Data Sheet
DS-TMF-5850*i*-MFC-eng
October, 2008

Industrial Mass Flow Controller
Model 5850*i*

Description

The Brooks® Model 5850*i* Mass Flow Controller accurately measures and controls gas flows. The heart of the system is the removable flow sensor which produces an electrical output signal linear with flow rate used for indicating, recording, and/or control purposes. It eliminates the need for continuous monitoring and readjustment of gas pressures to provide a stable gas flow.

Design Features

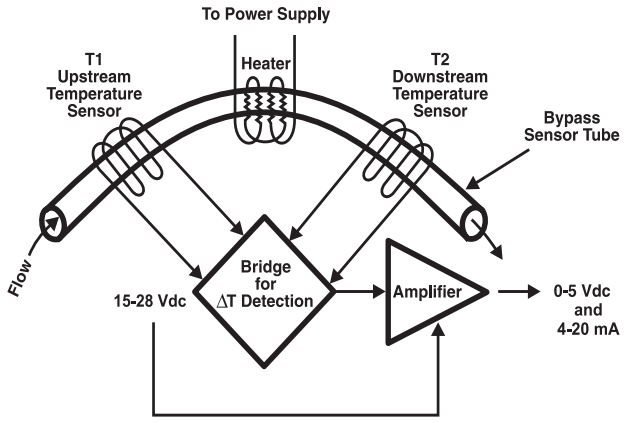
- Easy maintenance
- Negligible flow overshoot/undershoot
- Removable sensor
- Insensitive to mounting attitude
- Wide flow range (up to 30 slpm N_2)
- End accessible zero and span potentiometers
- Jumper selectable response time
- Electrically activated valve override
- Low command flow cutoff
- Normally closed valve
- Mechanically compatible with other mass flow controllers
- Corrosion resistant valve
- Dual analog signal outputs 0 - 5 Vdc and 4 - 20 mA or 0 - 20 mA
- User configurable set point input 0 - 5 Vdc or 4 - 20 mA
- Wide power supply tolerance, 15 - 28 Vdc
- Subminiature D-connector electrical interface for RFI immunity

Principle of Operation

The operating principle of the Brooks Mass Flow Controller is thermodynamic. A precision power supply directs heat to the midpoint of the sensor tube carrying a constant percentage of the flow. On the same tube equidistant upstream and downstream of the heat input are resistance temperature measuring elements.

With no flow, the heat reaching each temperature element is equal. With increasing flow, the flow stream carries heat away from the upstream element, T1 and an increasing amount towards the downstream element, T2. An increasing temperature difference develops between the two elements and this difference is proportional to the amount of gas flowing or the mass flow rate. A bridge circuit interprets the temperature difference and an amplifier provides the output to the control circuitry as well as 0-5 Vdc output signal.

Model 5850i



Principle of Operation

The control circuitry compares the command setpoint to the flow signal and positions the precision solenoid control valve. When the command signal is below 2% of full scale, the control valve is positioned to fully closed. The control valve can be held fully open or closed by activation of the valve override circuit.

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Specification

Flow Ranges

Any range from zero to 3 sccm* to zero to 30,000 sccm (Nitrogen equivalent).

***Standard pressure and temperature in accordance with SEMI (Semiconductor Equipment and Materials Institute)standard: 0°C and 101 kPa (760 Torr). The mass flow controller can be calibrated to other reference standard conditions. Specify at time of ordering.**

Performance

Accuracy: ±1% full scale including linearity at calibrated conditions; ±1.5% full scale for flow rates greater than 20 slpm.

Repeatability

0.25% of rate

Response Time

Standard less than 6 seconds to within 2% of full scale of final value for a 0 to 100% command change

Control Range

50 to 1

Sensitivity to Mounting Attitude

±0.5% F.S. maximum deviation from specified accuracy after rezeroing under 200 psig. Specify mounting attitude at time of order to insure optimum performance.

