

5850EMH Series

Thermal Mass Flow



Model 5850EMH

High Temperature, Metal Sealed, Thermal Mass Flow Controllers

Overview

Originally developed and manufactured in Japan as a solution to support the growing fiber optic cable industry in Asia, the 585xEMH Series of high temperature mass flow controllers continue to be manufactured using the same supply chain and manufacturing process by Brooks Instrument in our Hatfield, Pennsylvania, USA facility.

The 585xEMH Series remains the mass flow controller of choice for critical silicon precursor and dopant vapor delivery in optical fiber preform manufacturing.

Product Description

The Brooks Model 585xEMH High Temperature Metal Sealed Mass Flow Controller offers state of the art performance in high temperature gas measurement and control. It combines the outstanding leak integrity of metal seals with a variety of options which allow maximum application flexibility. The heart of the 585xEMH is the highly stable sensor which provides an electrical output signal linear with flow rate. This signal is used for indicating, recording and/or control purposes without the need for an auto-zero circuit.

Model Descriptions

5850EMH Low Flow High Temperature Metal Sealed Mass Flow Controller with Analog
5851EMH High Flow High Temperature Metal Sealed Mass Flow Controller with Analog

Product Features

- High leak integrity (less than 10^{-11} Pa.m³/s (10^{-10} atm.cc/s) He)
- Normally closed valve (normally open valve optional)
- Particulate-free
- High purity 316L Stainless Steel
- High flow capability (100 slpm N₂)
- Helium leak check ports
- Wide flow range (0.003 – 100 slpm)
- Electrically-activated valve override
- Low command flow cutoff
- TTL compatible "valve off" function

Product Specifications

Performance	5850EMH	5851EMH
Flow Range	0.003 - 30 lpm (N2 equivalent)	10 - 100 lpm (N2 equivalent)
Flow Accuracy	±1% full scale	
Control Range	5-100%	
Repeatability	±0.25% of rate	
Linearity	Included in accuracy	
Response Time (Settling time within ± 2% for 0 - 100% command step)	< 3 sec	

Ratings

Operating Temperature Range	85 - 105°C (41 - 221°F)	
Maximum Pressure Rating	1 MPaG (145 psig)	
Pressure Differential (Controller)*	50 - 350 kPa (7 - 50 psid)	50 - 350 kPa (7 - 50 psid)
* Specify the operating differential pressure at time of request.		
Leak Integrity	1x10 ⁻¹¹ Pa.m ³ /s (1 x 10 ⁻¹⁰ atm.cc/s) Helium	

Mechanical

Valve Type	Normally Closed, Normally Open	
Primary Wetted Materials	316L and high alloy ferritic stainless steel	
Valve Seat Material	316L stainless steel	
Process Connection	1/4" MVCR	1/2" MVCR or 1/4" MVCR

Communication Protocol

Electrical Connection	1 x 15-pin Male D-sub
Input Signal	0 - 5 Vdc linearly proportional to required flow
Output Signal	0 - 5 Vdc linearly proportional to flow rate
Power Requirement	±15 Vdc @ 350 mA (max)

Model Code

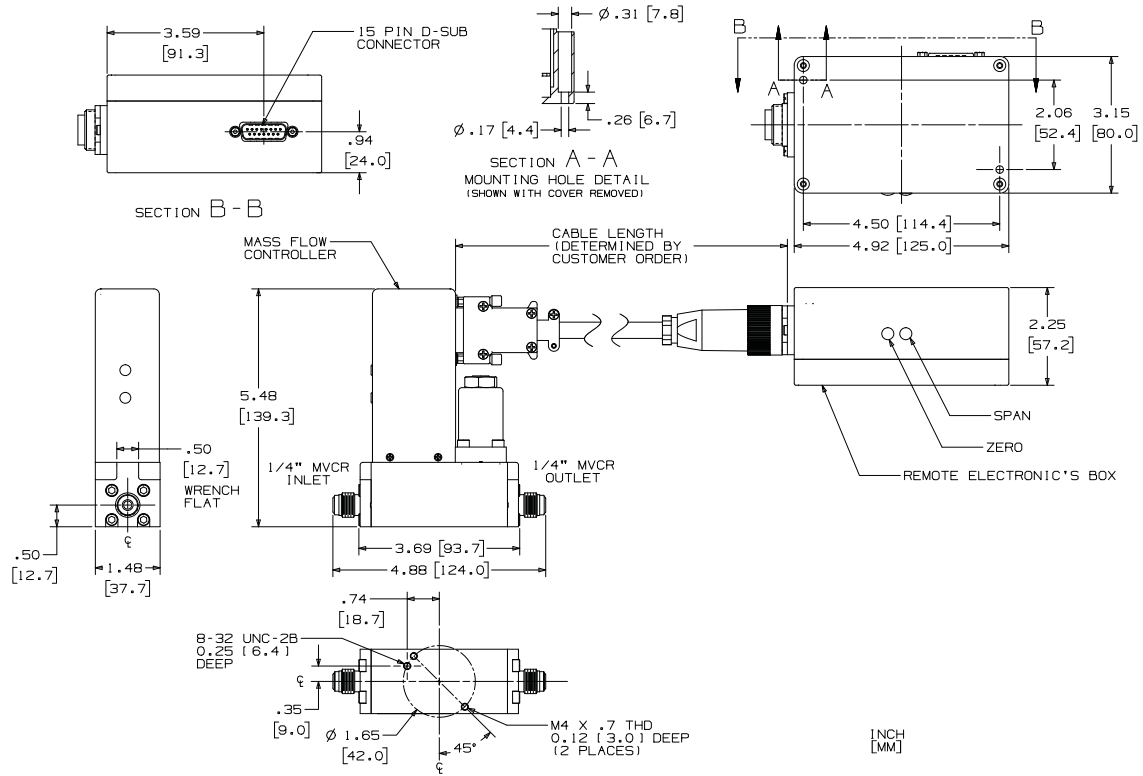
Code Description	Code Option	Option Description
I. Base Model Number	585	SLA Series
II. Flow Range	0	Low Flow (0.003 - 30 lpm N2 equivalent)
	1	High Flow (10 - 100 lpm N2 equivalent)
III. Model Series	EMH	E-Series, Metal Seal, High Temperature
IV. Valve	1	Normally Closed Control Valve
	5	Normally Open Control Valve
V. Temperature Range	A	85°C Calibration Temperature
	B	90°C Calibration Temperature
	C	95°C Calibration Temperature
	D	100°C Calibration Temperature
	E	105°C Calibration Temperature
VI. Cable Length	2	2 meters cable
	3	3 meters cable
	5	5 meters cable (only available on 85°C calibration device)
VII. Orientation	1	Horizontal, Base Down
	2	Vertical, Inlet Up
	3	Horizontal, Either Side Down
	4	Vertical, Inlet Down
	5	Horizontal, Upside Down
VIII. Orifice	C	Consult Factory
IX. Restrictor	G	Consult Factory

Sample Standard Model Code

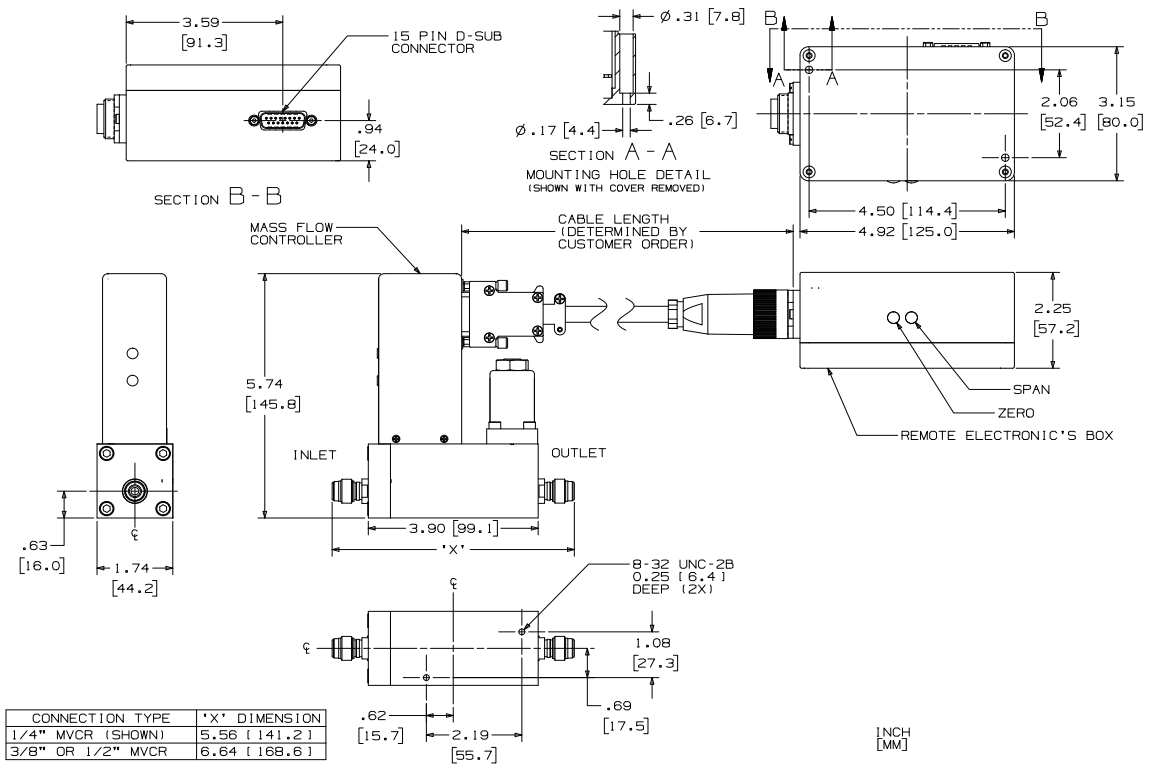
I	II	III	IV	V	VI	VII	VIII	IX
585	0	EMH	5	A	3	2	C	G

Product Dimensions

5850EMH



5851EMH



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.



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

Brooks® Model 585xEMH High Temperature Mass Flow Controllers



*Model 5850EMH High Temperature
Thermal Mass Flow Controller*



*Model 5851EMH High Temperature
Thermal Mass Flow Controller*

Essential Instructions Read before proceeding!

Brooks Instrument designs, manufactures and tests its products to meet many national and international standards. These products must be properly installed, operated and maintained to ensure they continue to operate within their normal specifications. The following instructions must be adhered to and integrated into your safety program when installing, operating and maintaining Brooks Instrument products.

- To ensure proper performance, use qualified personnel to install, operate, update, program and maintain the product.
- Read all instructions prior to installing, operating and servicing the product. If this instruction manual is not the correct manual, please see back cover for local sales office contact information. Save this instruction manual for future reference.

▲ WARNING: Do not operate this instrument in excess of the specifications listed in the Instruction and Operation Manual. Failure to heed this warning can result in serious personal injury and / or damage to the equipment.

- If you do not understand any of the instructions, contact your Brooks Instrument representative for clarification.
- Follow all warnings, cautions and instructions marked on and supplied with the product.

▲ WARNING: Prior to installation ensure this instrument has the required approval ratings to meet local and national codes. Failure to heed this warning can result in serious personal injury and / or damage to the equipment.

- Install your equipment as specified in the installation instructions of the appropriate instruction manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- Operation: (1) Slowly initiate flow into the system. Open process valves slowly to avoid flow surges. (2) Check for leaks around the flow meter inlet and outlet connections. If no leaks are present, bring the system up to the operating pressure.
- Please make sure that the process line pressure is removed prior to service. When replacement parts are required, ensure that qualified people use replacement parts specified by Brooks Instrument. Unauthorized parts and procedures can affect the product's performance and place the safe operation of your process at risk. Look-alike substitutions may result in fire, electrical hazards or improper operation.
- Ensure that all equipment doors are closed and protective covers are in place to prevent electrical shock and personal injury, except when maintenance is being performed by qualified persons.

▲ WARNING: For liquid flow devices, if the inlet and outlet valves adjacent to the devices are to be closed for any reason, the devices must be completely drained. Failure to do so may result in thermal expansion of the liquid that can rupture the device and may cause personal injury.

European Pressure Equipment Directive (PED)

All pressure equipment with an internal pressure greater than 0.5 bar (g) and a size larger than 25mm or 1" (inch) falls under the Pressure Equipment Directive (PED).

- The Specifications Section of this manual contains instructions related to the PED directive.
- Products described in this manual are in compliance with EN directive 97/23/EC.
- All Brooks Instrument Flowmeters fall under fluid group 1.
- Products larger than 25mm or 1" (inch) are in compliance with PED category I, II or III.
- Products of 25mm or 1" (inch) or smaller are Sound Engineering Practice (SEP).

European Electromagnetic Compatibility (EMC)

The Brooks Instrument (electric/electronic) equipment bearing the CE mark has been successfully tested to the regulations of the Electro Magnetic Compatibility (EMC directive 2004/108/EC).

Special attention however is required when selecting the signal cable to be used with CE marked equipment.

Quality of the signal cable, cable glands and connectors:

Brooks Instrument supplies high quality cable(s) which meets the specifications for CE certification.

If you provide your own signal cable you should use a cable which is overall completely screened with a 100% shield.

"D" or "Circular" type connectors used should be shielded with a metal shield. If applicable, metal cable glands must be used providing cable screen clamping.

The cable screen should be connected to the metal shell or gland and shielded at both ends over 360 Degrees.

The shield should be terminated to an earth ground.

Card Edge Connectors are standard non-metallic. The cables used must be screened with 100% shield to comply with CE certification.

The shield should be terminated to an earth ground.

For pin configuration : Please refer to the enclosed Instruction Manual.

ESD (Electrostatic Discharge)

▲ CAUTION: This instrument contains electronic components that are susceptible to damage by static electricity. Proper handling procedures must be observed during the removal, installation or other handling of internal circuit boards or devices.

Handling Procedure:

1. Power to unit must be removed.
2. Personnel must be grounded, via a wrist strap or other safe, suitable means before any printed circuit card or other internal device is installed, removed or adjusted.
3. Printed circuit cards must be transported in a conductive container. Boards must not be removed from protective enclosure until immediately before installation. Removed boards must immediately be placed in protective container for transport, storage or return to factory.

Comments

This instrument is not unique in its content of ESD (electrostatic discharge) sensitive components. Most modern electronic designs contain components that utilize metal oxide technology (NMOS, SMOS, etc.). Experience has proven that even small amounts of static electricity can damage or destroy these devices. Damaged components, even though they appear to function properly, exhibit early failure.

Installation and Operation Manual

X-TMF-585xEMH-MFC-eng

Part Number: 541B212AAG

February, 2016

Brooks® Model 585xEMH

Dear Customer,

We appreciate this opportunity to service your flow measurement and control requirements with a Brooks Instrument device. Every day, flow customers all over the world turn to Brooks Instrument for solutions to their gas and liquid low-flow applications. Brooks provides an array of flow measurement and control products for various industries from biopharmaceuticals, oil and gas, fuel cell research and chemicals, to medical devices, analytical instrumentation, semiconductor manufacturing, and more.

The Brooks product you have just received is of the highest quality available, offering superior performance, reliability and value to the user. It is designed with the ever changing process conditions, accuracy requirements and hostile process environments in mind to provide you with a lifetime of dependable service.

We recommend that you read this manual in its entirety. Should you require any additional information concerning Brooks products and services, please contact your local Brooks Sales and Service Office listed on the back cover of this manual or visit www.BrooksInstrument.com

Yours sincerely,

Brooks Instrument

*THIS PAGE WAS
INTENTIONALLY
LEFT BLANK*

<u>Paragraph Number</u>		<u>Page Number</u>
Section 1 Introduction		
1-1	How to Use This Manual	1-1
1-2	Description	1-1
1-3	Specifications	1-1
Section 2 Installation		
2-1	General	2-1
2-2	Receipt of Equipment	2-1
2-3	Recommended Storage Practice	2-1
2-4	Return Shipment	2-2
2-5	Transit Precautions	2-2
2-6	Removal from Storage	2-2
2-7	Installation	2-2
2-8	Electrical Interface	2-5
2-9	Operation Procedure	2-6
Section 3 Operation		
3-1	Overview	3-1
3-2	Connection and Controls	3-1
3-3	Theory of Operation	3-3
3-4	Features	3-5
3-5	Adjustment Potentiometers	3-6
3-6	Zero Adjustment	3-7
3-7	Calibration Procedure	3-7
3-8	Response Adjustment	3-10
Section 4 Maintenance & Troubleshooting		
4-1	Overview	4-1
4-2	Troubleshooting	4-2
4-3	Gas Conversion Factors	4-5
4-4	Orifice Sizing	4-13
4-5	Restrictor Sizing	4-17
Section A Essential Instructions		A-1
Warranty, Local Sales/Service Contact Information		Back Cover

Brooks® Model 585xEMH

Figures

<u>Figure Number</u>		<u>Page Number</u>
1-1	Dimensions - Model 585xEMH with D-Connector and VCR Fittings	1-3
2-1	MFC Mounting Hole Positions for Models 5850EMH & 5851EMH	2-3
2-2	Connecting and Tightening Process Connections	2-4
2-3	Remote Electronics Box Mounting Diagram	2-5
2-4	Common Electrical Hookups	2-6
3-1	Model 585xEMH Controller Components	3-1
3-2	Externally Accessible Adjustments at Remote Electronics Box	3-2
3-3	15-Pin D-Sub Connector at Remote Electronics	3-2
3-4	15-Pin D-Connector Shielded Cable Hookup Diagram	3-2
3-5	Flow Sensor Operational Diagram	3-3
3-6	Flow Control System Block Diagram	3-4
3-7	Customer Connections and Settings	3-4
3-8	Bench Troubleshooting Circuit	3-8
3-9	Response Adjustment	3-11
4-1	Model 585xH Orifice Sizing Nomograph	4-14
4-2	Example Nomograph	4-17

Tables

<u>Table Number</u>		<u>Page Number</u>
1-1	585xEMH Specifications	1-2
4-1	Bench Troubleshooting	4-4
4-2	Sensor Troubleshooting	4-5
4-3	Conversion Factors	4-7

1-1 How to Use This Manual

This instruction manual is intended to provide the user with all the information necessary to install, operate and maintain the Brooks® Models 5850EMH and 5851EMH.

This manual is organized into the following sections:

Section 1.	Introduction
Section 2.	Installation
Section 3.	Operation
Section 4.	Maintenance
Appendix A	Essential Instructions
Back Cover	Warranty, Local Sales/Service Contact Information

1-2 Description



The Brooks Models 5850EMH and 5851EMH Mass Flow Controllers are used in gas flow handling systems that require high ambient/operating temperatures such as vapor flow control. Unlike standard mass flow controllers, the 585xEMH has two distinct modules connected by a signal cable. The controller module is mounted in the process line and the remote electronics module is mounted away from the high temperature environment. The Models 5850EMH and 5851EMH incorporate metal seals or welded joints, insuring leak integrity for high purity and high vacuum applications. Reducing the amount of internal threads makes the design less prone to system contamination. The control electronics and flow sensor designs have been well- proven in precision gas delivery systems. Standard features include:

- High leak integrity (less than 10^{-11} PA.m³/s (10-10 atm-cc/sec) He)
- High purity VAR 316L Stainless Steel
- All metal seals
- Particulate free
- Wide flow range (0.003 through 100 slpm)
- Helium leak check ports
- Class 100 Clean Room assembly and calibration
- Low command flow cutoff
- TTL compatible “valve off” function

1-3 Specifications

⚠ WARNING

Do not operate this instrument in excess of the specifications listed below. Failure to heed this warning can result in serious personal injury and/or damage to the equipment.

⚠ CAUTION

It is the user's responsibility to select and approve all materials of construction. Careful attention to metallurgy, engineered materials and elastomeric materials is critical to safe operation.

Brooks® Model 585xEMH

Table 1-1 585xEMH Specifications

Performance	5850EMH	5851EMH
Flow Range	0.003 - 30 lpm (N2 equivalent)	10 - 100 lpm (N2 equivalent)
Flow Accuracy	±1% full scale	
Control Range	5-100%	
Repeatability	±0.25% of rate	
Linearity	Included in accuracy	
Response Time (Settling time within ± 2%)	< 3 sec for 0 - 100% command step)	

Ratings

Operating Temperature Range	85 - 105°C (41 - 221°F)	
Maximum Pressure Rating	1 MPaG (145 psig)	
Pressure Differential (Controller)*	50 -350 kPa (7 - 50 psid)	50 - 350 kPa (7 - 50 psid)
* Specify the operating differential pressure at time of request.		
Leak Integrity	1x10 ⁻¹¹ Pa.m ³ /s (1 x 10 ⁻¹⁰ atm.cc/s) Helium	

Mechanical

Valve Type	Normally Closed, Normally Open	
Primary Wetted Materials	316L, 316L VAR and high alloy ferritic stainless steel	
Valve Seat Material	316L stainless steel	
Process Connection	1/4" MVCR	1/2" MVCR or 1/4" MVCR

Communication Protocol

Electrical Connection	1 x 15-pin Male D-sub	
Input Signal	0 - 5 Vdc linearly proportional to required flow	
Output Signal	0 - 5 Vdc linearly proportional to flow rate	
Power Requirement	±15 Vdc @ 350 mA (max)	

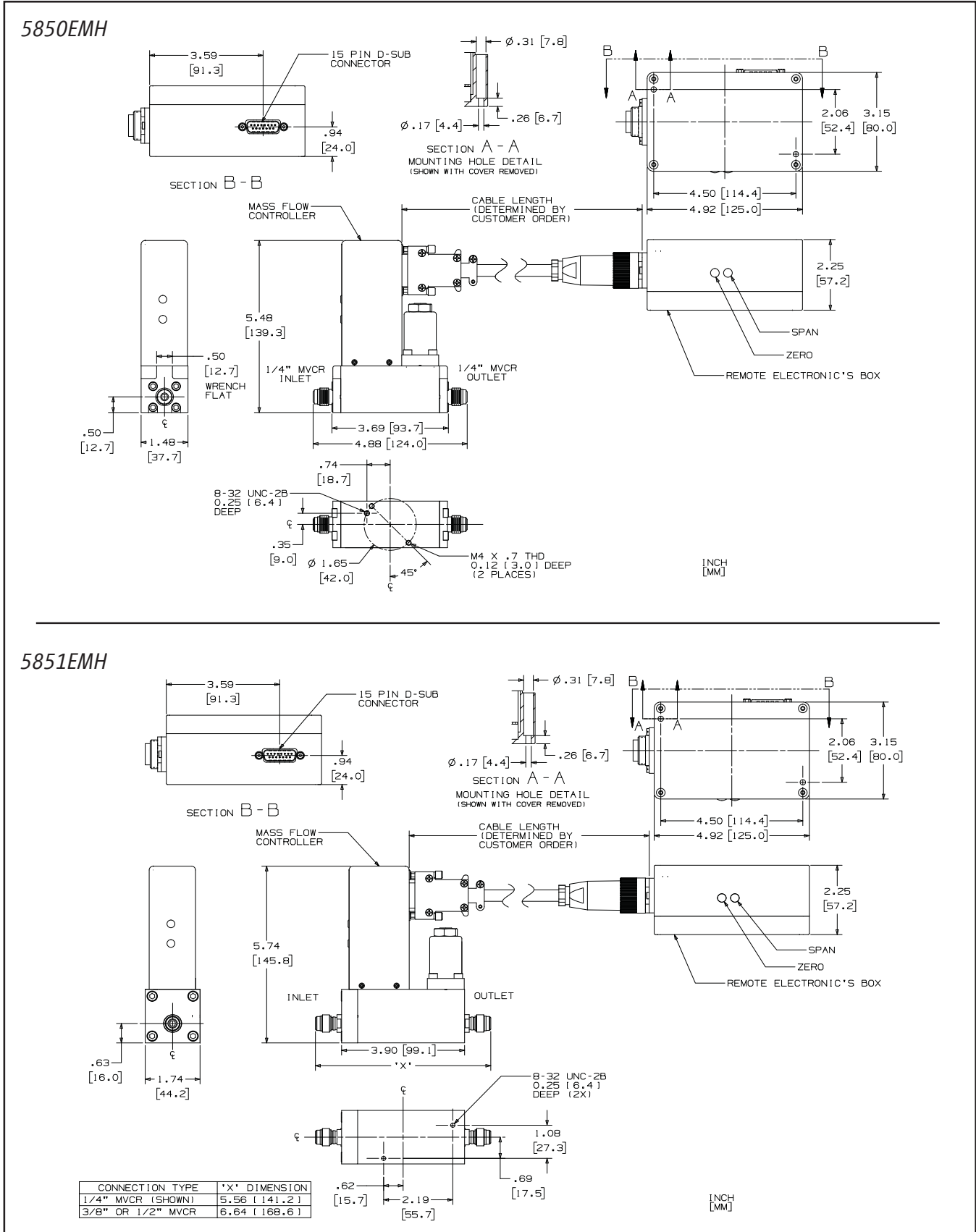


Figure 1-1 Dimensions - Model 585xEMH with D-Connector and VCR Fittings

*THIS PAGE WAS
INTENTIONALLY
LEFT BLANK*

2-1 General

This section contains the procedures for the receipt and installation of the instrument. See Section 1 for dimensional and connection requirements. Do not attempt to start the system until the instrument has been permanently installed. It is important that the start-up procedures be followed in the exact sequence presented.

2-2 Receipt of Equipment

When the instrument is received, the outside packing case should be checked for damage incurred during shipment. If the packing case is damaged, the local carrier should be notified at once regarding his liability. A report should be submitted to your nearest Product Service Department.

Brooks Instrument

407 W. Vine Street
P.O. Box 903
Hatfield, PA 19440 USA
Toll Free (888) 554-FLOW (3569)
Tel (215) 362-3700
Fax (215) 362-3745
E-mail: BrooksAm@BrooksInstrument.com www.BrooksInstrument.com

Brooks Instrument

Neonstraat 3
6718 WX Ede, Netherlands
P.O. Box 428
6710 BK Ede, Netherlands
Tel 31-318-549-300
Fax 31-318-549-309
E-mail: BrooksEu@BrooksInstrument.com

Brooks Instrument

ITW Japan Ltd.
1-4-4 Kitasuna Koto-Ku
Tokyo, 136-0073 Japan
Tel 011-81-3-5633-7100
Fax 011-81-3-5633-7101
Email: BrooksAs@BrooksInstrument.com

Remove the envelope containing the packing list. Carefully remove the instrument from the packing case. Make sure spare parts are not discarded with the packing materials. Inspect for damaged or missing parts.

2-3 Recommended Storage Practice

If intermediate or long-term storage of equipment is required, it is recommended that the equipment be stored in accordance with the following conditions:

- a. Within the original shipping container.
- b. Stored in a sheltered area, preferably a warm, dry, heated warehouse.
- c. Ambient temperature 21°C (70°F) nominal, 32°C (90°F) maximum, 45°F (7°C) minimum.
- d. Relative humidity 45% nominal, 60% maximum, 25% minimum

Brooks® Model 585xEMH

2-4 Return Shipment

Prior to returning any device to the factory, visit the Brooks web site (www.BrooksInstrument.com) for a Return Materials Authorization Number (RMA#), or contact one of the locations provided on p. 2-1.

Prior to returning the device, it must be purged in accordance with the following:

! WARNING

Before returning the device purge thoroughly with a dry inert gas such as Nitrogen before disconnecting gas connections. Failure to correctly purge the instrument could result in fire, explosion or death. Corrosion or contamination may occur upon exposure to air.

All flow devices returned to Brooks require completion of Form RPR003-2, Brooks Instrument Decontamination Statement, along with a Material Safety Data Sheet (MSDS) for the fluid(s) used in the instrument. Failure to provide this information will delay processing by Brooks personnel. Copies of these forms can be downloaded from the Brooks website (www.BrooksInstrument.com) or are available from any of the Brooks Instrument locations provided on p. 2-1.

2-5 Transit Precautions

To safeguard the instrument against transportation damage, it is recommended to keep the instrument in its factory container until ready for installation.

2-6 Removal from Storage

Upon removal of the instrument from storage, a visual inspection should be conducted to verify its “as-received” condition. If the instrument has been subject to storage conditions in excess of those recommended (See Section 2-3), it should be subjected to a pneumatic pressure test in accordance with applicable vessel codes

2-7 Installation

Unlike most flow controllers, the Model 585xEMH requires that two separate components be mounted close enough together that the supplied cable is sufficient. The two modules and the signal cable are calibrated together at the factory as a matched set. Ensure that the two components are mounted close enough together that the supplied cable length is sufficient.

Controller

Prior to installation make certain all piping is clean and free of obstructions, for tubing installations. Install the piping in such a manner that permits easy access to the instrument if it needs to be removed for cleaning or test bench troubleshooting.

CAUTION

When installing the Mass Flow Controller or Meter, care should be taken that no foreign materials enter the inlet or outlet of the instrument. Do not remove the protective end caps until time of installation.

Recommended installation procedures:

- a. The Model 585xEMH should be located in a clean, dry atmosphere relatively free from shock and vibration.
- b. Leave sufficient room for access to the 15-pin Dsub connector located at the top portion of the cover pointing towards the control valve.
- c. Install in such a manner that permits easy removal if the instrument requires servicing.

CAUTION

When used with a reactive (sometimes toxic) gas, contamination or corrosion may occur as a result of plumbing leaks or improper purging. Plumbing should be checked carefully for leaks and the instrument purged with clean, dry N₂ before use.

- d. The Model 585xEM Mass Flow Controller can be installed in any position. However, mounting in orientations other than the original factory calibration (see calibration data sheet) can result in a full scale shift after re-zeroing.
- e. The controller must be positioned so that the gas flow is in the direction of the arrow stamped on the controller base. The controller is designed and calibrated to be mounted in the position indicated on the calibration sheet.
- f. Match the mounting holes on the bottom of the flow controller with those on the mounting surface. Using one #8-32 screw or two M4 screws, mount the flow controller. See Figure 2-1 for mounting hole positions.

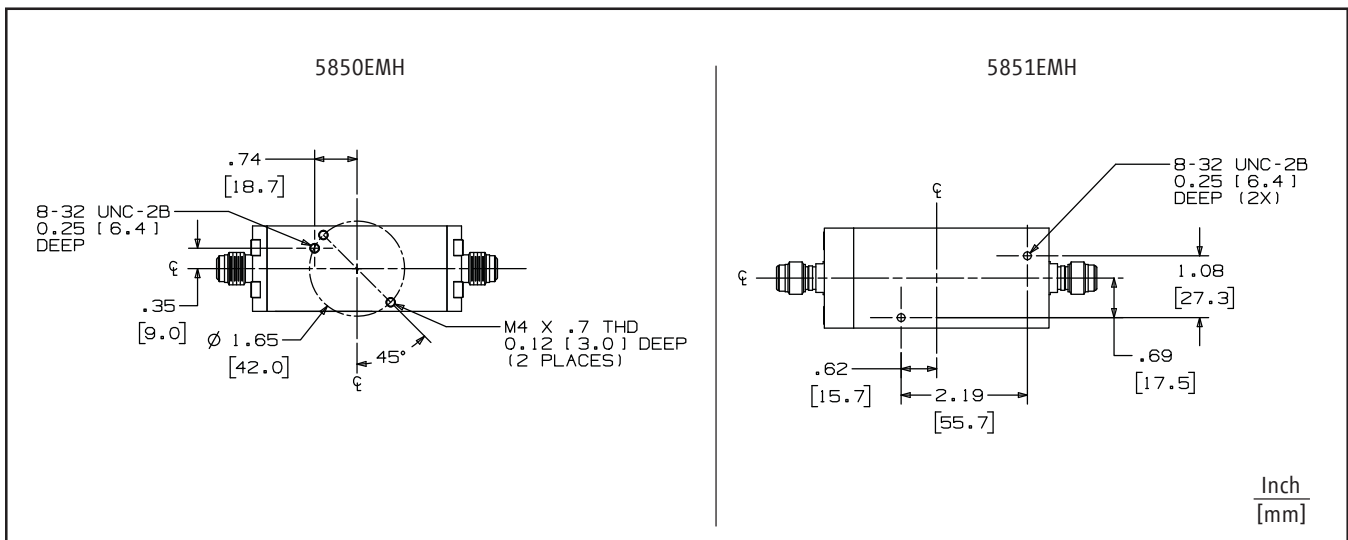


Figure 2-1 MFC Mounting Hole Positions for Models 5850EMH & 5851EMH

Brooks® Model 585xEMH

g. Once the controller is correctly mounted, connect the inlet and outlet VCR® fittings to the gas supply line.

1. Install new gaskets compatible with the gas to be used.
2. Tighten nut finger tight.
3. Tighten in accordance with the Swagelok® VCR® fitting installation specifications

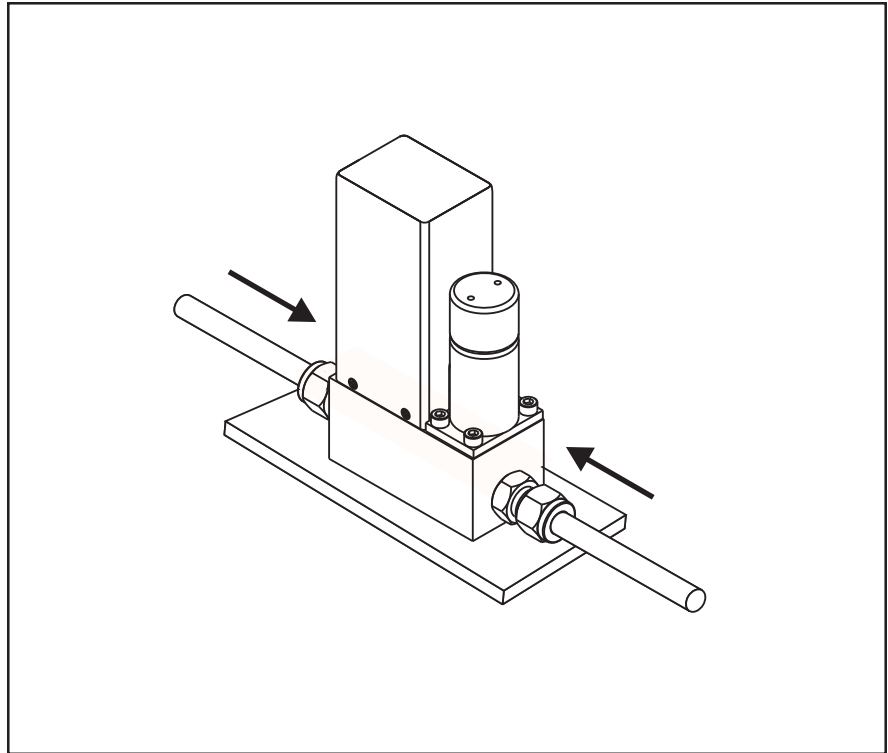


Figure 2-2 Connecting and Tightening Process Connections

N.B. The control valve in the Model 585xEMH provides precision control and is not designed for positive shut-off. If positive shut-off is required, it is recommended that a separate shut-off valve be installed in-line.

CAUTION

Since the Model 585xEMH control valve may not provide positive shut-off, a separate shut-off valve may be installed downstream for that purpose. It should be noted that a small amount of gas may be trapped between the downstream side of the mass flow controller and the shut-off valve which will result in a surge upon accuation of the shut-off valve. This surge can be reduced in magnitude either by locating the controller and the shut-off valve close together or by moving the shut-off valve upstream of the controller.

Remote Electronics Box

The remote electronics box must be mounted outside of the high temperature area (ambient temperature <math><50^{\circ}\text{C}</math>) using the two mounting holes located in the base of the remote electronics box. To gain access to the mounting holes, remove the four screws on the cover of the remote electronics box. See Figure 2-3.

