

5800 Series

Thermal Mass Flow



Model 5850E

Elastomer Sealed, Analog Thermal Mass Flow Meters and Controllers

Overview

The 5800 Series mass flow meters and mass flow controllers have gained broad acceptance as the standard for stability and reliability. These products have a wide flow measurement range and are suitable for a broad range of temperature and pressure conditions making them well suited for applications in chemical and petrochemical research, laboratory, analytical, fuel cell and life science among others.

Highlights of the 5800 Series mass flow products include: industry leading long term stability, accuracy backed by superior metrology systems and methods using primary calibration systems directly traceable to international standards, and a range of analog I/O options

Product Description

The 5800 Series provides a highly configurable platform based on a simple modular architecture. The 5800 Series feature set was carefully selected to enable drop-in replacement of many brands of mass flow controllers. With the wide range of options and features available, the 5800 Series provides users with a single platform to support a broad range of applications.

Features and Benefits

| Features | Benefits |
|---|---|
| Industry leading long term sensor stability | Increased system uptime and reduced cost of ownership by reducing maintenance and eliminating periodic recipe adjustments and/or recalibrations |
| Superior valve technology | Minimum leak-by, wide turndown, and superior corrosion resistant materials reduces overall gas panel cost |
| Adaptable mechanical configurations | Easily retrofit to existing systems |
| Primary standard calibration systems | Ensures measurement accuracy is traceable to international standards |
| Simple modular design | Easy-to-service elastomer sealed design provides for factory or field service maximizing uptime and reducing total cost of ownership |

Product Description

Advanced Thermal Flow Measurement Sensor

Brooks' sensor technology combines:

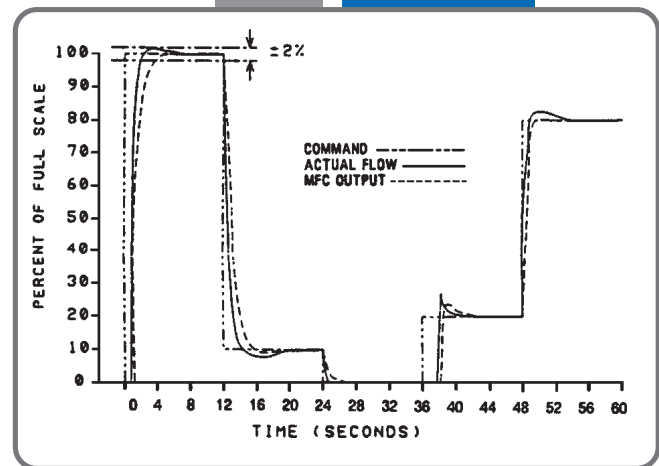
- Excellent signal to noise performance for improved accuracy at low setpoints
- Superior long-term stability through enhanced sensor manufacturing and burn in process
- Isothermal packaging to reduce sensitivity to external temperature changes

Wide Flow Range

The 5800 Series covers an extremely broad range of flow rates. Model 5850 can have a full scale flow as low as 3 ccm. With a high turndown ratio of 50:1 repeatable gas flow can be measured or controlled down to 0.06 ccm! Model 5853 can monitor or control gas flows up to 1000 lpm.

Fast Response Performance

The electronics and superior mechanical configuration in the 5800 Series provide for fast stable response characteristics.



Product Specifications

Flow Ranges and Pressure Ratings:

| Mass Flow Controller Model | Mass Flow Meter Model | Flow Ranges N2 Eq. Ratings | | Pressure Unit psi/bar Standard | PED Module H Category |
|----------------------------|-----------------------|----------------------------|-----------|--------------------------------|---|
| | | Min. F.S. | Max. F.S. | | |
| 5850 | 5860 | 0.003 | 30 lpm | 1500 psi/100 bar | SEP |
| 5851 | 5861 | 10 | 100 lpm* | 1500 psi/100 bar | SEP |
| 5853 | 5863 | 100 | 1000 lpm | 1000 psi/70 bar | 1 for all 150 lb flanges 2 for all other connections |

