Installation and Operation Manual X-TMF-9000-Series-MFC-eng Part Number: 541B194AAG November, 2014

Brooks[®] 9000 Series[™] Models 9660/9861



9000 Series Analog Thermal Mass Flow Controller



Installation and Operation Manual X-TMF-9000-Series-MFC-eng Part Number: 541B194AAG November, 2014

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, operateed 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, using and maintaining Brooks 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.
- A 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.
- · Inform and educate your personnel in the proper installation, operation and maintenance of the product.
- 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 subsitutions may result in fire, electrical hazards or improper operation.
- · 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, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.
- A 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 persoanl injury.

European Pressure Equipment Directive (PED)

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

- · The Specifications section of this manual contains instructions related to the PED directive.
- Meters described in this manual are in compliance with EN directive 97/23/EC.
- All Brooks Instrument Flowmeters fall under fluid group 1.
- Meters larger than 25 mm or 1" (inch) are in compliance with PED category I, II or III.
- · Meters of 25 mm 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 shield or gland and shielded at both ends over 360 degrees.

The shield should be terminated to an earth ground.

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

The shield should be tenninated to an earth ground.

ESD (Electrostatic Discharge)

A 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.

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

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Brooks® 9000 Series

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Installation and Operation Manual

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Brooks® 9000 Series

1-1 Introduction

The 9000 Series (9660/9861 models) remains the optimum choice for critical precursor and dopant vapor delivery in semiconductor, MOCVD, and optical fiber manufacturing. The 9000 Series products are thermal mass flow controllers and meters designed for challenging high-temperature delivery of condensable precursors and dopants. A high-purity, high-leak integrity metal flow path ensures compatibility with all processes gases and vapors. The patented IsoSensor[™] is a high-stability flow sensor compatible with the elevated environmental temperatures [≤ 150°C (≤ 300°F)] found in heated gas lines and gas boxes (baking systems). The ultra-low drift performance of the IsoSensor[™] reduces the need for frequent re-zeroing and recalibration typical in high temperature applications.



Figure 1-1 9000 Series Analog Thermal Mass Flow Controller

1-2 How to Use This Manual

This manual is intended to provide the user with all the information necessary to install, operate, troubleshoot, and maintain these thermal mass flow devices. The manual is organized in the following sections:

Section 1 Introduction

Section 2 Theory of Operation and Features

Section 3 Installation

Section 4 Operation

Section 5 Maintenance and Troubleshooting

Section 6 Product Description Code

Section A Essential Instructions

Warranty, Local Sales/Service Contact Information

It is recommended that this manual be read in its entirety before attempting to operate or repair these devices.

1-3 Product Support References Refer to www.BrooksInstrument.com for Brooks sales and service locations and to obtain other documents that support the 9000 Series. Those documents include: DS-TMF-9000-Series-MFC-eng 1-4 Notice and Caution Statements Warning, caution and notice statements are located throughout this manual in the ANSI format. A WARNING statement indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury. A CAUTION statement indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices. A NOTE statement describes specific information that requires special attention. 1-5 Product Warranty Product warranty information can be found on the back cover of this manual and on the Brooks website at www.BrooksInstrument.com. This information provides general warranty information, limitations, disclaimers, and applicable warranty periods according to product group. 1-6 How to Order a 9000 Series Device

Refer to Section 6.

1-7 Industry Standard References

Reference	
Number	Reference Description
MIL-STD-810	Method 514.4, Category 1, Transportation Requirement
	Method 516.4, Procedure 1, Functional Shock Test Requirement
SEMI E12	Standard temperature and pressure
SEMI E16	Guideline for determining and describing MFC leak rates
SEMI E17	Guideline for MFC transient characteristics tests
SEMI E18	Guideline for temperature specifications of the MFC
SEMI E27	Standard for MFC and MFM linearity
SEMI E28	Guideline for pressure specifications for the MFC
SEMI E52	Practice for referencing gases used in digital MFCs
SEMI E54	Sensor actuator network connections for DeviceNet

Table 1-1 Industry Standard References

Reference		
Number		
SEMI E56	Test method for determining accuracy, linearity, repeatability, short-term reproducibility, hysteresis of thermal MFCs	
SEMI E66	Test method for determining particle contribution by MFCs	
SEMI E67	Test method for determining reliability of MFCs	
SEMI E68	Test method for determining warm-up time of MFCs	
SEMI E69	Test method for reproducibility and zero drift for thermal MFCs	
SEMI E80	Test method for determining attitude sensitivity of MFCs	
SEMI E16-90	Guidelines for determining and describing mass flow controllers leak rates	
SEMI F19	Specification for the finish of the wetted surface of electro polished 216L stainless steel components	
SEMI F20	Specifications for 316L stainless steel bar, extruded shapes, plate, and investment castings for components used in ultra-high purity semi manufacturing applications	
SEMI F36	Guide for dimensions and connections of gas distribution components	
SEMI F37	Method for determination of surface roughness parameters for gas distribution system components	
SEMI F44	Guideline for standardization of machined stainless steel weld fittings	
SEMI F45	Guideline for standardization of machined stainless steel reducing fittings	
SEMI F47	Specifications for semiconductor processing equipment voltage sag immunity	
SEMI S2	Environmental, Health and Safety Guidelines	
SEMI S9	Dielectric testing	
SEMI S10	Risk assessment	
SEMI S12	Decontamination of fielded products	

Table 1-1 Industry Standard References

1-8 Glossary of Terms and Acronyms

Table I El l'oddot	
Term	Definition
Analog	An analog signal is one in which a base carrier's alternating current frequency is modified in some way, such as by amplifying the strength of the signal or varying the frequency, in order to add information to the signal.
Bypass Assembly	Reduces or restricts the flow of gas through the MFC in order to maintain a specified flow range.
Control Valve Assembly	An electromagnetic solenoid control valve that is used to open and/or close the flow of gas through the MFC. Refer to Figure 8 for a detailed description.

Table 1-2 Product Terms and Acronvms

Table 1-2 Product	Terms and Acronyms	
Term	Definition	
CVD	Chemical vapor deposition (CVD) is a chemical process often used in the semiconductor industry for the deposition of thin films of various materials.	
Diffusion	Diffusion is the spontaneous spreading of matter (particles or molecules), heat, momentum, or light.	
Digital	A digital system is one that uses discrete numbers, especially binary numbers, or non-numeric symbols such as letters or icons, for input, processing, transmission, storage, or display, rather than a continuous spectrum of values (an analog system).	
	The distinction of <i>digital</i> versus <i>analog</i> refers to method of input, data storage and transfer, internal workings, and the kind of display.	
EPI	A process technology that is used in some semiconductor designs where a pure silicon crystalline structure is deposited or grown on a bare wafer, enabling a high-purity starting point for building the semiconductor device.	
HOV	Horizontal On Vertical	
HOS	Horizontal On Side	
Mass Flow	mass/time g/sec	
MFC	Mass Flow Controller	
MFM	Mass Flow Meter	
РСВ	Printed Circuit Board	
Plasma Etching	Plasma etching removes organic and inorganic contamination, increases wetability, increases bond strength, and removes residues.	
RTD	Rate of Temperature Differential	
RMA	Return Material Authorization	
sccm	Standard Cubic Centimeters per Minute	
SEMI	Semiconductor Equipment Manufacturing International	
sensor	Measures the gas temperature difference across the sensor and feeds this information to the PCB assembly.	
slm	Standard Liters per Minute	

Table 1-2 Product Terms and Acronyms

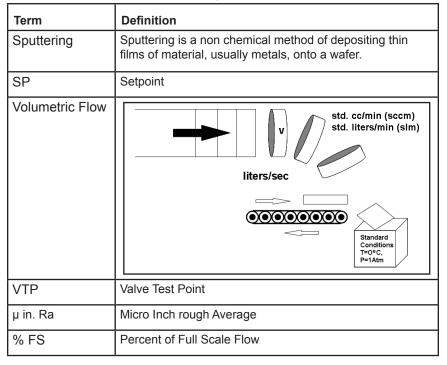


Table 1-2 Product Terms and Acronyms

1-9 Description

Brooks Instrument's 9000 Series is a metal-sealed analog/digital thermal mass flow measurement and control instrument that offers unparalleled performance in critical low pressure precursor and dopant vapor delivery. The 9000 Series is designed for use in high temperature ambient environments between 0–150°C (32–302°F). The result is a highly accurate, robust, and responsive MFC for challenging conditions.

- High temperature capability ensures reliable delivery of condensable gases and precursors
- Digital measurement and control enhances accuracy (±1% of setpoint) and repeatability (±0.15% FS)
- Ultra-high purity flow path (10 or 4µ in. Ra) ensures integrity and purity of the gas/vapor
- Ultra-stable flow sensor (≤0.6% per year w/o auto-zero) reduces maintenance resulting in superior uptime and lower COO
- All metal diaphragm-free control valve design optimizes reliability

1-9-1 Ultra High Purity Flow Path

The Brooks 9861 model device is constructed with a 4 μ in. Ra max surface finish, while the 9660 model device is constructed with a 10 μ in. Ra.

