically in a horizontal bar graph format. The rear compartment is completely separated from the electronics, and has large, easy-to-access, well marked terminals, for ease of customer wiring. It is powered by 24 VDC (115/230 VAC optional). The power dissipation is under 2.5 watts (e.g. under 100 mA at 24 VDC).

Standard outputs include 4–20mA, pulsed outputs of totalized flow and full Modbus compliant RS485 RTU communications or optional HART communication.

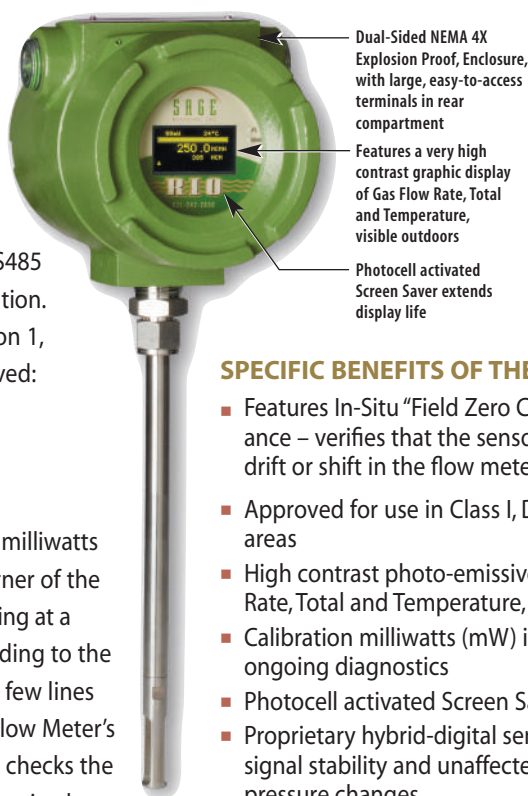
The Sage Rio is approved for use in Class I, Division 1, Groups B, C, and D areas and is ATEX Zone 1 approved:

Ⓔ II 2G Ex d IIB+H2 T6 Gb.

CONTINUOUS DIAGNOSTICS & FIELD CONFIGURABILITY

Rio has continuous diagnostics. The raw calibration milliwatts (mw) is always displayed in the upper left hand corner of the meter's display. At any time, you can check this reading at a "No Flow" (0 SCFM) condition, and compare the reading to the original reported "No Flow" value noted on the last few lines of your meter's Certificate of Conformance or the Flow Meter's data tag. This in-situ diagnostic procedure 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 that the meter is operating properly, verifies that there is no shift or drift, and eliminates the need for annual factory calibrations. This simple field diagnostic procedure, in addition, verifies that the sensor is free from contamination, even without inspection.

Although Sage Rio is fully configured upon shipment for the pipe and process conditions requested, if changes are needed, Addresser software is optionally available.



MAJOR BENEFITS OF THERMAL MASS FLOW METERS

- Direct Mass Flow – No need for separate temperature or pressure transmitters
- High Accuracy and Repeatability – Precision measurement and extraordinary repeatability
- Turndown of 100 to 1 and resolution as much as 1000 to 1
- Low-End Sensitivity – Measures as low as 5 SFPM (e.g., 1 SCFM in a 6" pipe)
- 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
- Ease of installation and convenient mounting hardware

SPECIFIC BENEFITS OF THE SAGE RIO

- Features In-Situ "Field Zero Calibration Check" of sensor's performance – verifies that the sensor is clean, and assures that there is no drift or shift in the flow meter
- Approved for use in Class I, Division 1, Groups B, C, and D hazardous areas
- High contrast photo-emissive OLED display with numerical Flow Rate, Total and Temperature, as well as Graphical Flow Indicator
- Calibration milliwatts (mW) is continuously displayed, providing for ongoing diagnostics
- Photocell activated Screen Saver to extend display life¹
- Proprietary hybrid-digital sensor drive circuit provides enhanced signal stability and unaffected by process temperature and pressure changes
- Modbus® compliant RS485 RTU communications
- HART communications optional
- Isolated 4-20 mA output and pulsed output of Totalized Flow
- Heavy industrial packaging with easy terminal access
- Optional Remote Style with Lead-Length Compensation. Allows remote electronics up to 1000 feet from probe; Explosion Proof Junction Box has no circuitry, just terminals (suitable for harsh environments)
- Low power dissipation, under 2.5 Watts (e.g. under 100 ma at 24 VDC)
- Field reconfigurability via optional Addresser software
- Flow conditioning built into In-Line flow meters (1/2" and up)
- Captive Flow Conditioners for Insertion meter applications, if required

¹ Note, a built-in photocell continuously monitors the ambient light, and adjusts the display brightness for optimum long-term life, and also senses motion which automatically switches display from Screen Saver mode to Normal mode

SAGE RIO STYLES AND SPECIFICATIONS

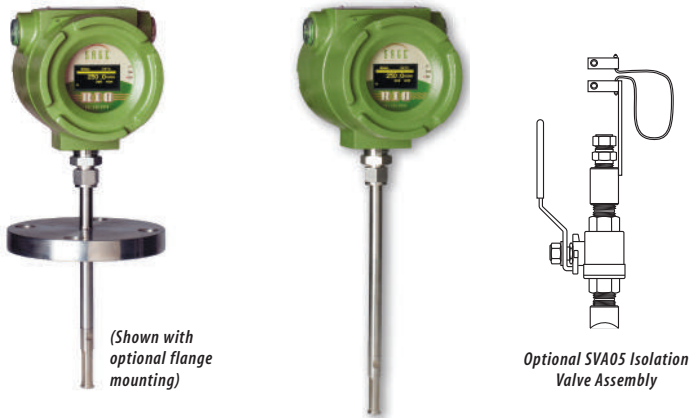
SAGE METERING is a manufacturer of high performance Thermal Mass Flow Meters which measure the flow rate and consumption of gases for multiple industrial applications. Frequently used for energy management systems to monitor and improve energy efficiency as well as for regulatory compliance in environmental systems including reporting of Greenhouse Gas Emissions.