* 200 lpm of H2 possible, 600 lpm of H2 possible with decreased accuracy

Product Specifications (continued)

| Performance | 5850/60 | 5851/61 | 5853/63 |
|---|---|---------|---------|
| Flow Accuracy* | 1% F.S. (<20 slpm) 1.5% F.S. (>20 SLPM) | 1% F.S. | 1% F.S. |
| Control Range | 50:1 | | |
| Repeatability & Reproducibility | 0.25% of rate | | |
| Linearity | Included in accuracy | | |
| Response Time (Settling Time within $\pm 2\%$ F.S. for 0-100% command step) | E-Series: <3 seconds i-Series: <6 seconds | | |
| Zero Stability | < $\pm 0.2\%$ F.S. per year | | |
| Temperature Coefficient | Zero: <0.075% of F.S. per °C. Span: <1.0% of F.S. shift from original calibration over 10-50°C (50-122°F) range | | |
| Pressure Coefficient | $\pm 0.03\%$ per psi (0-200 psi N2) | | |
| Attitude Sensitivity | <0.5% F.S. maximum deviation from specified accuracy after re-zeroing | | |

* Accuracy including linearity at calibration conditions.

Ratings

| | | | |
|---|-----------------------------------|-----------------|---|
| Operating Temperature Range | 5-65°C (41-149°F) | | |
| Minimum Pressure Differential (Controllers)** | 5 psi/0.35 bar | 10 psi/0.69 bar | Min.: 7.5 psi/0.52 <500 lpm Min.: 11.8 psi/0.81 >500 lpm |
| Maximum Pressure Differential (Controllers)** | 50 psi/3.45 bar | | 290 psi/20 bar |
| Leak Integrity (external) | 1×10^{-9} atm. cc/sec He | | |

** Differential pressures beyond the specified limits may be possible depending on process conditions.

Mechanical

| | |
|--------------------------|--|
| Valve Type | Normally Closed, Normally Open, Meter |
| Primary Wetted Materials | 316L Stainless Steel, High Alloy Stainless Steel, Viton® fluoroelastomers, Buna-N, Kalrez® and Teflon® |


Electrical - 5800 E-Series

| | 5850E | 5851E | 5853E | 5860E/5861E/5863E |
|-------------------------|---|--|--|---|
| Electrical Connection | 15-Pin Male Sub D-Type (DA-15P) or Card Edge connector (Controller models only) | | | |
| Input (Setpoint) Signal | 0 to 5 Vdc (200 K ohms input resistance) | | | N/A |
| Output Signal | 0 to 5 Vdc into 2000 ohms (or greater) load | | | |
| Reference Output Signal | 5 Vdc ± 0.01 Vdc, max. load 2 K ohm | | | |
| Power Requirements | N. C. Valve or N.O. Valve with flow <2.5 slpm: 3.5 watts, +15 Vdc @ 35 mA, -15 Vdc @ 180 mA N.O. Valve with flow rate > 2.5 slpm: 10.5 watts, +15 Vdc @ 350 mA, -15 Vdc @ 350 mA | 10.5 watts, +15 Vdc @ 350 mA, -15 Vdc @ 350 mA | 3.5 watts, +15 Vdc @ 35 mA, -15 Vdc @ 180 mA | 1.05 watts +15 Vdc @ 35 mA, -15 Vdc @ 35 mA |