• Overall reduced surface area and un-swept volumes for faster drydown during purge steps Long-term sensor and device stability for maximum yield and throughput

1-9-2 Ultra High Purity Process Connections

9000 Series supports all metal seal/UHP industry gas connection interface standards for full OEM and process coverage.

- 1/4-in. VCR on 1-1/2-in. body
- 3/8-in. VCR on 1-1/2-in. body

1-9-3 Analog and Digital Communication Interfaces

The 9000 Series supports analog 0–5 Vdc and RS-485 communication protocols. Analog connections can be accessed via the RS-485 or analog-only connector option utilizing the dual RJ11 ports, the Cardedge connector, or the 9-pin/15-pin D connector. RS-485 is a multi-drop connection that allows a maximum of 32 devices to be connected on the same network. A range of low profile adapter cables facilitate replacing previously installed devices eliminating the need to carry multiple devices of the same gas/range but different electrical connectors.

1-10 Specifications for 9000 Series Devices

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

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.

Specifications and features are subject to change without notice.

Performance Specifications	
Settling Time (to within 2% of setpoint)	
Fast Start	≤ 1.0 sec (per SEMI E17-91)
Soft Start	Linear 20% per sec (0 to 100% in 5 sec)
Accuracy (N, equivalent)	
35% to 100% F.S.	±1% setpoint (per SEMI E56-96)
< 35% F.S.	±0.35% full scale (per SEMI E56-96)
Repeatability (full scale)	±0.15% (per SEMI E56-96)
Linearity (full scale)	±0.5% (per SEMI E27-92)
Inlet Pressure Coefficient	0.007% per psi (N ₂)
Ambient Temperature Coefficient	
Zero	0.05% full scale per °C
Span	0.1% full scale per °C
Leak Integrity	1 x 10 ⁻¹⁰ atm-cc/sec (He) (per SEMI E16-90)
Automatic Zero	Optional (customer programmable)
Zero Drift	\leq 0.6% per year without auto-zero
Thermal Siphoning and Attitude Sensitivity	< 0.1% full scale (30 psi SF ₆)
Operating Limits	
Standard Flow Range	3 sccm to 10 slm (N, equivalent)
Control Range (full scale)	2-100%
Valve Leak Rate	≤1% full scale
Gases	All
Ambient Temperature Range	0-150°C (32-302°F)
Maximum Operating Pressure	1,050 kPa (150 psi)
Differential Operating Pressure (Typical)	1.33-350 kPa (10 torr - 50 psia)
	30 minutes
Warm-up Period	
Mounting Position	HOV or HOS
Valve	Normally closed solenoid
Electrical Characteristics	
Input/Output Signal	0.5 V/ds linearly generational to generic d flow
Setpoint Input Output Monitor	0-5 Vdc linearly proportional to required flow 0-5 Vdc linearly proportional to flow rate
Digital Input/Output	RS485L (via R]11 ports)
Valve Off	External: TTL signal
Auto shut-off	Setpoint < 2% full scale commands valve off
Power	
Controller (RS485)	+15 Vdc (160 mA max.), -15 Vdc (160 mA max.)
Meter (Analog)	+15 Vdc (50 mA max.), -15 Vdc (50 mA max.)
Power Consumption	9660 = 5 watts, 9861 = 5 watts max.
Mechanical Characteristics	
Surface Finish	10µ inch Ra (Model 9660), 4µ inch Ra (Models 9861)
Fittings	1/4" VCR [®] , 3/8" VCR [®]
Valve Position	Downstream
Materials	Wetted Components: 316L SS/KM-45/304/7MO+
Weight	1.2 kg (2.65 lbs)
Calibration References	
Traceability	National Institute of Standards and Technology (N.I.S.T.)
Standard Temperature and Pressure	0°C and 760 mm Hg per (SEMI E 12-96)

Specifications and features are subject to change without notice.

Section 1 Introduction

Brooks® 9000 Series

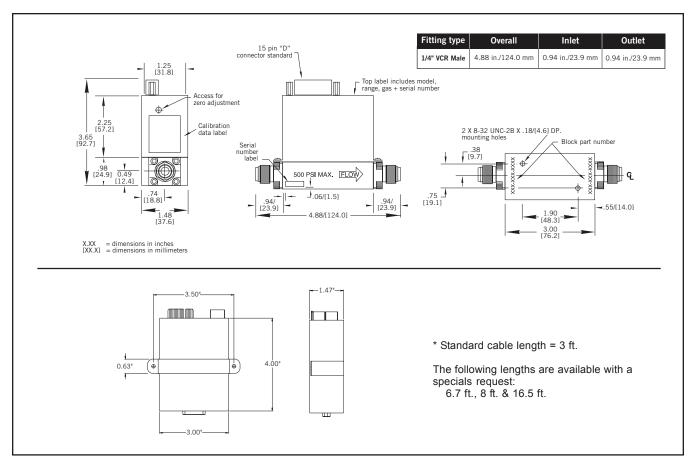


Figure 1-2 9000 Series Dimensions

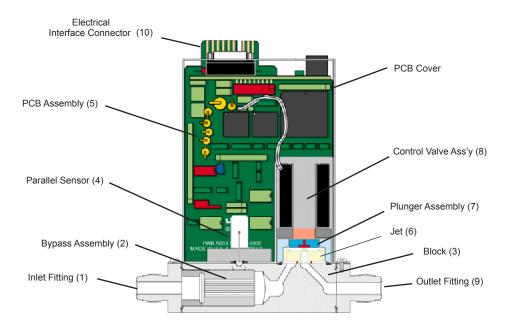
2-1 Introduction

November, 2014

This section provides a general description of a typical MFC and how it operates. Standard and optional features are also described herein.

2-2 General Description

Figure 2-1, MFC Components, below shows a typical MFC and its primary components. Component functions are listed in Table 2-1, MFC Component Functions, below.





Component)	Component Function
Bypass Assembly (2)	Restricts the flow of gas through the MFC. Refer to Figure 2-2, Bypass Assembly Functional Diagram, on p. 2-2 for further details.
Parallel Sensor (4)	Measures the gas temperature across the sensor and feeds this information to the PCB assembly. Refer to Figure 2-2, Bypass Assembly Functional Diagram, on p. 2-2 and to Figure 2-5, Thermal Sensor Operation, on p. 2-3 for further details.
PCB Assembly (5)	Electronic circuitry, which stores bypass/sensor information, and also provides the ability to fine tune the MFC in order to achieve proper flow and response times. Refer to Figure 2-1, MFC Components, above, and to Figure 2-6, MFC Theory of Operation Block Diagram, on p. 2-5 for details.
Jet (6)	A preset orifice that restricts the flow of gas to reduce upstream and downstream pressure fluctuations.

Component)	Component Function
Plunger Assembly (7)	Moves the coil inside the valve assembly to allow flow through the MFC.
Control Valve Assem- bly (8)	Opens and/or closes gas flow through the MFC. Refer to Figure 2-3, Measurement and Control Electronics, below, and to Figure 2-4, Control Valve Assembly, on p. 2-3 for further details.
Electrical Interface Connector (10)	Communication interface from the MFC to the tool's software. Refer to "3-14 Connect to Power Supply" on p. 3-5 for further details.

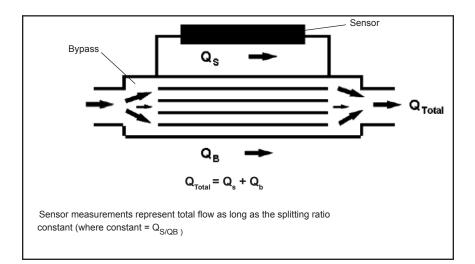


Figure 2-2 Bypass Assembly Functional Diagram

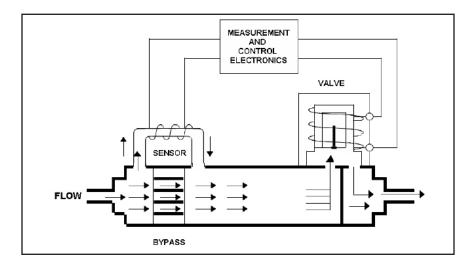


Figure 2-3 Measurement and Control Electronics

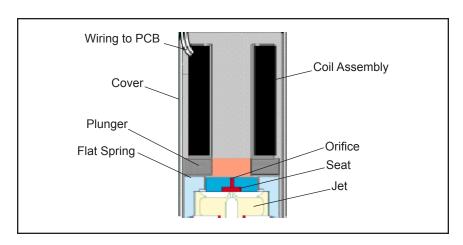


Figure 2-4 Control Valve Assembly

2-3 Theory of Operation

To obtain accurate and stable flow rates to the tool, each MFC measures and controls three areas: gas temperature, gas properties, and gas pressure.

2-3-1 Gas Temperature

Each MFC utilizes a thermal sensor tube to measure the mass flow rate (m) of gas passing through the MFC. Each gas molecule has a specific ability to pick up heat. This property (Cp) directly relates to mass and physical structure of the molecule. Gas is heated in a tube and resistive temperature devices measure the temperature gradient along the tube. This process is described in the following formula and shown in Figure 2-5, Thermal Sensor Operation, below.

