Natural Gas & Propane Immersible Thermal Gas Mass Flow Meter

Features

- Fast response flow meter optimized for natural gas or propane measurement applications
- 200 millisecond response to changes in flow rate
- Programmable pulse output for remote totalization
- Optional Modbus communication
- Smart electronics permit field adjustment of critical flow meter settings
- Field validation of flow meter calibration
- Outstanding rangeability
- 2 x 12 backlit LCD display totalizer values along with instantaneous flow display
- Minimal flow blockage and low pressure drop
- CE approved

Description

Sierra Instruments’ Boiler-Trak™ Immersible Thermal Mass Flow Meter provides an optimized solution for natural gas or propane flow measurement applications. Boiler-Trak is designed to provide an economical solution to new regulations for the burning of natural gas or propane in heaters and boilers. The meter’s sensor offers long-term reliability and a 200 millisecond response to changes in flow rate.

The versatile microprocessor-based transmitter integrates the functions of flow-range adjustment, meter validation and diagnostics in a probe-mounted NEMA 4X (IP65) housing. Mass flow rate and totalized flow, as well as other configuration variables, are displayed on the meter’s 2 x 12 backlit LCD panel.

The meter also provides an optical/galvanic isolated 4-20 mA output and two alarm outputs along with a programmable pulse output for remote totalization. An optional Modbus Communications package is also available. The programmable transmitter is easily configured via RS-232 and Sierra’s Smart Interface™ Windows™ based software (supplied with the meter) or three push buttons in the device. Boiler-Trak is suitable for pipes or ducts from 1-inch to 6-inches.

For information online...
www.sierrainstruments.com

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Performance Specifications

Alarms
Hard contact user-adjustable high and low
Dead band adjustable with Smart Interface™ software
Relay ratings 42 VAC or 42 VDC, 140 mA

Displays
Alphanumeric 2 x 12 digit backlit LCD
Adjustable variables via on-board switches (password protected)
or with Smart Interface™ software
Adjustable variables
- Full scale (50 to 100 %)
- Time Response (1 to 7 seconds)
- Correction factor setting (0.5 to 5)
- Zero and span

Totalizer
Eight digits (9,999,999) in engineering units
Resettable by software or on-board switches

Software
Smart Interface™ Windows™-based software
Minimum 8 MB of RAM, preferred 16 MB of RAM
RS-232 communication

Additional features
- Alarm dead band adjustment
- Low flow cut-off adjustment
- Linearization adjustment
- Save / Load configurations
- Flow meter validation

Wetted Material
- Probe: 304SS, glass coating epoxy
- Sensor: 316SS
- Enclosure: NEMA 4X (IP65) powder-coated cast aluminum

Electrical Connections
- One 1/2-inch female NPT

Certifications
- CE approved

Operating Specifications

Gases
Natural gas, Propane, Methane

Gas Pressure
0 psig to 120 psig (0 to 8 barg)
Note: actual gas calibration limited to 30 psig (2 barg)

Pressure Drop
Negligible

Gas & Ambient Temperature
Gas: -40°F to 176°F (-40°C to 80°C)
Ambient: -40°F to 120°F (-40°C to 50°C)

Power Requirements
15 to 18 VDC (regulated), 625 mA maximum
Note: no other option available due to safety consideration

Output Signal
Linear 0–5 VDC and 4–20 mA proportional to mass flow rate
*Modbus Optional

Accuracy of Point Velocity
+/- 1% of full scale (actual gas calibration)
+/- 1% of full scale (correlation)

Repeatability
+/- 0.2% of full scale

Temperature Coefficient
+/- 0.02% of reading per °F within +/− 50°F of customer specified conditions
+/- 0.03% of reading per °F within +/− 50°F to 100°F of customer specified conditions
+/- 0.04% of reading per °C within +/− 25°C of customer specified conditions
+/- 0.06% of reading per °C within +/− 25°C to 50°C of customer specified conditions

Pressure Coefficient
0.02% per 7 kpa for natural gas / Methane / Propane

Response Time
200 milliseconds to 63% of final velocity value

Operating Specifications (cont.)