Electrical - 5800 i-Series

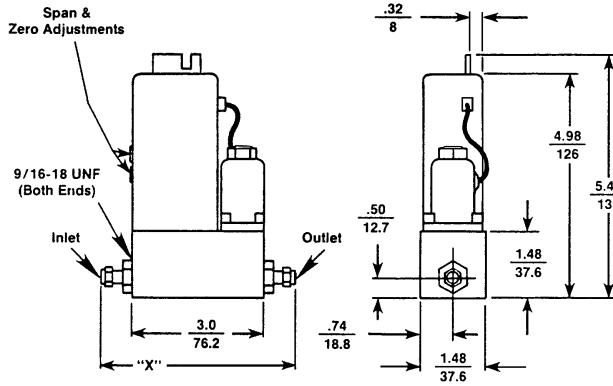
| | 5850i | 5851i | 5853i | 5860i/5861i/5863i |
|-------------------------|--|--|--|--|
| Electrical Connection | 15-Pin Male Sub D-Type (DA-15P) | | | |
| Input (Setpoint) Signal | 0 to 5 Vdc (200 K ohms input resistance) or 4-20 mAdc (75 ohms input resistance) | | | N/A |
| Output Signal | 0 to 5 Vdc into 2000 ohms (or greater) load and 4 - 20 mAdc or 0 - 20 mA, maximum loop resistance is power supply dependent (500 ohms maximum @ +15 Vdc) | | | |
| Reference Output Signal | 5 Vdc ± 0.01 Vdc, max. load 2 K ohm | | | |
| Power Requirements | +15 to +28 Vdc, 240 mA @ +15 Vdc 370 mA @ 28 Vdc | +22 to +28 Vdc, 290 mA @ 20 Vdc, 370 mA @ 28 Vdc | +15 to +28 Vdc, 240 mA @ +15 Vdc 370 mA @ 28 Vdc | +15 to + 28 Vdc, max current draw 90 mA @ 28 Vdc |

Certifications

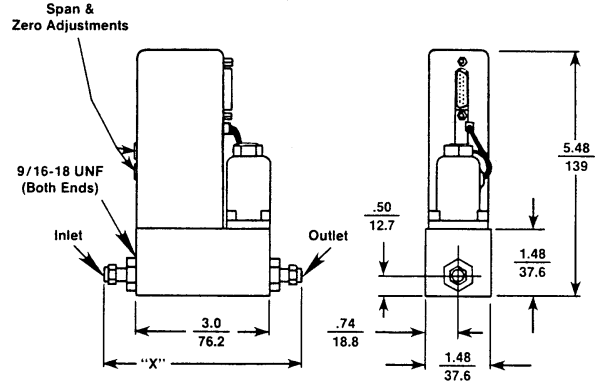
| Mark | Agency | Certification | Applicable Standard | Details |
|---|--------|---------------------------|---------------------|---------|
|  | CE | EMC Directive 2004/108/EC | EN:61326-1:2006 | PASS |

Product Dimensions - Models 5850 & 5860

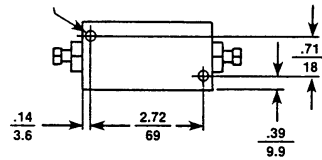
5850E, Card Edge Connector



5850E/5850i, 15-Pin D Connector



8-32 UNC
x 3/16 DP
Mtg. Holes (2)

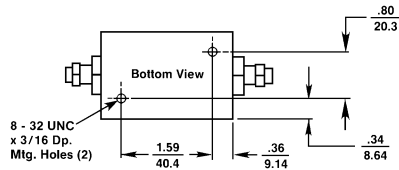
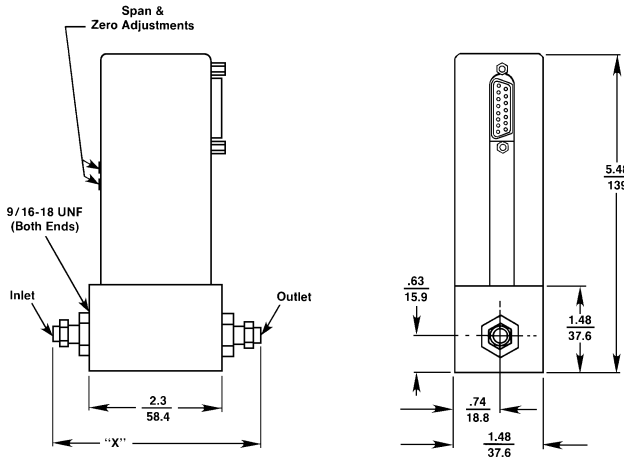