Sensor output = mCp T

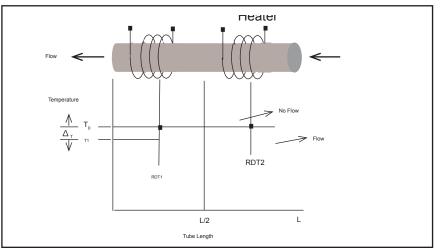


Figure 2-5 Thermal Sensor Operation

2-3-2 Gas Properties

The thermal sensor relies on established thermal mass properties from the gas being used. The temperature dependence is associated with the molecule's rotational and vibrational degrees of freedom represented by N. Since a mole of any perfect gas occupies the same volume at standard conditions (22,414.00 cc/mol at 0 degrees C at 1 atm pressure), molar specific heat is essentially specific heat (J/gm/K) multiplied by standard density (gm/mol). Therefore, the following formula can be expressed where *ps* is the standard density.

 $C_p x ps = (J/gmK) x gm/mol = J/mol x K$

The conversion factor (CF) then becomes,

 $CF = (N_{gas}/N_{N_2}) \times (C_p \times ps) N_2 / (C_p \times ps)_{gas}$

N is shown in Table 2-2, Conversion Factors, below. For example, a flow of 5 sccm nitrogen corresponds to a flow of 3.66 sccm of phosphine (PN_2) in Table 2-3, Gas Flow Correction Factors, below.

Gas Type	Ν
Monatomic	1.04
Diatomic	1.00
Triatomic	0.94
Polytomic	0.88

Table 2-2 Conversion Factors

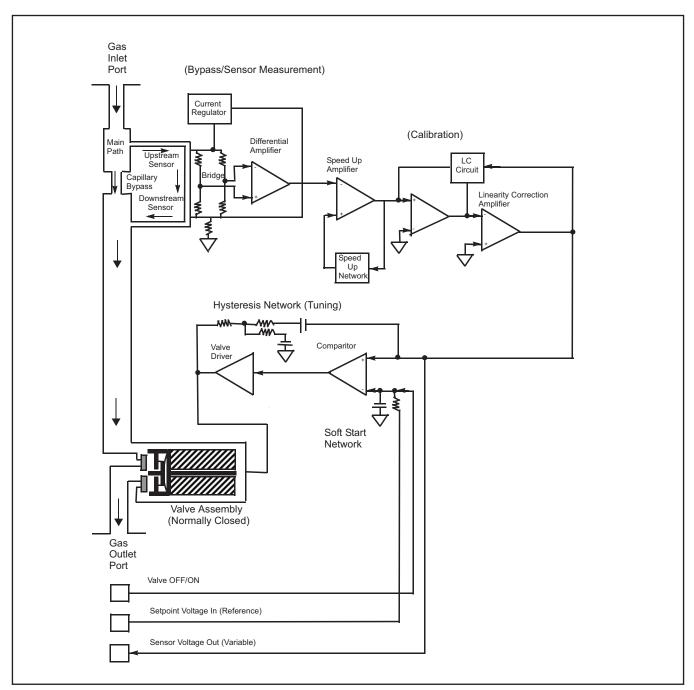
Gas	Thermal MFC
N ₂	1.0
AsH ₃	0.742
PH ₃	0.673
BF ₃	0.528

Table 2-3 Gas Flow Correction Factors

2-3-3 Gas Pressure

Inlet pressure is often overlooked as a source of potential zero error on MFCs. Many high density, low viscosity gases exhibit slight changes in zero output as a function of MFC inlet pressure. Gases such as tungsten hexafluoride (WF6) and many fluorocarbons are especially sensitive to this problem.

Under certain conditions, lighter gases such as H2 and He may experience oscillation problems if inlet pressures are too high. A simple way of minimizing this problem is to keep the inlet pressure as low as possible.



MFC theory of operation is described in greater detail in Figure 2-6, MFC Theory of Operation Block Diagram, below.

Figure 2-6 MFC Theory of Operation Block Diagram

Refer to this block diagram during the following discussion.

	When voltage is applied to the MFC valve assembly, the valve assembly opens and allows gas to pass into the inlet port and through the bypass assembly and sensor. As gas passes through the bypass assembly, the sensor measures the gas temperature across the upstream and downstream area of the sensor and relays that information to the printed circuit board (PCB) circuitry that consists of several amplifiers and a speed up network. The temperature difference across the sensor determines indicated gas flow.
	When a specified amount of gas flow is needed at the process chamber, the tool initiates a setpoint voltage command from 1-5 Vdc. For example, if the bypass assembly allows up to 90 sccm ml/min of gas and the setpoint command is 4 Vdc, only 80% of the maximum flow range (or 72 sccm ml/min) would flow through the MFC outlet port. If the setpoint were reduced to 2 Vdc, only 18 sccm ml/min would flow through the MFC outlet port.
	When gas is exhausted out of the bypass assembly it enters the valve assembly area. Inside the valve assembly, gas travels through a preset orifice (called a jet) and into the plunger area. The jet helps to control upstream and downstream pressure fluctuations. The plunger pushes on the valve coil, which in turn, regulates the proper amount of gas flowing out of the outlet port.
	An accurate amount of gas must enter the process chamber at a steady flow rate and at a specified response time without any pressure fluctua- tions. Information stored within the PCB circuitry provides the means to perform tuning and calibration functions before the unit is shipped. This tuning and calibration process adjusts the MFC to precise flow rates and response times in accordance to customer requirements.
2-4 Standard Features	
2-4-1 Attitude	
	Each MFC is built for a specific attitude, either Horizontal On Side (HOS), or Horizontal On Vertical (HOV). Further details are described in the installation instructions in Chapter 3.
2-4-2 Calibration Conditions	
	MFCs ordered as Atmosphere are calibrated with the MFCs outlet exhausting to atmosphere. MFCs order as Vacuum are calibrated with the MFCs to vacuum.
2-4-3 Standard Temperature and Pro	essure Operating Range
	MFCs are calibrated at 0°C and operate up to 760 mm Hg.
2-4-4 Calibration Traceability	
	MFCs use the National Institute of Standards and Technology (NIST) as a guideline.
6	

2-4-5 Manufacturing Environment	
	MFCs are assembled, calibrated, tested, and packaged in a Class 100 cleanroom environment.
2-4-6 Purge Capability	
	MFCs have full purge capability with 1 slm purge minimum (depends on gas density and pressure).
2-4-7 Control Valve Options	
2.5. Ontional Eastures	The MFC valve is configured at the factory to be Normally Closed, meaning the valve is closed when there is no power applied to the unit. This valve option cannot be modified by the user.
2-5 Optional Features	
	The following optional features are set at the factory. These features cannot be modified by the user, unless otherwise specified.
2-5-1 Auto Shut-Off Option	
	With the Auto Shut-Off option, a setpoint command of less than 2% (0.1 Vdc) closes the MFC control valve.
2-5-2 Response Time Options	
	Fast Response: <1 second to a setpoint command of 20-100%.
	Fast Response: <1 second to a setpoint command of 20-100%. Standard Response: Ramping gradually (5 second linear ramp)
2-5-3 Electrical Connector Options	Standard Response: Ramping gradually (5 second linear ramp)
2-5-3 Electrical Connector Options	Standard Response: Ramping gradually (5 second linear ramp)
2-5-3 Electrical Connector Options 2-5-4 Special Adapters	Standard Response: Ramping gradually (5 second linear ramp) Soft Start Response Options: 4-6, 6-10, 10-15, 20-30, or 40-60 seconds Electrical connector options vary according to model type. Refer to
2-5-4 Special Adapters	Standard Response: Ramping gradually (5 second linear ramp) Soft Start Response Options: 4-6, 6-10, 10-15, 20-30, or 40-60 seconds Electrical connector options vary according to model type. Refer to
	Standard Response: Ramping gradually (5 second linear ramp) Soft Start Response Options: 4-6, 6-10, 10-15, 20-30, or 40-60 seconds Electrical connector options vary according to model type. Refer to Section 3 for connector descriptions and pinout details. Retrofitting the models of most competitors is accomplished using special electronic and mechanical adapters. Contact Brooks Instrument
2-5-4 Special Adapters	Standard Response: Ramping gradually (5 second linear ramp) Soft Start Response Options: 4-6, 6-10, 10-15, 20-30, or 40-60 seconds Electrical connector options vary according to model type. Refer to Section 3 for connector descriptions and pinout details. Retrofitting the models of most competitors is accomplished using special electronic and mechanical adapters. Contact Brooks Instrument

NOTE: The proper application of Auto Zero depends entirely on the ability to ensure absolutely no flow across the MFC sensor during the Auto Zero cycle. Therefore, with few exceptions, shut-off valves must be installed immediately upstream and downstream of the MFC with proper valve sequencing. Digital MFCs already have the Auto Zero circuit installed.

2-5-6 Fitting Options

The following fittings are available for the MFC: 1/4-in. male VCR and 3/8-in. male VCR.

X-TMF-9000-Series-MFC-eng Part Number: 541B194AAG November, 2014

Brooks[®] 9000 Series

3-1 General

This section provides installation instructions for the Brooks 9000 Series Thermal Mass Flow Devices. The installation process consists of purging the gas supply line prior to installation, unpacking and inspecting the device, connecting the device to the gas supply line and testing for leaks.