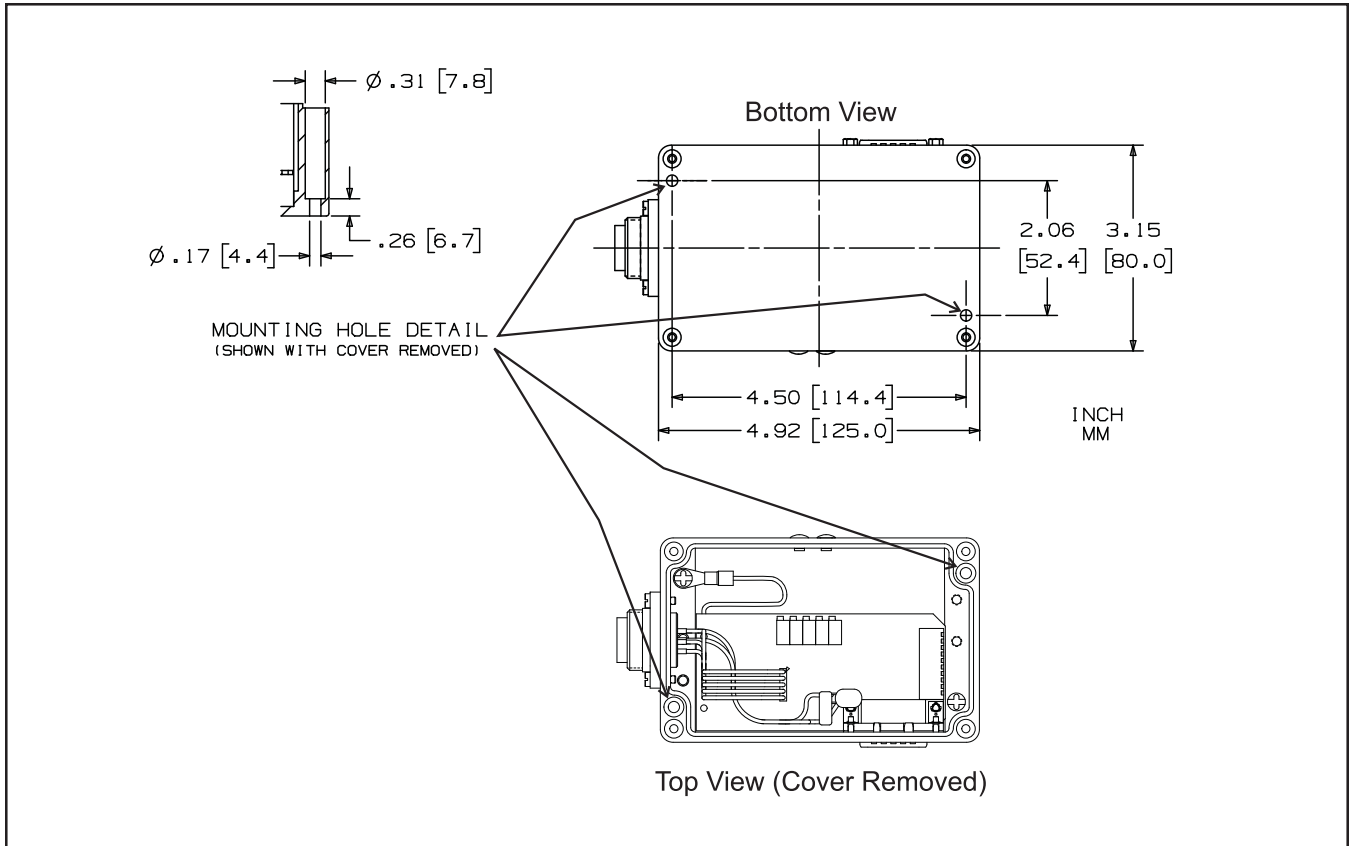


Figure 2-3 Remote Electronics Box Mounting Diagram

The remote electronics box can be mounted in any position that is convenient, within reach of the high temperature cable. The temperature limit of the electronics is 0-50°C (32°F-122°F).

Connect the Remote Electronics Box with the Controller utilizing the 15-pin D sub connector on the end of the cable which is wired to the Remote Electronics Box.

2-8 Electrical Interface

To insure proper operation, the Model 585xEMH must be connected per Figure 3-4. As a minimum, the following connections must be made:

Voltage I/O Version

- Chassis Ground
- Signal Common
- Signal Output
- +15 Vdc Supply
- -15 Vdc Supply
- Command Input
- Command Common
- Supply Common

Brooks® Model 585xEMH

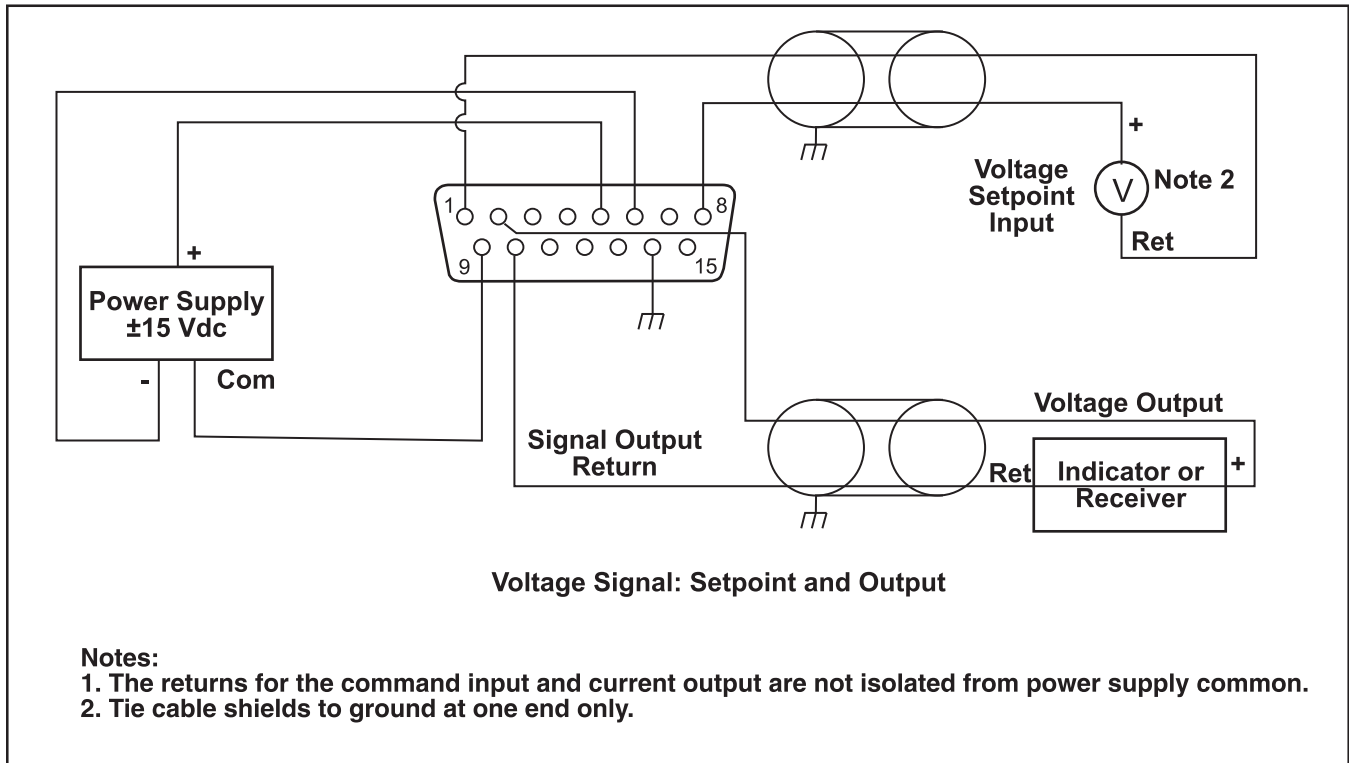


Figure 2-4 Common Electrical Hookups

2-9 Operation Procedure

- a. Mount the controller & remote electronics box in their final location and orientation.
- b. Apply any and all heater devices and thermal insulation around the controller and the process lines.
- c. Apply power to the device and to any external heaters for approximately 60 minutes to allow the instrument to warm up and stabilize its temperature.
- d. Prior to introducing process gas, insure that the MFC and gas lines have been thoroughly purged with clean, dry N₂.

3-1 Overview

After the flowmeter has been properly installed in the process line, it is ready for operation. When initiating flow, slowly open the valve to avoid a flow surge. Using a bypass can help in bringing the flow on smoothly. Avoid starting a pump to supply the flowmeter without the use of a valve upstream of the flowmeter.

⚠ WARNING

Before operating the flow controller, ensure all gas connections have been properly tightened and, where applicable, all electrical connections have been properly terminated.

This section contains the following information:

- Features and Jumper Configurations
- Theory of Operation
- Adjustment Potentiometers
- Calibration and Response Adjustments

3-2 Connections and Controls

Figure 3-1 shows the locations of the Model 585xEMH controller connections. Figure 3-2 identifies the externally accessible adjustment potentiometers located on the remote electronics box on the side opposite the 15-pin D sub connector. Figure 3-3 shows the 15 pin D-sub connector. Figure 3-4 identifies the pin out diagram for the 15 pin D-sub connector.

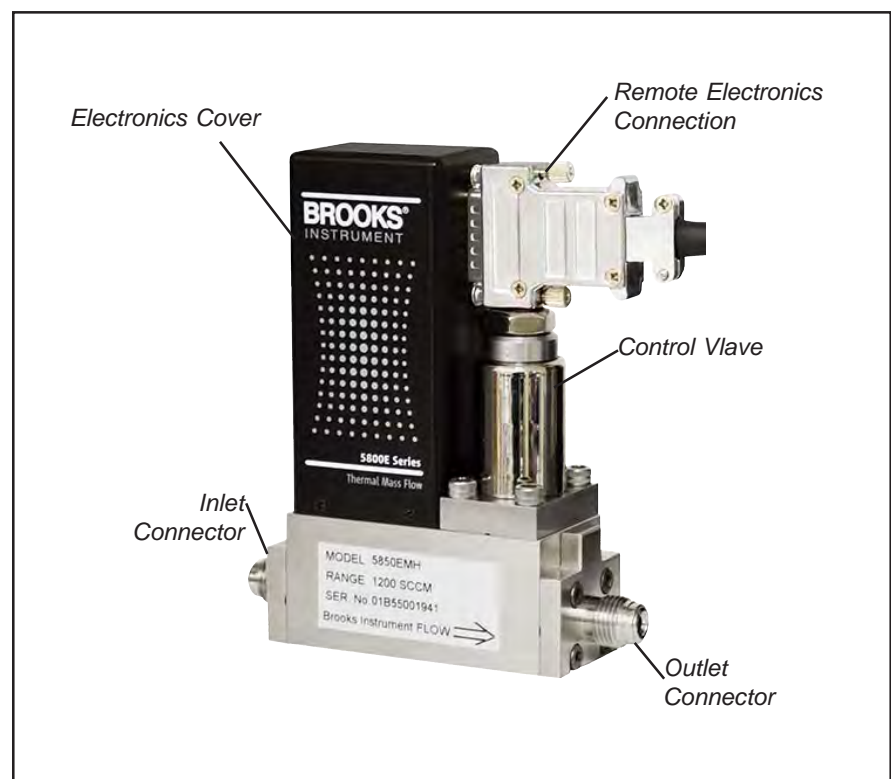


Figure 3-1 Model 585xEMH Controller Components

Brooks® Model 585xEMH

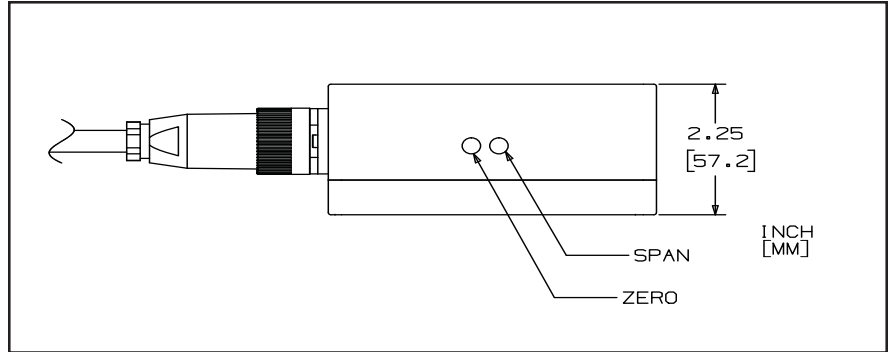


Figure 3-2 Externally Accessible Adjustments at Remote Electronics Box

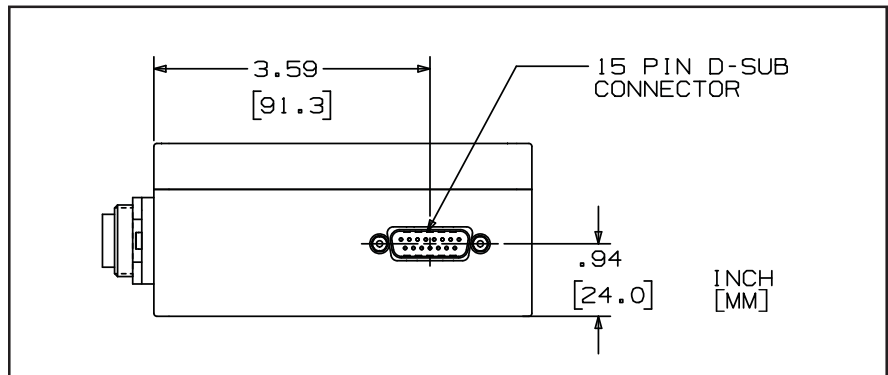


Figure 3-3 External 15-Pin D-Sub Connector at Remote Electronics

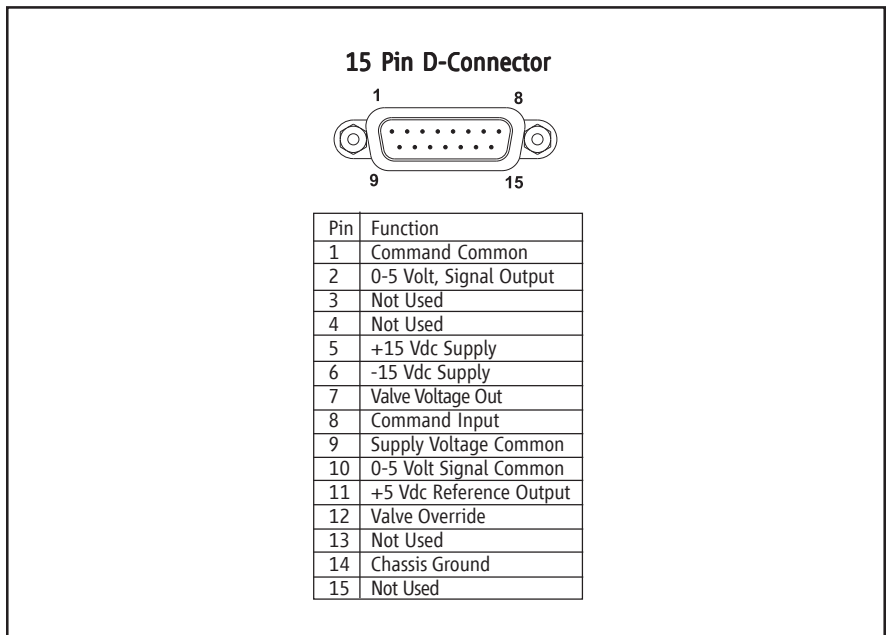


Figure 3-4 15-Pin D-Connector Shielded Cable Hookup Diagram

3-3 Theory of Operation

The thermal mass flow sensing technique used in the Model 585xEMH operates as follows:

A precision power supply provides a constant power heat input (P) at the heater which is located at the midpoint of the sensor tube. Refer to Figure 3-3. At zero, or no flow conditions, the heat reaching each temperature sensor is equal. The temperatures T1 and T2, therefore, are equal. When gas flows through the sensor tube, the upstream sensor is cooled and the downstream sensor is heated which produces a temperature difference. The temperature difference T2-T1 is directly proportional to the gas mass flow. The equation is:

- Where:
- $$DT = A * P * C_p * m$$
- DT = Temperature difference T2 - T1 (K)
 C_p = Specific heat of the gas at constant pressure (kJ/kg-K)
 P = Heater power (kJ/s)
 m = Mass flow (kg/s)
 A = Constant of proportionality (s²-K²/kJ²)

A bridge circuit interprets the temperature difference and a differential amplifier generates a linear 0-5 Vdc signal directly proportional to the gas mass flow rate.

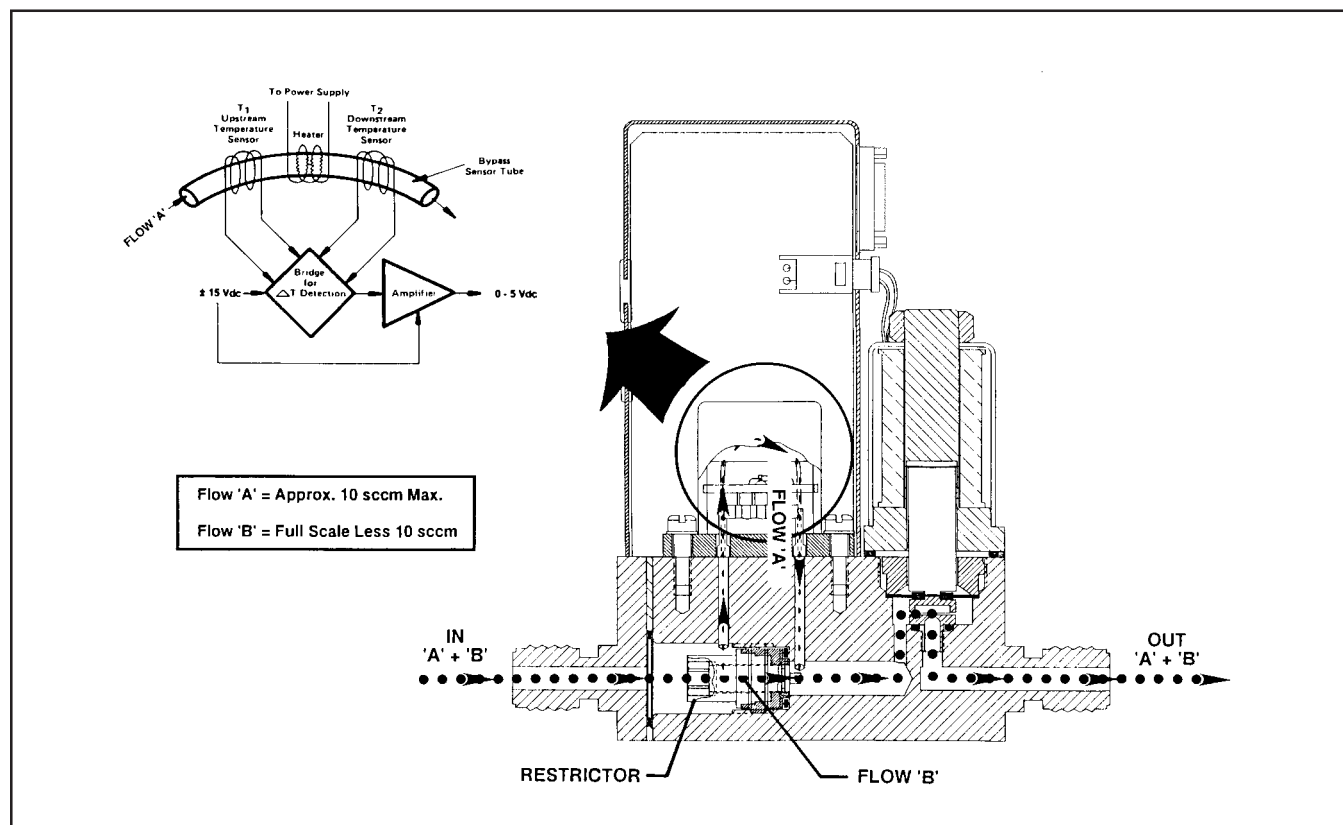


Figure 3-5 Flow Sensor Operational Diagram

Brooks® Model 585xEMH

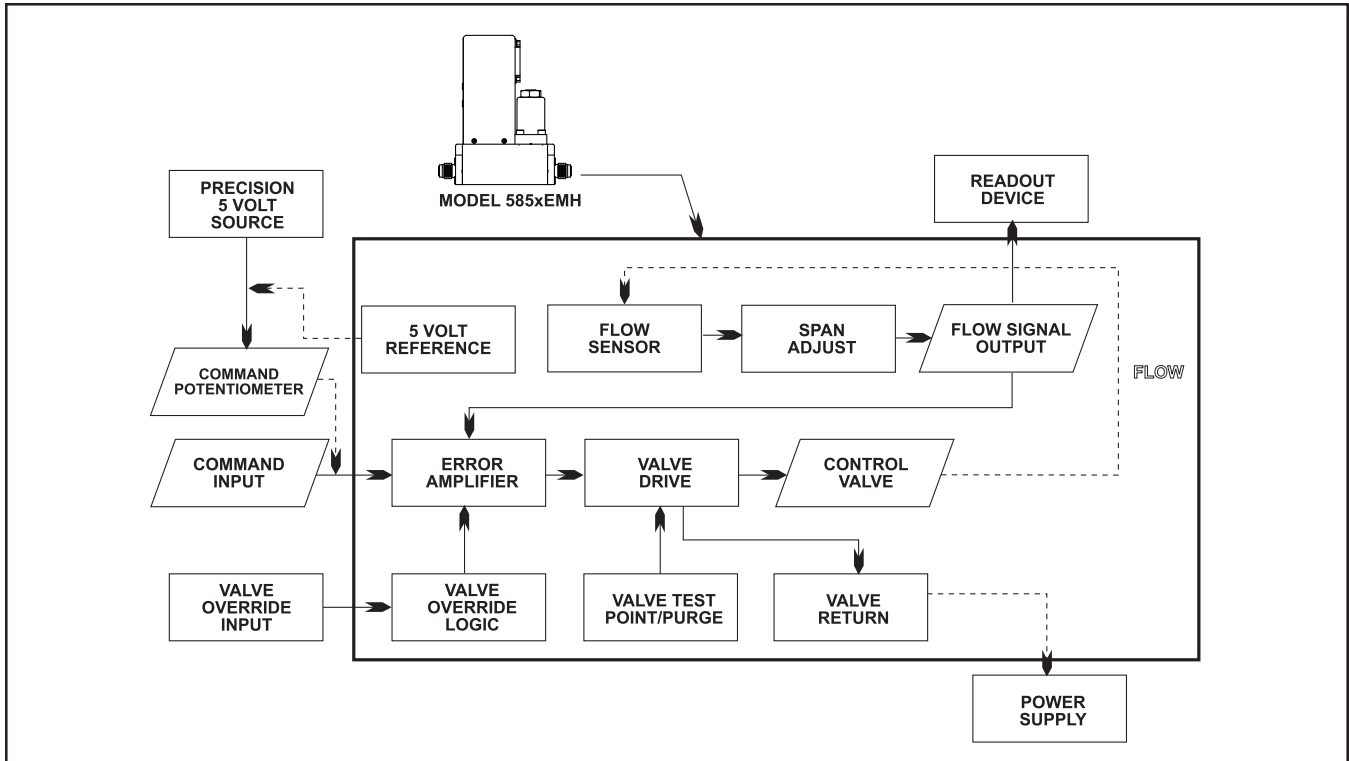
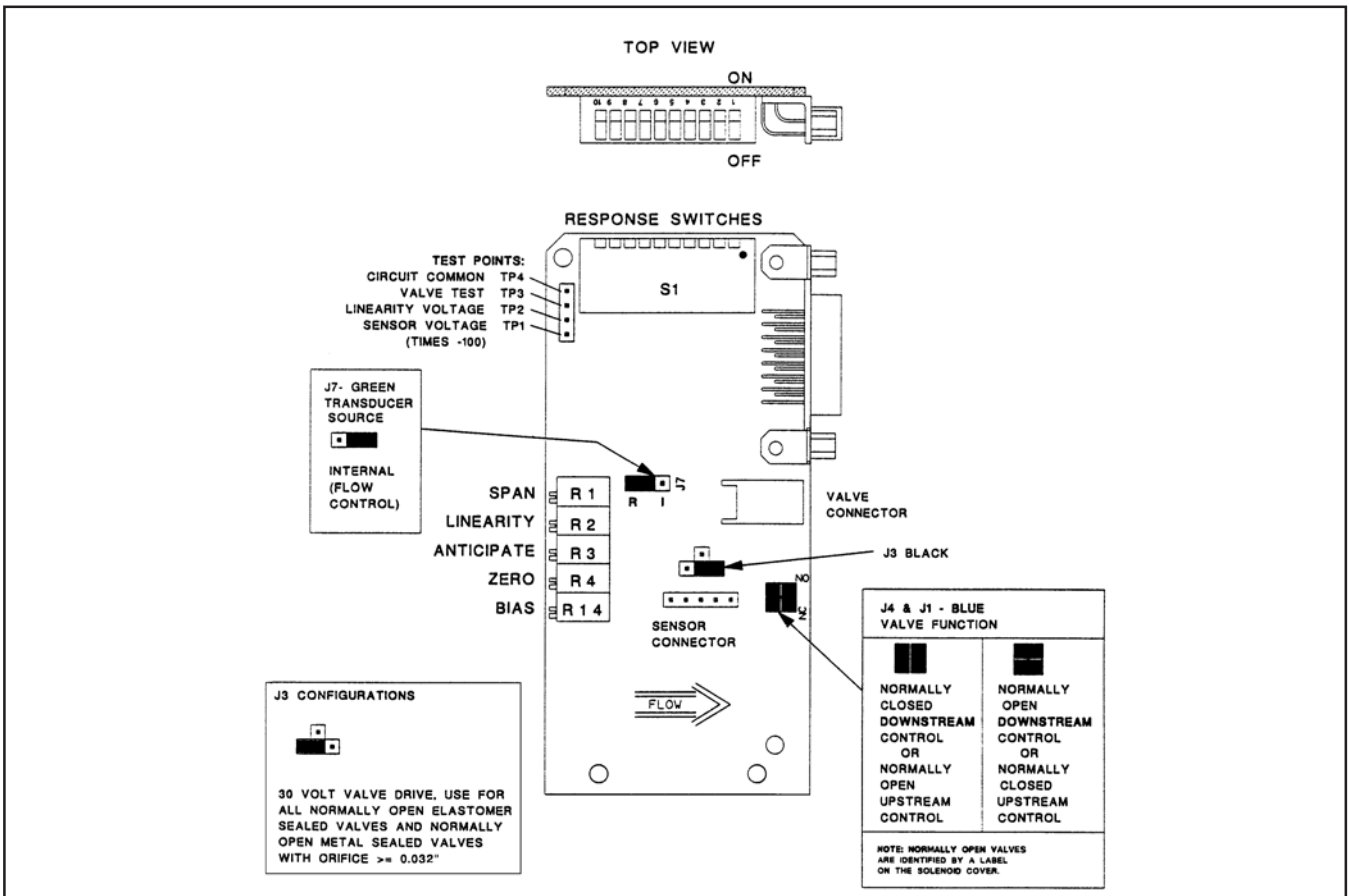


Figure 3-6 Flow Control System Block Diagram



3-4 Figure 3-7 Customer Connections and Settings

The flow restrictor shown in Figure 3-5 performs a ranging function similar to a shunt resistor in an electrical ammeter. The restrictor provides a pressure drop that is linear with flow rate. The sensor tube has the same linear pressure drop/flow relationship. The ratio of the restrictor flow to the sensor tube flow remains constant over the range of the meter. Different restrictors have different pressure drops and produce meters with different full scale flow rates. The span adjustment, in the electronics, affects the fine adjustment of the meter's full scale flow.

In addition to the mass flow sensor, the Model 585xEMH Mass Flow Controller has an integral control valve and control circuit as shown in Figure 3-6. The control circuit senses any difference between the flow sensor signal and the command input, adjusting the current in the modulating solenoid valve to increase or decrease the flow.

3-4 Features

Note: All Model 585xEMH mass flow controllers are configured at the factory as ordered and do not require adjustment. The following section is for reference should installation conditions change. Not all features are available on all devices.

Five-Volt Reference Output/Valve Drive Configuration

The 5 Volt reference output is required if a potentiometer is to be used to generate the Command Signal.

CAUTION

Do not ground the 5 Volt reference output when it is enabled. Improper operation of the printed circuit board will result.

Valve Override

Allows full opening and closing of the control valve, independent of the command setting. The valve override for normally closed and normally open mass flow controllers is as follows:

- To open the valve, apply +15 Vdc supply voltage to the valve override pin.
- To close the valve, apply -15 Vdc supply voltage to the valve override pin.
- The valve override function is activated by applying the appropriate voltage to Pin 12.
- For normal operation, Pin 12 may be left open (floating).

Precision 5V Reference

The Model 585xEMH is equipped with a precision 5 Vdc reference. The reference is used internally for precise zero adjustment and is also available as a buffered output for use in conjunction with a 1 – 10K ohm potentiometer to provide 0-5 Vdc set point. The 5 Vdc reference is available at Pin 11.

Low Command Flow Cutoff (Auto Shut-Off)

Prevents the valve from opening whenever the command input is less than 2% of full scale.

Valve Test Point

The valve voltage may be monitored on Pin 7 of the D connector.

Brooks® Model 585xEMH

3-5 Adjustment Potentiometers

All Model 585xEMH instruments are factory calibrated for optimum performance. The only potentiometer recommended for field adjustment is the Zero. Reference Figure 3-2 to access the Zero Potentiometer adjustment screw. N. B. We recommend removing the cover to ensure you are accessing the correct potentiometer. The Span Adjustment is also accessible by removing the plug on the remote electronics box adjacent to the Zero Potentiometer; however, its adjustment is not recommended as described below.

⚠ CAUTION

Adjusting potentiometers can seriously affect the performance of the mass flow controller and should only be performed by properly trained and qualified personnel.

Span

The Span Potentiometer is used to adjust the full scale setting of the mass flow controller. An adjustment in the clockwise direction will give less flow while turning counterclockwise will give more flow. Adjusting this potentiometer will alter the calibration and is therefore not recommended unless calibrating the device.

Linearity

The linearity potentiometer is used to linearize the flow calibration due to subtle non-linearities in various bypass elements. The linearity signal can be viewed between TP2 and TP4 (circuit common). The value of the signal is flow rate and gas dependent. On enhanced response PC boards adjusting the potentiometer clockwise will increase the absolute value of this number. On standard response and Current I/O PC boards adjusting the potentiometer clockwise will increase this number. Adjusting this potentiometer will alter the calibration and is therefore not recommended unless calibrating the device.

Anticipate

The anticipate potentiometer is used to adjust the response of the sensor for steps in flow. Adjusting this potentiometer in the clockwise direction will slow the response of flow signal and cause a **controller** to overshoot more. Adjusting this potentiometer will alter the response of the mass flow controller and is therefore not recommended unless adjusting the response of the device.

Zero

The zero potentiometer is used to balance the thermal sensor at a no flow condition. This potentiometer is adjusted at the time of calibration and minor adjustments may be done in the field. See the Zero Adjustment section below for details.

Bias

The bias potentiometer is not used and should not be adjusted by the end user.

3-6 Zero Adjustment

Turn on the process gas supply.

Each device is factory adjusted to provide a zero ± 10 mVdc at zero flow. The adjustment is made in Brooks' calibration laboratory which is temperature controlled to the temperature specified at the time of order. (See the calibration sheet supplied with the device for the temperature the device was calibrated at.) After initial installation and warm-up in the gas system, the zero flow indication may be other than the factory setting. This is primarily caused by changes in temperature between Brooks' calibration laboratory and the final installation. The zero flow reading can also be affected, to a small degree, by changes in line pressure and mounting attitude.

Flow the process fluid into the instrument and allow at least 45 minutes for the sensor to reach normal operating temperature.

Note: Before zeroing the instrument, zero pressure differential MUST be established across the device. If there is pressure across the instrument during the zero process, any detected flow through the sensor will be misinterpreted as the zero flow reading. This will result in calibration inaccuracy during normal operation.

a. Once zero differential pressure is established and verified, check the flow output signal using a suitable voltmeter. If it differs from the factory setting, adjust it by removing the lower pot hole plug (refer to Figure 3-2) which is located closest to the 7-pin circular connector on the remote electronics module. Adjust the zero potentiometer until the desired output signal is within ± 10 mV of zero on the output of the device.

3-7 Calibration Procedure

If the valve has been disassembled and any of the following parts have been replaced, the control valve adjusting procedure in Section 4-4 must be performed before the Model 585xEMH is calibrated.

- orifice
- valve stem
- plunger assembly
- lower guide spring
- valve seat

Calibration of the Model 585xEMH mass flow controller requires the use of a digital voltmeter (DVM) and a precision flow standard calibrator such as the Brooks Instrument's Vol-U-Meter. It is recommended that the calibration be performed only by trained and qualified service personnel. The recommended flow circuit for performing zero, adjustments, calibration and troubleshooting is shown in Figure 3-8.

If the mass flow controller is to be used on a gas other than the calibration gas, apply the appropriate gas conversion factor, (Refer to Section 4-3). Size the orifice for actual operating conditions (Refer to Section 4-4).

CAUTION

Do not ground the 5 Volt reference output when it is enabled. Improper operation of the printed circuit board will result.

Brooks® Model 585xEMH

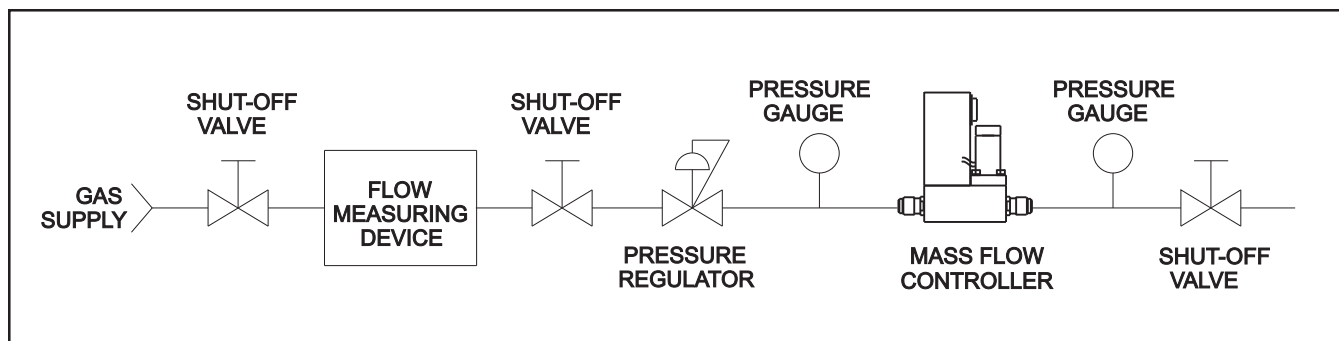


Figure 3-8 Bench Troubleshooting Circuit

Calibration Procedure for the Standard Response PC Board

- a. With the controller installed in an unpressurized gas line, apply power and allow approximately 45 minutes for warm-up. During the warm-up, adjustment, and calibration check procedures, do not allow the control valve to drift when gas flow is not present. This situation is not a normal operating mode and will cause abnormal heat-up of the control valve. With this abnormally warm valve, the meter will be difficult to calibrate. This situation can be prevented by switching a normally closed valve to valve override closed or a normally open valve to valve override open when there is no gas flow.
- b. Rough adjust the anticipate potentiometer with 20 clockwise full turns. Then, adjust the anticipate potentiometer with 10 counterclockwise turns to center the potentiometer. This will provide a rough adjustment of this circuit and make the flow more stable for calibration.
- c. Connect the DVM positive lead to the 0-5 Volt signal output, (Pin 3 Card Edge, Pin 2 D-Connector) and the negative lead to TP4 (circuit common). Adjust the zero potentiometer for an output of zero mV \pm 2 mV.
- d. Apply pressure to the system and insure that the zero signal repeats within 2 mV of the voltage set in Step c above. If the zero does not repeat, check for leakage.