Bottom View

| Connection Type | "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 |

Inches/Millimeters

5860E/5860i, 15-Pin D Connector

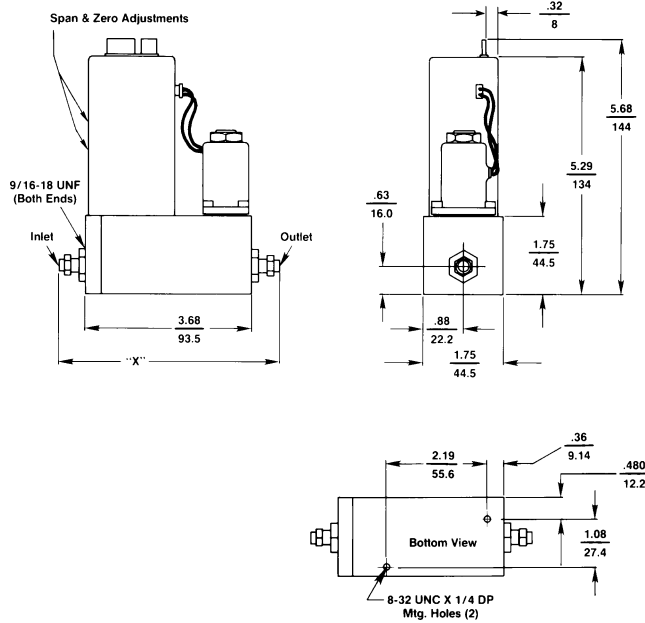


| Connection Type | "X" Dim |
|--------------------------|------------|
| 1/8" Compression Fitting | 4.14/105.2 |
| 1/4" Compression Fitting | 4.32/109.7 |
| 3/8" Compression Fitting | 4.44/112.8 |
| 1/4" Tube VCO® | 3.86/98.0 |
| 1/4" VCR® | 4.18/106.2 |