3-2 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 their 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

Europe Brooks Instrument GmbH Zur Wetterwarte 50 Haus 377/B 01109 Dresden Germany Tel +49 (0) 351 215 20 442 Asia Brooks Instrument Korea, Ltd. D-406 Bundang Techno Park 151 Sungnam, Kyungki-do, 463-070 Korea Tel +82 31 708 2522

In case you need technical assistance:

USA 888 275 8946 Europe +49 351 215 2040 Japan +81 3 5633 7100 Korea +82 31 708 2521 Taiwan +886 3 5590 988 China +86 21 5079 8828 Singapore +6297 9741

Remove the envelope containing the packing list. Outside of your clean area, carefully remove the equipment from the packing case. Make sure spare parts are not discarded with the packing material. Inspect the contents for damaged or missing parts. Verify that the controller was not damaged in transit. The following items are part of the 9000 Series controller:

9000 Series controller

9000 Series remote electronics

High temperature cable assembly, length 3 ft P/N 955-012-0002

Remote clamp bracket P/N 860-004-1015

Do not remove the shipping caps over the inlet and outlet fittings until immediately prior to actual installation.

This device has been assembled, calibrated, and double-vacuum bagged in a Class 100 clean room. In your semi-clean area, remove the outer bag only. Pass the device into your clean area. Remove the second clean room compatible bag only when the device is ready to be tested and/or installed in your clean system.

3-3 Recommended Storage Practice

If intermediate or long term storage is required for equipment, as supplied by Brooks Instrument, it is recommended that said equipment be stored in accordance with the following conditions:

- Within the original shipping container.
- Ambient temperature: 21.0°C (70°F) nominal, 32°C (90°F) maximum, 7°C (45°F) minimum.
- Relative humidity 45% nominal, 60% maximum, 25% minimum.

3-4 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 in "3-2 Receipt of Equipment" on p. 3-1.

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

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 RPR003-1, 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 in "3-2 Receipt of Equipment" on p. 3-1.

3-5 Transit Precautions

To safeguard against damage during transit, transport the device to the installation site in the same container used for transportation from the factory, if circumstances permit.

3-6 Removal from Storage

Upon removal of the device from storage, a visual inspection should be conducted to verify its "as-received" condition. If the device has been subject to storage conditions in excess of those recommended (refer to "3-3 Recommended Storage Practice" above), it should be subjected to a pneumatic pressure test in accordance with applicable vessel codes. To maintain a device's ultraclean integrity, this service should be performed by the factory or one of the certified service centers.

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3-7 Gas Connections

3-8 Mechanical Installation

Prior to installation, ensure that all piping is clean and free from obstructions. Install piping in such a manner that permits easy access to the device if removal becomes necessary.

The recommended installation procedure guidelines are as follows:

- The device should be located in a clean, dry atmosphere relatively free from shock and vibration.
- Install the device in such a manner that permits easy purge and removal if the device requires servicing.

3-9 In-Line Filter

It is recommended that you do NOT install an in-line filter or point-of-use purifier upstream of the mass flow controller or meter so as to eliminate the possibility of vapor condensation. If an in-line filter is required, please contact your local Brooks Instrument application engineer for precautions and recommendations.

3-10 Flow Controller Installation Arrangement

A typical vapor supply arrangement is shown in the following figure.

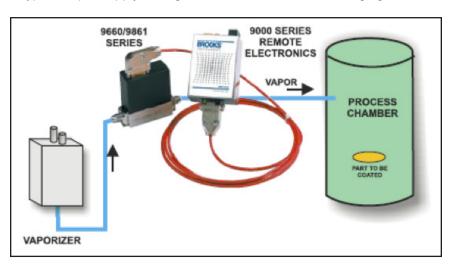


Figure 3-1 Typical High Temperature Vapor Supply Arrangement

3-11 Purge the Gas Supply Line Before MFC Installation

Before installing the 9000 Series MFC, the gas supply line must be completely purged with nitrogen or argon to ensure the line is free from toxic or flammable gases, contaminants, moisture, and oxygen. The purge gas must be free of moisture and oxygen to less than 100 ppb. Purge the gas lines as follows or in accordance to prescribed company and safety procedures.

- Shut off the process gas supply valve(s) upstream of the MFC. If such a valve is not available, shut the valve on the gas panel. Tag the valve at this point to prevent accidental re-exposure of the process gas to the gas line.
- 2. Cycle purge the gas line with dry nitrogen or argon to fully flush out the process gas. Cycle purging consists of evacuating to a low pressure adequate to induce out-gassing and then purging to remove adhered moisture and oxygen. If a toxic or reactive gas is present and a clogged MFC is suspected, then proceed with caution. Pump down and purge the MFC from both downstream and upstream lines. If check valves are present in the gas line, both pumping down and purging are required. Pumping down without purging is inadequate. If a good vacuum source is not available, the MFC can be decontaminated by purge only.
- 3. Repeat the purge cycle several times within 2-4 hours to complete the cleaning. For toxic and corrosive gasses, it is recommended to use 100-120 cycles.

3-12 Position and Mount the 9000 Series MFC

The controller must be positioned so that the gas flow is in the direction of the arrow stamped on the controller base. The 9000 Series controller is designed and calibrated to be mounted in a horizontal or vertical (HOV) or horizontal on side (HOS) mounting position as shown in the following figure.

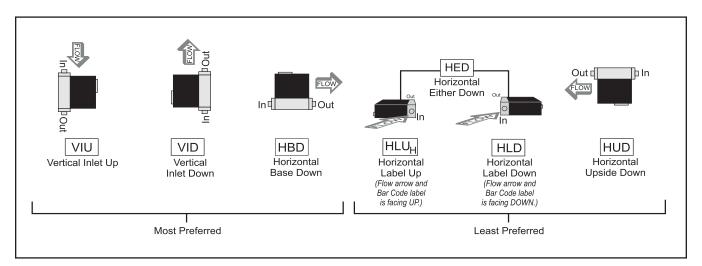


Figure 3-2 9000 Series Mounting Attitude Positions

If your MFC is mounted directly to a mounting surface such as a gas panel, align the two mounting holes on the bottom of the flow controller with those on the mounting surface. Using two #8-32 screws, mount the flow controller. Tighten the screws to manufacturer recommendations. The Remote Electronics must be mounted outside of the high temperature area. The Controller and Remote Electronics are connected through the high temperature cable assembly. Using the remote clamp bracket, mount the Remote Electronics in any position that is convenient, within reach of the high temperature cable. Longer length cable can be specially ordered. The temperature limit of the electronics is 0–50°C (32–122°F).

3-13 Connect to a Gas/Vapor Supply Line

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

- 1. Install new washers compatible with the gas to be used.
- 2. Tighten nut finger tight.
- 3. Tighten in accordance with the fitting manufacturers specifications.

It is critical to leak test the gas supply lines and MFC connections before turning on the process gas supply after any new installation. Check for leaks using a helium leak detector or any other appropriate leak test method. Follow leak test specifications as defined by the integrator.

3-14 Connect to Power Supply

The Remote Electronics module is offered in two configurations. One configuration presents a 9-pin D connector, a 20-pin Cardedge connector and dual RF11 ports for power, flow, and control signal lines (see Figure 3-3, 9000 Series Controller with 9-Pin D Connector and Cardedge Connector, on p. 3-6). The alternative configuration presents a 15-pin D connector in place of the 9-pin D connector (see Figure 3-4, 9000 Series Controller with 15-Pin D Connector and Cardedge Connector, on p. 3-6). If you are using a power supply other than one from Brooks Instruments, check the pin assignments, making sure they match those in Figure 3-5, 9000 Series Cardedge Connector Pinouts, on p. 3-7, Figure 3-6, 9000 Series 15-Pin D Connector Pinout, on p. 3-8, and Figure 3-7, 9000 Series 9-Pin D Connector Pinout, on p. 3-8. Once the power supply is securely plugged in, the flow controller should be warmed up for at least 30 minutes before any other operation.



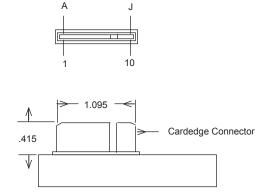
Figure 3-3 9000 Series Controller with 9-Pin D Connector and Cardedge Connector



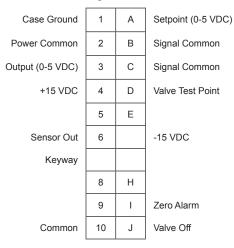
Figure 3-4 9000 Series Controller with 15-Pin D Connector and Cardedge Connector

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Brooks® 9000 Series



MFC Cardedge Connector Pinout



MFM Cardedge Connector Pinout

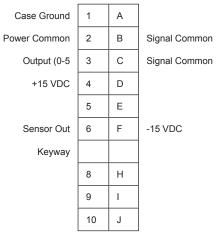


Figure 3-5 9000 Series Cardedge Connector Pinouts

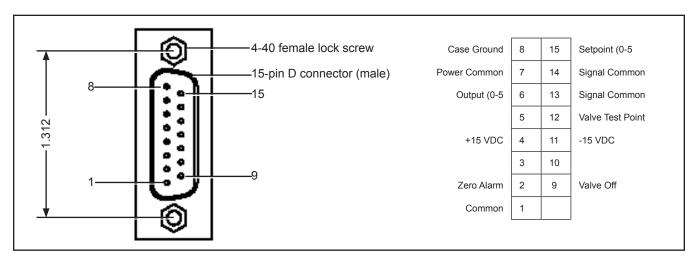


Figure 3-6 9000 Series 15-Pin D Connector Pinout

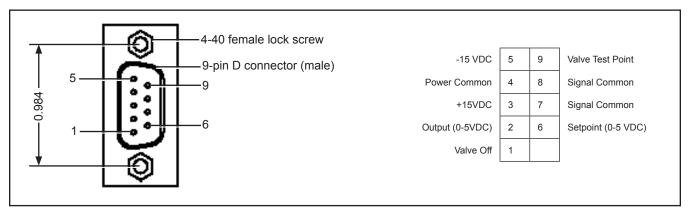


Figure 3-7 9000 Series 9-Pin D Connector Pinout

3-15 Purging the 9000 Series MFC

Prior to introducing process gas, ensure that the MFC and gas lines have been thoroughly purged with clean, dry nitrogen.