Note: Controllers supplied with all metal valve seats do not provide tight shut-off. A 0-5% leak-through is typical. Close a downstream shut-off valve and observe the flow signal.

- e. Set the command potentiometer for 100% of flow (5.000 V). Connect the DVM positive lead to TP2 (linearity voltage) and the negative lead to TP4 (circuit common). Adjust the linearity potentiometer for an output of 0.0 V (zero volts).
- f. Connect the DVM positive lead to TP1 (-100x sensor voltage) and the negative lead to TP4 (circuit common). The command potentiometer should still be set at 100% flow (5.000 V). Measure the flow rate using suitable volumetric calibration equipment. To adjust the controller to the proper full scale flow, calculate a new TP1 voltage using the following equation:

$$\text{New TP1 Voltage} = \frac{\text{Measured TP1 Voltage}}{\text{Measured Flow Rate}} \times \text{Desired Flow Rate}$$

Adjust the span potentiometer until the voltage at TP1 is equal to the value calculated above. Recheck the flow rate after the flow is stable (at least two minutes). Repeat this check and adjustment procedure until the measured flow rate is within 1% of the desired flow rate.

Note: The voltage at TP1 is -100 times the output voltage of the sensor. This voltage can range from -1.2 to -12 Volts, however, it is recommended that this voltage stay between

-2.0 and -9.0 Volts for proper operation. If the recommended voltage range exceeds the desired range, accuracy and/or signal stability may not be achieved. If one of the limits is reached, check the orifice and restrictor sizing procedures given in Sections 4-4 and 4-5 respectively.

g. Set the command potentiometer for zero percent of flow. Connect the DVM positive lead to flow signal output (Pin 2) and the negative lead to TP4 (circuit common). Readjust the zero potentiometer for an output of zero mV \pm 2 mV as necessary.

h. Set the command potentiometer for 50% of flow (2.500 V) and measure the flow rate. Calculate the error as a percentage of full scale.

$$\text{Full Scale Error} = 100\% \times \frac{\text{Measured Flow Rate} - \text{Desired Flow Rate}}{\text{Full Scale Flow Rate}}$$

Example:

What is the percent of full scale error when full scale is equal to 100 sccm?

Measured flow rate = 48.5 sccm

Desired flow rate = 50.0 sccm

$$\text{Full Scale Error} = 100\% \times \frac{48.5 - 50}{100} = -1.5\%$$

i. Calculate the TP2 correction voltage: error calculated in Step h x 0.450 Volts Example:

Error = -1.5%

TP2 correction voltage = -1.5 x 0.450 = -0.675 Volts New TP2 voltage = zero volts + (-0.675) = -0675 Volts

j. Set the command potentiometer for 100% flow (5.000 V). Connect the DVM positive lead to TP2 (linearity voltage) and the negative lead to TP4 (circuit common).

k. Adjust the linearity potentiometer for an output equal to the new calculated TP2 voltage.

l. Repeat Steps f, g and h.

l1. If the error calculated in Step h is less than 0.5%, then the calibration procedure is complete.

l2. If the error is greater than 0.5%, set the command potentiometer for 100% (5.000 V). Connect the DVM positive lead to TP2 (linearity voltage) and the negative lead to TP4 (circuit common). Calculate a new TP2 voltage as follows employing the measured TP2 voltage:

$$\text{New TP2 Voltage} = \text{Error Calculated in Step h} \times 0.45\text{V} + \text{Measured TP2 Voltage}$$

Example:

Controller error = 0.7%

Measured TP2 voltage = -0.567 Volts

TP2 correction = 0.7 x 0.450 = 0.315 Volts

New TP2 correction = 0.315 + (-0.567) = -0.252 Volts

Adjust the linearity potentiometer for an output equal to the new TP2 correction voltage and then repeat Steps f, g and h.

Brooks® Model 585xEMH

Note: The voltage at TP2 can range from -10 to +3 Volts. It is recommended, however, that this voltage stay between -2.5 and +2.5 Volts for proper operation. If the recommended voltage range is exceeded, the desired accuracy and/or signal stability may not be achieved. If one of the limits is reached, check the restrictor sizing in Section 4-5.

3-8 Response Adjustment

This section describes the procedure for step response adjustment. For standard response PC Boards (5 potentiometers) follow the standard response procedures.

Adjustment #1 describes a method that will get the step response close to optimum quickly and without any flow measuring equipment. This method should be used when the response time of the flow controller is not critical to overall system performance.

Adjustment #2 describes a method that will allow adjustment of your Model 585xEMH mass flow controller to optimum step response performance. This method is the preferred way to adjust the step response.

Adjustment of the response circuit will not affect the accuracy of the flow controller as adjusted in Section 3-7.

Note: For a metal valve seat a positive offset up to 250 mV can be expected for a zero command.

Response PC Board Adjustment #1

(specification not guaranteed)

Note: This procedure requires an oscilloscope, chart recorder or a DVM - to monitor the rate of change of the output signal.

- a. Set the command potentiometer for 100% of flow (5.000 V) and wait about 30 seconds for the flow output signal to stabilize.
- b. Step the command signal to zero percent or activate valve override closed to stop the flow. Observe the flow signal output as it decays.
- c. The behavior of the flow signal during this transition between 100% and zero percent flow indicates the adjustment required of the anticipate potentiometer. Refer to Figure 3-9.
 - c1. If the flow signal decays to -0.05 to -0.5 Volt, then rises to zero Volts, the anticipate potentiometer properly adjusted.
 - c2. If the flow signal decays rapidly and goes below -0.5 Volt before rising to zero Volt, the anticipate potentiometer must be adjusted clockwise and Steps a and b repeated.
 - c3. If the flow signal decays slowly and does not go below -0.5 Volt, the anticipate potentiometer must be adjusted counterclockwise and Steps a and b repeated.

Response PC Board Adjustment #2

(specification guaranteed)

Note: Adjustment of the response circuitry to obtain a flow performance to be within 2% of final value in less than three seconds after command change of 0-100% requires the use of a *fast response flowmeter* (less than 100 millisecond response to within 0.2% of final value) in series with the Model 585xEMH and a storage oscilloscope or recorder.

- a. Set the command to zero percent flow rate (0.000 V) and allow the flow signal output to stabilize (30 seconds minimum). Step change the command to 100% of flow (5.000 V) and record the output signal from the *fast response flowmeter*.
- b. This flow signal should overshoot above the final value, then overshoot below the final value.
 - b1. If the signal from the *fast response flowmeter* does not overshoot the final value and/or the signal does not reach and stay within $\pm 2\%$ of final value within 3 seconds, adjust the anticipate potentiometer one-half to one turn clockwise. If this signal does overshoot above the final value then overshoots below the final value by more than 2%, the anticipate potentiometer must be adjusted one-half to one turn clockwise.
 - b2. If the signal from the *fast response flowmeter* overshoots above the final value by more than 2% and does not overshoot below the final value, then the anticipate potentiometer must be adjusted one-half to one turn counterclockwise.
- c. Repeat Steps a and b above until no further anticipate potentiometer adjustment is necessary.
- d. If the response time and overshoot are not within the required limits, the response potentiometer must be adjusted to control the amount of overshoot. Set the command to 0% flow rate (0.000 V) and allow the flow signal output to stabilize (30 seconds minimum). Step change the command to 100% (5.000 V) and record the output signal from the *fast response flowmeter*.
 - d1. If this signal shows excessive overshoot above the final value, adjust the response potentiometer 2 to 3 turns counterclockwise.
 - d2. If this signal shows that the overshoot above the final value is not excessive, adjusting the response potentiometer one-half to one turn clockwise will speed up the response with correspondingly more overshoot and may also significantly reduce the dead-time between application of a change in command and the first noticeable change in flowrate.
- e. Repeat Step d above until no further adjustment of the response potentiometer is necessary. If the desired response characteristics are still not achieved, some additional improvement can be realized by making adjustments to the flow control valve. Refer to Section 4-4.

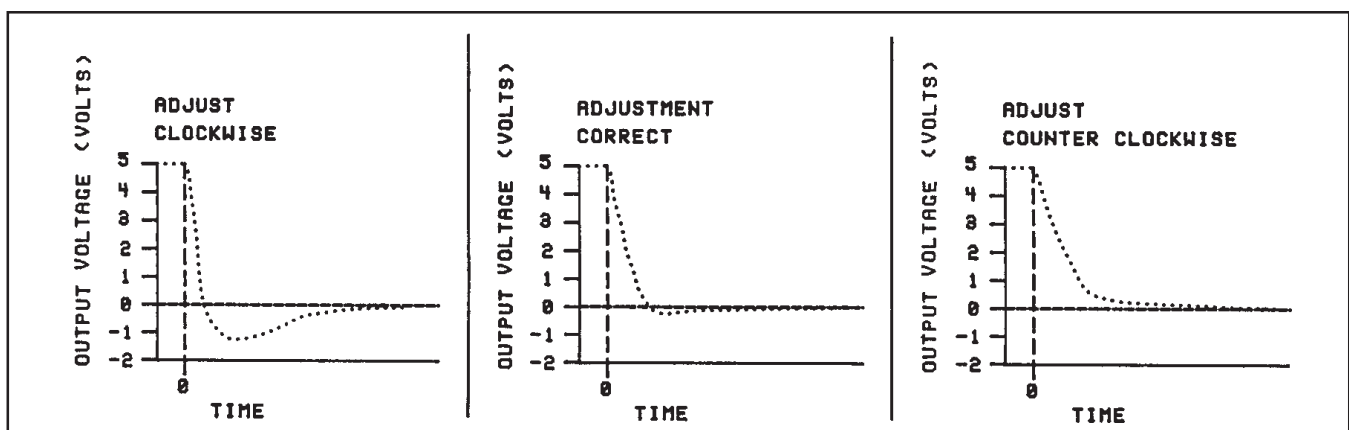


Figure 3-9 Response Adjustment

*THIS PAGE WAS
INTENTIONALLY
LEFT BLANK*

4-1 Overview

	<p>⚠ WARNING</p> <p>METER/CONTROLLER SEAL COMPATIBILITY</p>
<p>Products in this manual may contain metal or elastomeric seals, gaskets, O-rings or valve seats. It is the "user's" responsibility to select materials that are compatible with their process and process conditions. Using materials that are not compatible with the process or process conditions could result in the Meter or Controller leaking process fluid outside the pressure boundary of the device, resulting in personnel injury or death.</p> <p>It is recommended that the user check the Meter or Controller on a regular schedule to ensure that it is leak free as both metal and elastomeric seals, gaskets, O-rings and valve seats may change with age, exposure to process fluid, temperature, and /or pressure.</p>	

<p>⚠ WARNING</p>
<p>If it becomes necessary to remove the instrument from the system, power to the device must be disconnected.</p>

<p>⚠ WARNING</p>
<p>If it becomes necessary to remove the MFC/MFM from the system after exposure to toxic, pyrophoric, flammable or corrosive gas, purge the MFC/MFM thoroughly with a dry inert gas such as Nitrogen before disconnecting the gas connections. Failure to correctly purge the MFC/MFM could result in fire, explosion or death. Corrosion or contamination of the MFC/MFM upon exposure to air, may also occur.</p>

<p>⚠ CAUTION</p>
<p>It is important that this MFC/MFM only be serviced by properly trained and qualified personnel.</p>

No routine maintenance is required on the Model 585xEMH. If an in-line filter is used, the filtering element should periodically be replaced.

This section provides the following information:

- Troubleshooting
- Cleaning
- Control Valve Adjustment
- Gas Conversion Factors
- Orifice Sizing
- Restrictor Sizing

4-2 Troubleshooting

⚠ CAUTION

It is important that this controller only be serviced by properly trained and qualified personnel.

A. System Checks

The Model 585xEMH is generally used as a component in gas handling systems which can be quite complex. This can make the task of isolating a malfunction in the system a difficult one. An incorrectly diagnosed malfunction can cause many hours of unnecessary downtime. If possible, make the following system checks before removing a suspected defective mass flow controller for bench troubleshooting or return, especially if the system is new.

1. Verify a low resistance common connection, correct power supply voltage and that signals are reaching and leaving the controller. The breakout board(P/N S273Z668AAA) D-Connector version available from Brooks Instrument, will make this job much easier.
2. Verify that the process gas connections have been correctly terminated and leak-checked.
3. If the mass flow controller appears to be functioning but cannot achieve set-point, verify that sufficient inlet pressure and pressure drop are available at the controller to provide the required flow.
4. Verify that all user selectable jumpers are in their desired positions Refer to Figure 3-7.

⚠ WARNING

If it becomes necessary to remove the controller from the system after exposure to toxic, pyrophoric, flammable or corrosive gas, purge the controller thoroughly with a dry inert gas such as Nitrogen before disconnecting the gas connections. Failure to correctly purge the controller could result in fire, explosion or death. Corrosion or contamination of the mass flow controller, upon exposure to air, may also occur.

B. Bench Troubleshooting

In order to assist in troubleshooting it is highly recommended that the controller be installed in a flow circuit as shown in Figure 3-8.

1. Properly connect the mass flow controller to a ± 15 Vdc power supply. Connect a command voltage source and an output signal readout device (4-1/2 digit voltmeter recommended) Pins 2 and 10 for the D-Connector version (Refer to Figure 3-4). Apply power, set the command voltage to zero and allow the controller to warm-up for 45 minutes. Do not connect to a gas source at this time.

Observe the output signal and, if necessary, perform the zero adjustment procedure (Section 3-6). If the output signal will not zero properly, refer to the sensor troubleshooting section and check the sensor. If the sensor is electrically functional, the printed circuit board is defective and will require replacement.

2. Connect the controller to a source of the gas on which it was originally calibrated. Command 100% flow and adjust the inlet and outlet pressures to the calibration conditions. Verify that the output signal reaches and stabilizes at 5.000 Volts. Vary the command voltage over the control range and verify that the output signal follows the command input.

Apply +15 Volts to the valve override input (Pin 12 for D-Connector version) and verify that the output exceeds 5.000 Volts.

Apply -15 Volts to the valve override terminal and verify that the output signal falls below 250 millivolts for a metal valve seat. If the controller is connected in series with a suitable flow standard, observe the actual flow behavior and verify the accuracy of the mass flow controller. If the mass flow controller functions as described above, it is functioning properly and the problem is most likely elsewhere. Table 4-1 lists possible malfunctions which may be encountered during bench troubleshooting.

C. Sensor Troubleshooting

If it is believed the sensor coils are either open or shorted, troubleshoot using Table 4-2. If any of the steps do not produce expected results, the sensor assembly is defective. Return to Brooks Instrument for sensor replacement.

Note: Do not attempt to disassemble the sensor.

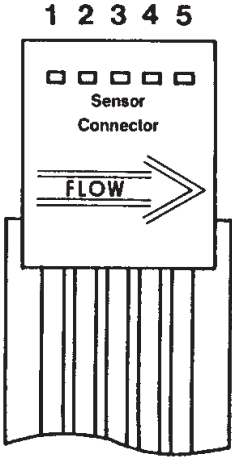
D. Cleaning Procedures

No routine external cleaning is required for Brooks thermal mass flow controller. Should the 585xEMH Mass Flow Controller require cleaning due to deposition, return the device to Brooks Instrument for servicing by trained technicians.

Table 4-1 Bench Troubleshooting

Trouble	Possible Cause	Check/Corrective Action
Actual flow overshoots setpoint by more than 5% full scale.	Anticipate potentiometer out of adjustment.	Adjust anticipate potentiometer. Refer to Sections 3-5 & 3-8 .
Output stays at zero level regardless of command and there is no flow through the controller.	Clogged Sensor tube and restrictor and/or a clogged orifice. Closed or clogged flow path up- or downstream of the controller. Clogged Control Valve. Internal reference being used as the command source and the yellow jumper is in the wrong position. -15 volts applied to the valve override input Defective printed circuit board.	Clean sensor. Refer to cleaning procedure, Section 4-2D. Open valve(s). Clean filter(s). Remove any foreign material from gas delivery system. Check TP3 with the command at 100%. If the voltage is more negative than -11V, disassemble and repair the control valve. Refer to Sections 4-3 and 4-4. Refer to Section 3-4. Check valve override input. Refer to Figure 3-4 for terminal assignments. Replace printed circuit board.
Output signal stays at +6.8 Volts (26 mA for Current I/O Vers.) regardless of command and there is flow through the controller.	Valve stuck open or leaky. +15 Volts applied to the valve override input. Defective printed circuit board. Command input floating.	Clean and/or adjust control valve. Refer to cleaning procedure and/or Section 4-2D. Check the valve override terminal. Refer to Figure 3-4 for terminal assignments. Replace printed circuit board. Connect command signal. Refer to Figure 3-4 for terminal assignments.
Output signal follows set-point at higher commands but will not go to zero.	Leaky control valve Excessive resistance in valve voltage return line.	Disassemble and repair valve. Refer to Section 4-3. Reduce wiring resistance
Output signal follows set-point at lower commands but does not reach full scale.	Insufficient inlet pressure or pressure drop. Partially clogged sensor Partially clogged valve. Valve out of adjustment. Valve guide spring failure.	Adjust pressures, inspect in-line filters and clear/replace as necessary. Check calibration. Refer to Section 3-7. Disassemble and repair control valve. Refer to Section 4-3. Adjust valve. Refer to Section 4-4. Check valve spring.
Controller grossly out of calibration. Flow is higher than desired.	Partially clogged sensor.	Clean sensor. Refer to the cleaning procedure, Section 4-2D.
Controller grossly out of calibration. Flow is lower than desired.	Partially clogged restrictor.	Replace restrictor. Refer to Section 4-3.
Controller oscillates.	Pressure drop or inlet pressure excessive. Oversized orifice. Valve out of adjustment. Anticipate potentiometer out of adjustment. Faulty pressure regulator. Defective printed circuit board.	Adjust pressures. Check orifice size. Refer to Section 4-4. Adjust valve. Refer to Section 4-3. Adjust anticipate potentiometer. Refer to Section 3-5. Check regulator output. Replace printed circuit board.

Table 4-2 Sensor Troubleshooting

SENSOR SCHEMATIC	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">PIN NO.</th> <th style="text-align: center; padding: 5px;">FUNCTION</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 5px;">1</td> <td style="padding: 5px;">Heater</td> </tr> <tr> <td style="text-align: center; padding: 5px;">2</td> <td style="padding: 5px;">Upstream Temperature Sensor (Su)</td> </tr> <tr> <td style="text-align: center; padding: 5px;">3</td> <td style="padding: 5px;">Downstream Temperature Sensor (Sd)</td> </tr> <tr> <td style="text-align: center; padding: 5px;">4</td> <td style="padding: 5px;">Sensor Common</td> </tr> <tr> <td style="text-align: center; padding: 5px;">5</td> <td style="padding: 5px;">Heater Common</td> </tr> </tbody> </table>	PIN NO.	FUNCTION	1	Heater	2	Upstream Temperature Sensor (Su)	3	Downstream Temperature Sensor (Sd)	4	Sensor Common	5	Heater Common
PIN NO.	FUNCTION												
1	Heater												
2	Upstream Temperature Sensor (Su)												
3	Downstream Temperature Sensor (Sd)												
4	Sensor Common												
5	Heater Common												
													
<p>Remove the sensor connector from the PC Board for this procedure.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 5px;">OHMMETER CONNECTION</th> <th style="text-align: left; padding: 5px;">RESULT IF ELECTRICALLY FUNCTIONAL</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Pin 1 or 4 to meter body</td> <td style="padding: 5px;">Open circuit on ohmmeter. If either heater (1) or sensor common (4) are shorted, an ohmmeter reading will be obtained.</td> </tr> <tr> <td style="padding: 5px;">Pin 4 to Pin 2</td> <td rowspan="2" style="padding: 5px;">Nominal 1100 ohms reading, depending on temperature and ohmmeter current.</td> </tr> <tr> <td style="padding: 5px;">Pin 4 to Pin 3</td> </tr> <tr> <td style="padding: 5px;">Pin 5 to Pin 1</td> <td style="padding: 5px;">Nominal 1200 ohm reading.</td> </tr> </tbody> </table>		OHMMETER CONNECTION	RESULT IF ELECTRICALLY FUNCTIONAL	Pin 1 or 4 to meter body	Open circuit on ohmmeter. If either heater (1) or sensor common (4) are shorted, an ohmmeter reading will be obtained.	Pin 4 to Pin 2	Nominal 1100 ohms reading, depending on temperature and ohmmeter current.	Pin 4 to Pin 3	Pin 5 to Pin 1	Nominal 1200 ohm reading.			
OHMMETER CONNECTION	RESULT IF ELECTRICALLY FUNCTIONAL												
Pin 1 or 4 to meter body	Open circuit on ohmmeter. If either heater (1) or sensor common (4) are shorted, an ohmmeter reading will be obtained.												
Pin 4 to Pin 2	Nominal 1100 ohms reading, depending on temperature and ohmmeter current.												
Pin 4 to Pin 3													
Pin 5 to Pin 1	Nominal 1200 ohm reading.												

4-3 Gas Conversion Factors

If a mass flow controller is operated on a gas other than the gas it was calibrated with, a scale shift will occur in the relation between the output signal and the mass flow rate. This is due to the difference in heat capacities between the two gases. This scale shift can be approximated by using the ratio of the molar specific heat of the two gases or by sensor conversion factor. A list of sensor conversion factors is given in Table 4-3. To change to a new gas, multiply the output reading by the ratio of the gas factor for the desired gas by the gas factor for the calibration gas used.

$$\text{Actual Gas Flow Rate} = \text{Output Reading} \times \frac{\text{Factor of the New Gas}}{\text{Factor of the Calibration Gas}}$$

Example:

The controller is calibrated for Nitrogen

The desired gas is Carbon Dioxide

The output reading is 75 sccm when Carbon Dioxide is flowing

Then $75 \times 0.773 = 57.98$ sccm

In order to calculate the conversion factor for a gas mixture, the following formula should be used:

$$\text{Sensor Conversion Factor}_{\text{Mixture}} = \frac{100}{P_1 \text{ Sensor Conversion Factor}_1} + \frac{100}{P_2 \text{ Sensor Conversion Factor}_2} + \frac{100}{P_3 \text{ Sensor Conversion Factor}_3}$$

Where,

P₁ = percentage (%) of gas 1 (by volume)

P₂ = percentage (%) of gas 2 (by volume)

P_n = percentage (%) of gas n (by volume)

Example: The desired gas is 20% Helium (He) and 80% Chlorine (Cl) by volume. The desired full scale flow rate of the mixture is 20 slpm. Sensor conversion factor for the mixture is:

$$\text{Mixture Factor} = \frac{100}{\frac{20}{1.386} + \frac{60}{.676}} = .945$$

Nitrogen equivalent flow = 20/.945 = 21.16 slpm Nitrogen

It is generally accepted that the mass flow rate derived from this equation is only accurate to ±5%. The sensor conversion factors given in Table 4-3 are calculated based on a gas temperature of 21°C and a pressure of one atmosphere. The specific heat of most gases is not strongly pressure, and/or temperature, dependent. However, gas conditions that vary widely from these reference conditions may cause an additional error due to the change in specific heat caused by pressure and/or temperature.

Table 4-3 Conversion Factors (Nitrogen Base)

GAS NAME	FORMULA	SENSOR FACTOR	ORIFICE FACTOR	DENSITY (km/m ³)	SEMI ID
1 1 2-Trichloro-1 1 2-Trifluoroet f-113	C2Cl3F3	0.231	2.520	7.92	126
1 1-Difluoro-1-Chloroethane	C2H3ClF2	0.341	1.957	4.776	103
1 1-Difluoroethane	CH3CHF2	0.415	1.536	2.940	82
1 1-Difluoroethylene	CH2:CF2	0.458	1.512	2.860	64
1 2-Dibromotetrafluoroethane f-114B2	C2Br2F4	0.215	2.905	10.530	130
1 2-Dichloroethane (Ethylene Dichloride)	C2H4Cl2	0.382	1.879	4.419	222
1 2-Dichlorotetrafluoroethane f-114	C2Cl2F4	0.231	2.449	7.479	125
1 3-Butadiene	C4H6	0.354	1.413	2.491	100
1,1,1,2-Tetrafluoroethane (R134A)	C2H2F4	0.307	1.908	4.556	156
1,1,2,2-Tetrafluoroethane (R134)	C2H2F4	0.295	1.908	4.556	
1,2-Propylene Oxide	C3H6O	0.348	1.440	2.594	
1-Butene	C4H8	0.294	1.435	2.503	104
1-Pentene, 4-Methyl	C6H12	0.200	1.733	3.758	178
2 2-Dichloro 1 1 1-Trifluoroethane (R123)	C2HCl2F3	0.259	2.336	6.829	186
2 2-Dimethylpropane	C(CH3)4	0.247	1.613	3.244	122
2-Chloro-1,1,1,2-Tetrafluoroethane (R124)	C2HC1F4	0.0268	2.207	6.094	
2-Chlorobutane	C4H9Cl	0.234	1.818	4.134	
2-Methyl-1,3-Butadiene	C5H8	0.247	1.559	3.042	
3-Methyl-1-Butene	C5H10	0.252	1.584	3.127	120
Acetonitrile	C2H3N	0.510	1.211	1.833	173
Acetylene (Ethyne)	C2H2	0.615	0.970	1.173	42
Acrolein	C3H4O	0.362	1.415	2.054	
Air	Mixture	0.998	1.018	1.293	8
Allene	C3H4	0.478	1.199	1.787	66
Ammonia	NH3	0.786	0.781	0.771	29
Argon	Ar	1.395	1.195	1.784	4
Arsine	AsH3	0.754	1.661	3.478	35
Benzene	C6H6	0.294	1.670	3.488	197
Borane	H3B	0.778	0.703	0.618	
Boron Trichloride	BCl3	0.443	2.044	5.227	70
Boron Trifluoride	BF3	0.579	1.569	3.025	48
Bromine	Br2	0.800	2.388	7.136	21

Brooks® Model 585xEMH

Table 4-3 Conversion Factors (Nitrogen Base) (Continued)

GAS NAME	FORMULA	SENSOR FACTOR	ORIFICE FACTOR	DENSITY (km/m ³)	SEMI ID
Bromine Pentafluoride	BrF5	0.287	2.502	7.806	116
Bromine Trifluoride	BrF3	0.439	2.214	6.108	76
Bromotrifluoroethylene	C2BrF3	0.326	2.397	7.165	105
Bromotrifluoromethane	f-13B1 CBrF3	0.412	2.303	6.615	80
Butane	C4H10	0.257	1.467	2.593	117
Carbon Dioxide	CO2	0.740	1.255	1.977	25
Carbon Disulfide	CS2	0.638	1.650	3.393	40
Carbon Monoxide	CO	0.995	1.000	1.250	9
Carbon Tetrachloride	CCl4	0.344	2.345	6.860	101
Carbon Tetrafluoride	f-14 CF4	0.440	1.770	3.926	63
Carbonyl Fluoride	COF2	0.567	1.555	2.045	46
Carbonyl Sulfide	COS	0.680	1.463	2.680	34
Chlorine	Cl2	0.876	1.598	3.214	19
Chlorine Dioxide	ClO2	0.693	1.554	3.011	201
Chlorine Trifluoride	ClF3	0.433	1.812	4.125	77
Chlorodifluoromethane	f-22 CHClF2	0.505	1.770	3.906	57
Chloroform (Trichloromethane)	CHCl3	0.442	2.066	5.340	71
Chloropentafluoroethane	f-115 C2ClF5	0.243	2.397	7.165	119
Chlorotrifluoroethylene	C2ClF3	0.337	2.044	5.208	206
Chlorotrifluoromethane	f-13 CClF3	0.430	1.985	4.912	74
CIS-2-Butene	C4H8	0.320	1.435	2.503	107
Cyanogen	(CN)2	0.498	1.366	2.322	59
Cyanogen Chloride	ClCN	0.618	1.480	2.730	37
Cyclobutane	C4H8	0.387	1.413	2.491	207
Cyclopropane	C3H6	0.505	1.224	1.877	61
Deuterium	D2	0.995	0.379	0.177	14
Diborane	B2H6	0.448	1.000	1.235	58
Diboromodifluoromethane	f-12B2 CBr2F2	0.363	2.652	8.768	209
Dichlorodifluoromethane	f-12 CCl2F2	0.390	2.099	5.492	84
Dichloroethylene	C2H2Cl2	0.397	1.860	4.329	210
Dichlorofluoromethane	f-21 CHCl2F	0.456	1.985	4.912	65
Dichloromethane	CH2Cl2	0.522	1.741	3.793	265
Dichlorosilane	SiH2Cl2	0.442	1.897	4.506	67
Diethylamine	C4H11N	0.222	1.616	3.266	213

Table 4-3 Conversion Factors (Nitrogen Base) (Continued)

GAS NAME	FORMULA	SENSOR FACTOR	ORIFICE FACTOR	DENSITY (km/m ³)	SEMI ID
Diethylsilane	C4H12Si	0.183	1.775	3.940	154
Difluoromethane f-32	CF2H2	0.627	1.360	2.411	160
Dimethylamine	(CH3)2NH	0.370	1.269	2.013	85
Dimethylether	(CH3)2O	0.392	1.281	2.055	73
Dimethylsulfide	C2H6S	0.357	1.489	2.775	
Dimethylzinc	C2H6Zn	0.234	1.846	4.262	135
Disilane	Si2H6	0.332	1.493	2.779	97
Ethane	C2H6	0.490	1.038	1.357	54
Ethanol	C2H6O	0.394	1.282	2.057	136
Ethyl Chloride	C2H5Cl	0.408	1.516	2.879	75
Ethylacetylene	C4H6	0.365	1.384	2.388	93
Ethylene	C2H4	0.619	1.000	1.261	38
Ethylene Oxide	C2H4O	0.589	1.254	1.965	45
Fluorine	F2	0.924	1.163	1.695	18
Fluoroform f-23	CHF3	0.529	1.584	3.127	49
Germanium Tetrahydride (Germane)	GeH4	0.559	1.654	3.423	43
Germanium Tetrachloride	GeCl4	0.268	2.766	9.574	113
Germanium Tetrafluoride	GeF4	0.356	2.303	6.636	99
Halothane (R-123B1)	C2HBrClF3	0.257	2.654	8.814	137
Helium	He	1.386	0.378	0.178	1
Hexafluoroacetone	C3F6O	0.219	2.434	7.414	225
Hexafluorobenzine	C6F6	0.632	2.577	8.309	192
Hexafluorobutadiene	C4F6	0.213	2.405	7.236	297
Hexafluoroethane f-116	C2F6	0.255	2.219	6.139	118
Hexafluoropropylene (HFP)	C3F6	0.249	2.312	6.663	138
Hexamethyldisilane (HMDS)	(CH2)6Si2	0.139	2.404	7.208	139
Hexamethyldisiloxane	C6H18OSi2	0.110	2.408	7.251	228
Hexane	C6H14	0.204	1.757	3.847	127
Hexylamine	C6H15N	0.158	1.901	4.519	
Hydrogen	H2	1.008	0.269	0.090	7
Hydrogen Bromide	HBr	0.987	1.695	3.645	10
Hydrogen Chloride	HCl	0.983	1.141	1.639	11
Hydrogen Cyanide	HCN	0.744	0.973	1.179	24
Hydrogen Fluoride	HF	0.998	0.845	0.893	12

Brooks® Model 585xEMH

Table 4-3 Conversion Factors (Nitrogen Base) (Continued)

GAS NAME	FORMULA	SENSOR FACTOR	ORIFICE FACTOR	DENSITY (km/m ³)	SEMI ID
Hydrogen Iodide	HI	0.953	2.144	5.789	17
Hydrogen Selenide	H ₂ Se	0.837	1.695	3.613	23
Hydrogen Sulfide	H ₂ S	0.850	1.108	1.539	22
Iodine Pentafluoride	IF ₅	0.283	2.819	9.907	115
Isobutane	C ₄ H ₁₀	0.260	1.440	2.596	111
Isobutene	C ₄ H ₈	0.289	1.435	2.503	106
Isopentane	C ₅ H ₁₂	0.211	1.605	3.222	231
Krypton	Kr	1.382	1.729	3.708	5
Methacrolein	C ₄ H ₆ O	0.313	1.582	3.130	
Methane	CH ₄	0.763	0.763	0.717	28
Methanol	CH ₄ O	0.609	1.069	1.431	176
Methyl Bromide	CH ₃ Br	0.646	1.834	4.236	44
Methyl Chloride	CH ₃ Cl	0.687	1.347	2.308	36
Methyl Fluoride	CH ₃ F	0.761	1.102	1.518	33
Methyl Mercaptan	CH ₄ S	0.588	1.313	2.146	47
Methyl Silane	CH ₆ Si	0.393	1.283	2.061	185
Methyl Trichlorosilane (MTS)	CH ₃ Cl ₃ Si	0.267	2.310	6.675	183
Methyl Vinyl Ether	C ₃ H ₆ O	0.377	1.435	2.567	81
Methylacetylene	C ₃ H ₄	0.473	1.196	1.782	68
Monoethanolamine	C ₂ H ₇ NO	0.305	1.477	2.728	
Monoethylamine (CH ₃ CH ₂ NH ₂)	C ₂ H ₇	0.359	1.269	2.013	233
Monomethylamine	CH ₃ NH ₂	0.565	1.067	1.420	52
Neon	Ne	1.398	0.847	0.902	2
Nickel Carbonyl	Ni(CO) ₄	0.212	2.371	7.008	140
Nitric Acid	HNO ₃	0.491	1.500	2.814	167
Nitric Oxide	NO	0.995	1.030	1.339	16
Nitrogen	N ₂	1.000	1.000	1.251	13
Nitrogen Dioxide	NO ₂	0.758	1.713	2.052	26
Nitrogen Trifluoride	NF ₃	0.501	1.598	3.168	53
Nitrogen Trioxide	N ₂ O ₃	0.443	1.649	3.389	78
Nitrosyl Chloride	NOCl	0.644	1.529	2.913	141
Nitrous Oxide	N ₂ O	0.752	1.259	1.964	27
Octafluorocyclopentene	C ₅ F ₈	0.181	2.751	9.466	266
Octafluorotetrahydrofuran	C ₄ F ₈ O	0.165	2.777	9.644	182
Octofluorocyclobutane	C ₄ F ₈	0.169	2.672	8.933	129

Table 4-3 Conversion Factors (Nitrogen Base) (Continued)

GAS NAME	FORMULA	SENSOR FACTOR	ORIFICE FACTOR	DENSITY (km/m ³)	SEMI ID
Oxygen	O2	0.988	1.067	1.429	15
Oxygen Difluoride	OF2	0.672	1.388	2.402	41
Ozone	O3	0.738	1.310	2.138	30
Pentafluoroethane	f-125 C2HF5	0.287	2.070	5.360	155
Pentane (n-Pentane)	C5H12	0.212	1.605	3.222	240
Perchloryl Fluoride	ClO3F	0.448	1.905	4.571	72
Perfluoro-2-Butene	C4F8	0.268	2.672	8.933	236
Perfluorobutane	C4F10	0.738	2.918	10.61	241
Perfluoromethyl-vinylether	PMVE PMVE	0.296	2.029	5.131	
Perfluoropropane	C3F8	0.179	2.591	8.396	128
Phosgene	COCl2	0.504	1.881	4.418	60
Phosphine	PH3	0.783	1.100	1.517	31
Phosphorous Oxychloride	POCl3	0.327	2.340	6.847	102
Phosphorous Pentafluoride	PF5	0.346	2.109	5.620	143
Phosphorous Trifluoride	PF3	0.495	1.770	3.906	62
Propadiene	C3H4	0.439	1.196	1.789	66
Propane (same as CH3CH2CH3)	C3H8	0.343	1.274	2.008	89
Propylene (Propene)	C3H6	0.401	1.234	1.875	69
Rhenium Hexafluoride	ReF6	0.230	3.279	13.41	243
Silane	SiH4	0.625	1.070	1.440	39
Silicon Tetrachloride	SiCl4	0.310	2.462	7.579	108
Silicon Tetrafluoride	SiF4	0.395	1.931	4.648	88
Sulfur Dioxide	SO2	0.728	1.529	2.858	32
Sulfur Hexafluoride	SF6	0.270	2.348	6.516	110
Sulfur Tetrafluoride	SF4	0.353	1.957	4.776	86
Sulfur Trioxide	SO3	0.535	1.691	3.575	246
Sulfuryl Fluoride	SO2F2	0.423	1.931	4.648	87
Tetrachloromethane	CCl4	0.344	2.345	6.858	101
Tetraethylsilane	C8H20Si	0.111	2.270	6.445	317
Tetrafluoroethylene (TFE)	C2F4	0.361	1.905	4.526	94
Tetrafluorohydrazine	N2F4	0.367	1.926	4.624	157
Tetramethylsilane	C4H12Si	0.183	1.775	3.940	251
Titanium Tetrachloride	TiCl4	0.296	2.602	8.470	114
Toluene	(C6H5)CH3	0.234	1.814	4.115	181
Trans-2-Butene	C4H8	0.291	1.435	2.503	98

Brooks® Model 585xEMH

Table 4-3 Conversion Factors (Nitrogen Base) (Continued)

GAS NAME	FORMULA	SENSOR FACTOR	ORIFICE FACTOR	DENSITY (km/m³)	SEMI ID
Trichlorofluoromethane f-11	CCl3F	0.374	2.244	6.281	91
Trichlorosilane	SiHCl3	0.329	2.201	6.038	147
Trifluoroethane	C2H3F3	0.333	1.732	3.753	
Trifluoropropene	C3H3F3	0.286	1.852	4.289	
Trimethyl Aluminum	C3H9Al	0.259	1.604	3.219	149
Trimethylamine	(CH3)3N	0.316	1.467	2.639	109
Trimethylgallium	C3H39Ga	0.237	2.025	5.123	152
Trimethyloxyborane (TMB)	B(OCH3)3	0.300	1.929	4.638	131
Trimethylsilane	C3H10Si	0.235	1.627	3.313	190
Tungsten Hexafluoride	WF6	0.227	3.264	13.28	121
Uranium Hexafluoride	UF6	0.220	3.548	15.70	123
Vinyl Bromide	C2H3Br	0.524	1.985	4.772	56
Vinyl Chloride	C2H3Cl	0.542	1.492	2.788	55
Vinyl Fluoride	C2H3F	0.576	1.281	2.046	51
Water Vapor	H2O	0.861	0.802	0.804	20
Xenon	Xe	1.383	2.180	5.851	6

4-4 Orifice Sizing

The Orifice Sizing Nomograph, Figure 4-1, is used to calculate the control valve's orifice size when changing any or all of the following factors from the original factory calibration:

gas
operating pressure (inlet and outlet)
flow range

The flow controller's orifice is factory-sized to a preselected gas, operating pressure and flow range. Note that the orifice is marked with its size in thousandths of an inch. When changing the aforementioned factors, calculate the new orifice size by following the procedure and example outlined in the following paragraphs.