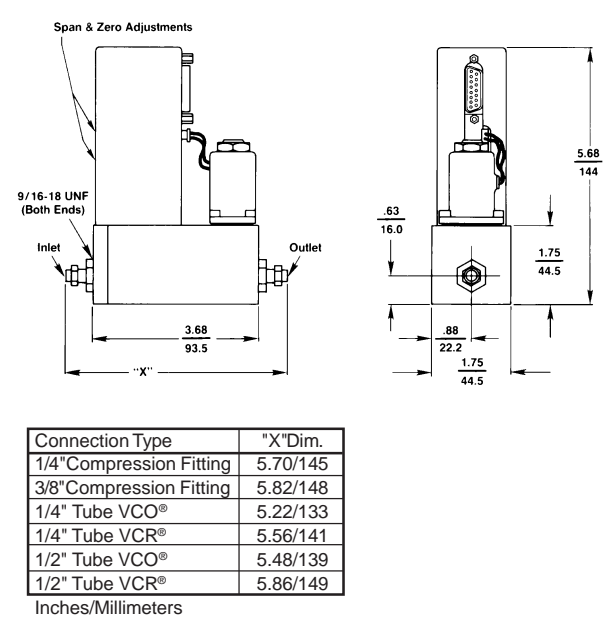
Inches/Millimeters

Product Dimensions - Models 5851 & 5861

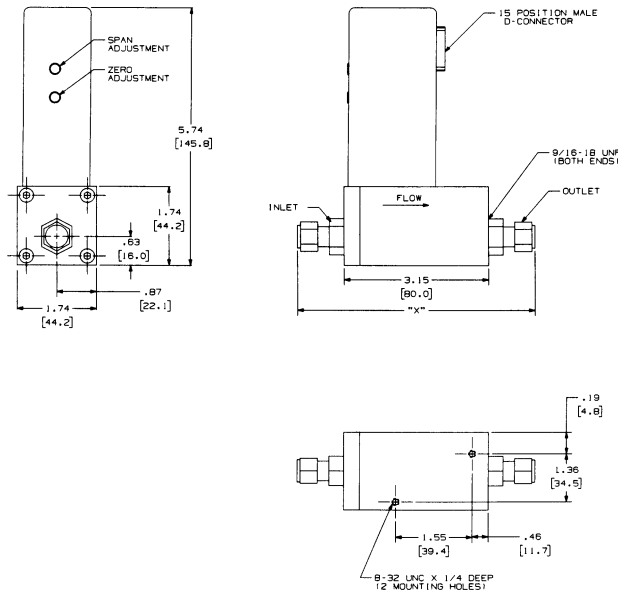
5851E, Card Edge Connector



5851E/5851i, 15-Pin D Connector



5861E/5861i, 15-Pin D Connector

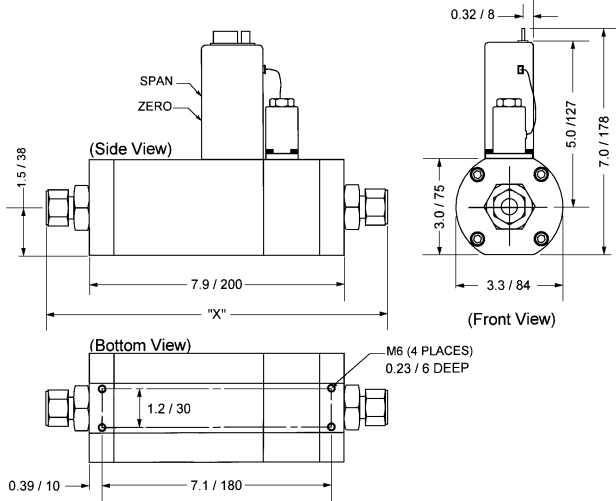


| Connection Type | "X" Dim |
|--------------------------|----------|
| 1/4" Compression Fitting | 5.17/131 |
| 1/4" Tube VCO® | 4.71/120 |
| 1/4" Tube VCR® | 5.03/128 |
| 3/8" Compression Fitting | 5.29/134 |
| 3/8" or 1/2" Tube VCO® | 5.15/131 |
| 3/8" or 1/2" Tube VCR® | 5.33/135 |

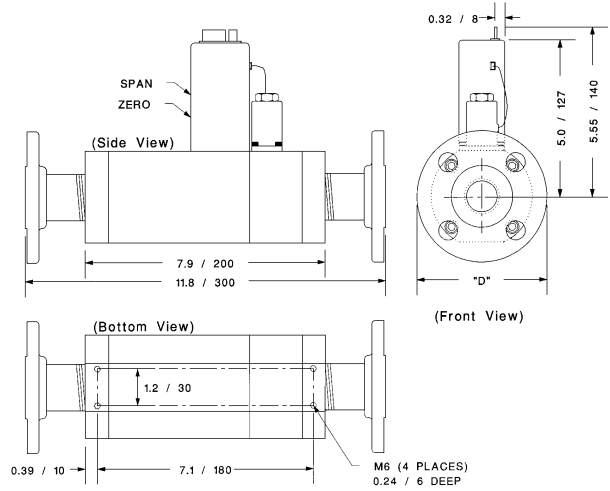
Inches/Millimeters

Product Dimensions - Model 5853

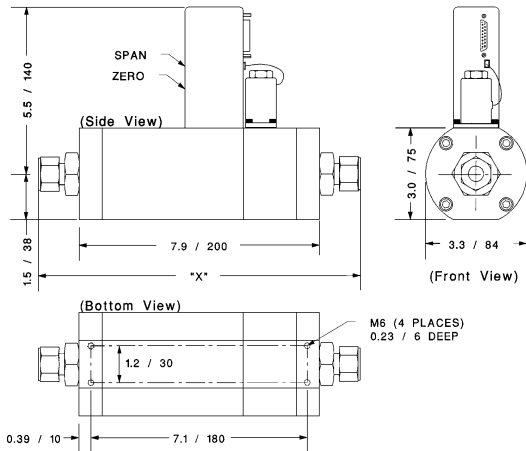
5853E, Card Edge Connector With Fittings