3-16 Warm Up the MFC and Check

Once purging is completed, warm up the MFC for at least 30 minutes and ensure the Controller module has been installed for at least 4 hours in the operating ambient environment.

4-1 Introduction

This section describes how to check the MFC for operating performance once installation and purging have been completed.

NOTE: Before you check the MFC for performance, be aware that certain environmental factors can affect its overall performance. Those factors are listed in Table 4-1, Environmental Factors That Affect MFC Performance, below.

MFC Symptoms	Causes		
Inaccurate flow	Temperature (steady state or transient)		
	Inlet pressure (steady state or transient)		
	Power supply problems, electrical interference		
Control Problems	Differential pressure out of operating range		
	Inlet pressure is unstable		
	Cable losses (excessive ground current)		
Zero Problems	Temperature (steady state or transient)		
	Inlet pressure (steady state or transient)		
	Power supply problems, electrical interference		
	Attitude sensitivity		

Table 4-1 Environmental Fact	ors That Affect MFC	Performance
------------------------------	---------------------	-------------

4-2 Zero the MFC

An MFC that is improperly zeroed can cause significant calibration errors and result in process inconsistencies. Electrical zero should be regularly monitored at six month intervals, or as needed.

NOTE: Digital MFCs can also be zeroed through the RS-485 interface, Class 0x68, Instance 1. Send a write command with an 8-bit integer value of 1. The status of the zero service routine can also be monitored through the RS-485 digital interface. Read the Class 0x68, Instance 1, Attribute 0xBA. The MFC returns an 8-bit integer value of 1 while it is in process of running the zero service routine and returns an 8-bit integer value of 0 when the zero service routine is completed.

4-2-1 Manually Zeroing Analog MFCs with Auto-Zero Disabled

NOTE: The following procedure does not apply to units with the Auto-Zero feature.

Perform the following steps to manually adjust the zero at the MFC.

 Make sure the MFC has been installed for a minimum of 4 hours and has been powered up for a minimum of 60 minutes prior to rezeroing. This assures the MFC is in its use attitude and operating temperature. The high temperature controller has a calibration temperature window that is ±15°C (±60°F) from the nominal operating temperature. If the MFC is subjected to vacuum purge for more than one minute, turn off the MFC control valve and allow the MFC to settle for a time period equal to twice the vacuum purge time period.

NOTE: If the MFC was recently purged or newly connected to the system, run the process gas for 5-10 minutes. Alternatively, evacuate the MFC using a vacuum pump. Then run the gas long enough to fill the MFC and gas line.

 Refer to Figure 4-1, MFC Installation, below. Open the upstream isolation valve and close the downstream isolation valve to eliminate the pressure drop by isolating the MFC within the process tool. The pressure drop across the MFC must be eliminated so the control valve leakage is not a factor.

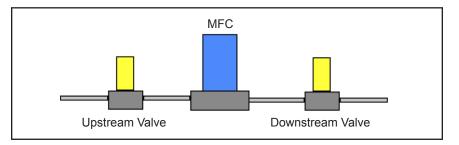


Figure 4-1 MFC Installation

- 3. Send the MFC a 100% full scale setpoint for no longer than 60 seconds to equalize the pressure across the MFC control valve.
- 4. Refer to Figure 4-1 and shut the upstream isolation valve. This prevents any creep effects from the regulator affecting the pressure.
- 5. Close the MFC control valve and wait 2 minutes.
- 6. Read the output signal of the MFC. This is the zero offset, in percent full scale. The MFC output signal should be 0% +/- 0.1% Full Scale. This would be 0.1 sccm for a 100 sccm full scale MFC. If you cannot read the output signal to the necessary resolution, assume it needs an adjustment. If the flow is zero sccm, assume that it is negative and zero the MFC. The controller is not set up to read negative flow.
- 7. Adjust the zero potentiometer and wait until the indication stabilizes.

4-2-2 Auto Zeroing with Auto-Zero Enabled Option

The Auto Zero feature overcomes zero drift by automatically adjusting the MFC meter to electrical zero during off-cycles between process runs.

NOTE: For remote readouts, including analog to digital converters, ensure that the readouts match the 9000 Series signals. Adjust the remote readout zero and full-scale to match the 9000 Series signals.

A stable zero enables operators to achieve repeatability of $\pm 1\%$ even in very low flow operations ($\pm 0.2\%$ of full scale). The following table demonstrates the critical effect of zero drift.

Setpoint %	Error if ± 1% Zero Offset	Error if ± 2% Zero Offset	Maximum Error with Auto-Zero
100	± 1	± 2	± 0.2
50	± 2	± 4	± 0.4
20	± 5	± 10	± 1.0
10	± 10	± 20	± 2.0
1	± 100	± 200	± 20.0

Table 4-2 Zero Drift

A typical Auto Zero circuit is shown in Figure 4-2, Auto Zero Circuit, below. The Auto Zero circuitry is triggered by a signal from a Valve-Off command, or by a zero setpoint for automatic shutoff, which initiates a 2 minute delay. After the delay, the Auto-Zero compares the output of the MFC meter to DC Common, which determines the direction and degree of variance. The Auto Zero then executes an incremental or detrimental step of its digital potentiometer (as determined) and compares the new reading to zero. This continuous incremental step-and-compare cycle continues indefinitely.

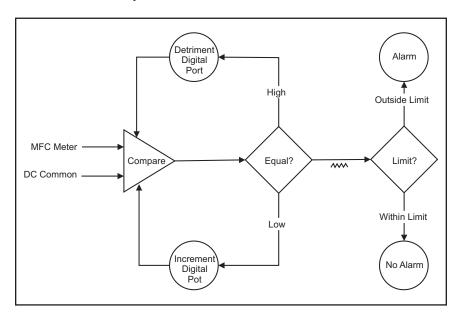


Figure 4-2 Auto Zero Circuit

The operator observes the progress of this cycle by monitoring the readout of the MFC meter. A stable zero readout is typically achieved in 30-60 seconds, at which point the MFC is ready for operation. After a stable zero (\pm 0.2%) is achieved, the operator turns on the MFC. This action disables the Auto Zero circuitry and maintains the new zero setting.

If the meter output never achieves zero, the MFC zero variance may have exceeded the correction limit of the Auto Zero circuitry (± 4-5% of full scale). The Automatic Zero alarm will then indicate the MFC requires service. Auto zeroing is not purely electronic in nature. It also requires that the physical gas flow be in a zero state. MFCs are control valves and are not designed to provide a positive shut-off. If a slight gas flow is allowed across the internal sensor during auto zeroing, the MFC will capture a false zero reference. Pressure fluctuations in the process chamber or gas supply can also result in minute flows across the sensor.

If the MFC zero is misadjusted, the entire calibration curve changes accordingly. To insure absolute zero flow conditions are maintained during the re-zeroing sequence, upstream and downstream isolation valves should be installed within a few inches of the MFC as shown in Figure 4-1, MFC Installation, on p. 4-2. The following shutdown sequence is highly recommended to provide optimum auto zeroing conditions.

NOTE: The following is a general shutdown sequence to ensure an absolute zero flow condition is present. Modifications to this sequence may be required to fit your application.

- 1. Close the upstream isolation valve.
- 2. Open the MFC control valve by establishing a high setpoint command, or by setting the purge command.
- 3. Evacuate the MFC.
- 4. Close the downstream isolation valve.
- 5. Initiate auto zero and wait 3 minutes for the auto zero sequence to terminate.

4-3 Check the MFC for Proper Sequencing

Systems that use a microprocessor or computer for operating the MFC should sequence the unit off between processes. To accomplish this, simply provide a zero setpoint command. The gas will shut off automatically.

If the MFC is not equipped with Auto Shut-Off, switch Pin J to OFF, if applicable.

Shut-Off valves that are upstream or downstream from the MFC should be programmed to turn ON prior to turning on the MFC, and to turn OFF after the MFC is turned off.

4-4 Check the MFC for Full Flow

Check for full flow as follows:

1. Apply the gas to the MFC at the appropriate inlet pressure.

- 2. Apply a setpoint of 100%.
- 3. Verify the indicated flow output reads a steady 5 Vdc. This is equivalent to a flow of 100% + 0.2%.

4-5 Check the MFC for Proper Calibration

Calibration is checked by flowing gas through a calibrated reference downstream from the MFC. If the gas is other than the specific surrogate gas, or the actual process gas such as nitrogen, MFC errors up to + 10% can be expected. This is due to the different characteristics among different gases.