Example: Determine the orifice size for the following conditions:

Gas: Hydrogen
 Flow Rate: 2,000 sccm
 Outlet Pressure: 30 psig
 Inlet Pressure: 50 psig

1. Determine Nitrogen equivalent flow rate (refer to Table 4-3).

$$Q_{\text{NITROGEN}} = Q_{\text{GAS}} \times \sqrt{\frac{\rho_{\text{GAS}}}{\rho_{\text{NITROGEN}}}}$$

OR

$$Q_{\text{NITROGEN}} = Q_{\text{GAS}} \times \sqrt{\frac{SG_{\text{GAS}}}{SG_{\text{NITROGEN}}}}$$

Where:

Q_{NITROGEN} = Nitrogen equivalent flow rate (sccm)

Q_{GAS} = Desired flow rate of the gas (sccm)

ρ_{NITROGEN} = Density of Nitrogen at 70°F

ρ_{GAS} = Density of the gas (taken at customer temperature)

SG_{GAS} = Specific gravity of the gas (taken at customer temperature)

Refer to Table 4-3 for densities.

Brooks® Model 585xEMH

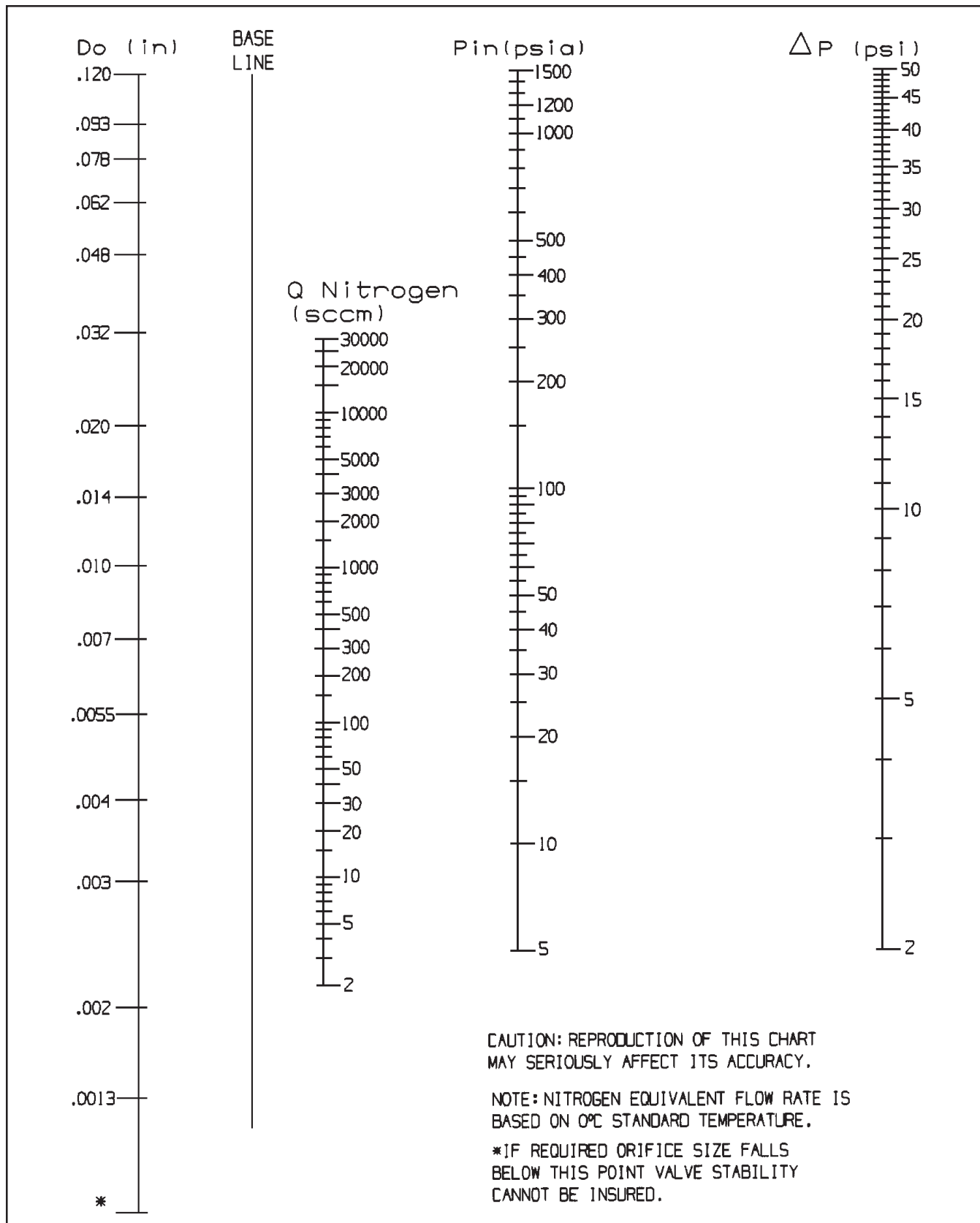


Figure 4-1 Model 585xEMH Orifice Sizing Nomograph

Example:

$$\begin{aligned}
 Q_{\text{gas}} &= 2,000 \text{ sccm} \\
 \sqrt{\frac{P_{\text{GAS}}}{P_{\text{NITROGEN}}}} &= .269 \\
 Q_{\text{NITROGEN}} &= Q_{\text{GAS}} \times \sqrt{\frac{P_{\text{GAS}}}{P_{\text{NITROGEN}}}} \\
 &= 2,000 \times .269 \\
 &= 538 \text{ sccm Nitrogen}
 \end{aligned}$$

In order to calculate the orifice conversion factor when using a gas mixture, the following formula must be used:

$$\text{Orifice Conversion Factor Mixture} = \sqrt{\frac{P_1 \left(\text{Orifice Conversion Factor 1} \right) + P_2 \left(\text{Orifice Conversion Factor 2} \right) + P_n \left(\text{Orifice Conversion Factor n} \right)}{100}}$$

Where P_1 = percentage by volume of gas 1
 P_2 = percentage by volume of gas 2
 P_n = percentage by volume of gas n

Example: Find the Nitrogen equivalent for 20 slpm of a 20% Helium and 80% Chlorine gas mixture.

$$\begin{aligned}
 \text{Orifice Conversion Factor Mixture} &= \frac{20(.378)}{100} + \frac{80(1.598)}{100} \\
 Q_{\text{Nitrogen}} &= Q_{\text{gas}} (\text{orifice conversion factor}) \\
 &= 20 \times 1.439 \\
 &= 28.78 \text{ slpm Nitrogen}
 \end{aligned}$$

2. If inlet and outlet pressures are given in gauge pressure (psig) add 14.7 to convert to absolute pressure (psia).

Outlet Pressure — 30 psig + 14.7 = 44.7 psia
 Inlet Pressure — 50 psig + 14.7 = 64.7 psia

3. Determine Critical Pressure Drop

Critical pressure drop occurs when the outlet pressure (psia) is less than half the inlet pressure (psia) or

$$P_{\text{outlet}} < \frac{P_{\text{inlet}}}{2}$$

If these conditions exist, the pressure drop (Dp) should be calculated as follows:

$$Dp = \frac{P_{\text{in}}}{2}$$

Dp = Pressure drop (psi)

P_{in} = Inlet pressure (psia)

If these conditions do not exist, pressure drop equals the inlet pressure minus the outlet pressure.

$$\text{Is } 44.7 \text{ psia} < \frac{64.7 \text{ psia}}{2} \quad ? \quad \text{—} \quad \text{No.}$$

$$\text{Then } Dp = 64.7 - 44.7 = 20 \text{ psi}$$

4. Using the nomograph, locate the pressure drop (psi) on the vertical line marked "Dp" (Point A).
5. Locate the Nitrogen equivalent flow rate (sccm Nitrogen) on the vertical line marked "Q_{Nitrogen}" (Point B).
6. Draw a line connecting Dp and Q_{Nitrogen} and extend it to the baseline. Mark this point (Point C).
7. Locate inlet pressure (psia) on the vertical line marked "P_{in}" (Point D).
8. Draw a line connecting P_{in} (Point D) and baseline (Point C) and then extend this line to the vertical line marked D_o (orifice diameter, inches) (Point E).
9. This point on the line is the minimum orifice size for the given conditions. If this point is between two orifice sizes, select the next largest size orifice to ensure adequate flow. If the orifice selected falls below .0013, choose .0013 size orifice.

For the example in Figure 4-2 the .007 size orifice would be selected.

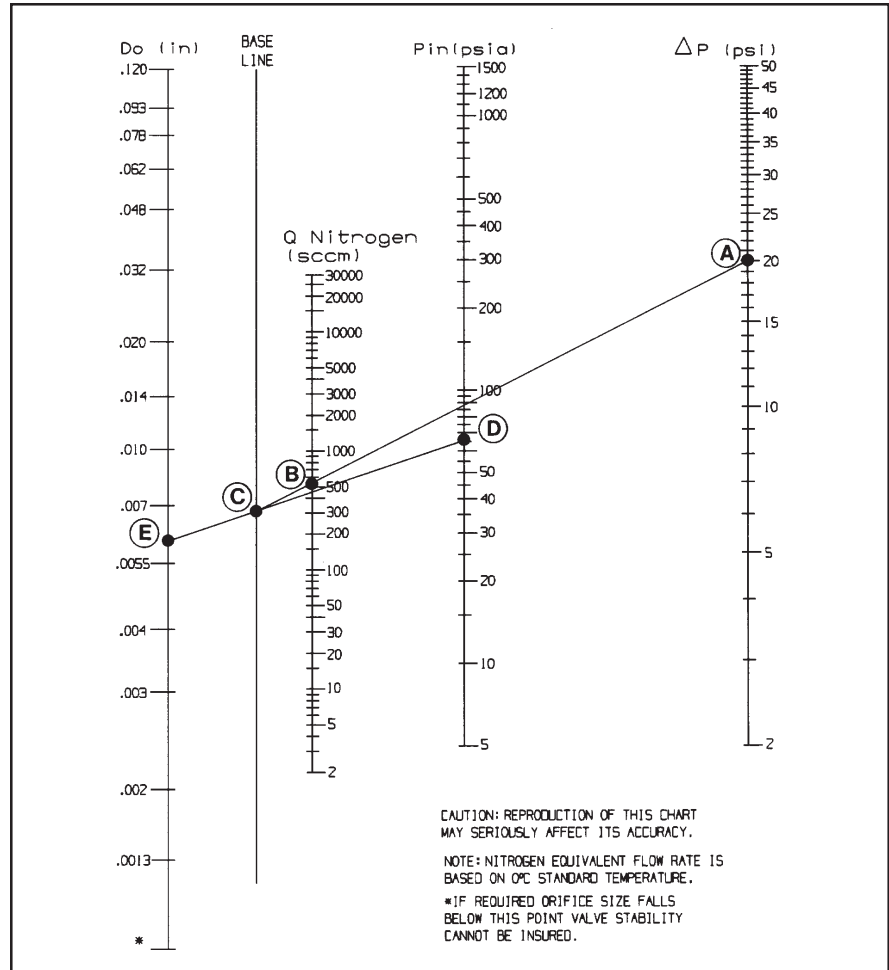


Figure 4-2 Example Nomograph

4-5 Restrictor Sizing

The restrictor assembly is a ranging device for the sensor portion of the controller. It creates a pressure drop which is linear with flow rate. This diverts a sample quantity of the process gas flow through the sensor. Each restrictor maintains the ratio of sensor flow to restrictor flow, however, the total flow through each restrictor is different. Different restrictors (active area) have different pressure drops and produce controllers with different full scale flow rates. For a discussion of the interaction of the various parts of the controller, you are urged to review Section 3-3, Theory of Operation. If the restrictor assembly has been contaminated with foreign matter, the pressure drop versus flow characteristics will be altered and it must be cleaned or replaced. It may also be necessary to replace the restrictor assembly when the mass flow controller is to be calibrated to a new flow rate.

Restrictor assembly replacement should be performed only by trained personnel.

Restrictors

The Model 585xEMH mass flow controller/device uses the Anti-Clog Laminar Flow Element (A.C.L.F.E.).

Sizing

All Model 585xEMH Series Restrictor Assemblies are factory adjusted to provide a specific pressure drop for each flow rate. This corresponds to the desired full scale flow rate. Contact Brooks Instrument for recommended restrictor size and part number.

Example:

The desired gas is Silane (SiH₄).

The desired full scale flow rate is 200 sccm. Sensor conversion factor is 0.625 from Table 4-3.

Nitrogen equivalent flow = 200/0.625 = 320 sccm Nitrogen

In the example above a Size P restrictor would be selected.

Note: If the calculated flow rate is such that two different size restrictors could be used, always select the larger size.

If a mixture of two or more gases is being used, the restrictor selection must be based on a Nitrogen equivalent flow rate of the mixture.

Example:

The desired gas is 20% Helium (He) and 80% Chlorine (Cl) by volume.

The desired full scale flow rate of the mixture is 20 slpm. Sensor conversion factor for the mixture is:

$$\text{Mixture Factor} = \frac{100}{\frac{20}{1.386} + \frac{60}{.676}} = .945$$

Nitrogen equivalent flow = 20/.945 = 21.16 slpm Nitrogen. In this example a Size 4 Wire Mesh Assembly would be selected.

Bulgarian

**Основни инструкции
Прочетете преди работа!**

Brooks Instrument проектира, произвежда и тества продуктите си по такъв начин, че те да отговарят на многобройни национални и международни стандарти. Тези оборудвания трябва правилно да се инсталират, експлоатират и поддържат за да се гарантира, че ще могат да работят съответно на техните нормални спецификации. Следващите инструкции трябва да се спазват и трябва да се включат в програмата за безопасност на труда при инсталирането, експлоатацията и поддръжката на продуктите на Brooks Instrument.

- За да се гарантира характерната производителност, инсталирането, експлоатацията, актуализирането, програмирането и поддръжката на продукта трябва да се извършват само от квалифициран персонал.
- Прочетете всички инструкции преди инсталирането, експлоатацията и поддръжката на продукта. Ако това ръководство не е съответстващото издание, вижте на задната обложка информацията за контакт с местния търговски офис. Запазете това ръководство за по-късно информирание.

▲ ВНИМАНИЕ: Не работете с оборудването извън диапазоните, указани в инструкцията и ръководството по експлоатация. Неизпълнението на това може да доведе до сериозни телесни повреди и / или повреждане на оборудването.

- Ако не разбирате някои инструкциите, свържете се с представителя на Brooks Instrument за изясняване на проблема.
- Спазвайте всички предупреждения, призови и инструкции означени върху оборудването или доставени заедно с него.

▲ ПРЕДУПРЕЖДЕНИЕ: Преди инсталацията се убедете, че този инструмент притежава необходимите одобрения за съответствие на местните и националните кодове. Неспазването на това предупреждение може да доведе до сериозни травми и/или повреда на оборудването.

- Инсталирайте оборудването съответно на указанията в инструкцията за инсталиране и на действащите на местни и национални предписания. Свързвайте продуктите само към подходящи източници на електричество и налягане.
- Ход: (1) Бавно въведете системата под налягане. Бавно отворете работните клапани за да се избегнат колебанията на потока. (2) Проверете дали няма изтичане при входното и изходното съединение на разходомера. Ако няма изтичане, напълнете системата до работно налягане.
- Преди извършване на поддръжката непременно проверете дали работният тръбопровод не се намира под налягане. Ако са необходими резервни части, с определените от Brooks Instrument резервни части трябва да борави само квалифициран персонал. Неразрешените части и процедури могат да окажат влияние върху работата на продукта, и също да застрашат безопасността на експлоатацията. Заместването с неоригинални части може да доведе до пожар, опасност от токов удар или неправилна работа.
- Всички врати на оборудването непременно да бъдат затворени, а защитните покрития да бъдат на мястото си, за да се избегнат токовите удари и телесните повреди, освен ако квалифицирани специалисти извършват работи по неговото поддръжане.

▲ ВНИМАНИЕ: При оборудването с протичащи течности, ако по някаква причина е необходимо да се затворят намиращите се до оборудването изходни и входни клапани, оборудването трябва напълно да се изпразни. Неизпълнението на това може да причини топлинно разширение на течността, което може да спуска оборудването и да доведе до телесни повреди.

Европейска директива за уреди под налягане (PED)

Всички съоръжения под налягане с вътрешно налягане над 0,5 bar (g) и с размер по-голям от 25 mm или 1" (inch), попадат под действието на европейската директива за уреди под налягане (PED).

- Глава „Технически данни“ на настоящото ръководство съдържа свързаните с директивата PED инструкции.
- Указаните в настоящото ръководство продукти съответстват на европейската директива 97/23/EO.
- Всички разходомери на Brooks Instrument се отнасят към флуиди от група 1.
- Продуктите по-големи от 25 mm или 1" (inch) съответстват на I, II или III категория според PED.
- Продуктите с размери 25 mm или 1" (inch), или по-малки, следват добрата инженерна практика (SEP).

Европейска директива за електромагнитна съвместимост (EMC)

Носещото знака CE (електрическо/електронно) оборудване на Brooks Instrument е изпълнило успешно тестовете за проверка на изискванията за електромагнитна съвместимост (директива EMC 2004/108/EC).

Особено внимание трябва да се обърща обаче на избирането на сигналните кабели, използвани с оборудването, носещо знака CE.

Качество на сигналните кабели, кабелните салници и съединители:

Brooks Instrument предлага висококачествени кабели, отговарящи на изискванията на CE сертификацията.

Ако използвате собствен сигнален кабел, трябва да изберете такъв, който е напълно защитен със 100%-ово екраниране.

Съединителите тип „D“ или „кръгов“ трябва да бъдат екранирани с метален щит. При необходимост за фиксирането на щита на кабела трябва да се използват метални кабелни салници.

Щитът на кабела трябва да се свърже с металното покритие или металния салник и в двата края да се екранира в 360°. Щитът трябва да бъде заземен.

Съединителите за печатни платки са стандартно неметални. Използваните кабели трябва да бъдат защитени със 100%-ово екраниране, за да отговарят на CE сертификацията.

Щитът трябва да бъде заземен.

Конфигурация на контактите: Виж приложената инструкция за експлоатация.

Електростатичен разряд (ESD)

▲ ВНИМАНИЕ: Приборът съдържа електронни компоненти, които са чувствителни към статичното електричество и могат да се повредят от него. Трябва да се спазват съответните процедури по време на изваждане, слагане или друго боравене с вътрешните монтажни платки и устройства.

Процедура за работа:

1. Изключете оборудването.
2. Персоналът трябва да се заземи с гривна или друго безопасно и подходящо за целта средство, преди да инсталира, изважда или регулира монтажна платка или друго вътрешно устройство.
3. Печатните монтажни платки трябва да се транспортират в проводяща опаковка. Печатните платки могат да се изваждат от защитното покритие само непосредствено преди инсталирането. Отстранените печатни платки незабавно трябва да се сложат в защитна опаковка, служеща за транспортиране, складиране или връщане на производителя.

Забележки:

Не е уникално явление, че този прибор съдържа чувствителни към електростатичния заряд (ESD) компоненти. Болшинството от съвременните електронни прибори съдържат компоненти, изготвени по технологията метал-окис (NMOS, SMOS и т.н.). Опитът доказва, че даже и малко количество статическо електричество може да повреди или съсипе тези прибори. Повредените компоненти даже ако привидно работят правилно, проявяват начални неизправности.

Brooks® Model 585xEMH

Czech

Základní instrukce

Před instalací si přečtěte následující instrukce!

Společnost Brooks Instrument konstruuje, vyrábí a testuje tento produkt tak, aby splnil mnoho národních a mezinárodních standardů. Přístroje musí být řádně nainstalovány, používány a udržovány tak, aby byl zajištěn jejich nepřetržitý provoz v rámci normálních technických specifikací. Musíte dodržovat následující pokyny a integrovat jejich obsah do svého bezpečnostního programu při instalování, používání a udržování produktů společnosti Brooks.

- Pro zajištění správné funkce zařízení mohou jeho instalaci, obsluhu, programování, údržbu a aktualizace firmwaru provádět výhradně kvalifikované osoby.
- Před instalací, provozem a údržbou produktu si prostudujte všechny pokyny. Pokud tato příručka není tou správnou příručkou pro dané zařízení, informujte se na zadní straně obálky o kontaktu na místní prodejní kancelář. Uchovejte si tuto příručku pro pozdější potřebu.

⚠ UPOZORNĚNÍ: Neprovazujte zařízení v rozsahu mimo daný rozsah v provozní příručce. Porušení tohoto upozornění může mít za následek vážné újmy na zdraví a vést k poškození zařízení.

- Pokud některým pokynům nerozumíte, kontaktujte svého prodejního zástupce společnosti Brooks a vyžádejte si objasnění.
- Dodržujte všechny výstrahy, upozornění a pokyny, uvedené a vyznačené na produktu, nebo s ním dodané.

⚠ VAROVÁNÍ: Před instalací prověřte, zda má tento přístroj požadované schválené parametry splňující místní a národní předpisy. Nedodržení tohoto varování může způsobit vážnou újmu na zdraví osob a/nebo poškození zařízení.

- Namontujte zařízení specifikovaným způsobem podle správné montážní příručky a podle platných místních a národních předpisů. Připojte všechny produkty ke správným zdrojům elektrické energie a stlačených médií.
- Postup: (1) Pomalu do systému přivádějte médium. Pro zabránění vzniku rázů v systému otvírejte procesní ventily postupně. (2) Překontrolujte těsnost vstupního a výstupního připojení průtokoměru. Pokud nezjistíte žádné netěsnosti, postupně zvedejte tlak na provozní hodnotu.
- Před prováděním servisních prací zkontrolujte, zda systém není pod tlakem. V případě potřeby výměny dílů zajistěte, aby byly použity náhradní součásti specifikované společností Brooks Instrument a výměnu prováděla kvalifikovaná osoba. Použití neschválených dílů a postupů může negativně ovlivnit efektivitu a bezpečnost procesu. Použití náhrad za originální díly může způsobit požár, úraz elektrickým proudem nebo nesprávnou funkci.
- Pokud není zrovna prováděna údržba kvalifikovanou osobou, ujistěte se, že zařízení je opatřeno všemi předepsanými kryty.

⚠ UPOZORNĚNÍ: Pokud je u zařízení s průtokem kapalin nutno z jakéhokoli důvodu uzavřít vstupní a výstupní ventily, je nutné zařízení kompletně vyprázdnit. Pokud tak neučiníte, může z důvodu teplotní roztažnosti zbytků média v zařízení dojít k jeho poškození nebo k ohrožení zdraví osob.

Evropská směrnice pro tlakové zařízení (PED)

Na veškerá tlaková zařízení s vnitřním tlakem vyšším než 0,5 baru (g) a velikosti větší než 25 mm nebo 1" (palec) se vztahuje platnost směrnice o tlakovém zařízení (PED).

Kapitola „Technické údaje“ v této příručce obsahuje důležité bezpečnostní a provozní pokyny související se směrnicí PED.

- Produkty popsané v této příručce jsou v souladu se směrnicí EN 97/23/ES.
- Všechny průtokoměry společnosti Brooks Instrument spadají do rámce Kapaliny, skupina I.
- Produkty větší než 25 mm nebo 1" (palec) jsou v souladu se směrnicí PED, kategorií I, II nebo III
- Produkty s velikostí 25 mm nebo 1" (palec) a menší spadají do rámce Správných technických postupů (SEP).

Evropská směrnice pro elektromagnetickou kompatibilitu (EMC)

Elektrické/elektronické zařízení Brooks Instrument nesoucí značku CE bylo úspěšně testováno dle předpisů pro elektromagnetickou kompatibilitu (směrnice EMC č. 2004/108/EC).

Výběru signálních kabelů pro použití se zařízením označeným CE je nutné věnovat zvláštní pozornost.

Kvalita signálních kabelů, kabelových průchodek a konektorů:

Brooks Instrument dodává vysoce jakostní kabely splňující požadavky kvalitativního zařazení CE. Pokud chcete použít vlastní signální kabely, zvolte typy s kvalitním stíněním všech žil a v celé délce trasy.

V případě použití konektorů kruhových nebo tvaru „D“, musí mít tyto kovové stínění. V případě jejich použití, musí kovové kabelové průchodky být propojeny se stíněním kabelu.

Stínění by mělo být připojené ke kovovému tělesu přístroje nebo krytu, na obou koncích kabelu a po celém jeho obvodu.

Stínění by mělo být uzemněno.

Připojky vedoucí ke kartám podle norem jsou nekovové. Pro splnění požadavků předpisů CE musí být použité kabely kompletně stíněny.

Stínění by mělo být uzemněno.

Konfigurace kontaktů je uvedena v přiloženém návodu k obsluze.

Elektrostatický výboj (ESD)

⚠ UPOZORNĚNÍ: Tento přístroj obsahuje komponenty citlivé na poškození statickou elektřinou. Při montáži, demontáži či jiné manipulaci s vnitřními elektronickými obvody je potřeba dodržovat příslušné postupy.

Postup ošetřování:

1. Odpojte přístroj od napájení.
2. Osoba provádějící údržbu má být při instalaci, vyjímání či práci na desce plošných spojů nebo jiné vnitřní elektronice uzemněna zemním náramkem, nebo jiným vyhovujícím způsobem.
3. Desky plošných spojů je nutné přepravovat v elektricky vodivém obalu. Plošné spoje vyjímajte z vodivého obalu až bezprostředně před instalací do přístroje! Plošné spoje vyjmuté z přístroje a určené pro další využití, opět neprodleně umístěte do ochranného obalu.

Poznámky:

Existence prvků, citlivé na elektrostatické výboje (ESD) v přístrojích je častým jevem. Prvky s technologií oxidu kovu (NMOS, SMOS) jsou používány u většiny moderních elektronických zařízení. Zkušenosti dokazují, že i jen malé elektrostatické výboje mohou poškodit nebo zničit tyto zařízení. U poškozených součástí, jakkoli zdánlivě pracujících bezchybně, dochází brzy k poruše.

Dansk

Grundlæggende vejledninger

Læs disse før anvendelse!

Brooks Instruments designer, fremstiller og afprøver sine produkter således, at de tilpasser sig både de indenrigs og internationale standarder. Disse udstyr bør installeres, bruges og repareres omhyggeligt, så at de kan virke tilsvarende deres normale anvendelsesperiode. De følgende regler skal overholdes og implementeres under installationen samt ved brug og reparation.

- For at garantere den passende kapacitet, er udstyrets installation, anvendelse, opdatering, programmering kun tilladt for kvalificeret personale. Alle vejledninger skal læses før produktets installation, anvendelse og reparation.
- Hvis denne manual ikke er den passende udgave, kontakt venligst jeres leverandør for yderligere information.
- Det anbefales at gemme denne manual for senere brug.

▲ OBS.: Udstyret må ikke anvendes til andet end det er angivet i brugsanvisningen. Hvis denne regel brydes, kan der forekomme alvorlige personskader eller brist på udstyret.

Hvis vejledningerne ikke er forståelige, kontakt venligst Deres Brooks repræsentant for at afklare problemet som er opstået.

- Overhold alle regler, som er markeret eller leveret sammen med udstyret.

▲ ADVARSEL! Før ibrugtagning/installation skal det kontrolleres, at det ihændenværende instrument opfylder de lokale og nationale sikkerhedskrav. Hvis denne advarsel ignoreres, kan det resultere i alvorlig personskade og/eller skader på instrumentet.

- Installer udstyret efter den angivne installationsvejledning og gældende lovgivning for anvendelsesområde. Udstyret må kun tilsluttes med kabler og stik som overholder kravspecifikationerne i vejledningen.
- Ibrugtagning: (1) Åbn langsomt for trykket i systemet. Åbn langsomt for alle procesventiler for at forhindre ustabil gas flow. (2) Tjek systemet for lækage ved tilsluttet måleinstrumenter, samlinger og andet tilsluttet udstyr. Derefter øg trykket i systemet indtil arbejdstrykket er opnået.
- Før reparation tjek altid at procesledningen ikke står under tryk. Hvis der er brug for at udskifte defekte dele må kun kvalificeret personale udføre arbejdet og af sikkerhedsmæssige årsager må der kun anvendes originale Brooks reservedele. Det er ikke tilladt at anvende reservedele eller udføre arbejde der på nogen måde kan ændre produktet fra dens oprindelige specifikationer. Manglende overholdelse af de foreskrevne procedurer kan resultere i brænd, og fare for elektrisk stød eller kortslutning.
- Af sikkerhedsmæssige årsager sørg for at alle sikkerhedsforanstaltninger er overholdt. Eksempelvis at alle afskærmninger eller anden form for installationsbeskyttelse er lukket eller installeret ved normal drift.

▲ Advarsel.: Ved brug af udstyr som anvendes til væske skal det sikres at indgangsventilen og udgangsventilen ikke bliver lukket på samme tid i forbindelse med aftapning. Såfremt dette ikke overholdes, er der risiko for at væsken på grund af varmeudvikling ekspanderer og dette kan forårsage skade på udstyr og personer.

Det Europæiske direktiv for trykudstyr (PED)

På alt udstyr hvis indgangstryk er større end 0,5bar (g) og større end 25 mm eller en tomme, gælder det europæiske direktiv for trykapparater. Manualens afsnit "tekniske data" indeholder anvisninger om PED direktivet.

- I manualen angives instrumenter der er tilpasset direktiv 97/23/EK EU.
- Alle Brooks gennemstrømningsmålere tilhører væskegruppe nr. 1.
- Alle instrumenter som er større end 25 mm eller en tomme beskrives i direktivet PED's kategorier I, II eller III.
- Alle instrumenter som er på 25 mm eller en tomme, eller mindre, beskrives i Sound Engineering Practice (SEP).

Det europæiske direktiv for elektromagnetisk kompatibilitet (EMC)

Alle Brooks instrumenter (elektrisk/elektronisk) som har CE markering er godkendt og testet ifølge om elektromagnetiske kompatibilitets forskrifter (EMC direktiv 2004/108/EC).

OBS: Man skal være opmærksom på hvilken type kabler der bruges til CE mærket udstyr..

Om kvalitet af signalkabler, kabeltilslutninger og koblinger:

Brooks tilbyder kabler af højest kvalitet, som er tilpasset CEE kvalificeringens forskrifter. Hvis man vælger at bruge egne kabler, skal man vælge et kabel som har den nødvendige afskærmning for at sikre 100 % mod udefra kommende støj.

Tilslutningerne "D" eller rundformede tilslutninger skal være afskærmet med skal af metal.

Stikket skal være afskærmet på alle sider. Al afskærmning skal jordes..

Card Edge tilslutninger er ifølge standarden ikke metalliske.. De anvendte kabler og stik skal være 100 % afskærmet for at opfylde CE kravene.. De skal ligeledes jordes.

For stik konfigurationen se vedlagte brugsvejledning.

Elektrostatisk afladning (ESD)

▲ OBS.: Udstyret indeholder tilbehør som kan skades ved elektrostatisk elektricitet. Alle forskrifter skal overholdes ved kontakt med alle elektriske komponenter både under drift og vedligeholdelse..

Behandlingsproceduren:

1. Sluk for al strømtilførsel til udstyret.
2. Personer som skal i kontakt med udstyret skal være jordet eller bære anden form for elektrisk beskyttende udstyr. Manglende overholdelse af dette kan medføre skader på alle elektriske komponenter.
3. Alle elektriske komponenter skal opbevares eller transporteres i deres originale indpakning for at sikre komponenter mod statiske elektriske skader. Emballagen må ikke åbnes før komponenten skal installeres i udstyret. Ved afslutning af vedligeholdelse/reparation af udstyret, skal udstyret installeres med det samme eller pakkes forsvarligt hvis det skal på lager eller transporteres.

Bemærkninger:

Dette udstyr er ikke unik i den hensigt, at det indeholder for elektrostatisk afladning (ESD) sensitive reservedel. I de fleste elektronisk udstyr findes der metaloxyd teknologiske reservedel (NMOS, SMOS m.m.). Erfaringerne viser at selv den mindste statiske elektricitet kan skade, eller ødelægge disse instrumenter. Selv en fungerende elektrisk del kan have levetiden markant reduceret på grund af statisk elektricitet..