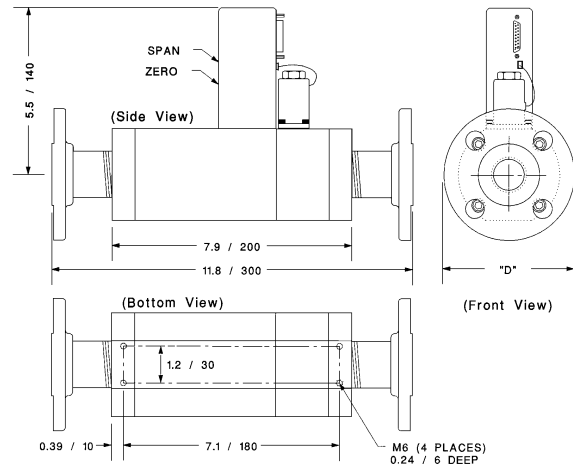
5853E, Card Edge Connector With Flanges



5853E/5853i, 15-Pin D Connector With Fittings



5853E/5853i, 15-Pin D Connector With Flanges



| Connection Type | "X" Dimension | |
|----------------------------|---------------|-----|
| | inch | mm |
| Female Pipe Thread | 7.9 | 200 |
| 1/2" Tube Compression* | 10.6 | 268 |
| 3/4" Tube Compression* | 10.6 | 268 |
| 1" Tube Compression* | 10.9 | 277 |
| 1/2" VCO** (100 slpm max.) | 9.9 | 251 |
| 3/4" VCO* | 10.2 | 258 |
| 1/2" VCR** (100 slpm max.) | 10.1 | 257 |
| 1/2" VCR* | 10.2 | 259 |

* 1-1/16 - 12 UNF Connection To Body

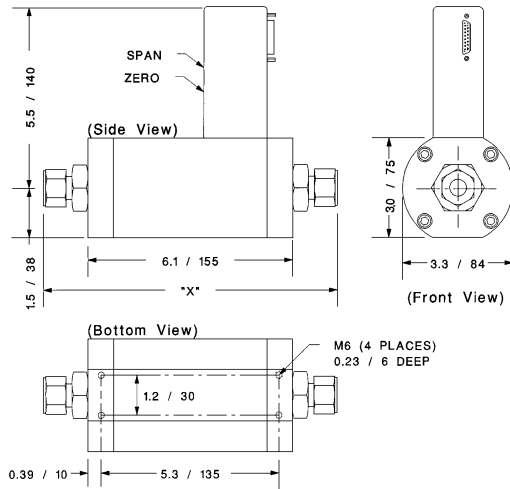
** 9/16 - 18 UNF Connection To Body

| Flange Type | Flange OD, "D" | |
|------------------|----------------|-----|
| | inch | mm |
| ANSI 1/2" 150 lb | 3-1/2 | 89 |
| ANSI 1/2" 300 lb | 3-3/4 | 95 |
| ANSI 1.0" 150 lb | 4-1/4 | 108 |
| ANSI 1.0" 300lb | 4-7/8 | 124 |
| ANSI 1.5" 150 lb | 5 | 127 |
| ANSI 1.5" 300 lb | 6-1/8 | 156 |
| ANSI 2.0" 150 lb | 6 | 152 |
| ANSI 2.0" 300 lb | 6-1/2 | 165 |
| DIN DN15 PN40 | 3.74 | 95 |
| DIN DN25 PN40 | 4.53 | 115 |
| DIN DN40 PN40 | 5.90 | 150 |
| DIN DN50 PN40 | 6.50 | 165 |