A typical performance chart is shown in Figure 4-3, Voltage Output (Setpoint) Versus Gas Flow, below for an analog MFC. Note that flow accuracy is \pm 10% if the output voltage setpoint is set at 10% of full scale and improves to \pm 1% if the output voltage setpoint is set at 100% full scale.

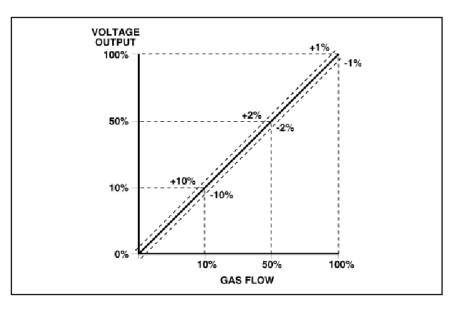


Figure 4-3 Voltage Output (Setpoint) Versus Gas Flow

4-6 MFC Flow Response Check

- 1. With the setpoint still at 100%, and at full flow, apply a Valve Off command.
- 2. Remove the Valve Off command.
- 3. Verify that the response time is correct for your application.

NOTE: For fast start units, review the response specifications for your model and flow range. For slow start (linear response) units, the response time is preset at the factory.

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Brooks® 9000 Series

5-1 Introduction

November, 2014

Mass flow controller (MFC) maintenance is discussed below in three areas: Routine Maintenance, Troubleshooting, and MFC Removal/ Packing/Shipping.

5-2 Routine Maintenance

Any precision unit such as a mass flow controller requires occasional servicing, especially if it has been operating for an extended period of time. If reactive gases are being used, it is recommended that you send the device to a Brooks Service Center for cleaning and recalibration at six month intervals.

Please follow the instructions for removal, product packaging and product return instructions found in "5-6 MFC Removal" on p. 5-5 through "5-8 MFC Return Shipping" on p. 5-6.

All active process instrumentation and equipment is subject to aging and wear from their environment. This includes temperature, mechanical stress, component tolerance shift, contaminant buildup, oxidation, and other influences. The effects are gradual, but over time the changes can affect the accuracy of even the best equipment. Therefore, it is recommended to re-zero the device at 6 month intervals. Refer to "4-2 Zero the MFC" on p. 4-1 for re-zeroing instructions.



A WARNING

METER/CONTROLLER SEAL COMPATIBILITY

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.

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.

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.

If it becomes necessary to remove the instrument from the system, power to the device must be disconnected.

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

This instrument contains electronic compoonents 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.

5-3 Troubleshooting

This section includes a Troubleshooting Guide and Checklist that identify symptoms, possible causes, and corrective actions.

NOTE: OEM tool problems are often caused by something other than the 9000 Series device. Therefore, Brooks recommends that you review both the Troubleshooting Guide and Checklist before removing the 9000 Series device from your system. It is also suggested that you contact your Brooks Service representative before removing the 9000 Series device from your system.

5-4 System Troubleshooting Guide

Table 5-1, System Troubleshooting Guide, on p. 5-3 identifies some basic problems, possible causes and solutions, and corrective action measures on systems where MFCs are installed. If the problem is not listed, contact your Brooks Instrument Support Representative for assistance.

Table 5-1 System Troubleshooting Guide

Problem	Possible Causes & Solutions	Corrective Action
No gas flow	Is the gas supply turned on?	Check the shut-off valve and the pressure readout.
	Is the regulator turned on and set at correct operating pressure?	Check regulator pressure (typically 25 psia).
	Are any upstream or downstream isolation valves closed, either by a system command or because of failure?	Verify pneumatic valves are operating properly.
	Is the commanded setpoint from the system set at 0% (0.00 Vdc)?	Use the tool's software. Verify interlocks.
	Has the MFC been commanded off by an active "valve close" input?	Use the tool's software. Verify interlocks.
Flow out of range	Is the gas inlet/outlet pressure differential either too high or too low? If the differential is too high, the MFC voltage will be zero or abnormally low for the setpoint. If the differential is too low, the MFC valve drive voltage will be at its maximum value or abnormally high for the setpoint.	Verify that the inlet pressure is correct for the gas being used.
	Is the setpoint correct for the required flow?	Use the tool's software to verify.
	Is the MFC calibrated for the particular gas?	Check the MFC side can label (see Figure 5-1, MFC Can Side Label, on p. 5-4). Run a full flow check to verify.
	Is the MFC zero correct?	Verify zero is correct. Refer to Section 4 for zeroing instructions.
No gas control. Flow is at or above maximum	Is there too much gas pressure across the MFC?	Verify that the pressure is correct for this gas range.
	Is a system valve open or purge input activated?	Use the tool's software to verify.
	Is the setpoint correct for the required flow?	Use the tool's software to verify.
Flow unable to reach setpoint	Note: When the setpoint is raised beyond this point, the MFC remains at some value lower than the setpoint. Is the gas inlet/outlet pressure-differential sufficient? If the differential is too low, the MFC valve drive voltage will be at its maximum value when the setpoint is raised above the point where the flow will increase.	Verify that the pressure is correct for the gas. Adjust regulator to the proper operating pressure.
	Is the MFC calibrated for the gas flowing? If not, replace the MFC with a properly calibrated unit.	Check the MFC side can label (see Figure 5-1, MFC Can Side Label, on p. 5-4). Run a full flow check to verify.
No gas flow control below some setpoint	(Note: when the setpoint is lowered below this point, the MFC signal remains at some value higher than the setpoint.)	Verify that the pressure is correct for the gas. Adjust regulator to the proper operating pressure.
	Is the gas inlet/outlet pressure differential too high? If the differential is too high, the MFC valve drive voltage will be at its minimum value when the setpoint is lowered below the point where the flow will decrease.	
	Is the MFC valve leaking?	Perform an MFC leak test with a helium leak detector.

Problem	Possible Causes & Solutions	Corrective Action
Gas flow or MFC reading oscillates	Is the MFC calibrated for the gas flowing? If not, replace MFC with properly calibrated unit.	Verify that the pressure is correct for the gas.
	Note: Most nitrogen calibrated MFCs will oscillate on hydrogen or helium.	
	Is the MFC output pressure sufficient?	If erratic, check for a faulty vacuum pump or fluttering downstream valve.
Gas flow or MFC reading oscillates	Is there too much gas pressure across the MFC?	Verify that the pressure is correct for the gas.
		Adjust regulator to proper operating pressure, if necessary.
	Are the inlet and outlet pressures steady?	Check inlet pressure. If erratic, a faulty pressure regulator can make an MFC appear to oscillate.
MFC does not read zero when gas is shut	Is differential pressure across the MFC really zero?	Verify that the pressure is correct for the gas.
off		Equalize the pressure across the MFC by opening the control valve briefly.
		Perform a zero adjustment. Refer to Section 4 for instructions.
	Is the MFC configured properly in the tool software?	Use the tool's software to verify.
	Is the MFC mounted in the proper attitude?	Check the MFC side can label (see Figure 5-1, MFC Can Side Label, below). Look for HOV (vertical) or HOS (horizontal).
		For the best results, the MFC must be calibrated according to the mounting attitude it is operating at.

Table 5-1 System Troubleshooting Guide

UFC-9861 —	MFC model number
750SCCM H20	FS flow and gas
SN:01B40361415	Serial number
Cal:M745910	Calibration reference for traceability
N2 REF 25% 211.48 50% 423.98 75% 637.05 100% 950.11	N2 calibration reference
Resp:F Exh:V	Response speed and exhaust condition
E Atta:HOV	Operating attitude
	Valve type
≡ Seal:M	Seal material
E Ref:0C, 760T	Refererence temperature and pressure
E Conn:UDU9	Electrical connector type
= Opt:AS	Options (Auto Shutoff/Auto Zero)
\equiv CSR=1087	Customer special request number
PID FW=4.14	Main firmware revision
Version:XXXX	 DeviceNet firmware revision

Figure 5-1 MFC Can Side Label

5-5 MFC Troubleshooting Checklist

Check for these factors before removing the MFC from your system:

- Verify that the supply voltage is correct.
- Verify that the grounding is consistent.
- Verify that the setpoint signal at the MFC connector is the same as the setpoint signal coming from the tool.
- Verify that the output (Indicated Flow) of the MFC is the same at the input of the tool.
- Verify the valve voltage response.
- Move the setpoint upward and downward, looking for the valve voltage to change accordingly.
- Compare recent valve voltage to past valve voltage. If it has changed and the other parameters have not, an MFC failure is likely.

5-6 MFC Removal

The following removal procedure is designed to minimize or eliminate the contamination normally associated with the most highly reactive gases.

5-6-1 Purge System Before Removing MFC

Before removing the MFC, purge the gas lines with nitrogen or argon. The purge gas must be moisture and oxygen free, to less than one hundred parts per billion. The preferable method is to cycle purge the line for a period of two to four hours, depending on the cleanliness required by the process and the reactiveness of the process gas.

Cycle purging consists of evacuating to a low pressure adequate to induce outgassing and then purging to remove adhered moisture and oxygen. The cycle is repeated several times to complete the cleaning. Alternatively, eight to twenty-four hours of purging alone may be used if vacuum is not available.