Brooks® Model 585xEMH

Dutch

Essentiële instructies Lees ze voordat u verder gaat!
<p>Brooks Instrument ontwerpt, produceert en test haar producten zodanig dat ze voldoen aan vele nationale en internationale normen. Deze producten moeten correct worden geïnstalleerd, bediend en onderhouden zodat ze binnen hun normale specificaties blijven werken. De volgende instructies moeten worden toegevoegd aan en geïntegreerd in uw veiligheidsprogramma als u producten van Brooks Instrument installeert, bedient en onderhoudt.</p> <ul style="list-style-type: none"> Om de juiste prestaties te kunnen garanderen mag alleen gekwalificeerd personeel het product installeren, bedienen, updaten, programmeren en onderhouden. Lees alle instructies voordat u het product gaat installeren, bedienen en onderhouden. Als dit niet de juiste handleiding is, kijk dan op de achterzijde voor contactinformatie van uw vertegenwoordiger. Bewaar deze handleiding voor later. <p>▲ WAARSCHUWING: gebruik dit instrument niet als niet is voldaan aan de specificaties in de handleiding. Het niet naleven van deze waarschuwing kan ernstig letsel en/of schade aan de apparatuur tot gevolg hebben.</p> <ul style="list-style-type: none"> Als u één of meer instructies niet begrijpt, vraag dan om uitleg aan uw vertegenwoordiger van Brooks Instrument. Neem alle waarschuwingen, voorschriften en instructies in acht die op het product zijn aangebracht of bij het product zijn geleverd. <p>▲ WAARSCHUWING: Zorg ervoor dat dit instrument de vereiste goedkeurings-classificatie heeft om te voldoen aan de lokale en nationale standaarden, voordat u het gaat installeren. Het niet naleven van deze waarschuwing kan ernstig letsel en/of schade aan de apparatuur tot gevolg hebben.</p> <ul style="list-style-type: none"> Installeer uw apparatuur volgens de instructies in de bijgeleverde handleiding en in overeenstemming met de geldende lokale en nationale voorschriften. Sluit alle producten aan op de juiste elektrische voedings- en drukbronnen. Bediening: (1) Laat het systeem langzaam volstromen. Open de procesafsluiters langzaam om drukstoten te voorkomen. (2) Controleer op lekkages rondom de inlaat- en uitlaataansluitingen van de stromingsmeter. Als er geen lekkages zijn, kan het systeem op de bedrijfsdruk worden gebracht. Zorg ervoor dat de procesleiding drukvrij is gemaakt voordat u servicewerkzaamheden gaat uitvoeren. Als vervangingsonderdelen nodig zijn, zorg er dan voor dat gekwalificeerd personeel de door Brooks Instrument gespecificeerde vervangingsonderdelen gebruikt. Niet goedgekeurde onderdelen en procedures kunnen de prestaties van het product en de veilige werking van uw proces in gevaar brengen. Niet goedgekeurde vervangingsonderdelen kunnen brand, elektrische schokken of een onjuiste werking tot gevolg hebben. Zorg ervoor dat alle deksels van de apparatuur gesloten zijn en de afdekkingen gemonteerd zijn om elektrische schokken en lichamelijk letsel te voorkomen, behalve als gekwalificeerd personeel de onderhoudswerkzaamheden uitvoert. <p>▲ WAARSCHUWING: bij vloeistofstroomapparaten waarvan de inlaat- en uitlaatkleppen om welke reden dan ook gesloten zijn, moet de vloeistof volledig worden afgetapt. Als dat wordt nagelaten, kan dit leiden tot thermische expansie van de vloeistof waardoor het apparaat kan barsten en lichamelijk letsel kan veroorzaken.</p>

PED (Pressure Equipment Directive)
<p>Alle drukapparatuur met een interne druk van meer dan 0,5 barg en een diameter van meer dan 25 mm valt onder de PED-richtlijn.</p> <ul style="list-style-type: none"> In het hoofdstuk Specificaties van deze handleiding staan aanwijzingen die verband houden met de PED-richtlijn. De producten die in deze handleiding worden beschreven, voldoen aan de Europese richtlijn 97/23/EG. Alle stromingsmeters van Brooks Instrument vallen in groep 1. Producten met een diameter van meer dan 25 mm voldoen aan de categorieën I, II of III van de PED-richtlijn. Producten met een diameter van 25 mm of kleiner voldoen aan de regels van goed vakmanschap.

Elektromagnetische compatibiliteit (EMC)
<p>De elektronische apparatuur van Brooks Instrument met de CE-markering is succesvol getest in overeenstemming met de EMC-voorschriften (richtlijn EMC 2004/108/EC).</p> <p>De keuze van de signaalkabel voor gebruik in combinatie met apparatuur met CE-markering verdient speciale aandacht.</p> <p>Kwaliteit van de signaalkabel, kabelafdichtingen en stekkers:</p> <p>Brooks Instrument levert hoogwaardige kabels die voldoen aan de specificaties voor de CE-markering.</p> <p>Als u zelf voor signaalkabel zorgt, moet u altijd een volledig afgeschermd kabel gebruiken.</p> <p>Stekkers van het type "D" of ronde stekkers moeten zijn voorzien van een metalen afscherming. Indien nodig moeten metalen kabelafdichtingen worden gebruikt waarvan de afscherming voor het klemmen van de kabel kan worden gebruikt.</p> <p>Het kabelscherm moet met het metalen omhulsel of de metalen afdichting worden verbonden en aan beide uiteinden rondom volledig worden afgeschermd.</p> <p>De afscherming moet aan de aardpotentiaal worden aangesloten.</p> <p>Card Edge Connectors zijn standaard niet van metaal. De gebruikte kabels moeten volledig zijn afgeschermd om te voldoen aan de CE-markering.</p> <p>De afscherming moet aan de aardpotentiaal worden aangesloten.</p> <p>Voor de pinconfiguratie: Raadpleeg de bijgevoegde handleiding.</p>

Elektrostatische ontlading
<p>▲ VOORZICHTIG: Dit instrument bevat elektronische componenten die gevoelig zijn voor statische elektriciteit. Neem de juiste procedures in acht bij het verwijderen en installeren of bij andere werkzaamheden aan de interne printplaten of apparaten.</p> <p>Procedure:</p> <ol style="list-style-type: none"> Schakel de voeding van de eenheid uit. Het personeel moet zich met een polsbandje of ander veilig en geschikt hulpmiddel aarden voordat een printplaat of ander intern apparaat mag worden geïnstalleerd, verwijderd of aangepast. Printplaten moeten in een geleidende verpakking worden vervoerd. De platen mogen pas vlak voor de eigenlijke installatie uit de beschermende verpakking worden gehaald. Verwijderde printplaten moeten onmiddellijk in de beschermende verpakking worden geplaatst om te worden getransporteerd, opgeslagen of teruggestuurd naar de fabriek. <p>Opmerkingen</p> <p>Dit instrument is niet uniek als het gaat om componenten die gevoelig zijn voor elektrostatische ontlading. De meeste moderne elektronische apparaten bevatten componenten die gebruik maken van de metaaloxidetechnologie (NMOS, SMOS, enz.). Uit ervaring blijkt dat zelfs kleine hoeveelheden statische elektriciteit deze apparaten al dan niet onherstelbaar kunnen beschadigen. Beschadigde componenten, zelfs als ze goed lijken te functioneren, raken eerder defect.</p>

Estonian

Olulised juhised**Enne kasutamist lugege hoolikalt läbi!**

Brooks Instrumenti konstrueerib, valmistab ja katsetab oma tooteid sellisel viisil, et need vastaksid paljudele riiklikele ja rahvusvahelistele standarditele. Ainult nõuetekohane paigaldamine, kasutamine ja hooldamine tagab toodete katkematu talituse tavaspetsifikatsiooni raames. Brooks Instrumenti toodete paigaldamisel, kasutamisel ja hooldamisel tuleb täita alljärgnevaid juhiseid ja integreerida need asjakohasesse ohutusprogrammi.

- Nõuetekohase talituse tagamiseks tohib toodet paigaldada, kasutada, täiustada, programmeerida ja hooldada ainult kvalifitseeritud personal.
- Enne toote paigaldamist, kasutamist ja hooldamist lugege kõik kasutusjuhised hoolikalt läbi. Kui see kasutusjuhend ei vasta teie tootele, pöörduge kohaliku edasimüüja poole, kelle kontaktandmed leiате kasutusjuhendi tagakaanelt. Hoidke see kasutusjuhend edaspidiseks alles.
 - ▲ **HOIATUS. Ärge kasutage seda instrumenti väljaspool kasutusjuhendis spetsifitseeritud piirväärtusi. Hoiatuse eiramine võib kaasa tuua raske kehavigastuse ja/või kahjustada seadet.**
- Kui te saa mõne juhise mõtte aru, pöörduge selgituste saamiseks kohaliku Brooks Instrumenti edasimüüja poole.
- Järgige kõiki hoiatusi, tähelepanule manitsusi ja juhiseid, mis on tootele peale kantud või tootega kaasa antud.
 - ▲ **HOIATUS. Enne paigaldamist veenduge, et see instrument vastaks kohalike ja riiklike määrustega kehtestatud nimiaandmetele. Hoiatuse eiramine võib kaasa tuua raske kehavigastuse ja/või kahjustada seadet.**
- Seadme paigaldamisel järgige vastavas kasutusjuhendis toodud paigaldusjuhiseid ning asjakohaseid kohalikke ja riiklikke eeskirju. Ühendage tooted nõuetekohaste toite- ja surveallikatega.
- Talitlus. (1) Avage aeglaselt vool süsteemi. Vooluimpulsside vältimiseks avage töövõti aeglaselt. (2) Kontrollige, et voolukulumõõtur sisend- või väljundühenduste ümber ei oleks lekkeid. Kui lekkeid ei ole, laske süsteemil saavutada töösurve.
- Enne seadme hooldamist veenduge, et kogu süsteem oleks surve alt vabastatud. Varuosasid tohib vahetada ainult kvalifitseeritud personal, kasutades selleks Brooks Instrumenti heakskiidetud varuosi. Mitteoriginaalvaruosade kasutamine ja ebapädev toimingute tegemine võivad kahjustada toote tööomadusi ja põhjustada riski tootmistegevuse ohutuse tagamiseks. Originaalvaruosadele sarnaste osade kasutamine võib põhjustada tule- või elektrilöögi- ja vigastuseohtu või seadme väärtalitust.
- Elektrilöögi- ja vigastuseohtu vältimiseks peavad seadme luugid olema alati suletud ja kaitsekatted oma kohal, v.a seadme hooldamisel kvalifitseeritud isikute poolt.
 - ▲ **HOIATUS. Voolava vedelikuga seadmete kasutamisel – kui seadmega külgnevad sisend- ja väljundklapid on vaja mingil põhjusel sulgeda, tuleb seadmed vedelikust täiesti tühjaks lasta. Vastasel korral võib vedelik soojuse mõjul paisuda niivõrd, et seade puruneb. See võib põhjustada raskeid kehavigastusi.**

Euroopa surveseadmete direktiiv (PED)

Euroopa surveseadmete direktiiv kohaldub kõikidele surveseadmetele, mille sisesurve on üle 0,5 baari (g) ja läbimõõt üle 25 mm või 1 tolli.

- Selle kasutusjuhendi spetsifikatsiooniosa sisaldab surveseadmete direktiivi seonduvaid juhiseid.
- Kasutusjuhendis kirjeldatud tooted vastavad EL direktiivi 97/23/EÜ nõuetele.
- Brooks Instrumenti voolukulumõõturid kuuluvad vedelike 1. gruppi.
- Tooted läbimõõduga üle 25 mm või 1 tolli vastavad surveseadmete direktiivi kategooriale I, II või III.
- Toodetele läbimõõduga alla 25 mm või 1 tolli kohaldatakse häid inseneritavasid.

Euroopa elektromagnetilise ühilduvuse direktiiv (EMÜ)

Brooks Instrumenti (elektrilised/elektroonilised) seadmed, millele on omistatud CE-tähis, on edukalt läbinud asjakohased katsed ja vastavad elektromagnetilise ühilduvuse nõuetele (EMÜ direktiiv 2004/108/EÜ).

Kuid signaalkaabli valimisel on vaja pöörata suurt tähelepanu CE-tähisega seadmetele.

Signaalkaabli, läbiviigutihendite ja konnektorite kvaliteet

Brooks Instrument turustab kõrgekvaliteedilisi kaableid, mis vastavad CE-sertifikaadi nõuetele.

Olemasoleva kaabli kasutamisel jälgige, et kaabel oleks täielikult ümbritsetud varjestusega.

„D“- või „Ring“-tüüpi konnektorid peavad olema varustatud metallvarjestusega. Võimaluse korral tuleb kasutada metallist läbiviike, mis tagavad kaabli varjestuse ühenduse.

Kaabli varjestus ühendatakse metallkesta või läbiviigutihendiga ja on mõlemast otsast kaitstud 360° ulatuses.

Varjestus peab olema maandatud.

Mikroskeemide servaühendused on üldjuhul mittemetallist. Vastavuse tagamiseks CE-sertifikaadi nõuetele peavad kasutatud kaablid olema 100% varjestatud.

Varjestus peab olema maandatud.

Klemmide konfigureerimine: vt komplekti kuuluvat kasutusjuhendit.

Elektrostaatiline laeng

▲ **TÄHELEPANU!** Seade sisaldab staatilise elektri suhtes tundlikke elektroonikakomponente. Seadmesse paigaldatud trükkplaatide eemaldamisel ja paigaldamisel, samuti trükkplaadi või seadmega muude toimingute teostamisel järgige nõuetekohase käsitsemise juhiseid.

Käsitsemisjuhised

1. Lahutage seade toiteallikast.
2. Enne trükkplaadi või mõne muu siseelemendi paigaldamist, eemaldamist või konfigureerimist peab personal olema maandatud läbi randmepaela või mõne muu sobiva vahendi.
3. Trükkplaate transportitakse voolujuhtivas konteineris. Võtke trükkplaat kaitsvast konteinerist välja vahetult enne selle paigaldamist. Seadmest eemaldatud trükkplaadid tuleb viivitamatult asetada kaitsvasse konteinerisse, kas siis edasiseks transportimiseks, hoiustamiseks või tehasesse tagasisaatmiseks.

Kommentaariid

See seade ei ole ainus, mis sisaldab staatilise elektri suhtes tundlikke elemente. Enamik kaasasestest elektroonikaseadmetest sisaldavad komponente, mille valmistamiseks on kasutatud metalloksiidtehnoloogiat (NMOS, SMOS jne). Kogemused näitavad, et isegi väike kogus staatilist elektrit võib neid seadmeid kahjustada või isegi hävitada. Kuigi võib näida, et kahjustatud komponendid töötavad nõuetekohaselt, hakkavad talitlushäired ilmnema juba varakult.

Brooks® Model 585xEMH

Finnish

Perusohjeet

Lue ensin ohjeet huolellisesti!

Brooks Instrument suunnittelee, valmistaa ja testaa laitteensa vastaamaan useimpien kotimaisten ja kansainvälisten standardien vaatimuksia. Tuotteet tulee asentaa, käyttää ja huoltaa käyttöohjeiden mukaan jotta niiden toimivuus taataan. Brooks Instrumentin laitteiden asennuksessa, käytössä ja huollossa on noudatettava soveltuvia määräyksiä ja ohjeita, lisäksi mainitut ohjeet on huomioitava työsuojelun ohjeistuksessa.

Oikean toiminnan varmistamiseksi vain valtuutettu huoltohenkilö saa asentaa, käynnistää, päivittää, ohjelmoida ja huoltaa laitteita.

Lue kaikki käyttöohjeet koskien tuotteen asennusta, käyttöä ja huoltoa. Jos käyttöohje on puutteellinen, lisätietoja saa paikalliselta jälleenmyyjältä. Yhteystiedot löytyvät oppaan kansilehdestä. Säilytä ohjeet.

VAROITUS! Käyttöohjeessa ilmoitettujen standardien mukaisia ohjeita ja raja-arvoja ei saa ylittää. Rajoitusten laiminlyönti voi aiheuttaa tuotteen rikkoutumisen ja/tai vakavan henkilövahingon vaaran.

- Jos ohjeissa on epäselvyyttä, ota yhteyttä Brooks Instrumentin edustajaan ongelman selvittämiseksi.
- Noudata kaikkia laitteessa olevia tai siihen liittyviä ohjeita, määräyksiä ja varoituksia.

VAROITUS! Tarkista ennen asennusta, että tällä laitteella on paikallisten ja maasi koodien mukaiset hyväksyntäluokituksset. Tämän varoituksen laiminlyönnistä saattaa aiheutua vakava vamma ja/tai laitevaurio.

- Laitteen asennuksessa on noudatettava erityisiä asennusohjeita sekä voimassa olevia paikallisia ja kansainvälisiä määräyksiä. Laitteet saa yhdistää vain sopivaan sähkö- ja paineverkkoon.
- Asennusohjeita: (1) Päästä virtaus hitaasti järjestelmään. Avaa venttiilit hitaasti, jotta virtaus pysyy tasaisena. (2) Tarkista, ettei virtausmittarin sisään- ja ulosmenon liitoksissa ole vuotoa. Jos järjestelmässä ei ole vuotoa, aseta oikea käyttöpaine.
- Tarkista, että laitteeseen menevä paine on katkaistu ennen laitteen korjaamista välttääksesi loukkaantumiseriskin. Mahdollisten varaosien tulee olla Brooks Instrumentin hyväksymiä. Vain valtuutettu huoltohenkilö saa asentaa varaosat. Ei-hyväksytyjen varaosien käyttö voi vahingoittaa tuotteen toimintaa ja aiheuttaa turvallisuusriskin. Samoin ei-hyväksytyjen varaosien käyttö voi aiheuttaa tulipalon, sähköiskun tai virhetoiminnan riskin.
- Varmista että kaikki laitteiden ovet/luukut ovat suljettuina ja tarkista että suojakannet ovat paikoillaan estääksesi mahdollisen sähköisku- ja loukkaantumisvaaran.

VAROITUS! Jos järjestelmässä virtaa neste ja laitteen sisään- ja ulosmenoveritit pitää sulkea, laite on ensin tyhjennettävä kokonaan. Tyhjentämisen laiminlyönti aiheuttaa nesteen lämpölaajenemista, joka saattaa johtaa laitteen rikkoutumiseen ja henkilövahingon vaaraan.

Eurooppalainen painelaitedirektiivi (PED)

Painelaitteet, joiden paine on suurempi kuin 0,5 bar (g) ja joiden koko on suurempi kuin 25 mm tai 1 tuuma, kuuluvat eurooppalaiseen painelaitedirektiiviin (PED).

- PED direktiiviä koskevat määräykset löytyvät käyttöoppaan "Tekniset tiedot" -luvusta.
- Käyttöoppaassa kuvatut tuotteet ovat 97/23/EC EU-direktiivin mukaisia.
- Kaikki Brooks Instrumentin virtausmittarit kuuluvat ryhmään 1. Laitteet, jotka ovat suurempia, kuin 25 mm tai 1 tuuma, ovat PED I, II, III kategorioiden mukaisia.
- Mittarit joiden koko on alle 25 mm tai 1 tuuma ovat hyvän konepajakäytännön (SEP) mukaisia.

Eurooppalainen direktiivi sähkömagneettisesta yhteensopivuudesta (EMC)

Brooks Instrumentin CE-merkin saaneet (sähkö/sähköiset) laitteet täyttävät EMC direktiivin vaatimukset ja testit sähkömagneettisesta yhteensopivuudesta (2004/108/EC EMC direktiivi).

Erityistä huomiota on kiinnitettävä CE-merkittyjen laitteiden käytössä olevien kaapelien valintaan.

Kaapelien, kiinnikkeiden ja liittimien laatu:

Brooks Instrumentin kaapelit ovat korkealaatuisia ja täyttävät CE-merkintä direktiivin vaatimukset.

Muun valmistajan kaapelia käytettäessä on käytettävä 100% suojattua kaapelia.

Liittimien tulee olla häiriösuojattua tyyppiä. Tarvittaessa käytetään metallisia kiinnikkeitä kaapelien suojuksen kiinnittämiseen. Kaapelien suojuksen pitää olla yhdistettynä metallisuojukseen tai laippaan ja sen pitää olla molemmista päistä suojattuna 360°. Suojaus päättyy maadoitukseen.

Standardin mukaan korttien liittimet eivät ole metallisia. Käytettyjen kaapelien suojaus on oltava 100%, jotta se täyttäisi CE-merkinnän direktiivin vaatimukset.

Suojaus päättyy maadoitukseen.

Napojen järjestys: Katso liitteessä oleva käyttöopas.

Elektrostaattinen purkaus (ESD)

VAROITUS! Tuote sisältää elektroniikkakomponentteja jotka voivat vahingoittua staattisesta sähköstä. Sisäisten piirilevyjen purkamisessa, asennuksessa ja käsittelyssä tulee noudattaa kaikkia määräyksiä ja ohjeita.

Asennusohjeet:

1. Järjestelmän sähköt katkaistaan.
2. Laitteen kanssa työskentelevä henkilö on suojattava sähköiskuilta rannehihnalla tai muulla suojaruuvilla ennen piirilevyn tai muun sisäosan asennusta, poistamista tai korjaamista.
3. Piirilevyt kuljetetaan antistaattisessa pakkauksessa. Piirilevyt puretaan paketista juuri ennen asennusta. Poistettu piirilevy on heti pakattava soveltuvaan suojauspakkaukseen kuljettamista, varastamista tai palautusta varten.

Huomautukset:

Tuotteen herkkyys elektrostaattiselle purkaukselle (ESD) ei ole epätavallista. Suurin osa elektroniikkatuotteista sisältää komponentteja jotka hyödyntävät metallioksiditeknologiaa (NMOS, SMOS jne.) Kokemusten mukaan pienikin elektrostaattinen purkaus voi aiheuttaa laitteiden virhetoiminnan tai vahingoittumisen. Vahingoittuneet komponentit saattavat aiheuttaa laitteen ennenaikaisen rikkoutumisen vaikka laite näyttäisi toimivan normaalisti.

French

Instructions essentielles A lire avant de commencer !
<p>Brooks Instrument conçoit, fabrique et teste ses produits pour répondre à de nombreuses normes nationales et internationales. Ces produits doivent être correctement installés, utilisés et entretenus pour pouvoir fonctionner dans le cadre de leurs spécifications normales. Les instructions qui suivent doivent être respectées et intégrées à votre programme de sécurité lors de l'installation, l'utilisation et l'entretien des produits Brooks Instrument.</p> <ul style="list-style-type: none"> Afin d'assurer un fonctionnement correct, faites appel à du personnel qualifié pour l'installation, l'utilisation, la mise à jour, la programmation et l'entretien du produit. Lisez toutes les instructions avant l'installation, l'utilisation et l'entretien du produit. Si le présent manuel d'utilisation n'est pas le bon, consultez la dernière page de la couverture pour connaître le point de vente le plus proche. Conservez ce manuel d'utilisation pour pouvoir vous y reporter par la suite. <p>▲ AVERTISSEMENT: n'utilisez pas cet instrument au-delà des spécifications énumérées dans le manuel d'utilisation. Le non-respect de cet avertissement peut entraîner de graves blessures et / ou endommager l'équipement.</p> <ul style="list-style-type: none"> Si vous ne comprenez pas l'une des instructions, prenez contact avec un représentant de Brooks Instrument pour obtenir des explications. Tenez compte de tous les avertissements, précautions et instructions marquées sur le produit et fournies avec celui-ci. <p>▲ AVERTISSEMENT: Avant toute installation, vérifier que cet instrument est conforme aux normes locales et nationales. Le non-respect de cet avertissement peut entraîner des blessures graves et/ou endommager l'équipement.</p> <ul style="list-style-type: none"> Installez votre équipement de la façon indiquée dans les instructions d'installation du manuel d'utilisation et conformément à la législation en vigueur au niveau local et national. Branchez tous les produits aux sources d'électricité et de pression agréées. Utilisation : (1) Faites lentement entrer le débit dans le système. Ouvrez progressivement les vannes de procédé pour éviter des pics de débits. (2) Vérifiez qu'il n'y a pas de fuite au niveau des branchements d'entrée et de sortie du débitmètre. S'il n'y a pas de fuite, amenez le système à sa pression d'utilisation. Avant de procéder à l'entretien, assurez-vous que la conduite de procédé n'est plus sous pression. Lorsqu'il faut remplacer une pièce, assurez-vous que les pièces de rechange sont celles indiquées par Brooks Instrument et que des personnes qualifiées effectuent le remplacement. Les pièces et procédures non autorisées peuvent porter atteinte au fonctionnement du produit et mettre en péril la sécurité de votre procédé. Les remplacements par des pièces d'apparence similaire peuvent entraîner des incendies, des risques électriques ou un mauvais fonctionnement. Vérifiez que toutes les trappes de l'équipement sont fermées et que les couvercles de protection sont en place pour éviter les chocs électriques et les blessures, sauf lorsque l'entretien est réalisé par des personnes qualifiées. <p>▲ AVERTISSEMENT: dans le cas d'appareils à écoulement liquide, si les vannes d'entrée et de sortie adjacentes aux appareils doivent être fermées pour une raison quelconque, les appareils doivent être complètement vidangés. Si cela n'est pas fait, une éventuelle dilatation thermique du fluide peut casser l'appareil et provoquer des blessures.</p>

Directive européenne « équipements sous pression » (PED)
<ul style="list-style-type: none"> Tous les équipements sous pression dont la pression interne est supérieure à 0,5 bar (pression relative) et dont la taille dépasse 25 mm ou un pouce entrent dans le cadre de la directive PED. La section « Spécifications » de ce manuel contient les instructions relatives à la directive PED. Les appareils de mesure de ce manuel sont conformes à la directive EN 97/23/EC. Tous les débitmètres Brooks Instrument fonctionnent avec des fluides de groupe 1. Les appareils de mesure d'une taille supérieure à 25 mm ou un pouce entrent dans la catégorie PED I, II ou III. Les appareils de mesure d'une taille inférieure ou égale à 25 mm ou un pouce relèvent des « bonnes pratiques d'ingénierie » (SEP).

Compatibilité électromagnétique européenne (CEM)
<p>L'équipement Brooks Instrument (électrique / électronique) portant le marquage CE répond à la réglementation en matière de compatibilité électromagnétique (directive CEM 2004/108/EC).</p> <p>Il faut cependant prêter une grande attention au choix du câble d'interconnexion à utiliser avec l'équipement marqué CE.</p> <p>Qualité du câble d'interconnexion, des presse-étoupes et connecteurs :</p> <p>Brooks Instrument fournit un ou des câbles de qualité supérieure qui répondent aux spécifications exigées pour la certification CE.</p> <p>Si vous utilisez votre propre câble d'interconnexion, ce câble doit être protégé par un blindage intégral.</p> <p>Les connecteurs rectangulaires ou circulaires utilisés doivent avoir un blindage métallique. S'il y a lieu, des presse-étoupes métalliques doivent faire office de serre-écran de câble.</p> <p>L'écran du câble doit être raccordé à l'enveloppe métallique ou au presse-étoupe et blindé aux deux extrémités sur 360 degrés.</p> <p>Le blindage doit s'achever sur une prise de terre.</p> <p>Les connecteurs de carte standards sont non métalliques. Les câbles utilisés doivent être protégés par un blindage intégral pour se conformer à la certification CE.</p> <p>Le blindage doit s'achever sur une prise de terre.</p> <p>En ce qui concerne la configuration des broches, veuillez vous reporter au manuel d'utilisation joint.</p>

ESD (décharge électrostatique)
<p>▲ ATTENTION : cet instrument contient des composants électroniques sensibles à l'électricité statique. Des procédures de manipulation adéquates doivent être respectées pendant le retrait, l'installation ou la manipulation des cartes de circuits imprimés ou des dispositifs internes.</p> <p>Procédure de manipulation :</p> <ol style="list-style-type: none"> L'alimentation électrique de l'appareil doit être coupée. Le personnel doit être mis à la terre, au moyen d'une bande de poignet ou d'un autre moyen sûr et adéquat, avant l'installation, le retrait ou le réglage de toutes les cartes de circuits imprimés ou autres dispositifs internes. Les cartes de circuits imprimés doivent être transportées dans un récipient conducteur. Les cartes ne doivent être enlevées de cette enveloppe protectrice qu'au dernier moment, juste avant l'installation. Les cartes retirées doivent être immédiatement placées dans un récipient de protection pour le transport, le stockage ou le retour à l'usine. <p>Observations</p> <p>Brooks Instrument n'est pas le seul à proposer des produits comportant des composants sensibles aux décharges électrostatiques. La plupart des produits électroniques modernes contiennent des composants qui utilisent des technologies à oxydes métalliques (NMOS, SMOS, etc.). L'expérience démontre que d'infimes quantités d'électricité statique suffisent à endommager ou détruire ces appareils. Les composants endommagés, même s'ils semblent fonctionner correctement, tombent rapidement en panne.</p>

Brooks® Model 585xEMH

German

Wichtige Anweisungen Bitte zuerst lesen!

Brooks Instrument entwickelt, produziert und testet seine Produkte derart, dass sie viele nationale und internationale Standards erfüllen. Nur bei korrektem Einbau sowie richtiger Bedienung und Wartung dieser Produkte ist ein Betrieb unter Einhaltung der Standardvorgaben sichergestellt. Die folgenden Anweisungen müssen eingehalten werden und in Ihr Sicherheitsprogramm integriert werden, wenn Sie Brooks Produkte installieren, bedienen und warten.

- Um die entsprechende Leistung zu gewährleisten, setzen Sie qualifiziertes Personal für die Installation, den Betrieb, die Aktualisierung, Programmierung und Wartung des Produkts ein.
- Lesen Sie alle Anweisungen, bevor Sie das Produkt installieren, in Betrieb nehmen und warten. Falls es sich bei diesem Handbuch nicht um das richtige Handbuch handelt, schauen Sie bitte auf der Rückseite nach den Kontaktdaten Ihres Vertriebsbüros vor Ort. Bewahren Sie dieses Handbuch auf, falls Sie später etwas nachschauen möchten.

▲ WARNUNG: Dieses Gerät nicht außerhalb der in Bedienungsanleitung und Handbuch angegebenen Grenzen betreiben. Wird diese Warnung nicht beachtet, kann dies zu schweren Personenschäden bzw. Schäden des Gerätes führen.

- Falls Sie Anweisungen nicht verstehen, wenden Sie sich zur Klärung an Ihren Brooks Instrument Vertreter.
- Befolgen Sie alle Warnhinweise und Anweisungen, die auf dem Produkt markiert sind oder zusammen mit diesem geliefert werden.

▲ ACHTUNG: Vor der Installation sicherstellen, dass dieses Instrument den nationalen und lokalen Vorschriften entspricht. Die Nichtbeachtung kann zu schweren Verletzungen und/oder Schäden am Gerät führen.

- Installieren Sie Ihr Gerät, wie in den Installationsanweisungen des entsprechenden Handbuchs angegeben und gemäß der gültigen regionalen und nationalen Gesetze. Schließen Sie alle Produkte an eine geeignete Strom- und Druckluftversorgung an.
- Bedienung: (1) Langsam den Zufluss zum System starten. Die Ventile langsam öffnen, um einen sprunghaften Anstieg der Durchflussmenge zu verhindern. (2) Bereich der Anschlüsse (Zufluss und Ausfluss) des Durchflussmessers auf Undichtigkeiten überprüfen. Wenn das System dicht ist, auf Betriebsdruck hochfahren.
- Sicherstellen, dass der Leitungsdruck vor Wartungsarbeiten heruntergefahren wird. Wenn Ersatzteile benötigt werden, stellen Sie sicher, dass qualifizierte Personen Ersatzteile verwenden, die von Brooks Instrument vorgegeben sind. Nicht genehmigte Teile und Verfahren können die Leistungsfähigkeit des Produkts beeinträchtigen und den sicheren Betrieb Ihres Prozesses gefährden. Ähnlich aussehende Austauschteile können zu Bränden, elektrischen Gefahren oder nicht sachgerechtem Betrieb führen.
- Stellen Sie sicher, dass alle Türen der Anlage geschlossen sind und dass alle Schutzabdeckungen angebracht sind, um Stromschläge und Personenschäden zu vermeiden, es sei denn die Wartungsaufgaben werden von qualifizierten Personen durchgeführt.

▲ WARNUNG: Werden die Ein- und Auslassventile neben Durchflussmessgeräten aus irgendwelchen Gründen geschlossen, so müssen die Geräte komplett entleert werden.

Durchflussmessgeräete muessen vor dem Schliessen von Ein- und Auslassventilen komplett entleert werden, anderenfalls kann es zu einer thermischen Ausdehnung der Flüssigkeit und damit zum Bruch des Gerätes kommen; Personenschäden können die Folge sein.

Europäische Druckgeräterichtlinie (PED)

Alle Druckgeräte mit einem internen Druck von mehr als 0,5 bar (g) und einer Größe von mehr als 1 in (1 in = 25,4 mm) unterliegen der Druckgeräterichtlinie.

- Das Kapitel zu den technischen Daten in dieser Anleitung enthält wichtige Sicherheits- und Betriebsanweisungen in Bezug auf die Druckgeräterichtlinie.
- Produkte die in diesem Handbuch beschrieben sind, erfüllen die europäische Richtlinie 97/23/EG.
- Alle Durchflussmesser von Brooks Instrument fallen unter die Fluidgruppe 1.
- Produkte die größer als 25 mm oder 1" (inch) sind, erfüllen die Kategorien I, II oder III der Druckgeräterichtlinie (PED).
- Produkte mit einer Größe von 25 mm oder 1" (inch) oder kleiner sind Sound Engineering Practice (SEP).

Europäische Verordnung zur elektromagnetischen Verträglichkeit (EMV)

Geräte von Brooks Instrument (elektrischer und elektronischer Art) mit CE-Zeichen haben den Test auf Einhaltung der Verordnung zur elektromagnetischen Verträglichkeit (EMV Richtlinie 2004/108/EC) erfolgreich bestanden.

Dennoch muss bei der Wahl des Signalkabels für das Gerät mit CE-Zeichen auf folgende Dinge geachtet werden.

Qualität von Signalkabel, Kabeldurchführung und Anschlüsse:

Brooks Instrument liefert qualitativ hochwertige Kabel, die den Anforderungen für eine CE-Zertifizierung entsprechen.

Sollten Sie eigene Kabel einsetzen, so sollte das Kabel überall mit einer 100%-Abschirmung versehen sein.

D- oder Rundstecker sollten eine Metallabschirmung aufweisen. Wenn möglich, müssen Kabeldurchführungen aus Metall mit Kabelschirmgeflechts-Klemmen verwendet werden.

Der Kabelschirm sollte an die Metallhülle oder -durchführung angeschlossen werden und an beiden Enden rundherum (360°) abgeschirmt werden.

Die Abschirmung sollte geerdet werden.

Randstecker auf Platinen sind standardmäßig nicht aus Metall. Die verwendeten Kabel müssen mit einer 100 % Abschirmung versehen werden, um die CE-Vorgaben zu erfüllen.

Die Abschirmung sollte geerdet werden.

Klemmenbelegung: Siehe beigefügtes Handbuch.

ESD (Elektrostatistische Entladung)

▲ ACHTUNG: Dieses Gerät enthält elektronische Komponenten, die durch elektrostatische Entladungen beschädigt werden können. Ordnungsgemäße Verfahrensanweisungen müssen während des Ausbaus, der Installation oder anderer Handhabung der eingebauten Platinen oder Geräte eingehalten werden.

Verfahrensanweisung:

1. Trennen Sie das Gerät von der Stromversorgung.
2. Das Personal ist vor dem Einbau, Ausbau oder der Einstellung von Platinen oder anderen internen Komponenten durch ein entsprechendes Armband mit dem Erdpotential zu verbinden.
3. Platinen sind in speziellen Behältern mit Schutz gegen elektrostatische Spannungen zu transportieren oder zu lagern. Platinen dürfen erst kurz vor dem Einbau aus der Schutzhülle entfernt werden. Ausgebaute Platinen müssen umgehend in Schutzhälter zum Transport, zur Lagerung oder Rücksendung an das Werk gelegt werden.