Inches/Millimeters

Product Dimensions - Model 5863

5863E/5863i, 15-Pin D Connector With Fittings

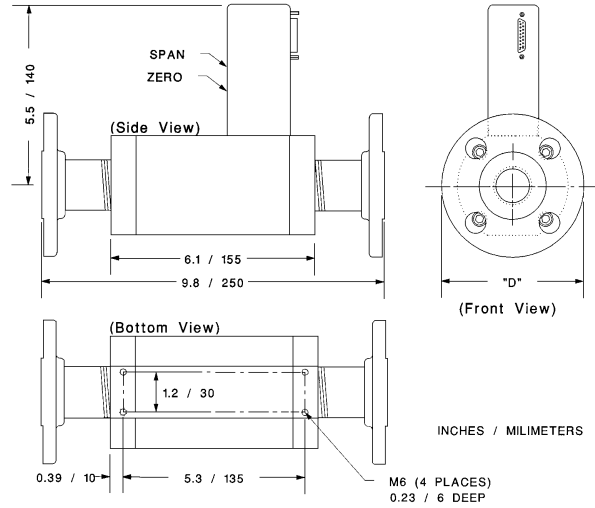


| Connection Type | "X" Dimension | |
|-----------------------------|---------------|-----|
| | inch | mm |
| Female Pipe Thread | 6.1 | 155 |
| 1/2" Tube Compression* | 8.8 | 223 |
| 3/4" Tube Compression* | 8.8 | 223 |
| 1" Tube Compression* | 9.1 | 232 |
| 1/2" VCO ** (100 slpm max.) | 8.1 | 206 |
| 3/4" VCO * | 8.4 | 213 |
| 1/2" VCR ** (100 slpm max.) | 8.3 | 211 |
| 1/2" VCR* | 8.4 | 214 |

* 1-1/16 - 12 UNF Connection To Body

** 9/16 - 18 UNF Connection To Body

5863E/5863i, 15-Pin D Connector With Flanges



| Flange Type | Flange OD, "D" | |
|------------------|----------------|-----|
| | inch | mm |
| ANSI 1/2" 150 lb | 3-1/2 | 89 |
| ANSI 1/2" 300 lb | 3-3/4 | 95 |
| ANSI 1.0" 150 lb | 4-1/4 | 108 |
| ANSI 1.0" 300lb | 4-7/8 | 124 |
| ANSI 1.5" 150 lb | 5 | 127 |
| ANSI 1.5" 300 lb | 6-1/8 | 156 |
| ANSI 2.0" 150 lb | 6 | 152 |
| ANSI 2.0" 300 lb | 6-1/2 | 165 |
| DIN DN15 PN40 | 3.74 | 95 |
| DIN DN25 PN40 | 4.53 | 115 |
| DIN DN40 PN40 | 5.90 | 150 |
| DIN DN50 PN40 | 6.50 | 165 |

Inches/Millimeters

Brooks Service and Support

Brooks is committed to assuring all of our customers receive the ideal flow solution for their application, along with outstanding service and support to back it up. We operate first class repair facilities located around the world to provide rapid response and support. Each location utilizes primary standard calibration equipment to ensure accuracy and reliability for repairs and recalibration and is certified by our local Weights and Measures Authorities and traceable to the relevant International Standards.

Visit www.BrooksInstrument.com to locate the service location nearest to you.

START-UP SERVICE AND IN-SITU CALIBRATION

Brooks Instrument can provide start-up service prior to operation when required. For some process applications, where ISO-9001 Quality Certification is important, it is mandatory to verify and/or (re)calibrate the products periodically. In many cases this service can be provided under in-situ conditions, and the results will be traceable to the relevant international quality standards.

CUSTOMER SEMINARS AND TRAINING

Brooks Instrument can provide customer seminars and dedicated training to engineers, end users, and maintenance persons.

Please contact your nearest sales representative for more details.

Due to Brooks Instrument's commitment to continuous improvement of our products, all specifications are subject to change without notice.

TRADEMARKS

Brooks Brooks Instrument, LLC
All other trademarks are the property of their respective owners.



www.gometrics.net
info@gometrics.net



Pol. Ind. Riera de Caldes
c/ Basters, 17
08184 Palau-Solità i Plegamans
Barcelona
T. +34 93 864 68 43

Global Headquarters

Brooks Instrument
407 West Vine Street
Hatfield, PA
19440-0903 USA

Toll-Free (USA): 888-554-FLOW
T: 215-362-3500
F: 215-362-3745

BrooksAM@BrooksInstrument.com

A list of all Brooks Instrument locations and contact details can be found at www.BrooksInstrument.com

©Copyright 2017 Brooks Instrument, LLC All rights reserved. Printed in U.S.A.

BROOKS[®]
INSTRUMENT