5-6-2 Remove the MFC from System

Once the line has been purged, the MFC can be removed. Inspect the upstream and downstream lines and the MFC inlet and outlet fittings for signs of contamination. Immediately hardcap the inlet and outlet fittings of the MFC and cap the line fittings as well. The unit should be sealed in a plastic bag before leaving the cleanroom area.

NOTE: The service and calibration documentation for your MFC should be maintained in order to determine the contamination state of each supply line.

Brooks[®] 9000 Series

5-7 Packaging the MFC

Installation and Operation Manual X-TMF-9000-Series-MFC-eng Part Number: 541B194AAG November, 2014

The unit can now be transported to the service or calibration location. If the MFC is transported outside of the facility, it should be packaged in its original carton with one inch of foam cushion on all sides.

Be sure to include documentation of any contamination found, failure symptoms, and the location of its installation. This documentation can facilitate future contamination analysis. If a product is being returned to Brooks Instrument, it must include your company name, a person to contact, and the RMA number. Contact Brooks Instrument for an RMA number prior to shipping (refer to "3-4 Return Shipment" on p. 3-2).

5-8 MFC Return Shipping

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 in "3-2 Receipt of Equipment" on p. 3-1. Prior to returning the device, it must be purged in accordance with the following:

Before returning the device, purge it 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.

All flow devices returned to Brooks require completion of Form RPR003-1, 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 "3-2 Receipt of Equipment" on p. 3-1.

6-1 9660 Product Description Code

9660 High Purity, Metal Seal, RS485 Digital and Analog Interface		
C Mass Flow Controller		
M Mass Flow Meter		
A Auto Shut-off		
X No Auto Shut-off		
F Fast Start 1 Second Response		
S 5 Second Linear Soft Start		
T 6-10 Second Soft Start		
X No Valve (Meter)		
XXXX XXXX Specify Pre-programmed Gas and Full Scale Range		
(example: Nitrogen = "0013"; 90sccm= "090C")		
4R 1/4" VCR		
3R 3/8" VCR		
HOV Horizontal or Vertical Mounting Attitude (Standard)		
HOS Horizontal or Side		
A Atmospheric Downstream Pressure		
V Vacuum Downstream Pressure		
MM Metal O-Ring/ Metal Seat		
MX Metal O-Ring- No Valve (Meter)		
T 9 Pin "D" Connector & 20 Pin Card Edge Connector & Dual RJ11 ports, 0-5 VDC		
U 15 Pin "D" Connector & 20 Pin Card Edge Connector &		
Dual RJ11 ports, 0-5 VDC		
XXXX Customer Special Request (CSR)		
C Normally Closed (Standard)		
X No Valve (Meter)		
S Standard (Valve Downstream)		
X No Valve (Meter)		
A Auto-Zero Enabled		
X Auto-Zero Disabled		
10E 10µ inch Ra Finish		
0°C Reference		
00 Calibration (Standard)		
Custom Reference		
XX Calibration (20°C=20)		

6-2 9661 Product Description Code

0004 Ultra Ultra Durity Matel Cool, D0405 Dirital and Analas Interface	
9861 Ultra-High Purity, Metal Seal, RS485 Digital and Analog Interface	
C Mass Flow Controller	
M Mass Flow Meter	
A Auto Shut-off	
X No Auto Shut-off	
F Fast Start 1 Second Response	
S 5 Second Linear Soft Start	
T 6-10 Second Soft Start	
X No Valve (Meter)	
XXXX XXXX Specify Pre-programmed Gas and Full Scale Range	
(example: Nitrogen = "0013"; 90sccm= "090C")	
3R 3/8" VCR	
HOV Horizontal or Vertical Mounting Attitude (Standard)	
HOS Horizontal or Side A Atmospheric Downstream Pressure	
V Vacuum Downstream Pressure	
MM Metal O-Ring/ Metal Seat	
MX Metal O-Ring- No Valve (Meter)	
T 9 Pin "D" Connector & 20 Pin Card Edge Connector &	
Dual RJ11 ports, 0-5 VDC	
U 15 Pin "D" Connector & 20 Pin Card Edge Connector &	
Dual RJ11 ports, 0-5 VDC	
XXXX Customer Special Request (CSR)	
C Normally Closed (Standard)	
X No Valve (Meter)	
S Standard (Valve Downstream)	
X No Valve (Meter)	
A Auto-Zero Enabled	
X Auto-Zero Disabled	
04E 4μ inch Ra Finish	
0°C Reference	
Calibration (Standard)	
Custom Reference	
Calibration (20°C=20)	

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 поддържката 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 информиране.

А 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.
- 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 поддържане.

А ВНИМАНИЕ: При оборудванията 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 до спука 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" (инч), попадат под действието на европейската директива за уреди под налягане (PED).

- Глава "Технически данни" на настоящото ръководство съдържа свързаните с директивата РЕД инструкции.
- Указаните в настоящото ръководство измерителни уреди съответстват на европейската директива 97/23/ЕО.
- Всички разходомери на Brooks Instrument се отнасят към флуиди от група 1.
- Измерителните уреди по-големи от 25 mm или 1" (инч) съответ стват на I, II или III категория според PED.
- Измерителните уреди с размери 25 mm или 1" (инч), или по-малки, следват добрата инженерна практика (SEP).

Европейска директива за електромагнитна съвместимост (ЕМС)

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 обръща обаче на избирането на сигналните кабели, използвани с оборудването, носещо знака СЕ. Качество на сигналните кабели, кабелните салници и съединители:

Brooks Insturment предлага висококачествени кабели, отговарящи на изискванията на СЕ 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 СЕ 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.

- 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.
- 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 технология 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[®] 9000 Series

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: Neprovozujte 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.
- 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.

Měřicí přístroje popsané v této příručce jsou v souladu se směrnicí EN 97/23/ES.

Všechny průtokoměry společnosti Brooks Instrument spadají do rámce Kapaliny, skupina I.

- Měřicí přístroje větší než 25 mm nebo 1" (palec) jsou v souladu se směrnicí PED, kategorii I, II nebo III
 - Měřicí přístroje 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 označeném 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.

Přípojky vedoucí ke kartám podle norem jsou nekovová. 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 zemnícím náramkem, nebo jiným vyhovujícím způsobem.

3. Desky plošných spojů je nutné přepravovat v elektricky vodivém obalu. Plošné spoje vyjímejte 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 kovů (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 součástek, 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 installeringen 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.

A 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 forståelig, kontakt venligst Deres Brooks repræsentant for at afklare problemet som er opstået.

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

A 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 måleinstrumenter der er tilpasset direktivet 97/23/EK EU.

- Alle Brooks gennemstrømningsmålere tilhører væskegruppen nr. 1.
- Alle målinstrumenter som er større end 25 mm eller en tomme beskrives i direktivet PED's kategorier I, II eller III.
- Alle målinstrumenter 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..

Dutch

Essentiële instructies

Lees ze voordat u verder gaat!

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.

- 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.

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.

- 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.
- 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.

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.

PED-richtlijn (Pressure Equipment Directive)

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.

- In het hoofdstuk Specificaties van deze handleiding staan aanwijzingen die verband houden met de PED-richtlijn.
- De meters die in deze handleiding worden beschreven, voldoen aan de Europese richtlijn 97/23/EG.
- Alle stromingsmeters van Brooks Instrument vallen in groep 1.
- Meters met een diameter van meer dan 25 mm voldoen aan de categorieën I, II of III van de PED-richtlijn.
- Meters met een diameter van 25 mm of kleiner voldoen aan de regels van goed vakmanschap.

Elektromagnetische compatibiliteit (EMC)

De elektronische apparatuur van Brooks Instrument met de CE-markering is succesvol getest in overeenstemming met de EMC-voorschriften (richtlijn EMC 2004/108/EC).

De keuze van de signaalkabel voor gebruik in combinatie met apparatuur met CE-markering verdient speciale aandacht.

Kwaliteit van de signaalkabel, kabelafdichtingen en stekkers:

Brooks Instrument levert hoogwaardige kabels die voldoen aan de specificaties voor de CE-markering.

Als u zelf voor signaalkabel zorgt, moet u altijd een volledig afgeschermde kabel gebruiken.

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.

Het kabelscherm moet met het metalen omhulsel of de metalen afdichting worden verbonden en aan beide uiteinden rondom volledig worden afgeschermd. De afscherming moet aan de aardpotentiaal worden aangesloten.

Card Edge Connectors zijn standaard niet van metaal. De gebruikte kabels moeten volledig zijn afgeschermd om te voldoen aan de CE-markering. De afscherming moet aan de aardpotentiaal worden aangesloten.

Voor de pinconfiguratie: Raadpleeg de bijgevoegde handleiding.

Elektrostatische ontlading

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. Procedure:

1. 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.

Opmerkingen

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.

A-4

Estonian

Olulised juhised Enne kasutamist lugege hoolikalt läbi!

Brooks Instrument konstrueerib, valmistab ja katsetab oma tooteid selliselt, et need vastaksid paljude erinevate riiklike ja rahvusvaheliste standardite nõuetele. Ainult nõuetekohane paigaldamine, kasutamine ja hooldamine tagab toodete katkematu talitluse tavaspetsifikatsiooni raames. Brooks Instrument'i toodete paigaldamisel, kasutamisel ja hooldamisel tuleb täita alljärgnevaid juhiseid ja integreerida need asjakohasesse ohutusprogrammi.