Alarms
Hard contact user-adjustable high and low
Dead band adjustable with Smart Interface™ software
Relay ratings 42 VAC or 42 VDC, 140 mA

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Alphanumeric 2 x 12 digit backlit LCD
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Minimum 8 MB of RAM, preferred 16 MB of RAM
RS-232 communication

Additional features
- Alarm dead band adjustment
- Low flow cut-off adjustment
- Linearization adjustment
- Save / Load configurations
- Flow meter validation

Physical Specifications

Wetted Material
- Probe: 304SS, glass coating epoxy
- Sensor: 316SS
- Enclosure: NEMA 4X (IP65) powder-coated cast aluminum

Electrical Connections
One 1/2-inch female NPT

Mounting
3/8-inch tube compression fitting with 1/2-inch male NPT

Certifications
CE approved

Dimensional Specifications

NEMA 4X—Side View (EN2)

NEMA 4X—Front View (EN2)

All dimensions are inches. Millimeters are in parentheses. Certified drawings are available on request.

Performance Specifications

Accuracy of Point Velocity
+/- 1% of full scale (actual gas calibration)
+/- 1% of full scale +/- 3% of reading (correlation)

Repeatability
+/- 0.2% of full scale

Temperature Coefficient
+/- 0.02% of reading per °F within +/- 50°F of customer specified conditions
+/- 0.03% of reading per °F within +/- 50°F to 100°F of customer specified conditions
+/- 0.04% of reading per °C within +/- 25°C of customer specified conditions
+/- 0.06% of reading per °C within +/- 25°C to 50°C of customer specified conditions

Pressure Coefficient
0.02% per 7 kpa for natural gas / Methane / Propane

Response Time
200 milliseconds to 63% of final velocity value

Gas
Natural gas, Propane, Methane

Gas Pressure
0 psig to 120 psig (0 to 8 barg)
Note: actual gas calibration limited to 30 psig (2 barg)

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Gas & Ambient Temperature
Gas: -40°F to 176°F (-40°C to 80°C)
Ambient: -40°F to 120°F (-40°C to 50°C)

Power Requirements
15 to 18 VDC (regulated), 625 mA maximum
Note: no other option available due to safety consideration

Output Signal
Linear 0–5 VDC and 4–20 mA proportional to mass flow rate
*Modbus Optional

Standard Calibrated Flow Rates

In various sizes of schedule 40 piping - 51°F = 21°F, 1 atm (21°C, 101.3 kpa)

<table>
<thead>
<tr>
<th>Size</th>
<th>SCFM</th>
<th>NAM³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25”</td>
<td>80</td>
<td>2.1 NAM³/min</td>
</tr>
<tr>
<td>1.5”</td>
<td>110</td>
<td>2.9 NAM³/min</td>
</tr>
<tr>
<td>2”</td>
<td>180</td>
<td>4.9 NAM³/min</td>
</tr>
<tr>
<td>2.5”</td>
<td>280</td>
<td>7.0 NAM³/min</td>
</tr>
<tr>
<td>3”</td>
<td>410</td>
<td>10.4 NAM³/min</td>
</tr>
<tr>
<td>4”</td>
<td>750</td>
<td>18.4 NAM³/min</td>
</tr>
<tr>
<td>6”</td>
<td>1600</td>
<td>42.1 NAM³/min</td>
</tr>
</tbody>
</table>

Tables

| L04  | 4.0 (101.6) |
| L06  | 6.0 (152.4) |
| L09  | 9.0 (228.6) |
| L13  | 13.0 (330.2) |

All dimensions are inches. Millimeters are in parentheses. Certified drawings are available on request.
**PART NUMBER**

620S BT  Boiler-Trak™ Mass Flow Meter

**PROBE LENGTH**

L04  3.7 - inches (9.5 cm)
L06  6 - inch (15 cm)
L09  9 - inch (23 cm)
L13  13 - inch (33 cm)

Longer: consult factory

**MOUNTING ACCESSORIES**

M1  Compression Fitting
    3/8-inch probe feed through by x 1/2-inch Male NPT

**ELECTRONICS ENCLOSURE**

EN2  NEMA 4X (IP65) Enclosure
     Mounted directly on probe.

**OUTPUT SIGNAL**

V1  0–5 VDC, Linear
V3  0–10 VDC, Linear
V4  4–20 mA, Linear

**DISPLAY**

NR  No Readout
DD  Digital Display

**SPECIFY GAS**

8  Methane (natural gas) calibration (+/- 1.0% full scale)
9  Methane (natural gas) correlation (+/- 3.0% reading plus 1.0% full scale)
12 Propane calibration (+/- 1.0% full scale)
13 Propane correlation (+/- 3.0% reading plus 1.0% full scale)

*Note: For other gases, please use Sierra Model 620S or 640S

**OPTION 1 (DIGITAL COMMUNICATIONS)**

PULSE  Pulse
MB  MODBUS