TYPICAL APPLICATIONS include measurement and sub-metering of natural gas and compressed air for energy utilization and cost accounting within a facility. Measurement of combustion air flow can be used for improving efficiency in boilers

and furnaces. Environmental reporting of Greenhouse Gases from combustion sources as well as measurement for carbon credits are frequently encountered.

OTHER KEY environmental applications include flare gas flow measurement in the Oil and Gas Industry where thermal technology offers economic advantages over traditional flow measurement technology. To meet the regulatory requirements of periodic re-calibration or calibration verification, Sage Metering has developed a unique in-situ accuracy verification process to ensure the meter is performing within the original NIST traceable gas calibration while the process remains in operation.

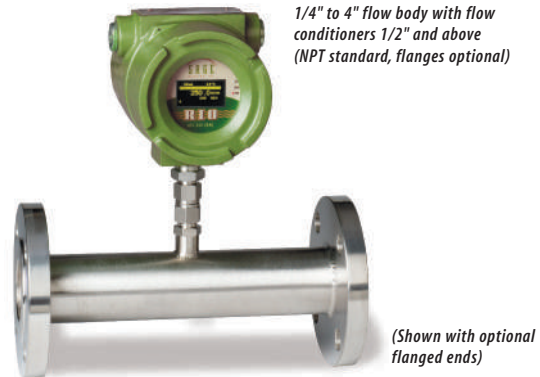
SIX SERIES – INSERTION PROBES



(Shown with optional flange mounting)

Optional SVA05 Isolation Valve Assembly

SIX SERIES – IN-LINE PROBE



1/4" to 4" flow body with flow conditioners 1/2" and above (NPT standard, flanges optional)

(Shown with optional flanged ends)

GENERAL INFORMATION

SENSOR Two reference grade Platinum RTDs clad in 316SS sheath. Hastelloy C276 optional

MATERIAL Weltered metal components: 316SS. Hastelloy C276 optional

POWER 24VDC Standard (115/230VAC optional)

POWER DISSIPATION <2.5 w (for 24VDC Models)

ELECTRONICS Microprocessor based

DISPLAY High contrast photo-emissive OLED graphical display (Flow Rate, Totalizer, Temperature)

TURNDOWN 100 to 1

RESOLUTION 1000 to 1

LOW END SENSITIVITY 5 SFPM

FIELD CALIBRATION CHECK Yes – Digital system allows raw signal validation in milliwatts (In-Situ Calibration Check)

COMMUNICATIONS Modbus® compliant RS485 RTU communications. HART communications optional

APPROVALS

- UL, cUL, Class I, Division 1, Groups B, C, D T6
- ATEX Zone 1
- II 2 G Ex d IIB+H2 T6 Gb
Note: T6 Rating is suitable for gases with ignition temperatures as low as 185°F (85°C)
- NEMA 4X, IP66

FIELD RECONFIGURABLE Yes –Sage Addresser or Sage Dongle

FLOW ACCURACY ±0.5% of Full Scale ±1% of reading. (Enhanced accuracy optionally available with limited turn-down)

FLOW REPEATABILITY 0.2%

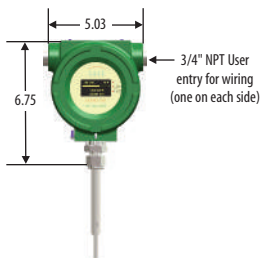
RESPONSE TIME 1 second

GAS TEMPERATURE RANGE –40° to 200°F (93°C) Standard. (For higher temperature options, contact Sage)

GAS PRESSURE 500 PSIG. (If higher pressure needed, contact Sage)

TEMPERATURE OUTPUT Through Modbus® only

AMBIENT TEMPERATURE –40°F (–40°C) to 122°F (50°C) for ATEX Rating



STYLE

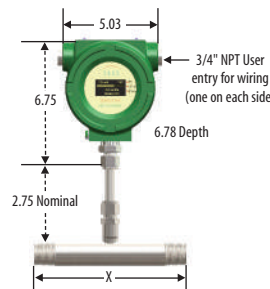
Insertion Mass Flow Meter

PROBE STYLE/LENGTH

1/2" OD Probe Lengths 6" to 36"

FLOW CONDITIONING

Captive Flow Conditioners available upon request with meter purchase



STYLE

In-Line Mass Flow Meter

FLOW BODY

316SS Schedule 40 Flow Bodies sized from 1/4" x 6" long to 4" x 12" long. Male NPT ends standard. (Flanges and other options available)

FLOW CONDITIONING

Flow conditioners are built in to In-Line Style Flow Bodies from 1/2" to 4"

REMOTE STYLE SRX

Optional Remote Styles available with lead-length compensation (up to 1000 ft). Contact Sage for further information.



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