Anmerkung

Dieses Gerät ist wie viele andere elektronische Geräte auch mit Komponenten bestückt, die anfällig für elektrostatische Entladung sind. Die meisten modernen, elektronischen Geräte enthalten Komponenten, die die Metalloxidtechnologie (NMOS, SMOS etc.) verwenden. Die Erfahrung hat gezeigt, dass schon geringe Mengen elektrostatischer Energie ausreichen, um diese Geräte zu beschädigen oder zu zerstören. Beschädigte Teile fallen früh aus, obwohl sie funktionsfähig zu sein scheinen.

Greek

**Βασικές οδηγίες
Διαβάστε πριν συνεχίσετε!**

Η Brooks Instrument σχεδιάζει, παράγει και δοκιμάζει τα προϊόντα της σε συμμόρφωση με πλήθος εθνικών και διεθνών προτύπων. Η σωστή εγκατάσταση, χρήση και συντήρησή τους αποτελεί απαραίτητη προϋπόθεση της λειτουργίας εντός των κανονικών ορίων. Οι παρακάτω οδηγίες πρέπει να τηρούνται και πρέπει να ενσωματωθούν στο πρόγραμμα ασφάλειας της εργασίας σας κατά την εγκατάσταση, χρήση και συντήρηση προϊόντων της Brooks Instrument.

- Για σωστό αποτέλεσμα η εγκατάσταση, λειτουργία, ενημέρωση, προγραμματισμός και συντήρηση πρέπει να γίνεται από ειδικευμένο προσωπικό.
- Διαβάστε όλες τις οδηγίες πριν εγκαταστήσετε, λειτουργήσετε και συντηρήσετε το προϊόν. Εάν το παρόν εγχειρίδιο δεν είναι το σωστό εγχειρίδιο, συμβουλευθείτε το πίσω εξώφυλλο για τα στοιχεία επικοινωνίας του τοπικού αντιπροσώπου. Φυλάξτε το εγχειρίδιο αυτό για μελλοντική αναφορά.

▲ ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μη λειτουργείτε τη συσκευή αυτή καθ' υπέρβαση των ορίων που αναγράφονται στο Εγχειρίδιο Οδηγιών και Λειτουργίας. Η μη συμμόρφωση με την προειδοποίηση αυτή μπορεί να οδηγήσει σε σοβαρό προσωπικό τραυματισμό ή/και ζημιά στον εξοπλισμό.

- Σε περίπτωση μη κατανόησης κάποιας από τις οδηγίες ζητήστε διευκρινίσεις από τον τοπικό αντιπρόσωπο της Brooks Instrument.
- Τηρείτε όλες τις προειδοποιήσεις, προφυλάξεις και οδηγίες που αναγράφονται ή συνοδεύουν το προϊόν.

▲ ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Πριν από την εγκατάσταση βεβαιωθείτε ότι αυτό το εργαλείο διαθέτει τις απαιτούμενες εγκεκριμένες προδιαγραφές ώστε να συμμορφώνεται με τους τοπικούς και εθνικούς κανονισμούς. Η αποτυχία τήρησης της παρούσας προειδοποίησης μπορεί να οδηγήσει σε σοβαρό τραυματισμό και/ή ζημιά στον εξοπλισμό

- Εγκαταστήστε τη συσκευή όπως προβλέπεται στις οδηγίες εγκατάστασης του σωστού εγχειριδίου οδηγιών και στις κείμενες τοπικές και εθνικές διατάξεις. Συνδέστε τα προϊόντα στις εκάστοτε σωστές παροχές ρεύματος και πίεσης.
- Διαδικασία: (1) Αφήστε να ξεκινήσει αργά η ροή στο σύστημα. Ανοίξτε αργά τις βαλβίδες λειτουργίας για να αποφύγετε τις απότομες αυξομειώσεις ροής. (2) Ελέγξτε για διαρροές τις συνδέσεις εισόδου και εξόδου του ροόμετρου. Αν δεν υπάρχουν διαρροές, γεμίστε το σύστημα μέχρι η πίεση να φτάσει την κανονική πίεση εργασίας.
- Πριν από τη συντήρηση βεβαιωθείτε ότι γραμμή εργασίας έχει τεθεί εκτός πίεσης. Σε περίπτωση αντικατάστασης ανταλλακτικών βεβαιωθείτε ότι το προσωπικό είναι ειδικευμένο και χρησιμοποιεί ανταλλακτικά που προβλέπει η Brooks Instrument. Μη εγκεκριμένα ανταλλακτικά και επεμβάσεις ενδέχεται να επηρεάσουν τις επιδόσεις του προϊόντος και να προκαλέσουν κίνδυνο για την ασφαλή λειτουργία. Αντικαταστάσεις με φαινομενικά όμοια ανταλλακτικά ενδέχεται να προκαλέσουν πυρκαγιά, κίνδυνο ηλεκτροπληξίας ή ανεπαρκή λειτουργία.
- Βεβαιωθείτε ότι όλα τα ανοίγματα του εξοπλισμού είναι κλειστά και τα προστατευτικά καλύμματα είναι στη θέση τους προκειμένου να αποφευχθεί ο κίνδυνος ηλεκτροπληξίας και προσωπικών τραυματισμών, εκτός εάν εκτελούνται εργασίες συντήρησης από ειδικευμένο προσωπικό.

▲ ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Προκειμένου για συσκευές με ροή ρευστού, όταν για οποιονδήποτε λόγο πρόκειται να κλείσουν οι βαλβίδες εισαγωγής και εξαγωγής κοντά στις συσκευές, οι συσκευές πρέπει να αποστραγγιστούν εντελώς. Η μη συμμόρφωση μπορεί να προκαλέσει θερμική διαστολή του υγρού που περιέχουν, με αποτέλεσμα να ραγίσει η συσκευή και να προκληθούν προσωπικοί τραυματισμοί.

Ευρωπαϊκή Οδηγία για τον εξοπλισμό υπό πίεση (PED)

Κάθε εξοπλισμός υπό πίεση με εσωτερική πίεση άνω του 0,5 bar (g) και μεγέθους μεγαλύτερου των 25 mm ή της 1 ίντσας εμπίπτει στις διατάξεις της ευρωπαϊκής Οδηγίας για τον εξοπλισμό υπό πίεση (PED).

- Το κεφάλαιο Προδιαγραφές του παρόντος εγχειριδίου περιλαμβάνει οδηγίες σχετικά με την Οδηγία PED.
- Τα προϊόντα που περιγράφονται στο παρόν εγχειρίδιο συμμορφώνονται με την ευρωπαϊκή Οδηγία 97/23/ΕΚ.
- Όλα τα ροόμετρα της Brooks Instrument ανήκουν στην ομάδα ρευστών 1.
- Προϊόντα μεγαλύτερα από 25 mm ή 1 ίντσα συμμορφώνονται με τις κατηγορίες I, II και III της Οδηγίας PED.
- Προϊόντα μεγέθους 25 mm ή 1 ίντσας ή και μικρότερα κατασκευάζονται σύμφωνα με ορθές τεχνικές πρακτικές (SEP).

Ευρωπαϊκή Οδηγία για την ηλεκτρομαγνητική συμβατότητα (EMC)

Ο (ηλεκτρικός/ηλεκτρονικός) εξοπλισμός της Brooks Instrument που φέρει το σήμα CE έχει υποστεί επιτυχώς τις δοκιμές που προβλέπουν οι διατάξεις της Οδηγίας για την ηλεκτρομαγνητική συμβατότητα (Οδηγία 2004/108/ΕΚ για την EMC).

Πάντως χρειάζεται ιδιαίτερη προσοχή στην επιλογή του καλωδίου σήματος για τον εξοπλισμό που φέρει το σήμα CE.

Ποιότητα των καλωδίων σήματος, στυπιοθλιπτών και βυσμάτων καλωδίων:

Η Brooks Instrument προσφέρει υψηλής ποιότητας καλώδια τα οποία πληρούν τις προδιαγραφές CE.

Σε περίπτωση παροχής δικού σας καλωδίου σήματος, χρησιμοποιείτε καλώδιο με πλήρη θωράκιση 100% σε όλα τα σημεία.

Βύσματα τύπου «D» ή κυκλικά πρέπει να έχουν μεταλλική θωράκιση. Να χρησιμοποιηθούν κατά προτίμηση μεταλλικοί στυπιοθλιπτες καλωδίων για τη στερέωση της θωράκισης.

Να συνδεθεί η θωράκιση του καλωδίου στο μεταλλικό κέλυφος ή στυπιοθλιπτή και να θωρακιστεί και στα δύο άκρα κατά 360 μοίρες. Η θωράκιση πρέπει να τερματίζει σε γείωση εδάφους.

Τα βύσματα άκρου της πλακέτας είναι εκ κατασκευής μη μεταλλικά. Τα χρησιμοποιούμενα καλώδια πρέπει να έχουν 100% θωράκιση για συμμόρφωση με την πιστοποίηση CE. Η θωράκιση πρέπει να τερματίζει σε γείωση εδάφους.

Για τη διάταξη των ακίδων: Συμβουλευθείτε το συνημμένο εγχειρίδιο οδηγιών.

Ηλεκτροστατική εκκένωση (ESD)

▲ ΠΡΟΦΥΛΑΞΗ: Η συσκευή αυτή περιέχει ηλεκτρονικά εξαρτήματα τα οποία μπορούν να υποστούν εύκολα βλάβες από τον στατικό ηλεκτρισμό. Πρέπει να ακολουθούνται οι ορθές διαδικασίες χειρισμού κατά την αφαίρεση, τοποθέτηση ή άλλο χειρισμό των εσωτερικών πλακετών και διατάξεων.

Διαδικασία χειρισμού:

1. Θέστε τη συσκευή εκτός τάσεως.
2. Φροντίστε για τη γείωση του προσωπικού ή άλλο ασφαλές και κατάλληλο μέσο πριν τοποθετήσετε, αφαιρέσετε ή ρυθμίσετε κάρτες τυπωμένων κυκλωμάτων ή άλλη εσωτερική διάταξη.
3. Οι κάρτες τυπωμένων κυκλωμάτων πρέπει να μεταφέρονται σε συσκευασία από αγώγιμο υλικό. Οι κάρτες δεν πρέπει να αφαιρεθούν από το προστατευτικό περιβλήμα παρά μόνο αμέσως πριν από την τοποθέτηση. Οι κάρτες που αφαιρέθηκαν πρέπει να τοποθετηθούν αμέσως σε προστατευτική συσκευασία για μεταφορά, αποθήκευση ή επιστροφή στο εργοστάσιο.

Παρατηρήσεις:

Η ύπαρξη εξαρτημάτων ευαίσθητων στα φαινόμενα ESD (ηλεκτροστατικής εκκένωσης) δεν είναι μοναδικό χαρακτηριστικό της συσκευής αυτής. Οι περισσότερες σύγχρονες ηλεκτρονικές συσκευές περιέχουν εξαρτήματα τεχνολογίας μεταλλικών οξειδίων (NMOS, SMOS κ.). Η πείρα έχει αποδείξει ότι μια μικρή ποσότητα στατικού ηλεκτρισμού αρκεί για να προκαλέσει βλάβες ή να καταστρέψει τις συσκευές αυτές. Εξαρτήματα που υπέστησαν βλάβη, ακόμη και αν μοιάζουν να λειτουργούν σωστά, κινδυνεύουν από πρόωμη αστοχία.

Brooks® Model 585xEMH

Hungarian

Alapvető utasítások Először olvassa el ezeket!

A Brooks Instrument olyan módon tervezi, gyártja és teszti termékeit, hogy azok megfeleljenek számos belföldi és nemzetközi szabványnak. Ezeket a berendezéseket megfelelően kell telepíteni, üzemeltetni és karbantartani ahhoz, hogy mindenképpen a normál működési tartományuknak megfelelően üzemelhessenek. Az alábbi utasításokat be kell tartani, és be kell építeni a munkavédelmi programba a Brooks Instrument termékeinek telepítése, üzemeltetése és karbantartása során.

A megfelelő teljesítmény garantálása érdekében kizárólag szakképzett személyzet végezze a termék telepítését, üzemeltetését, frissítését, programozását és karbantartását.

Valamennyi utasítást el kell olvasni a termék telepítése, üzemeltetése és szervizelése előtt. Amennyiben ez a kézikönyv nem a megfelelő kiadvány, a hátsó borítón keresse meg a helyi forgalmazót, és további tájékoztatásért lépjen kapcsolatba vele. Őrizze meg ezt a kézikönyvet későbbi tájékoztatásként.

▲ FIGYELEM: Ne működtesse a berendezést az üzemeltetési utasításban megadott üzemi tartományokon túl. Ennek megsértése súlyos személyi sérüléshez vagy a berendezés meghibásodásához vezethet.

- Amennyiben a kézikönyv utasításai nem egyértelműek, lépjen kapcsolatba Brooks Instrument képviselőjével, hogy tisztázzák a problémát.
- Tartsa be a berendezésen feltüntetett vagy azzal együtt szállított összes figyelmeztetést, felhívást és utasítást.

▲ FIGYELEM: Üzembe helyezés előtt győződjön meg arról, hogy a műszer rendelkezik-e a helyi és nemzeti szabványoknak megfelelő jóváhagyásokkal. Ennek elmulasztása súlyos személyi sérülést és / vagy az eszköz károsodását okozhatja!

- A megfelelő telepítési utasításban megadott utasítások valamint a hatályos helyi és nemzeti előírások szerint telepítse a berendezést. A termékeket kizárólag a megfelelő elektromos és nyomásellátó forrásra kösse.
- Menete: (1) Lassan helyezze nyomás alá a rendszert. Lassanként nyissa ki az üzemi szelepeket az áramlásszabályozás elkerülése érdekében. (2) Ellenőrizze, nincs-e szivárgás az áramlásmérő be-, és kimeneti bekötéseinél. Ha nincs szivárgás, töltsse fel a rendszert az üzemi nyomásra.
- Szervizelés előtt mindenképpen ellenőrizze, hogy az üzemi vezeték nincs-e nyomás alatt. Amennyiben cserealkatrészekre van szükség, mindenképpen szakképzett személynek kell kezelnie a Brooks Instrument által meghatározott cserealkatrészeket. A nem engedélyezett alkatrészek és tevékenységek befolyásolhatják a termék teljesítményét, illetve veszélyeztethetik a biztonságos üzemeltetést. A pusztán hasonló alkatrészekkel történő helyettesítés tüzet, áramütésveszélyt vagy elégtelen működést eredményezhet.
- A berendezés összes ajtaja mindenképpen legyen zárva, a védőburkolatok pedig legyenek a helyükön az áramütés és a személyi sérülések elkerülése érdekében, kivéve, ha szakképzett szakember végez rajta karbantartási munkákat.

▲ FIGYELEM: Folyadékot áramoltató berendezések esetében, ha bármilyen okból el kell zárni a berendezés melletti ki-, és belépő szelepeket, a berendezést teljesen le kell üríteni. Ennek elmulasztása a folyadék hőtágulását okozhatja, ami károsíthatja a berendezést, és személyi sérüléshez vezethet.

Nyomástartó berendezésekre vonatkozó európai irányelv (PED)

Minden 0,5 bar-nál (g) magasabb belső nyomású és 25 mm-nél vagy 1 hüvelyknél nagyobb nyomástartó berendezés a nyomástartó berendezésekre vonatkozó európai irányelv (PED) hatálya alá tartozik.

- A használati utasítás „Műszaki adatok” fejezete tartalmaz a PED irányelvre vonatkozó utasításokat.
- A használati utasításban megadott termékek megfelelnek a 97/23/EK EU irányelvnek.
- Minden Brooks átfolyásmérő az 1-es folyadékcsoportba tartozik.
- A 25 mm-nél vagy 1 hüvelyknél nagyobb termékek megfelelnek a PED I, II, vagy III kategóriának.
- A 25 mm-es illetve 1 hüvelykes vagy kisebb termékek az elfogadott mérnöki gyakorlatot (SEP) követik.

Elektromágneses kompatibilitásra vonatkozó európai irányelv (EMC)

A Brooks Instrument CE jelölést kiérdemelt (elektromos/elektronikus) berendezései sikeresen teljesítették az elektromágneses kompatibilitási követelményeket (2004/108/EC sz. EMC irányelv) vizsgáló teszteket.

Ugyanakkor különös figyelmet kell fordítani a CE jelölésű berendezésekhez felhasznált jelkábelek kiválasztására.

A jelkábelek, kábelösszekötők, csatlakozók minősége:

A Brooks Instrument magas minőségű kábeleket kínál, melyek megfelelnek a CE minősítés követelményeinek.

Amennyiben saját jelkábel alkalmaznak, olyat kell választani, amely 100%-os árnyékolással, teljes mértékben szűrt.

A „D” vagy „kör alakú” csatlakozóknak fémárnyékolóval árnyékoltnak kell lennie. Szükség esetén fém kábelösszekötőket kell alkalmazni a kábelszűrő rögzítésére.

A kábelszűrőt a fém házhoz vagy hüvelyhez kell csatlakoztatni és mindkét felén 360°-ban le kell árnyékolni. Az árnyékolásnak földelésben kell végződnie.

A kártyákhoz tartozó csatlakozók szabványosan nem fémek. Az alkalmazott kábeleknek 100%-os árnyékolással szűrteknek kell lenniük, hogy megfeleljenek a CE minősítésnek.

Az árnyékolásnak földelésben kell végződnie.

Érintkező konfiguráció: Lásd a mellékelt kezelési utasítást.

Elektrosztatikus kisülés (ESD)

▲ VIGYÁZAT: A készülék olyan alkatrészeket tartalmaz, melyek hajlamosak a sztatikus elektromosság okozta károsodásra. Be kell tartani a megfelelő eljárásokat a belső áramköri kártyák és eszközök eltávolítása, behelyezése vagy egyéb kezelése során.

Kezelési eljárás:

1. A berendezést áramtalanítani kell.
2. A személyt földelni kell csuklópántal vagy egyéb biztonságos és a célra alkalmas eszközzel, mielőtt áramköri kártyát vagy egyéb belső eszközt telepítene, venne ki, vagy állítana be.
3. A nyomtatott áramköri kártyákat vezetőképes csomagolásban kell szállítani. A kártyák kizárólag közvetlenül a behelyezés előtt vehetők ki a védőburkolatból. A kiserelt kártyát haladéktalanul el kell helyezni a mozgásra, raktározásra vagy a gyári visszaszállításra szolgáló védőcsomagolásba.

Megjegyzések:

Nem egyedi jelenség, hogy a készülékben elektrosztatikus kisülésre (ESD) érzékeny alkatrészek találhatók. A legtöbb korszerű elektronikus eszközben fémoxid technológiás alkatrészek (NMOS, SMOS stb.) találhatók. A tapasztalatok azt igazolják, hogy még kis mértékű sztatikus elektromosság is károsíthatja, vagy tönkretelheti ezeket az eszközöket. A károsodott alkatrészek, még ha látszólag megfelelően működnek is, kezdődő hibára utalnak.

Italian

Istruzioni fondamentali**Leggerle subito!**

La Brooks Instrument progetta, fabbrica e collauda i propri prodotti in maniera tale che siano conformi ai vari standard nazionali ed internazionali. Tali apparecchiature devono essere installate, messe in esercizio e tenute in manutenzione in maniera adeguata affinché operino in conformità alle loro normali specifiche di funzionamento. Le seguenti istruzioni devono essere rispettate ed inserite nel programma di tutela sul lavoro durante l'installazione, il funzionamento e la manutenzione dei prodotti Brooks Instrument.

- Per garantire un adeguato rendimento l'installazione, il funzionamento, l'aggiornamento, la programmazione e la manutenzione del prodotto devono essere eseguiti esclusivamente da personale specializzato.
- Leggere tutte le istruzioni prima dell'installazione, utilizzo e manutenzione del prodotto. Se questo manuale non è quello relativo al Vostro prodotto, cercare sul retro della copertina il distributore locale e contattarlo per ulteriori informazioni. Conservare il presente manuale per future consultazioni.

⚠ ATTENZIONE: Non utilizzare questo strumento in condizioni che eccedono le specifiche riportate nel Manuale d'Uso. L'inosservanza può causare gravi lesioni alle persone e/o danni all'apparecchiatura.

- Qualora le istruzioni del manuale non siano chiare, contattare un rappresentante della Brooks Instrument per chiarire il problema.
- Rispettare tutti gli avvisi, le istruzioni e gli avvertimenti riportati sull'apparecchiatura o forniti insieme ad essa.

⚠ ATTENZIONE: prima di installare questo strumento, assicurarsi che sia in regola rispetto alle normative di sicurezza locali e nazionali. La non osservanza di questo avvertimento può procurare seri danni a persone e/o danneggiare sia lo strumento che le cose circostanti.

- Installare l'apparecchiatura in base alle istruzioni riportate nel Manuale d'Uso e alle prescrizioni locali e nazionali in vigore. Collegare i prodotti esclusivamente ad un'adeguata sorgente di pressione ed alimentazione elettrica.
- Procedimento: (1) mettere lentamente sotto pressione il sistema. Aprire lentamente le valvole di servizio per evitare l'oscillazione del flusso. (2) Controllare che non ci siano perdite nei punti di connessione in entrata e in uscita del misuratore di flusso. Se non ci sono perdite, caricare il sistema alla pressione d'esercizio.
- Prima di effettuare manutenzione controllare che la linea di processo non sia sotto pressione. Se avete bisogno di pezzi di ricambio, il personale specializzato deve usare i pezzi di ricambio definiti dalla Brooks Instrument. Attività e pezzi di ricambio non autorizzati possono influire sul rendimento del prodotto e comprometterne il funzionamento in sicurezza. La sostituzione con pezzi di ricambio non originali può causare incendi, pericolo di scosse elettriche o funzionamento improprio.
- Tutti gli sportelli dell'impianto devono essere chiusi, le cappe di protezione devono essere al loro posto per evitare scosse elettriche e lesioni personali, tranne quando il personale specializzato esegue lavori di manutenzione.

⚠ ATTENZIONE: In caso di apparecchiature in cui scorre un liquido, se per qualsiasi motivo bisogna chiudere le valvole d'entrata e d'uscita accanto all'apparecchiatura, allora si deve svuotare completamente l'apparecchiatura. L'inosservanza può causare la dilatazione termica del liquido che può danneggiare l'apparecchiatura e provocare lesioni alle persone.

Direttiva europea relativa alle apparecchiature a pressione (PED)

Ogni apparecchiatura a pressione con pressione interna maggiore di 0,5 bar (g) e più grande di 25 mm o di 1 pollice ricade nell'ambito della Direttiva Europea relativa alle apparecchiature a pressione (PED).

- Il capitolo „Dati tecnici“ del manuale contiene le disposizioni relative alla direttiva PED.
- I prodotti di misura descritti nel presente manuale sono conformi alla Direttiva UE 97/23/CE.
- Ogni flussimetro Brooks appartiene al gruppo di fluidi 1.
- I prodotti di misura maggiori di 25 mm o di 1 pollice sono conformi alla categoria I, II o III della PED.
- I prodotti di misurazione minori di 25 mm o di 1 pollice rientrano nella categoria SEP (Sound Engineering Practice).

Direttiva europea relativa alla compatibilità elettromagnetica (EMC)

Le apparecchiature (elettriche/elettroniche) Brooks Instrument dispongono del marchio CE ed hanno superato positivamente i test per i requisiti di compatibilità elettromagnetica (Direttiva EMC 2004/108/EC).

In ogni caso bisogna prestare particolare attenzione alla scelta dei cavi di segnale utilizzati per le apparecchiature con marchio CE.

Qualità dei cavi di segnale, dei pressacavi e dei connettori:

La Brooks Instrument offre cavi d'alta qualità conformi ai requisiti della certificazione CE.

Qualora vengano utilizzati cavi di segnale propri, devono essere scelti con schermatura al 100% e interamente filtrati.

I connettori „D“ o „rotondi“ devono essere schermati con schermatura metallica. In caso di necessità bisogna utilizzare pressacavi metallici di collegamento per fissare la schermatura del cavo.

La schermatura del cavo deve far contatto col guscio metallico o col pressacavo; il cavo deve essere schermato su entrambi i lati a 360°. La schermatura deve essere effettuata con messa a terra.

I connettori Card Edge normalmente non sono di metallo. I cavi utilizzati devono essere filtrati con schermatura al 100% per essere conformi alla marcatura CE.

La schermatura deve essere effettuata con messa a terra.

Configurazione pin: Vedi Manuale d'uso allegato.

Scarica elettrostatica (ESD)

⚠ ATTENZIONE: Il dispositivo contiene componenti elettronici che possono essere danneggiati da elettricità statica. Bisogna rispettare le adeguate procedure durante la rimozione, l'installazione o altra manovra delle schede del circuito elettrico interno.

Procedura di manovra:

1. Togliere alimentazione elettrica all'apparecchiatura.
2. La persona deve essere collegata a terra con una cerniera o con altri strumenti di sicurezza e adeguati allo scopo prima di installare, togliere o impostare la scheda del circuito elettrico o altri dispositivi interni.
3. Le schede del circuito stampato devono essere spedite in contenitori conduttivi. Le schede devono essere tolte dal rivestimento protettivo esclusivamente prima dell'installazione. Le schede confezionate devono essere collocate immediatamente nell'imballaggio protettivo per la movimentazione, l'immagazzinamento o resa alla fabbrica.

Note:

È un fenomeno comune che nei dispositivi di questo tipo si trovino componenti sensibili alla scarica elettrostatica (ESD). Nella maggior parte degli strumenti elettronici moderni si trovano componenti tecnologici metallo-ossido (NMOS, SMOS, ecc.). Le esperienze dimostrano che l'elettrostaticità anche in piccola misura può danneggiare o rovinare gli strumenti. I componenti danneggiati, anche se all'apparenza funzionano correttamente, potrebbero manifestare il difetto rapidamente.

Brooks® Model 585xEMH

Latvian

Svarīga instrukcija

Pirms turpināt izlasiet!

„Brooks Instrument” projektē, ražo un pārbauda savus izstrādājumus atbilstoši daudziem nacionālajiem un starptautiskajiem standartiem. Lai nodrošinātu šo izstrādājumu turpmāku darbību atbilstoši noteiktajiem parametriem, tie ir pareizi jāuzstāda, jālieto un jāapkopj. Uzstādot, lietojot „Brooks Instrument” izstrādājumus un veicot to apkopi, ir jāievēro šie norādījumi un jāiekļaujas tie jūsu drošības programmā.

- Lai nodrošinātu pienācīgu izstrādājuma sniegumu, izstrādājuma uzstādīšanu, lietošanu, atjaunināšanu, programmēšanu un apkopi uzticiet veikt tikai kvalificētam personālam.
- Pirms izstrādājuma uzstādīšanas, lietošanas un apkalpošanas izlasiet visus norādījumus. Ja šī instrukciju rokasgrāmata nav pareizā, izstrādājumam atbilstošā rokasgrāmata, lūdzu skat. aizmugurējo vāku, kur ir sniegta vietējā tirdzniecības biroja kontaktinformācija.
 - ▲ **BRĪDINĀJUMS! Nelietot instrumentu ārpus Instrukciju un lietošanas rokasgrāmatā norādītajiem parametriem. Šī brīdinājuma neievērošanas rezultātā var rasties traumas un/vai aprikojuma bojājumi.**
- Ja jūs nesaprotat kādu no instrukcijām, sazinieties ar „Brooks Instrument” pārstāvi un lūdziet izskaidrot to.
- Ievērojiet visus brīdinājumus, piesardzības mērus un instrukcijas, kas norādīti uz izstrādājuma vai piegādāti kopā ar to.
 - ▲ **BRĪDINĀJUMS. Pirms uzstādīšanas pārlicinieties, ka šim instrumentam ir nepieciešamie apstiprinājuma novērtējumi, lai atbilstu vietējiem un valsts kodeksiem. Šī brīdinājuma neizlasīšanas rezultātā var rasties nopietni personas savainojumi un/vai aprikojuma bojājumi.**
- Uzstādiat aprikojumu tā, kā tas norādīts attiecīgajā instrukciju rokasgrāmatā iekļautajā uzstādīšanas instrukcijā un atbilstoši piemērojamajām vietējām un nacionālajām normām. Pievienojiet visus izstrādājumus pareiziem elektriskajiem un spiediena avotiem.
- Lietošana: (1) Lēnām uzsāciet plūsmu sistēmā. Lai izvairītos no straujiem plūsmas kāpumiem, lēnām atveriet procesa vārstus. (2) Pārbaudiet, vai nav noplūdes ap plūsmas mērītāja iekšējās un izplūdes savienojumiem. Ja noplūdes nav, uzstādiat sistēmā darba spiedienu.
- Pārlicinieties par to, lai pirms instrumenta tehniskās apkopes būtu likvidēts procesa līnijas spiediens. Ja ir nepieciešams veikt kādu daļu nomaigu, nodrošiniet, lai tiktu izmantotas „Brooks Instrument” norādītās daļas un daļu nomaigu veiktu kvalificēts personāls. Neatļautu daļu un procedūru izmantošana var ietekmēt izstrādājuma sniegumu un samazināt procesa drošību. Līdzīgu, bet ne identisku daļu nomaigu lietošana var izraisīt ugunsgrēku, elektrisko traucējumu riskus un nepareizu izstrādājuma darbību.
- Nodrošiniet, lai būtu aizvērtas visas durvis un būtu pareizi uzstādīti visi aizsargpārsegumi, tādējādi novēršot elektrošoka un traumu risku. Izņēmums ir gadījumi, kad kvalificēts personāls veic ražojuma apkopi.
 - ▲ **BRĪDINĀJUMS! Ja šķidrās plūsmas ierīču tuvumā esošos iekšējos iekārtas vārstus kāda iemesla dēļ ir jāaizver, no ierīcēm ir jāizslēdz viss šķidrums. Pretējā gadījumā šķidrums var termiski izplesties, pārraut ierīci un radīt traumas.**

Eiropas spiedieniekārtu direktīva (PED)

Uz visām spiedieniekārtām, kuru iekšējais spriegums pārsniedz 0,5 bar (g) un ir lielākas par 25 mm jeb 1" (collu), attiecas Eiropas spiedieniekārtu direktīva (PED).

- Šīs rokasgrāmatas tehnisko parametru nodaļā ir sniegtas a PED Direktīvu saistītās instrukcijas.
- Šajā rokasgrāmatā aprakstītie izstrādājumi atbilst EN Direktīvas 97/23/EK prasībām.
- Visi „Brooks Instrument” plūsmas mērītāji ietilpst 1. šķidrumu grupā.
- Uz 25 mm jeb 1" (collu) maziem un mazākiem izstrādājumiem attiecas labas inženierijas prakse (SEP).
- 25 mm jeb 1" (collu) mazi vai mazāki izstrādājumi atbilst PED kategorijai I, II vai III.

Eiropas elektromagnētiskās savietojamības direktīva (EMS)

„Brooks Instrument” (elektriskās/elektroniskās) iekārtas ar CE zīmi ir izturējušas pārbaudi un atzītas par atbilstošām Eiropas elektromagnētiskās savietojamības direktīvas (EMS) prasībām (EMS 2004/108/EC)

Tomēr, izvēloties signālkabeļi, kas tiks lietoti kopā ar CE marķējuma iekārtu, ir jāievēro īpaša uzmanība.

Signālkabeļa, kabeļa blīvslēgu un savienotāju kvalitāte:

„Brooks Instrument” piegādā augstas kvalitātes kabeļus, kas atbilst CE sertifikācijas tehniskajiem parametriem.

Ja jūs lietojat pats savu signālkabeļi, tam ir jābūt pilnībā, 100% ekranizētam.

„D” un „apaļā” tipa savienotājiem ir jābūt aprīkoti ar metāla ekranizējumu. Ja nepieciešams, ir jāizmanto metāla blīvslēgi ar kabeļa ekranizējuma skavojumu.

Kabeļa ekranizējumam ir jābūt savienotam ar metāla apvalku un abās pusēs aizsargātam 360 grādu diapazonā.

Ekranizējumam ir jābeidzas pie iezemējuma.

„Card Edge” savienotāji standarta izpildījumā ir nemetāla. Kabeļiem ir jābūt pārklātiem ar 100% ekranizējumu, lai tie atbilstu CE sertifikācijas prasībām.

Ekranizējumam ir jābeidzas pie iezemējuma.

Attiecībā uz tapu konfigurāciju: skat. pievienoto instrukciju rokasgrāmatu.

ESD (elektrostatiskā izlāde)

▲ **IEVĒROT PIESARDZĪBU! Šis instruments satur elektriskos komponentus, kas ir jutīgi pret statisko elektrību. Izņemot un uzstādot iekšējās ķēdes plates un ierīces vai kā citādi darbojoties ar tām, ir jāievēro noteikta darba kārtība.**

Darba kārtība:

1. Iekārta jāatslēdz no barošanas.
2. Pirms jebkādas drukātas shēmas kartes vai citas iekšējās ierīces uzstādīšanas, izņemšanas vai regulēšanas personālam, kas veiks šos darbus, ir jābūt iezemētam, piem., izmantojot aprocus vai citus drošus, piemērotus līdzekļus.
3. Drukātās shēmas kartes ir jātransportē vadošā iepakojumā. Plāksnes no aizsargkorpusa drīkst izņemt tikai tieši pirms uzstādīšanas. Transportējot, uzglabājot vai atgriežot rūpnīcā, izņemtās plāksnes ir nekavējoties jāievieto aizsargiepakojumā.

Komentāri

Instruments nav unikāls tajā aspektā, ka tas satur pret ESD (elektrostatisko izlādi) jutīgus komponentus. Vairākums mūsdienu elektroiekārtu satur komponentus, kuru ražošanā izmantota metāla oksīdu tehnoloģijas (NMOS, SMOS u.c.). Pieredze rāda, ka pat neliels daudzums statiskās elektrības var nodarīt bojājumus šādām ierīcēm vai pilnībā sabojāt tās. Bojātie komponenti pat tad, ja tie šķietami darbojas pareizi, ir pakļauti ātrāki atcei.

Lithuanian

Pagrindinės instrukcijos

Perskaitykite prieš tęsdami!

„Brooks Instrument“ projektuoja, gamina ir išbando savo gaminius, kad jie atitiktų įvairius nacionalinius ir tarptautinius standartus. Šie gaminiai turi būti tinkamai montuojami, eksploatuojami ir prižiūrimi, kad ir toliau veiktų pagal jiems būdingus techninius parametrus. Toliau pateiktų nurodymų reikia laikytis ir įtraukti juos į saugos programą montuojant, eksploatuojant ir prižiūrint „Brooks Instrument“ gaminius.

- Siekiant užtikrinti tinkamą veikimą, montuoti, eksploatuoti, naujinti, programuoti ir prižiūrėti gaminį turi tik kvalifikuoti darbuotojai.
- Perskaitykite visus nurodymus prieš montuodami, eksploatuodami ir prižiūredami gaminį. Jei gavote netinkamą instrukciją, galiniame jos viršelyje ieškokite vietinės prekybos atstovybės kontaktinės informacijos. Neišmeskite šios instrukcijos, jos gali prireikti ateityje.

⚠️ ĮSPĖJIMAS: nenaudokite šio prietaiso viršydami instrukcijoje ir eksploatacijos vadove nurodytus techninius duomenis. Nesilaikydami šio įspėjimo galite susižeisti ir (arba) sugadinti įrangą.

- Jei nesuprantate kokių nors nurodymų, kreipkitės į „Brooks Instrument“ atstovą, kad paaiškintų.
- Paisykite visų įspėjimų, perspėjimų ir nurodymų, pažymėtų ant gaminio arba pateiktų su juo.

⚠️ ĮSPĖJIMAS: prieš montuodami įsitinkinkite, kad ši įranga atitinka vietinius ir nacionalinius teisės aktus. Nepaisant šio įspėjimo gali būti sužeisti žmonės ir (arba) pažeista įranga.