Pressure Sensitivity

±0.03% per psi up to 200 psig (N_2)

Set Point (Command) Signal Requirements

0 to 5 Vdc (200k ohms input resistance) or 4 - 20 mAdc (75 ohms input resistance)

Output Signals

0 to 5 Vdc into 2000 ohms (or greater) load and 4 - 20 mAdc or 0 - 20 mA, 500 ohms or maximum resistance.

Max. Operating Pressure

1500 psig; allowable pressure drop depends on gas and range.

Temperature, Ambient/Gas

41 to 149°F (5 to 65°C)

Temperature Sensitivity

Zero: Less than ±0.075% F.S. per degree C.

Span: Less than ±1.0% F.S. shift from original calibration over 10-50°C range (50-122°F).

Leak Integrity, Outboard

1 x 10^{-9} atmosphere cc/sec. Helium

Power Requirements

+15 to +28 Vdc, 240 mA @ at +15 Vdc 370 mA @ 28 Vdc

Materials of Construction

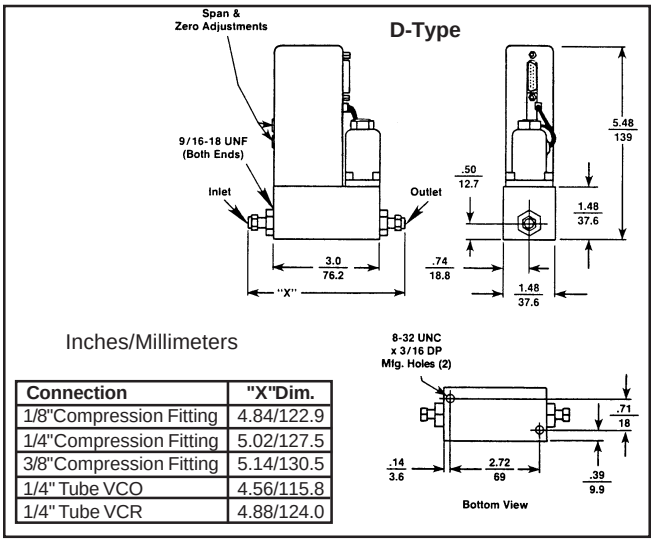
Wetted Parts - Standard: Stainless Steel with Viton® fluoroelastomers or Buna-N; Optional: Kalrez®

Connections

Standard: 9/16-18 UNF with Stainless Steel Compression Fittings; Optional: VCO™ and VCR™

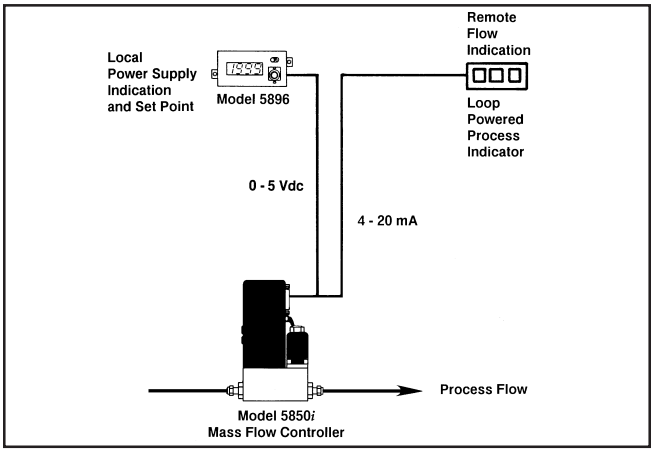
Electrical Connections

D-type connector (DA-15P)



Connection	"X"Dim.
1/8"Compression Fitting	4.84/122.9
1/4"Compression Fitting	5.02/127.5
3/8"Compression Fitting	5.14/130.5
1/4" Tube VCO	4.56/115.8
1/4" Tube VCR	4.88/124.0

Dimensions



Typical Configuration

TRADEMARKS
Brooks ..... Brooks Instrument, LLC
Kalrez ..... E.I. DuPont de Nemours & Co.
VCO, VCR ..... Cajon Co.
Viton ..... DuPont Performance Elastomers

Specifications Subject to Change Without Notice

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