- Įrangą montuokite taip, kaip nurodyta atitinkamos instrukcijos montavimo nurodymuose arba taikomuose vietiniuose ar nacionaliniuose teisės aktuose. Visus gaminius junkite prie tinkamų elektros ir slėgio šaltinių.
- Naudojimas: (1) lėtai įjunkite srautą į sistemą. Lėtai atidarykite proceso vožtuvus, kad išvengtumėte srauto antplūdžių. (2) Patikrinkite, ar nėra nuotėkių aplink srauto matuoklio įleidimo ir išleidimo jungtis. Jei nuotėkių nėra, sukurkite sistemoje darbinį slėgį.
- Prieš atlikdami priežiūros darbus būtina pašalinti slėgį proceso linijoje. Jei reikia pakeisti dalis, užtikrinkite, kad kvalifikuoti darbuotojai naudotų „Brooks Instrument“ nurodytas pakaitines dalis. Naudojant netinkamas dalis ir netinkamai atliekant procedūras, gali pablogėti gaminio veikimas ir gali kilti pavojus naudojimo proceso saugai. Naudojant tik panašiai atrodančius pakaitalus gali kilti gaisro ar elektros smūgio pavojus arba gaminys gali veikti netinkamai.
- Užtikrinkite, kad visos įrangos durtelės būtų uždarytos, o apsauginiai dangčiai uždėti, kad išvengtumėte elektros smūgio ir sužeidimų, išskyrus, kai kvalifikuoti darbuotojai atlieka priežiūros darbus.

⚠️ ĮSPĖJIMAS: naudojant skysto srauto įrenginius, jei dėl kokios nors priežasties prireikia uždaryti šalia įrenginio esančius įleidimo ir išleidimo vožtuvus, iš įrenginio reikia išleisti visą skystį. To nepadarius galimas šiluminis skysčio plėtimasis, galintis sugadinti įrenginį ir sužeisti žmonės.

Europos slėginės įrangos direktyva (PED)

Visa slėginė įranga, kurios vidinis slėgis didesnis nei 0,5 bar (g), o dydis didesnis nei 25 mm arba 1 col., yra reglamentuojama Slėginės įrangos direktyvos (PED).

- Šios instrukcijos dalyje „Techniniai duomenys“ pateikiami nurodymai, susiję su PED direktyva.
- Šioje instrukcijoje aprašyti gaminiai atitinka Europos Sąjungos direktyvą 97/23/EB.
- Visi „Brooks Instrument“ srauto matuokliai priklauso 1 skysčių grupei.
- Didesni nei 25 mm arba 1 col. gaminiai atitinka PED I, II arba III kategoriją.
- 25 mm arba 1 col. ar mažesni gaminiai atitinka tinkamą inžinerijos praktiką (SEP).

Europoje taikomi elektromagnetinio suderinamumo (EMS) reikalavimai

CE ženklą pažymėta „Brooks Instrument“ (elektrinė / elektroninė) įranga buvo sėkmingai išbandyta pagal elektromagnetinio suderinamumo reikalavimus (EMS direktyvą 2004/108/EB).

Tačiau ypač atidžiai reikia rinktis signalizavimo kabelį, kuris bus naudojamas su CE ženklą pažymėta įranga.

Signalizavimo kabelio, kabelių riebokščių ir jungčių kokybė:

„Brooks Instrument“ tiekia kokybiškus kabelius, kurie atitinka CE sertifikavimo specifikacijas.

Jei naudojate savo signalizavimo kabelį, jis turi būti visiškai ir visas ekranuotas 100 % ekranu.

Naudojamos „D“ arba „apskrito“ tipo jungtys turi būti ekranuotos metaliniu ekranu. Jei taikoma, reikia naudoti metalinius kabelių riebokščių, užtikrinančius kabelio ekrano suspaudimą.

Kabelio ekraną reikia jungti prie metalinio apvalkalo ar riebokščio ir ekranuoti abiejuose galuose 360 laipsnių.

Ekranas turi užsibaigti žeminiu.

Standartinės kraštinės jungtys yra nemetalinės. Naudojami kabeliai turi būti ekranuoti 100 % ekranu, kad atitiktų CE sertifikavimą.

Ekranas turi užsibaigti žeminiu.

Keturių kontaktų konfigūracija: žr. pridėtą instrukciją.

ESD (elektrostatinis išlydis)

⚠️ PERSPĖJIMAS: šiame prietaise yra elektroninių komponentų, kuriuos gali sugadinti statinė elektra. Išimant ar įdedant vidines spausdintines plokštes ar įrenginius, arba atliekant su jomis kitus darbus, reikia laikytis tinkamų darbo procedūrų.

Darbo procedūra:

1. Atjunkite įrenginio maitinimą.
2. Darbuotojai turi pasirūpinti žeminiu naudodami riešo juostelę ar kitas saugias tinkamas priemones prieš įdėdami, išimdami ar reguliuodami bet kokią spausdintinės plokštės kortelę ar kitą vidinį komponentą.
3. Spausdintinės plokštės kortelės reikia transportuoti laidžiame konteineryje. Neleidžiama išimti plokštės iš apsauginio dėklo, nebent prieš pat įdėjimą. Išimtas plokštės reikia nedelsiant įdėti į apsauginį konteinerį, kuriame jos bus transportuojamos ar saugomos, arba grąžinti į gamyklą.

Pastabos

Šis instrumentas nėra unikalus dėl jame esančių ESD (elektrostatiniai išlydžiai) jautrių komponentų. Daugelyje šiuolaikinių elektroninių gaminių yra komponentų, kuriuose naudojama metalo oksidų technologija (NMOS, SMOS ir pan.). Patirtis rodo, kad net ir mažas statinės elektros kiekis gali pakenkti tokiems gaminiams ar juos sugadinti. Sugadinti komponentai, net jei atrodo, kad jie veikia tinkamai, greitai sugenda.

Brooks® Model 585xEMH

Polish

Niezbędne zalecenia**Prosimy przeczytać przed rozpoczęciem użytkowania!**

Brooks Instrument projektuje, wytwarza i testuje swoje produkty tak, aby spełniały wymagania licznych norm krajowych i międzynarodowych. Produkty te muszą być poprawnie instalowane, obsługiwane oraz konserwowane, aby zapewnić ich prawidłowe działanie zgodnie ze specyfikacją techniczną. Podczas instalowania, obsługiwanie i konserwowania produktów firmy Brooks Instrument należy przestrzegać następujących zaleceń:

- Aby zapewnić właściwe działanie sprzętu, instalacja, obsługa, aktualizacje, programowanie i konserwacja powinny być wykonywane przez przeszkolony personel.
- Przed instalacją, obsługą i czynnościami serwisowymi należy zapoznać się ze wszystkimi zaleceniami producenta. Aby uzyskać instrukcję obsługi odpowiednią dla danego sprzętu, należy skontaktować się z lokalnym przedstawicielem handlowym producenta. Instrukcję obsługi należy zachować do późniejszego użycia.

▲ OSTRZEŻENIE: Nie wolno przekraczać podanych w instrukcji zakresów działania urządzenia. Nieprzestrzeganie tego zalecenia może doprowadzić do poważnego zagrożenia życia lub zdrowia personelu i / lub uszkodzenia sprzętu.

- Jeżeli jakieś zalecenia w instrukcji obsługi urządzenia są niezrozumiałe, prosimy o skontaktowanie się z przedstawicielem firmy Brooks Instrument, aby wyjaśnić problem.
- Należy przestrzegać wszystkich ostrzeżeń, uwag i zaleceń umieszczonych na produkcie lub do niego dołączonych

▲ OSTRZEŻENIE: Przed rozpoczęciem instalacji należy sprawdzić, czy wymagana specyfikacja niniejszego urządzenia zgodna jest z miejscowymi i krajowymi normami. Zignorowanie tego ostrzeżenia może spowodować poważne obrażenia ciała i/lub uszkodzenie sprzętu.

- Instalację urządzenia należy przeprowadzić zgodnie z zaleceniami zawartymi w instrukcji instalacji oraz z obowiązującymi lokalnymi i narodowymi oznaczeniami. Wszystkie urządzenia można podłączać wyłącznie do odpowiednich źródeł energii elektrycznej oraz ciśnienia.
- Pierwsze czynności obsługowe: (1) Należy powoli włączyć przepływ w instalacji. Następnie powoli otworzyć zawory robocze tak, aby uniknąć wahań przepływu. (2) Należy teraz sprawdzić, czy nie występują nieszczelności przy podłączeniach wejściowym i wyjściowym miernika przepływu. Jeżeli nie ma żadnych nieszczelności, można zwiększyć ciśnienie w instalacji do wartości ciśnienia roboczego.
- Przed przystąpieniem do czynności serwisowych należy upewnić się, że ciśnienie robocze jest odłączone. Jeżeli konieczna jest wymiana części zamiennych, należy zawsze stosować części zamienne specyfikowane przez firmę Brooks Instrument a czynności ich wymiany powinien w każdym przypadku dokonywać przeszkolony personel. Stosowanie nieautoryzowanych części i procedur serwisowych może niekorzystnie wpłynąć na działanie produktu oraz zagrazić bezpieczeństwu instalacji. Korzystanie z podobnie wyglądających zamienników może doprowadzić do pożaru, porażenia prądem lub nieprawidłowego działania urządzenia.
- Należy upewnić się, że wszystkie otwory urządzenia są zamknięte a osłony umocowane na swoich miejscach, aby zapobiec obrażeniu ciała lub porażeniu prądem personelu. Zalecenie to nie dotyczy przeszkolonego pracownika wykonującego prace serwisowe lub konserwacyjne.

▲ OSTRZEŻENIE: W przypadku mierników przepływu cieczy, jeżeli znajdujące się na nich zawory wejściowe i wyjściowe mają być z jakiegokolwiek powodu zamknięte, to urządzenie musi zostać całkowicie opróżnione z ciekłego medium. Niedopełnienie tego zalecenia może doprowadzić do termicznego zwiększenia objętości cieczy, co z kolei może spowodować uszkodzenie urządzenia i obrażenia personelu.

Europejska dyrektywa dotycząca urządzeń ciśnieniowych (PED)

Wszystkie urządzenia ciśnieniowe pracujące przy ciśnieniu wewnętrznym względnym większym niż 0,5 bara i wielkości powyżej 25 mm lub 1 cala podlegają dyrektywie europejskiej dotyczącej urządzeń ciśnieniowych (PED).

- Rozdział „Specyfikacja techniczna” niniejszej instrukcji zawiera zalecenia dotyczące dyrektywy PED.
- Produkty opisane w tej instrukcji są zgodne z dyrektywą EN 97/23/EC.
- Wszystkie mierniki przepływu firmy Brooks Instrument należą do 1. grupy cieczy.
- Produkty o wielkości powyżej 25 mm lub 1 cala należą do kategorii I, II lub III dyrektywy PED.
- Produkty o wielkości 25 mm lub 1 cala lub mniejsze podlegają zaleceniom „Uznanej Praktyki Inżynierskiej” (SEP).

Europejska dyrektywa dotycząca kompatybilności elektromagnetycznej (EMC)

Urządzenia elektryczne / elektroniczne firmy Brooks Instrument posiadające oznaczenie CE, przeszły pozytywnie testy pod kątem spełnienia przez nich wymogów kompatybilności elektromagnetycznej (Dyrektywa EMC 2004/108/EC).

Jednakże szczególnie uwagę należy poświęcić przy doborze przewodów sygnałowych, które mają być stosowane z urządzeniami ze znakiem CE.

Jakość przewodu sygnałowego, dławic oraz złączy przewodu:

Firma Brooks Instrument dostarcza wysokiej jakości przewody, które spełniają wymagania zawarte w specyfikacji dla certyfikatu CE.

Jeżeli stosuje się własne przewody sygnałowe, to powinny one być w całości w pełni ekranowane.

Złącza typu „D” lub okrągłe powinny zawierać metalowy ekran. Jeśli to możliwe, należy stosować metalowe dławice przewodu zapewniające mocowanie jego ekranu.

Ekran przewodu powinien być połączony z metalową osłoną lub dławicą zapewniając całkowite, dookólne ekranowanie na obu końcach przewodu. Ekran przewodu powinien być uziemiony.

Złącza krawędziowe są standardowo niemetaliczne. Stosowane przewody muszą być w pełni ekranowane zgodnie z certyfikatem CE.

Ekran przewodu powinien być uziemiony.

Konfiguracja styków jest podana w niniejszej instrukcji obsługi.

Wyładowania elektrostatyczne (ESD)

▲ UWAGA: Urządzenie zawiera części elektroniczne podatne na uszkodzenia spowodowane ładunkami elektrostatycznymi. Przy obchodzeniu się z wewnętrznymi podzespołami i częściami elektronicznymi należy przestrzegać następujących zasad postępowania:

1. Należy odłączyć zasilanie od urządzenia.
2. Osoba wykonująca czynności musi zostać uziemiona za pomocą opaski na przegubie dłoni lub w inny, bezpieczny sposób, zanim przystąpi do instalacji, wyjęcia lub regulacji obwodów drukowanych lub innych wewnętrznych podzespołów elektronicznych urządzenia.
3. Obwody drukowane należy transportować w przewodzącym pojemniku. Płytki drukowane należy wyjmować z opakowania ochronnego bezpośrednio przed ich montażem. Wymontowane płytki należy niezwłocznie umieścić w opakowaniu ochronnym służącym do transportowania, składowania lub odsyłania do producenta.

Uwagi:

Fakt, że urządzenie zawiera części nieodporne na wyładowania elektrostatyczne (ESD) jest rzeczą normalną. Większość nowoczesnych urządzeń elektronicznych zawiera komponenty wykonane w technologii Ilenków metali (NMOS, SMOS itp.). Jak pokazuje praktyka, nawet niewielkie wyładowanie elektrostatyczne może uszkodzić lub zniszczyć także urządzenie. Uszkodzone części, nawet jeżeli na pozór działają poprawnie, szybko doprowadzają do nieprawidłowej pracy urządzenia.

Portuguese

Instruções Básicas**Ler antes de proceder!**

A Brooks Instrument projecta, fabrica e testa os seus produtos de forma a satisfazer numerosas normas nacionais e internacionais. Estes equipamentos devem ser instalados, utilizados e mantidos de forma adequada, e devem funcionar dentro da sua gama de utilização. As instruções seguintes devem ser, durante a instalação, uso e/ou manutenção dos equipamentos da Brooks Instrument, apreendidas e integradas no plano de protecção e segurança no trabalho.

- Para assegurar o desempenho adequado, a instalação, exploração, actualização e/ou manutenção do equipamento deve ser realizada, exclusivamente, por pessoal qualificado.
- Antes de instalar, utilizar e/ou executar operações de manutenção devem ser lidas todas as instruções do equipamento. No caso do presente manual não ser apropriado procure, na capa traseira, o distribuidor mais próximo e contacte-o para obter informações adicionais. Guarde este manual para futura referência.

⚠ ATENÇÃO: não sujeite o equipamento a condições fora das gamas de serviços indicadas. Ao não respeitar esta advertência poderá provocar avarias no equipamento e/ou danos pessoais.

- Se as instruções deste manual não estiverem suficientemente claras, contacte o representante Brooks Instrument para esclarecer as suas dúvidas.
- Tenha sempre presente todas as advertências, apelos e instruções indicadas no equipamento e/ou fornecidas junto com o mesmo.

⚠ AVISO: Antes de proceder à instalação, certifique-se de que este instrumento está em conformidade com as categorias de homologação exigidas pelas regulamentações locais e nacionais. O incumprimento pode resultar em lesões pessoais graves e/ou danos no equipamento.

- A instalação do equipamento deverá ser efectuada cumprindo todas as instruções indicadas no manual assim como as normas e regulamentos locais e nacionais vigentes. Ligue o equipamento exclusivamente a fontes de energia eléctrica e/ou pneumática adequadas.
- Procedimento: (1) Pressurize lentamente o sistema. Abra lentamente as válvulas para evitar variações bruscas de caudal. (2) Verifique se há fugas nas ligações de entrada e saída do medidor de caudal. Se não detectar fugas, poderá colocar o sistema à pressão de trabalho.
- Antes de efectuar qualquer operação de manutenção verifique sempre a possibilidade do equipamento estar sob pressão. No caso de ser preciso substituir peças, estas devem ser as recomendadas pela Brooks Instrument e o trabalho de substituição deverá ser efectuado por técnicos qualificados. Procedimentos e peças não conformes poderão alterar o desempenho do equipamento, danificá-lo ou colocar em risco a sua segurança ou de outros. Substituir peças por outras não originais, meramente semelhantes, poderá originar choques eléctricos, fogo ou em funcionamento inadequado.
- Deverá manter o equipamento intacto e fechado, verificando se as coberturas de protecção estão nos seus lugares devidos, de forma a evitar choques eléctricos e/ou danos pessoais, excepto no caso de se tratar de um técnico qualificado e se estiver a executar trabalhos de manutenção.

⚠ ATENÇÃO: Se por qualquer razão for necessário fechar as válvulas a montante e jusante do equipamento, tenha em atenção que o mesmo deverá ser previamente esvaziado do fluido que o atravessa. Esta obrigação surge do facto de existir a possibilidade de ocorrer dilatação térmica do líquido, no interior do aparelho, podendo provocar danos pessoais ou materiais graves.

Directiva Europeia para equipamentos sob pressão (PED)

Todos os equipamentos sujeitos a pressão interior superior a 0,5 bar (g) e com calibre superior a 25 mm (1 polegada) estão sob a vigência da directiva europeia de equipamentos sob pressão (PED).

- O capítulo "Dados técnicos" do manual contém instruções relativas à Directiva PED.
- O produto objecto deste manual satisfaz a directiva 97/23/CE da UE.
- Os caudalímetros Brooks pertencem ao grupo 1 de fluidos.
- Os produtos com calibre superior a 25 mm (1 polegada) pertencem às categorias PED I, II, ou III.
- Os produtos de 25 mm (1 polegada) ou menores seguem as "Boas regras de engenharia" (SEP).

Directiva Europeia sobre Compatibilidade electromagnética (EMC)

Os equipamentos (eléctricos/electrónicos) da Brooks Instrument que têm a marcação CE passaram os testes comprovativos dos requisitos de compatibilidade electromagnética (Directiva EMC número 2004/108/EC).

Todavia, ao utilizar os aparelhos compete-lhe a escolha dos cabos de sinal adequados para os equipamentos com marcação CE.

Qualidade dos cabos de sinal, buçins e conectores:

A Brooks Instrument fornece cabos de alta qualidade que cumprem todos os requisitos da marcação CE.

No caso de utilizar os seus próprios cabos de sinal, assegure uma blindagem a 100%.

Os conectores do tipo "D" ou "circular" têm que ser blindados por uma malha metálica. Se precisar de usar buçins, estes têm que permitir a crimpagem da malha/blindagem do cabo.

A blindagem do cabo deve ser ligada ao corpo metálico ou bocal e assegurando a blindagem em 360°. A blindagem deve terminar numa ligação à terra.

Os conectores ligados a cartões serão, em geral, não-metálicos. Os cabos utilizados devem ter fita de blindagem a 100% para satisfazer a marcação CE.

A blindagem, deverá terminar numa ligação à terra.

Atribuição de pinos: Veja as instruções de operação anexas.

Descarga Electrostática (ESD)

⚠ ATENÇÃO: Alguns componentes deste equipamento são susceptíveis à acção da electricidade estática, podendo ficar danificados. Ao remover, colocar ou manipular placas de circuitos electrónicos deverá ter em atenção os seguintes procedimentos:

1. Desligar o equipamento da rede.
2. O utilizador, antes de qualquer intervenção que envolva os cartões de circuitos ou outros dispositivos internos, terá que se ligar à terra por meio dum bracelete de pulso ou outro dispositivo adequado.
3. Os circuitos impressos deverão ser transportados numa embalagem condutiva. Os cartões só deverão ser retirados da embalagem protectora imediatamente antes da sua inserção. O cartão retirado deverá ser recolocado imediatamente na embalagem protectora que servirá para o seu transporte, armazenagem ou retorno a fábrica.

Observações:

Tenha presente que este equipamento poderá não ser o único objecto capaz de ser portador de peças sensíveis a descargas electrostáticas (ESD).

Na maioria dos dispositivos electrónicos Brooks encontram-se peças de tecnologia de óxidos metálicos (NMOS, SMOS, etc.). A experiência mostra que até pequenas quantidades de electricidade estática são capazes de danificar ou destruir esses dispositivos. Os componentes danificados, embora inicialmente funcionem aparentemente bem, acabam por ter falhas prematuramente.

Brooks® Model 585xEMH

Romanian

Indicații de referință**Citiți-le întâi pe acestea!**

Brooks Instrument își proiectează, produce și testează produsele într-un mod ce respectă un mare număr de standarde autohtone și internaționale. Aceste instalații trebuie amplasate, exploatate și întreținute corespunzător, pentru ca în toate situațiile, domeniul lor de lucru să corespundă operării normale. În ceea ce privește instalarea, operarea și întreținerea produselor Brooks Instrument, indicațiile de mai jos trebuie respectate și trebuie introduse în programul de protecția muncii.

- Pentru garantarea prestației corecte, instalarea, operarea, actualizarea, programarea și întreținerea produsului poate fi realizată doar de către personal calificat.
- Instrucțiunile de instalare ale produsului trebuie citite integral, înainte de punerea în serviciu și exploatarea sa. În măsura în care ediția acestui manual nu este cea adecvată, identificați pe ultima copertă coordonatele distribuitorului local și pentru lămuriri suplimentare adresați-vă acestuia. Păstrați acest manual pentru referințe ulterioare.

⚠ ATENȚIE: Nu utilizați instalația în afara intervalului de funcționare indicat în instrucțiunile de operare. Nerespectarea acestui lucru se poate solda cu răni grave de persoane sau defectarea instalației.

- În măsura în care indicațiile cărții mașinii nu sunt suficient de lămuritoare, luați legătura cu reprezentantul Brooks Instrument pentru clarificarea problemei.
- Păstrați toate avertismentele, avizele și instrucțiunile livrate odată cu instalația sau inscripționate pe aceasta.

⚠ AVERTISMENT: Înainte de instalare, asigurați-vă că valorile nominale ale acestui instrument respectă codurile naționale. Nerespectarea acestui avertisment poate avea drept rezultat răni personale grave și/sau defectarea echipamentelor.

- Efectuați instalarea echipamentului în conformitate cu indicațiile de instalare corespunzătoare, respectiv cu respectarea prevederilor naționale. Echipamentul se conectează exclusiv la surse de energie electrică și de presiune corespunzătoare.
- Succesiune: (1) Presurizați lent instalația. Deschideți încetul cu încetul supapa de funcționare pentru evitarea fluctuațiilor de flux. (2) Controlați dacă nu sunt prelingerii la intrarea sau ieșirea debitmetrului de branșare. Dacă nu sunt scurgeri, presurizați instalația la presiunea de lucru.

- Înaintea exploatării/ întreținerii, verificați neapărat dacă conducta uzinală nu este sub presiune. În măsura în care este nevoie de piese de schimb, este neapărat necesar ca manevrarea pieselor de schimb să fie făcută de personal cu calificare profesională agreat de Brooks Instrument. Utilizarea altor piese de schimb decât cele originale și licențiate poate avea efecte asupra performanțelor instalației și asupra siguranței sale în exploatare. Utilizarea de piese asemănătoare de substituie poate avea ca rezultat pericol de incendiu și electrocutare.
- În toate cazurile toate ușile instalației trebuie să fie închise, cuștile de protecție să fie puse la locurile lor, pentru evitarea electrocutării și rănirii de persoane, exceptând situațiile când un specialist efectuează lucrări de întreținere.

⚠ ATENȚIE: În cazul instalațiilor cu flux de fluide, dacă din orice motiv este necesară închiderea valvelor de intrare și ieșire, limitrofe instalației, instalația trebuie complet golită. Neglijarea acestui lucru poate avea ca efect dilatarea termică a fluidului, care poate defecta instalația și poate produce răni de persoane.

Directiva europeană pentru instalațiile sub presiune (PED)

Toate instalațiile și sistemele presurizate ce se află sub presiuni interne ce depășesc 0,5 mbar (g) și au mai mult de 25 mm sau 1 țol, cad sub incidența normei europene corespunzătoare (PED).

- La capitolul "Date tehnice" din cartea mașinii se găsesc indicațiile corespunzătoare directivei PED.
- Produsele menționate în cartea mașinii corespund directivei 97/23/EK EU.
- Toate debitmetrele Brooks corespund clasei 1 de fluide.
- Produsele mai mari de 25 mm sau 1 țol corespund categoriei PED I, II sau III.
- Produsele mai mici de 25 mm sau 1 țol se conformează practicii ingineresti acceptate (SEP).

Directiva europeană privitoare la compatibilitatea electromagnetică (EMC).

Instalațiile (electrice /electronice) ce poartă marca Brooks Instrument CE îndeplinesc cu succes cerințele testelor de verificare ale compatibilității electromagnetice (Cf. directivelor europene EMC cu nr. 2004/108/EC).

În același timp trebuie acordată o atenție deosebită la alegerea cablurilor de semnalizare utilizate pentru instalațiile ce poartă marcajul CE.

Calitatea cablurilor de semnalizare, a legăturilor prin cablu și a conectoarelor:

Brooks Instrument oferă cabluri de calitate ridicată, care corespund cerințelor calitative ale CE.

În măsura în care folosiți cabluri proprii, trebuie alese acelea care sunt 100% ecranate și prevăzute cu filtre.

Conectoarele „D” sau cele „circulare” trebuie sa dispună de ecrane metalice. În caz de nevoie trebuie folosite conectoare metalice pentru montarea filtrelor de cablu.

Filtrul de cablu trebuie conectat la carcasa metalică sau manșon și în ambele cazuri trebuie asigurată ecranarea la 360°. Ecranarea trebuie terminată cu o legare la pământ.

Conform standardului, conectoarele aparținând plăcilor electronice nu sunt metalice. Cablurile folosite trebuie să fie 100% ecranate și prevăzute cu filtre pentru a corespunde clasificării CE.

Ecranarea trebuie terminată cu o legare la pământ.

Configurație de contact: Vezi instrucțiunile de operare atașate.

Descărcare electrostatică (ESD)

⚠ ATENȚIE: Instalația include piese care sunt predispuse la defectare sub influența electricității statice. Trebuie respectate metodele corespunzătoare de extragere, instalare sau alte manipulări ale circuitelor electronice.

Procedură de manipulare:

1. Instalația trebuie scoasă de sub tensiune.
2. Înaintea de inserarea, scoaterea sau reglarea vreunei cartele electronice, sau a altui dispozitiv intern, persoana trebuie să se lege la pământ cu banda pentru articulația mâinii sau alte dispozitive de siguranță disponibile pentru acest scop.
3. Cartelele cu cablaje electronice imprimate trebuie transportate în ambalaje anti-electrostatice (conductive). Cartelele se pot scoate din ambalaj, doar nemijlocit înaintea amplasării lor. Cartela demontată trebuie pusă neîntârziat în ambalajul de protecție în vederea transportării, a depozitării sau returnării la producător.

Observații:

În echipamente se găsesc adesea componente sensibile la descărcare electrostatică (ESD). Majoritatea echipamentelor moderne includ componente electronice realizate în tehnologie metal-oxid semiconductor (NMOS, SMOS, etc.) Experiența a dovedit că acestea pot fi afectate sau deteriorate chiar de energii electrostatice de slabă intensitate. Componentele defectate, cu toate că în aparență sunt funcționale, duc în timp la defecțiuni incipiente.

Slovak

Základné príkazy**Prečítať pred inštaláciou!**

Brooks Instrument svoje výrobky projektuje, vyrába a testuje takým spôsobom, aby tieto vyhoveli domácim aj medzinárodným normám. Tieto zariadenia je potrebné predpísaným spôsobom inštalovať, prevádzkovať a udržiavať, na zabezpečenie ich spoľahlivej a normálnej prevádzky v celom pracovnom rozsahu. Nižšie uvedené príkazy je potrebné dodržiavať a začleniť do programu bezpečnostných predpisov v priebehu inštalácie, prevádzky a údržby výrobkov Brooks Instruments.

- V záujme zabezpečenia vyhovujúceho výkonu inštaláciu, prevádzku, programovanie, aktualizáciu a údržbu zariadení má vykonávať výlučne odborné kvalifikovaný personál.
- Pred inštaláciou, prevádzkou a servisom zariadení je potrebné prečítať všetky príkazy. Ak táto príručka nie je správna, tak na zadnej strane treba nájsť miestneho distribútora, kontaktovať ho pre ďalšie informácie. Pre neskoršie informácie uschovajte príručku.

▲ UPOZORNENIE: Neprevádzkovať zariadenie v rozsahu mimo rozsahu uvedenom v prevádzkovej príručke. Porušenie tohto oznámenia môže mať za následok ťažkú ujmu na zdraví a vedie k poškodeniu zariadenia.

- Ak príkazy v návode nie sú jednoznačné, kontaktujte zástupcu Brooks Instrument na objasnenie problémov.
- Dodržujte všetky upozornenia, príkazy a usmernenia uvedené na zariadení, alebo s ním dodané.

▲ VAROVANIE: pred montážou sa uistite, že toto zariadenie disponuje potrebnými klasifikáciami povolení, ktoré spĺňajú miestne a národné predpisy. Nedodržanie tohto varovania môže mať za následok vážne zranenia osôb alebo poškodenie zariadenia.

- Zariadenia inštalujte podľa návodu uvedeného v príkaze na inštaláciu, v súlade s miestnymi a národnými predpismi. Zariadenie pripojte výlučne len na vyhovujúci elektrický a tlakový zdroj
- Postup: (1) Pomaly natlakujte systém. Prevádzkový ventil otvorte pomaly na zamedzenie kolísania prietoku. (2) Prekontrolujte tesnosť vstupného a výstupného zapojenia prietokomeru. Keď nie je presakovanie, spoje sú tesné, naplniť systém na prevádzkový tlak.
- Pred vykonávaním servisných prác kontrolovať, či systém nie je pod tlakom. V prípade, že je potrebná výmena súčiastky, výmenu dielov, určených Brooks Instrument musí vykonať kvalifikovaná osoba. Použitie nepovolených dielov a vykonávanie nepovolených aktivít ohrozujú bezpečnosť prevádzky a majú negatívny vplyv na výkon zariadenia. Nahradenie súčiastok len podobnými komponentmi môže mať za následok požiar, úraz elektrickým prúdom alebo nedostatočnú funkciu zariadenia
- Všetky ochranné kryty, dvierka zariadenia majú byť zatvorené na zabezpečenie ochrany proti úrazu elektrickým prúdom a proti poraniam obsluhy. Výnimku tvorí vykonávanie údržby kvalifikovaným odborníkom.

▲ UPOZORNENIE: Pri zariadeniach s prietokom kvapalín, keď z akéhokoľvek dôvodu je nutné uzavrieť vstupné a výstupné ventily, zariadenie je potrebné úplne vyprázdniť. Zanedbanie vypúšťania má za následok poškodenie zariadenia s možnosťou zranenia obsluhy z dôvodu tepelnej rozťažnosti náplne.

Európska smernica vzťahujúca sa na tlakové zariadenia (PED)

- Všetky zariadenia s vyšším vnútorným pretlakom ako 0,5 bar (g), a väčšieho rozmeru ako 25 mm alebo 1 anglický palec, podliehajú pod Európsku smernicu vzťahujúcu sa na tlakové nádoby (PED).
- Kapitola "Technické údaje" návodu na obsluhu obsahuje príkazy vzťahujúce sa na smernicu PED.
- Produkty uvedené v návode na obsluhu vyhovujú smernici 97/23/ES EÚ.
- Všetky prietokomery Brooks patria do 1. skupiny kvapalín.
- Produkty presahujúce rozmery 25 mm alebo 1 " spĺňajú I., II., alebo III. kategóriu PED.
- Produkty menšie alebo rovné ako 25 mm alebo 1 " zodpovedajú zaužívanej meracej praxi (SEP).

Európska smernica vzťahujúca sa na elektromagnetickú kompatibilitu (EMC)

Elektrické / elektronické zariadenia Brooks Instrument, ktoré si zaslúžili značku CE, úspešne splnili skúšobné testy požiadaviek elektromagnetickej kompatibility (smernica EMC č. 2004/108/EC).

Pri tom treba venovať zvláštnu starostlivosť na výber signálnych káblov zariadenia, s označením CE.

Kvalita signálnych káblov, káblových spojov a pripojov:

Brooks Instrument ponúka vysoko kvalitné káble, ktoré spĺňajú požiadavky kvalitatívneho zaradenia CE.

Ak použijete vlastné signálne káble, majú mať 100%-né tienenie, s plným filtrovaním.

Pripojky "kruhové" alebo tvaru "D" majú mať kovové tienenie. V prípade potreby treba použiť kovové káblové spojky k upevneniu káblového filtra.

Káblový filter treba pripojiť ku kovovému telesu alebo k puzdru, na oboch stranách zabezpečiť tienenie v kruhu 360 °. Tienenie má byť ukončené uzemnením.

Pripojky vedúce ku kartám podľa noriem sú nekovové. Použitie káble, pre vyhovenie predpisom CE musia mať 100%-né filtrovanie tienením.

Tienenie má byť ukončené uzemnením.

Konfigurácia kontaktov: Viď priložený návod na obsluhu. .

Elektrostatický výboj (ESD)

▲ UPOZORNENIE: Prístroj obsahuje súčiastky, ktoré môžu byť poškodené od elektrostatických nábojov. Pri montáži, odstraňovaní alebo inej údržby vnútorných obvodových kariet je potrebné dodržiavať príslušné postupy.

Postup ošetrovania:

1. Zariadenie odpojiť od napájania.
2. Osoba vykonávajúca údržbu má byť uzemnená uzemňujúcim náramkom, alebo iným, na túto prácu vyhovujúcim spôsobom pred vykonávaním inštalácie, demontáže a nastavenia obvodových kariet alebo iného vnútorného prostriedku.
3. Karty obvodov sa musia prepravovať v elektricky vodivom balení. Karty sa môžu vyberať z ochranného obalu výlučne len tesne pred montážou, zasunutím! Vybranú kartu okamžite treba umiestniť do ochranného obalu, určeného pre dopravu, skladovanie, alebo pre spätnú prepravu do výrobného závodu.

Poznámky:

Existencia prvkov, ktoré sú citlivé na elektrostatické výboje (ESD) v prístroji je častým javom. U väčšiny moderných elektronických prostriedkov sú použité prvky s technológiou oxidu kovov (NMOS, SMOS, atď.). Skúsenosti dokazujú, že aj nepatrné elektrostatické výboje poškodzujú, zničia tieto prostriedky. Poškodené súčiastky, aj keď zdánlivo pracujú bez chyby, odkazujú na vznikajúce poruchy.

Brooks® Model 585xEMH

Slovene

Osnovna navodila

Preberite jih pred nadaljevanjem.

Brooks Instrument oblikuje, proizvaja in preskuša svoje izdelke tako, da ustrezajo številnim nacionalnim in mednarodnim standardom. Te izdelke je treba ustrezno namestiti, jih uporabljati in vzdrževati, saj bodo le tako še naprej delovali v skladu s svojimi običajnimi tehničnimi podatki. Upoštevajte spodnja navodila in jih vključite v svoj varnostni program pri namestitvi, uporabi in vzdrževanju izdelkov družbe Brooks Instrument.

- Če želite zagotoviti ustrezno delovanje, zagotovite, da bo izdelek namestilo, uporabljalo, posodabljalo, programiralo in vzdrževalo usposobljeno osebje.
- Pred namestitvijo, uporabo in servisiranjem izdelka preberite vsa navodila. Če ta priročnik ni ustrezen priročnik, na hrbtni strani poiščite podatke za stik z lokalnim prodajnim mestom. Ta priročnik shranite za poznejšo uporabo.

▲ OPOZORILO: To napravo lahko uporabljate samo v okviru tehničnih podatkov, ki so navedeni v priročniku z navodili za uporabo. Če tega opozorila ne upoštevate, lahko pride do hudih telesnih poškodb in/ali poškodb opreme.

- Če katerih koli navodil ne razumete, se za pojasnilo obrnite na svojega zastopnika družbe Brooks Instrument.
- Upoštevajte vsa opozorila, svarila in navodila, ki so navedena na izdelku ali so mu priložena.

▲ OPOZORILO: Pred namestitvijo se prepričajte, da ima ta naprava zahtevane ocene odobritve, ki izpolnjujejo lokalne in nacionalne zakone. Če tega opozorila ne upoštevate, lahko pride do hudih telesnih poškodb in/ali poškodb opreme.

- Opremo namestite v skladu z navodili za namestitve, ki so navedena v ustreznem uporabniškem priročniku, ter v skladu z veljavnimi lokalnimi in nacionalnimi zakoni. Vse izdelke priključite na ustrezne električne vire in vire tlaka.
- Postopek: (1) V sistemu počasi zaženite pretok. Počasi odprite procesne ventile, da preprečite nihanja pretoka. (2) Preverite, ali prihaja do puščanj okrog vhodnih in izhodnih priključkov merilnika pretoka. Če ne prihaja do puščanj, vzpostavite delovni tlak v sistemu.
- Pred servisom morate odstraniti tlak v obdelovalni liniji. Če potrebujete rezervne dele, zagotovite, da usposobljeno osebje uporablja rezervne dele, ki jih je odobrila družba Brooks Instrument. Neodobreni deli in postopki lahko vplivajo na učinkovitost delovanja izdelka ali ogrozijo varno upravljanje postopka. Rezervni deli, ki so podobni samo na videz, lahko povzročijo požar, nevarnost elektičnega udara ali nepravilno delovanje.
- Prepričajte se, da so vrata zaprta in da so zaščitni pokrovi nameščeni, da preprečite električni udar in telesne poškodbe, razen kadar usposobljeno osebje izvaja vzdrževalna dela.

▲ OPOZORILO: Če je pri napravah za pretok tekočine vhodne in izhodne ventile ob napravi treba iz kakršnega koli razloga zapreti, je treba naprave popolnoma izprazniti. Če tega ne naredite, lahko pride do toplotnega raztezanja tekočine, zaradi katerega se lahko naprava prelomi in povzroči telesne poškodbe.

Evropska direktiva o tlačni opremi (PED)

Vsa tlačna oprema z notranjim tlakom, ki je večji od 0,5 bara (g), in velikostjo, ki je večja od 25 mm ali 1 palca, spada v direktivo o tlačni opremi (PED).

- V poglavju »Tehnični podatki« v tem priročniku najdete navodila, ki se nanašajo na direktivo PED.
- Izdelki, opisani v tem priročniku, so skladni z direktivo EN 97/23/ES.
- Vsi merilniki pretoka družbe Brooks Instrument spadajo v skupino tekočin 1.
- Izdelki, večji od 25 mm ali 1 palca, so skladni s kategorijo I, II, ali III direktive PED.
- Izdelki, katerih velikost je 25 mm ali 1 palec ali manjši izdelki, so skladni z dobro inženirsko prakso (SEP).

Evropska direktiva o elektromagnetni združljivosti (EMC)

Naprave družbe Brooks Instrument (električne/elektronske) z oznako CE so bile uspešno preskušene v skladu s predpisi direktive o elektromagnetni združljivosti (Direktiva o elektromagnetni združljivosti 2004/108/ES).

Posebno pozornost morate nameniti izbiri signalnega kabla, ki jih uporabljate za naprave z oznako CE.

Kakavost signalnih kablov, kablskih tesnil in priključkov:

Brooks Instrument ponuja kable visoke kakovosti, ki ustrezajo tehničnim podatkom za pridobitev oznake CE.

Če uporabljate svoj signalni kabel, morate uporabiti kabel, ki je na splošno popolnoma oklopljen s 100 % zaščito.

Priključki tipa »D« ali »krožni« priključki morajo biti zaščiteni s kovinskim ščitom. Po potrebi je treba uporabiti kovinske kablске tesnilke, ki zagotavljajo vpenjala za zaslon kabla.

Zaslon kabla je treba priključiti na kovinsko ohišje ali tesnilko in ga na obeh koncih popolnoma zaščititi.

Zaščito je treba prekiniti pri ozemljitvi.

Robni priključki običajno niso kovinski. Kable je treba zaščititi s 100 % zaščito, da ustrezajo oznaki CE.

Zaščito je treba prekiniti pri ozemljitvi.

Navodila z konfiguracijo nožic najdete v priloženem uporabniškem priročniku.

Elektrostatična razelektritev (ESD)

▲ OPOZORILO: Naprava vsebuje elektronske komponente, ki so občutljive na poškodbe zaradi statične elektrike. Pri odstranitvi, namestitvi ali drugih postopkih uporabe notranjega tiskanega vezja ali naprav morate upoštevati ustrezne postopke.

Postopek ravnanja:

1. Izklopite napravo.
2. Osebje je treba pred namestitvijo, odstranitvijo ali prilagajanjem katere koli kartice tiskanega vezja ali druge notranje naprave ozemljiti z zapesnim paščkom ali drugimi varnostnimi in primernimi sredstvi.
3. Kartice s tiskanim vezjem je treba prevažati v prevodnem vsebniku. Plošče lahko iz zaščitne embalaže odstranite šele tik pred namestitvijo. Odstranjene plošče je treba takoj shraniti v zaščitno embalažo za prevoz, shranjevanje ali vračilo v tovarno.

Opombe:

Ta naprava ni edinstvena z vidika komponent, ki so občutljive na elektrostatično razelektritev. Večina sodobnih elektronskih naprav vsebuje komponente, ki uporabljajo oksidno tehnologijo (NMOS, SMOS itd.). Izkušnje dokazujejo, da lahko celo majhne količine statične elektrike poškodujejo ali uničijo te naprave. Poškodovane komponente se predčasno okvarijo, čeprav navidez delujejo pravilno.

Spanish

Instrucciones básicas

¡Léalos primero!

El Brooks Instrument proyecta, fabrica y prueba sus productos de manera que éstos respondan a numerosas normas nacionales e internacionales. Dichas instalaciones deben ser emplazadas, operadas y mantenidas adecuadamente, para que puedan marchar de todas formas en conformidad con el alcance normal de funcionamiento. Las siguientes instrucciones deben cumplirse e incorporadas en su programa de seguridad cuando instalando, operando y mantenimiento los productos Brooks Instrument.

- Para asegurar el adecuado rendimiento, para instalar, operar, actualizar, programar y mantener tiene que realizarse exclusivamente por una persona calificada.
- Antes de la instalación, operación y servicio del producto leer todas las respectivas instrucciones. Si el presente manual no es la adecuada publicación, busque al distribuidor local que figura en la contraportada y póngase en contacto con él para obtener informaciones. Guarde el presente manual para tener informaciones también en el futuro.

▲ ATENCIÓN: No haga funcionar los equipos fuera del rango indicado en las instrucciones de funcionamiento. El incumplimiento de estas últimas puede conducir a graves daños personales o a la avería del equipo.

- Si las instrucciones del manual no son evidentes, póngase en contacto con el representante de Brooks Instrument para aclarar el problema
- Observar todas las alertas, advertencias e instrucciones indicadas en el equipo o suministradas con el mismo.

▲ ADVERTENCIA: Antes de la instalación, asegúrese de que el instrumento ofrece las características de aprobación necesarias para satisfacer los requisitos normativos locales y nacionales. En caso contrario, se pueden producir lesiones personales y/o daños en el equipo.

- Instale su equipo en conformidad con las recomendaciones indicadas en las respectivas instrucciones de instalación y con las pautas de las normas vigentes locales e internacionales. Conectar el producto exclusivamente a la adecuada fuente eléctrica y presión.
- Proceso: (1) Colocar lentamente flujo en el sistema. Abrir lentamente las válvulas de proceso para evitar oscilación del flujo. (2) Verificar si hay fuga alrededor de las conexiones de entrada y salida del flujómetro, Si no hay, llenar el sistema con la presión de operación.
- Antes de efectuar el servicio, verificar si hay presión o no en la tubería de la red. Si se requiere realizar un recambio de piezas, solamente el personal calificado puede manipular las piezas de repuesto determinadas por Brooks Instrument. Las piezas y operaciones no autorizadas pueden afectar el rendimiento del producto o arriesgar el funcionamiento seguro. El recambio realizado con piezas sólo similares pueden traer como consecuencias incendios, choques eléctricos o funcionamiento bajo.
- Todas las puertas de la instalación deben estar cerradas, las cubiertas de protección tienen que hallarse en el debido sitio con el fin de evitar los daños personales y los choques eléctricos, salvo cuando un especialista efectúa el mantenimiento.

▲ ADVERTENCIA: En caso de instalaciones que circulen líquido, si por cualquier razón se hubiera de cerrar las válvulas de entrada y salida situadas al lado del equipo, dichas instalaciones deberán ser completamente vaciadas. La omisión de esto último puede provocar la dilatación térmica del líquido, lo que puede dañar al equipo y conducir a daños personales.

Directriz Europea de los Equipos de Presión (PED)

Todos los equipos de presión, con una presión interna que supere a 0,5 bar (g) con tamaño mayor a 25 mm o 1 pulgada entran el ámbito de la Directriz Europea de los Equipos de Presión (PED).

- El capítulo Datos Técnicos del manual incluye las instrucciones respecto a las directivas de PED
- Los instrumentos de medición indicados en el Manual responden a las EN directivas 97/23/EC.
- Todos los caudalímetros Brooks pertenecen a la categoría 1 del grupo de fluidos.
- Los instrumentos de medición más grandes que 25 mm o 1 pulgada están en conformidad con las categorías I, II o III de PED
- Los instrumentos de medición más pequeños que 25 mm o 1 pulgada siguen la Práctica Aceptada de Ingeniería (SEP).

Directriz Europea respecto a la Compatibilidad Electromagnética (EMC)

Las instalaciones de Brooks Instrument (eléctricas/electrónicas) merecedores de la categoría CE cumplieron con éxito las pruebas que verifican las exigencias de la compatibilidad electromagnética (directiva de EMC 2004/108/EC).

Al mismo tiempo se ha de prestar una especial atención en la selección de los cables de señal, utilizados con los equipos marcados con CE.

Calidad de los cables de señal, piezas de unión de cable y conectores:

El Brooks Instrument ofrece cables de alta calidad, que responden a los requerimientos de calificación CE.

Si se utiliza cable propio de la firma, se ha de elegir uno que sea completamente filtrado con blindaje de 100%.

Las piezas de unión de forma „D” o „circular” deben ser blindadas mediante blindaje metálica. Si es necesario, aplicar piezas de unión de metal para sujetar el filtro de cable.

Conectar el filtro de cable a la caja o manguito de metal blindándolo en ambas caras en 360°.

El blindaje debe terminarse en tierra.

Los conectores que pertenecen a las tarjetas normalmente no son metalizados. Los cables utilizados deben ser filtrados con una blindaje de 100% para responder a la calificación CE.

El blindaje debe terminarse en tierra.

Configuración de contacto: Véase Instrucciones de operación adjuntas.

Descarga Electroestática (ESD)

▲ PRECAUCIÓN: El aparato incluye piezas electrónicas que son susceptibles a los daños provocados por la electricidad estática.

Observar los adecuados procesos para remover, instalar o manipular las tareas y medios de circuitos eléctricos internos

Proceso de operación:

1. Desconectar la fuente eléctrica de la unidad.
2. La persona debe ponerse a tierra mediante una palanca acodada o por otro medio seguro y apropiado para dicho fin antes de instalar, sacar o ajustar el circuito impreso eléctrico u otro medio interno.
3. El circuito impreso debe ser transportado en embalaje conductor. Las tarjetas no pueden sacarse de la cubierta protectora exclusivamente directamente antes de la instalación. Las tarjetas desmontadas deben colocarse sin tardar en el embalaje protector utilizado para manipulación, almacenamiento o devolución a la fábrica.

Notas:

Este equipo no es el único contenido de piezas susceptibles a la descarga electroestática (ESD). En la mayoría de los medios electrónicos modernos se encuentran piezas fabricadas por tecnología de óxido metálico. (NMOS, SMOS etc.). Las experiencias confirman que incluso una mínima electricidad estática puede dañar o destruir dichos medios. Las piezas averiadas, aunque funcionen aparentemente bien, indican una falla inicial.

Brooks® Model 585xEMH

Swedish

Väsentliga anvisningar. Läs detta innan du fortsätter!

Brooks Instrument konstruerar, tillverkar och testar sina produkter med syfte att uppfylla alla nationella och internationella standarder. Dessa produkter måste installeras på rätt sätt, handhas och underhållas för att de skall fungera kontinuerligt enligt deras normala specifikation. De följande anvisningarna bör följas och integreras till Ert säkerhetsprogram varje gång när Brooks Instruments produkter installeras, handhas och underhålls.

- För att garantera angiven funktion, använd kvalificerad personal till att installera, handha, uppgradera, programmera och serva produkten.
- Läs alla instruktioner innan produkten installeras, startas upp och underhålls. Om du finner att denna instruktionshandbok inte är den rätta instruktionsboken, titta på i slutet av pärmen för information om hur man kan kontakta lokala representanter. Spara denna instruktions manual för senare behov.

⚠ WARNING: Kör inte detta instrument utanför dess specifikationer som är angiven i Instruktionsboken. Undvikande att ta denna varning kan leda till allvarliga personliga skador och / eller skada utrustningen.

- Om du inte förstår någon av dessa instruktioner, kontakta din representant för Brooks Instrument för klargörande.
- Följ alla varningar och instruktioner som följer med leveransen av denna produkt.

⚠ WARNING: Säkerställ före installation att detta instrument har alla nödvändiga godkännanden för att uppfylla lokala och nationella regler. Underlåtenhet att följa denna varning kan leda till personskador och/eller skador på utrustningen.

- Installera din utrustning på sättet som anges i den gällande handbokens installationsanvisningar och enligt tillämpliga lokala och nationella föreskrifter. Koppla varje produkt till föreskriven ström- och tryckkällan.
- Igångsättning: (1) Koppla långsamt på flöde i systemet. Öppna processventiler sakta för att undvika för höga flöden. (2) Kontrollera läckor vid mätarens anslutningar för in- och utlopp. Om inget läckage förekommer, kör systemet upp till drifttrycket.
- Kontrollera att processledningens tryck är bortkopplat före service. I fall det behöves kompletteras med nya delar, se till att komponenter föreskrivna av Brooks Instrument används. Samt att kvalificerad personal utför arbetet. Ej rekommenderade komponenter och åtgärder kan påverka produktens prestanda och sätta din driftsäkerhet på spel. "Felaktiga" ersättningar kan orsaka eld, elektriska skador samt felaktig funktion.
- Se till att anordningens kåpor och skyddslock ligger på sin plats med syfte att förebygga elektriska kontakt och personliga skador; det enda undantag gäller när underhållsarbete utförs av kvalificerad personal.

⚠ WARNING: I fall av - flödesmätare / regulatorer för vätskor: Ifall ventiler före och efter skall stängas av, måste alla ledningar tömmas på all vätska. Att ej tömma ledningar alt koppla bort trycket kan göra så att vätskans värmeutvidgning kan spräcka / skada utrustningen och orsaka personliga skador.

European Pressure Equipment Directive (PED) - (Rådets Direktiv 99/36/EG av den 29 april 1999[1] om transportabla tryckbärande anordningar)

Alla utrustning för tryck med ett tryck över 0.5 Bar(g) bar och större demensioner än 25 mm eller 1" (inch) faller under Tryck direktiv 99/36/EG av den 29 april 1999[1] om transportabla tryckbärande anordningar - PED.

- Den här Instruktionsbokens Sektion " Specifikation" innehåller anvisningar gällande PED Direktivet.
- Mätare som beskrivs i denna Instruktionsbok är i överensstämmelse med EN Direktivet 97/23/EC.
- Brooks Instruments alla flödesmätare faller under flödesgrupp nr. I.
- Mätare som är större än 25 mm eller 1" (inch) överensstämmer med PED kategorier I, II eller III.
- Mätare på 25mm eller 1" (inch) eller mindre faller under Sound Engineering Practice (SEP) (God Teknisk Praxis).

European Electromagnetic Compatibility (EMC) - Elektromagnetisk kompatibilitet

Brooks Instrument (elektriska/elektroniska) CE-märkta anordningar har redan genomgått ett framgångsrikt prov enligt regleringar under Electromagnetic Compatibility (EMC directive 2004/108/EC). Man måste dock ägna särskild uppmärksamhet till valet av signalkabeln som skall användas för CE-märkta anordningar.

Signalkablars, packboxars och kontaktdons kvalitet:

Brooks Instrument levererar högkvalitativa kablar som överensstämmer med specifikation för CE-intygade produkter.

Om man använder sin egen signalkabel, då bör man använda en kabel som är fullständigt skärmad med en 100% avskärmning.

"D" eller "Cirkelformiga" kontaktdon skall vara skärmade med metalliska avskärmningar. Om det är användbart, bör metallpackboxar som ger en bra fastspänning för kabelskärmar användas.

Kabelavskärmningen måste kopplas till den metalliska skärmande anordningen eller packboxen och skämmas vid båda ändar runt omkring.

Avskärmningens avspänning måste jordas.

Card Edge Kontaktdon är icke metalliska. För att överensstämna med krav på CE-intyg, skall de kablarna som används vara skärmade med 100% skärmning.

Skärmningen måste jordas.

Vad gäller stiftkonfigurationen: Se den bifogade Instruktionshandboken.

ESD (Elektrostatiska urladdningar)

⚠ OBS: Denna utrustning innehåller elektroniska komponenter som är lättpåverkade av skada orsakad av statisk elektricitet. Lämplig hanteringsprocedur måste följas när man tar bort, installerar eller på något annat sätt hanterar inre kretskort eller andra anordningar.

1. Ström till enheten måste kopplas från.
2. Personalen måste jordas med hjälp av ett armband eller något annat säkert medel innan något kretskort eller andra inre anordningar installeras, tas bort eller justeras.
3. Kretskort måste transporteras i en speciell förpackning för elektronik. Kort skall ej tas bort från deras skydsskåpa innan man skall installera dem. De borttagna korten bör omedelbart läggas i speciell förpackning för transport, lagring eller återlämnande till fabriken.

Anmärkingar:

Dessa instrument är ej unika vad gäller dess ESD (Elektrostatiska urladdningar) - känsliga komponenter. De flesta samtida konstruktioner innehåller komponenter som utnyttjar metalloxd teknologi (NMOS, SMOS, o.s.v.). Erfarenhet har visat att även små mängder av statisk elektricitet kan skada eller förstöra dess komponenter. Skadade komponenter - även om de annars verkar fungera ordentligt - har ofta en kortare livslängd.

*THIS PAGE WAS
INTENTIONALLY
LEFT BLANK*

Brooks® Model 585xEMH

LIMITED WARRANTY

Seller warrants that the Goods manufactured by Seller will be free from defects in materials or workmanship under normal use and service and that the Software will execute the programming instructions provided by Seller until the expiration of the earlier of twelve (12) months from the date of initial installation or eighteen (18) months from the date of shipment by Seller.

Products purchased by Seller from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer.

All replacements or repairs necessitated by inadequate preventive maintenance, or by normal wear and usage, or by fault of Buyer, or by unsuitable power sources or by attack or deterioration under unsuitable environmental conditions, or by abuse, accident, alteration, misuse, improper installation, modification, repair, storage or handling, or any other cause not the fault of Seller are not covered by this limited warranty, and shall be at Buyer's expense.

Goods repaired and parts replaced during the warranty period shall be in warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. This limited warranty is the only warranty made by Seller and can be amended only in a writing signed by an authorized representative of Seller.

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.

HELP DESK

In case you need technical assistance:

- Americas ☎ 1 888 554 FLOW
- Europe ☎ +31 (0) 318 549 290
- Asia ☎ +81 (0) 3 5633 7100

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.



Brooks Instrument
 407 West Vine Street
 P.O. Box 903
 Hatfield, PA 19440-0903 USA
 T (215) 362 3700
 F (215) 362 3745
 E-Mail BrooksAm@BrooksInstrument.com
www.BrooksInstrument.com

Brooks Instrument
 Neonstraat 3
 6718 WX Ede, Netherlands
 T +31 (0) 318 549 300
 F +31 (0) 318 549 309
 E-Mail BrooksEu@BrooksInstrument.com

Brooks Instrument
ITW Japan Ltd.
 1-4-4 Kitasuna Koto-Ku
 Tokyo, 136-0073 Japan
 T +81 3 5633 7100
 F +81 3 5633 7101
 E-Mail Sales-Japan@BrooksInstrument.com



This Quick Start Guide applies to the following Brooks products (E-Series: 5850EMH, 5851EMH):
 In an effort to be more eco-friendly, Brooks is no longer supplying printed instruction manuals with the product shipments to reduce our paper consumption.
 For your product's complete instruction manual, please download it at: www.BrooksInstrument.com/Manuals.

Dear Customer,
 Thank you for your purchase. We appreciate this opportunity to service your flow measurement and control needs with a Brooks Instrument device. Brooks' award-winning meters and controllers consistently rank at the top of their category for accuracy, reliability and user preference, as judged by the audience that matters - real users of flow instrumentation, like you.
 But Brooks' products are only half of the story. You are backed by Brooks' unsurpassed local technical expertise in virtually every corner of the planet. Your local Brooks product and application specialist is truly your "partner in flow". They have been extensively trained to help you select the optimal solutions for your flow measurement or control needs and offer years of experience solving application problems just like yours.
 Should you require any additional information concerning Brooks' products and services, please contact your local Brooks Sales and Service office listed on the back cover of this guide.
 Sincerely,
 Brooks Instrument

Visit us online at www.BrooksInstrument.com

Brooks Instrument
 407 West Vine Street
 P.O.Box 903
 Hatfield, PA 19440-0903 USA
 Tel (215) 362 3700
 Fax (215) 362 3745
 E-mail BrooksAm@BrooksInstrument.com

Brooks Instrument
 Neonstraat 3
 6718 WX Ede, Netherlands
 P.O. Box 428
 6710 BK Ede, Netherlands
 Tel +31 (0) 318 549 300
 Fax +31 (0) 318 549 309
 E-mail BrooksEu@BrooksInstrument.com

Brooks Instrument
ITW-Japan Ltd.
 1-4-4 Kitasuna Koto Ku
 Tokyo, 136-0073 Japan
 Tel +81 (0) 3 5633 7100
 Fax +81 (0) 3 5633 7101
 E-mail Sales-Japan@BrooksInstrument.com

Brooks is a trademark of Brooks Instrument, LLC.
 All other marks are property of their respective owners.
 PN: 541B209AAG/A
 Reference: 834z986



© Copyright 2016, Brooks Instrument, LLC.
 All rights reserved. Printed in USA.

CAUTION

• Incorrect voltage will cause flowmeter damage or failure.
 • If your mass flow product operates with current I/O it sources its own 4-20mA output signal. Do not source this output with an external supply.
 • Do not use a current sinking PLC output card.
 • If your mass flow product operates with current I/O it is an input sinking device.

WARNING

• Read all instructions prior to installing, operating and servicing this product.
 • Follow all warnings, cautions and instructions marked on and supplied with this product.
 • Install your equipment as specified in the installation instructions in the appropriate instruction manual and per local and national codes. Connect all products to the proper electrical and pressure sources.
 • Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.
 • Do not operate this instrument in excess of the specifications marked on and supplied with this product. Failure to heed this warning can result in serious personal injury and/or damage to the equipment.
 • Before operating the device, ensure all electrical connections have been properly terminated.
 • If it becomes necessary to remove the device from the system, power to the device must be disconnected.
 • If it becomes necessary to remove the device from the system after exposure to toxic, pyrophoric, flammable or corrosive gas, purge the device thoroughly with a dry inert gas such as nitrogen before disconnecting the gas connections. Failure to correctly purge the device could result in fire, explosion or death.
 • Corrosion or contamination of the device upon exposure to air may also occur.

X-TMF-585xEMH-QS-eng
 January, 2016
 PN: 541B209AAG/A

Quick Start Guide
585xEMH High Temperature Thermal Mass Flow Controllers Metal Seal

Thermal Mass Flow

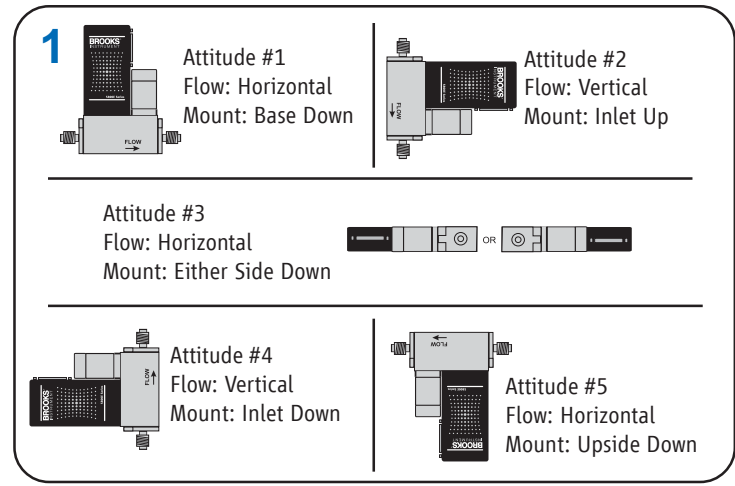


Step 1: Location/Orientation

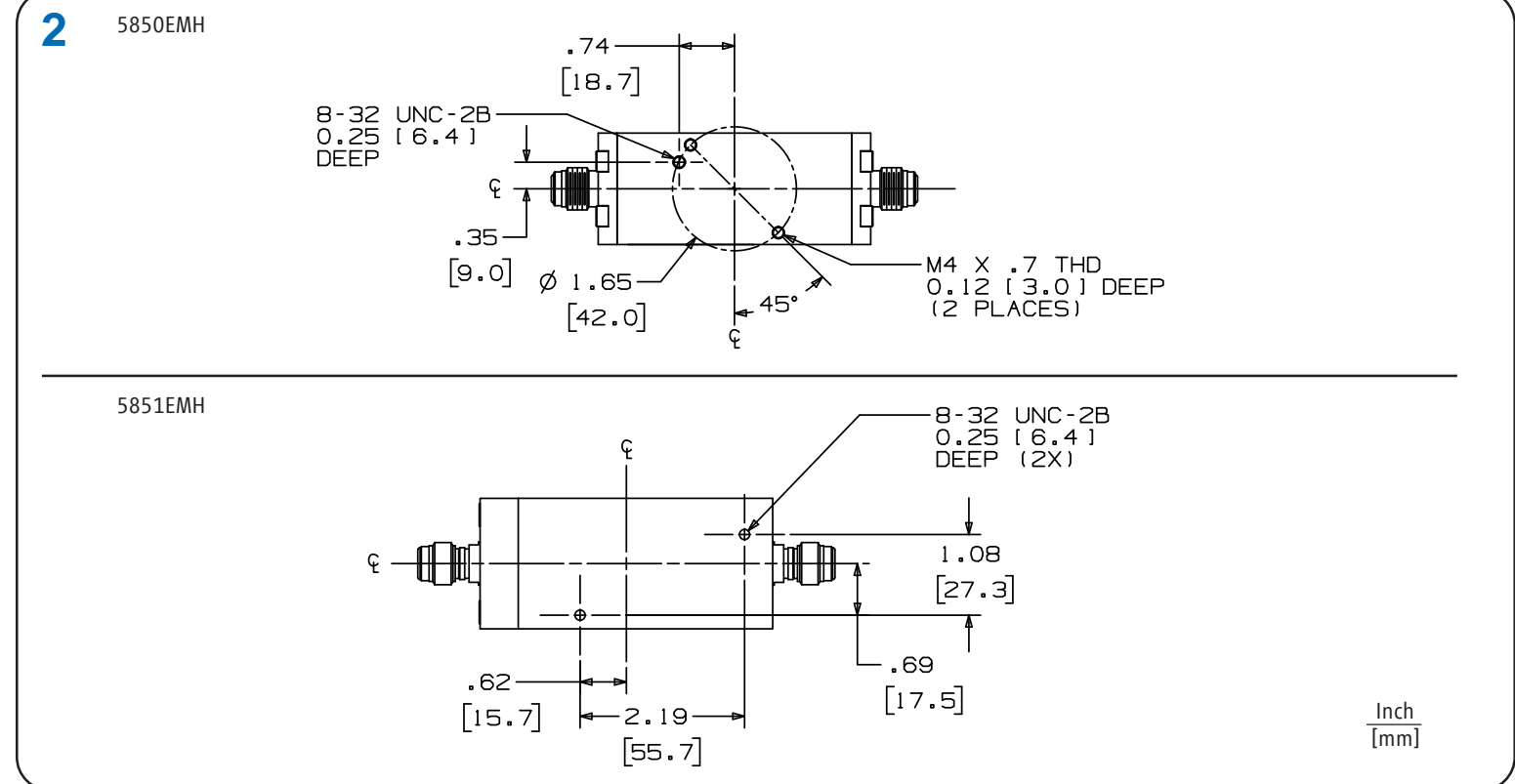
The instrument may be located anywhere in the process line, as long as the following conditions are met:

- Ambient temperature must remain between 85° and 105°C (185°F and 221°F).
- The instrument (cable connections, wiring compartments and/or conduit openings) should be accessible for service.

The instrument can be mounted in any orientation. It's best if the mounting orientation matches the orientation specified on the Calibration Data Sheet. Refer to Figure 1 for the different mounting options:



Step 2: Mounting the Controller to a Plate, Shelf or Panel



Step 3: Gas Connections

3

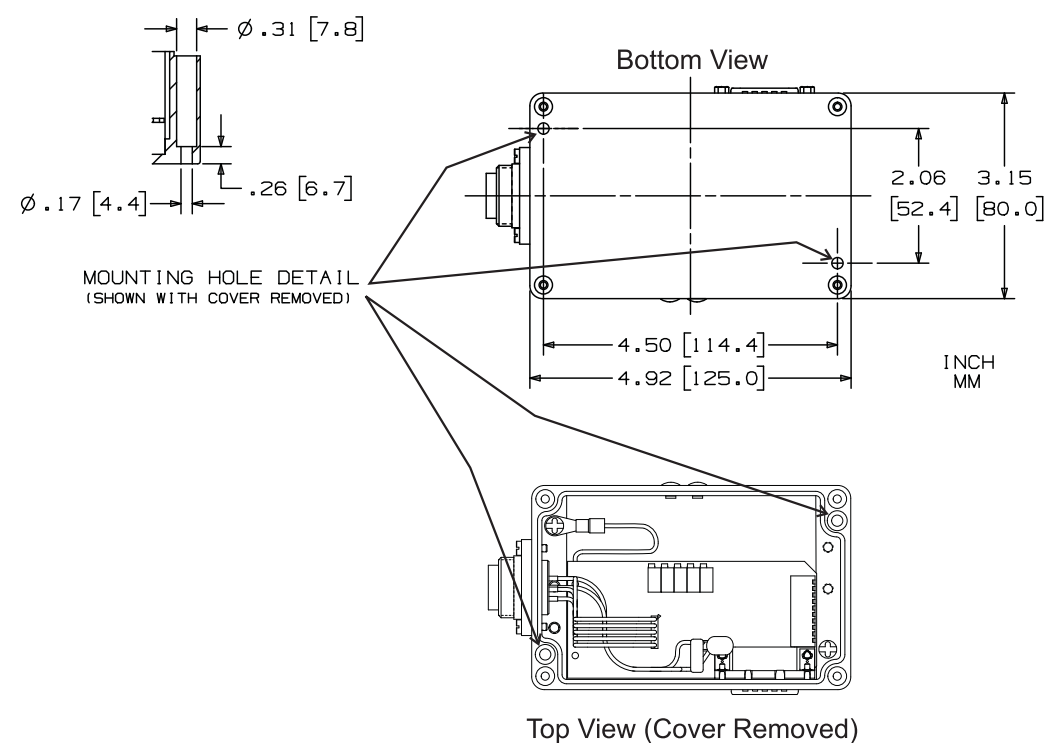
After mounting the Controller, carefully connect and tighten the process lines. Ensure the fittings are leak-free.

Step 4: Remote Electronics Box

The remote electronics box can be mounted in any position that is convenient and within reach of the high temperature cable. The temperature limit of the electronics is 0-50°C (32°F -122°F).

Connect the remote electronics box with the controller utilizing the 15-pin D sub connector on the end of the cable which is wired to the remote electronics box.

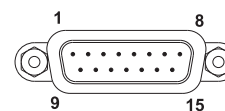
4



Step 5: Electrical Connections

5

15 Pin D-Connector



Pin	Function
1	Command Common
2	0-5 Volt, Signal Output
3	Not Used
4	Not Used
5	+15 Vdc Supply
6	-15 Vdc Supply
7	Valve Voltage Out
8	Command Input
9	Supply Voltage Common
10	0-5 Volt Signal Common
11	+5 Vdc Reference Output
12	Valve Override
13	Not Used
14	Chassis Ground
15	Not Used

To insure proper operation, the Model 585xEMH must be connected per Figure 5.

As a minimum, the following connections must be made:

Voltage I/O Version

- Chassis Ground (Pin 14)
- Signal Common (Pin 10)
- Signal Output (Pin 2)
- +15 Vdc Supply (Pin 5)
- -15 Vdc Supply (Pin 6)

Each device is factory adjusted to provide a flow signal of zero volts (± 10 mVdc) at zero flow. The adjustment is made in our calibration laboratory which is temperature controlled to the temperature specified at the time of order. After initial installation and warm-up in the gas system, the zero flow indication may be other than the factory setting. This is primarily caused by changes in temperature between our calibration laboratory and the final installation. The zero flow reading can also be affected, to a small degree, by changes in line pressure and mounting attitude.

To check zero, always mount the controller in its final configuration and apply power to the instrument and any associated heaters for 60 minutes to reach a stable thermal condition prior to applying flow. Flow the process fluid into the instrument and allow sufficient time for the sensor to reach normal operating temperature.

Note: Before zeroing the instrument, zero pressure differential **MUST** be established across the device. If there is pressure across the instrument during the zero process, any detected flow through the sensor will be misinterpreted as the zero flow reading. This will result in calibration inaccuracy during normal operation.

Close the shutoff valve downstream of this instrument to eliminate any pressure differential across the instrument. Once zero differential pressure is established and verified, check the flow output signal using a suitable voltmeter. If it differs from the factory setting, adjust it by removing the lower pot hole plug (refer to Figure 4) which is located closest to the 7-pin circular connector on the remote electronics module. Adjust the zero potentiometer until the desired output signal is within ± 10 mV of zero on the output of the device.

Step 6: Operation

After the flow controller has been installed in the system it is ready for operation.

Controller: You must provide a setpoint/command signal to the controller. The controller will read the setpoint signal and will automatically adjust the valve to the appropriate position to achieve the desired flow and will provide a flow signal proportional to the full scale flow of the device as indicated on the device label.

Equipment Receipt and Return Procedures

Receipt of Equipment

If the packing case is damaged, the local carrier should be notified at once regarding their liability. Carefully remove the equipment from the packing case and inspect for damage or missing parts. If damaged, please contact Brooks Instrument at one of the locations listed on the back of this Quick Start Guide.

Return Shipment

Please note that prior to returning any instrument to the factory Brooks Instrument requires the completion of Form RPR003-1, a Brooks Instrument Decontamination Statement, as well as a Materials Safety Data Sheet (MSDS) for fluid(s) used in the instrument. Copies of these forms can be found online at BrooksInstrument>Returns.com along with complete details on how to process your return shipment or you can contact your nearest Brooks location for the necessary forms and instruction.