- Nõuetekohase talitluse tagamiseks tohib toodet paigaldada, kasutada, täiustada, programmeerida ja hooldada ainult kvalifitseeritud personal.
- Enne toote paigaldamist, kasutamist ja hooldamist lugege kõik kasutusjuhised hoolikalt läbi. Kui käesolev kasutusjuhend ei vasta tele tootele, pöörduge kohaliku edasimüüja poole, kelle kontaktandmed leiate kasutusjuhendi tagakaanelt. Hoidke see kasutusjuhend edaspidiseks alles A HOIATUS: ärge kasutage seda instrumenti väljaspool kasutusjuhendis spetsifitseeritud piirväärtusi. Selle hoiatuse eiramine võib põhjustada tõsiseid kehavigastusi ja/või kahjustada seadet.
- Kui te saa mõne juhise mõttest aru, pöörduge selgituste saamiseks kohaliku Brooks Instrument'i edasimüüja poole.
- Järgige kõiki hoiatusi, tähelepanule manitsusi ja juhiseid, mis on tootele peale kantud või tootega kaasa antud.
- 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 tööventiilid aeglaselt. (2) Kontrollige, et voolukulumõõturi sisend- või väljundühenduste ümber ei ole lekkeid. Kui lekkeid ei ole, laske süsteemil saavutada töösurve.
- Enne seadme hooldamist veenduge, et kogu süsteem on surve alt vabastatud. Varuosasid tohib vahetada ainult kvalifitseeritud personal, kasutades selleks Brooks Instrument'i poolt heakskiidetud varuosi. Mitteoriginaalvaruosade kasutamine ja ebapädev toimingute tegemine võivad kahjustada toote tööomadusi ja põhjustada riski tootmistegevuse ohutuse tagamisel. Õriginaalvaruosadele sarnaste osade kasutamine võib põhjustada tule- või elektrilöögiohtu või seadme väärtalitlust
- Elektrilöögi- ja vigastuseohu vältimiseks peavad seadme luugid olema alati suletud ja kaitsekatted oma kohal, va seadme hooldamisel kvalifitseeritud isikute poolt

Å 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 tõsiseid 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

- Käesoleva kasutusjuhendi spetsifikatsiooniosa sisaldab surveseadmete direktiiviga seonduvaid juhiseid.
- Käesolevas kasutusjuhendis kirjeldatud mõõturid vastavad EN direktiivi 97/23/EÜ nõuetele.
- Brooks Instrument'i voolukulumõõturid kuuluvad vedelike 1. gruppi. .
- Mõõturid läbimõõduga üle 25 mm või 1 tolli vastavad surveseadmete direktiivi kategooriale I, II või III.
- Mõõturitele läbimõõduga alla 25 mm või 1 tolli kohaldatakse häid inseneritavasid. .

Euroopa elektromagnetilise ühilduvuse direktiiv (EMÜ)

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

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. Kus kohaldatav, 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

A 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. Käsitsemisiuhised

Lahutage seade toiteallikast

Enne trükkplaadi või mõne muu siseelemendi paigaldamist, eemaldamist või konfigureerimist peab personal olema maandatud läbi randmepaela või mõne 2. muu sobiva vahendi.

- 3.
- Trükkplaate transporditakse 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. Kommentaarid

See seade ei ole ainus, mis sisaldab staatilise elektri suhtes tundlikke elemente. Enamik kaasaegsetest 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.

Finnish

	Perusohjeet			
Lue ensin ohjeet huolellisesti!				
vaat laitte	oks Instrument suunnittelee, valmistaa ja testaa laitteensa vastaamaan useimpien kotimaisten ja kansainvälisten standardien imuksia. Tuotteet tulee asentaa, käyttää ja huoltaa käyttöohjeiden mukaan jotta niiden toimivuus taataan. Brooks Instrumentin siden asennuksessa, käytössä ja huollossa on noudatettava soveltuvia määräyksiä ja ohjeita, lisäksi mainitut ohjeet on mioitava työsuojelun ohjeistuksessa.			
	Oikean toiminnan varmistamiseksi vain valtuutettu huoltohenkilö saa asentaa, käynnistää, päivittää, ohjelmoida ja huoltaa aitteita.			
L	uue kaikki käyttöohjeet koskien tuotteen asennusta, käyttöä ja huoltoa. Jos käyttöohje on puutteellinen, lisätietoja saa paikalliselta älleenmyvjältä. Yhteystiedot löytyvät oppaan kansilehdestä. Säilytä ohjeet.			
A	vAROITUSI: Käyttöohjeessa ilmoitettujen standardien mukaisia ohjeita ja raja-arvoja ei saa ylittää. Rajoitusten aiminlyönti 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, määräyksia ja varoituksia.			
	Laittteen asennuksessa on noudatettava erityisiä asennusohjeita sekä voimassa olevia paikallisia ja kansainvälisiä määräyksiä. Laitteet saa yhdistää vain soveltuvaan sähkö- ja paineverkkoon.			
l i i v v A t	Asennusohjeita: (1) Päästä virtaus hitaasti järjestelmään. Avaa venttiilit hitaasti, jotta virtaus pysyy tasaisena. (2) Tarkista, ettei virtausmittarin sisään- ja ulosmenon vieressä ole vuotoa. Jos järjestelmässä ei ole vuotoa, aseta oikea käyttöpaine. Tarkista, että laitteeseen menevä paine on katkaistu ennen laitteen korjaamista välttääksesi äkillisen painepäästön aiheuttaman oukkaantumisriskin. Mahdollisten varaosien tulee olla Brooks Instrumentin hyväksymiä. Vain valtuutettu huoltohenkilö saa asentaa varaosat. Ei-hyväksyttyjen varaosien käyttö voi vahingoittaa tuotteen toimintaa ja aiheuttaa turvallisuusriskin. Samoin ei- hyväksyttyjen varaosien käyttö voi aiheuttaa tulipalon, sähköiskun tai virhetoiminnan riskin. Varmista että kaikki kaikki laitteen ovet/luukut ovat suljettuina ja tarkista että suojakannet ovat paikoillaan estääksesi mahdolliser sähköisku- ja loukkaantumisvaaran. IROITUSI: Jos järjestelmässä virtaa neste ja laitteen sisään- ja ulosmenoventtiilit pitää sulkea, laite on ensin tyhjennettävä kokonaan. Tyhjentämisen laiminlyönti aiheuttaa nesteen lämpölaajenemista, joka saattaa johtaa laitteen tikkoutumiseen ja henkilövahingon vaaraan.			
Pain	elaitteet, joidenpaine on suurempi kuin 0,5 bar ja joiden koko on suurempi kuin 25 mm tai 1 tuuma , kuuluvat eurooppalaiseen			
pain	elaitedirektiiviin (PED).			
	PED direktiiviä koskevat määräykset löytyvät käyttöoppaan "Tekniset tiedot" -luvusta.			
	Käyttöoppaassa kuvatut mittarit ovat 97/23/EC EU-direktiivin mukaisia.			
	Kaikki Brooks Instrumentin virtausmittarit kuuluvat virtausryhmään 1. Laitteet jotka ovat suurempia, kuin 25mm tai 1 tuuma, ovat PED I, II, III kategorien mukaisia.			
	Mittarit joiden koko on alle 25 mm tai 1 tuuma ovat hyvän konepajakäytännön (SEP) mukaisia.			
	Eurooppalainen direktiivi sähkömagneettisesta yhteensopivuudesta (EMC)			
Proc	bks Instrumentin CE-merkin saaneet (sähkö/sähköiset) laitteet täyttävät EMC direktiivin vaatimukset ja testit sähkömagneettisesta			
	ensopivuudesta (2004/108/EC EMC direktiivi).			
Érity <u>Kaa</u>	ristä huomioita on kiinnitettävä CE-merkittyjen laitteiden käytössä olevien kaapelien valintaan. pelien, kiinnikkeiden ja liittimien laatu:			
Érity <u>Kaa</u> Broc	ristä huomioita on kiinnitettävä CE-merkittyjen laitteiden käytössä olevien kaapelien valintaan. pelien, kiinnikkeiden ja <u>liittimien laatu:</u> oks Insturmentin kaapelit ovat korkealaatuisia ja täyttävät CE-merkintä direktiivin vaatimukset.			
Érity <u>Kaa</u> Broc Muu	ristä huomioita on kiinnitettävä CE-merkittyjen laitteiden käytössä olevien kaapelien valintaan. pelien, kiinnikkeiden ja liittimien laatu: oks Insturmentin kaapelit ovat korkealaatuisia ja täyttävät CE-merkintä direktiivin vaatimukset. n valmistajan kaapelia käytettäessä on käytettävä 100% suojattua kaapelia.			
Érity <u>Kaa</u> Broc Muu Liittii suoja	ristä huomioita on kiinnitettävä CE-merkittyjen laitteiden käytössä olevien kaapelien valintaan. pelien, kiinnikkeiden ja liittimien laatu: oks Insturmentin kaapelit ovat korkealaatuisia ja täyttävät CE-merkintä direktiivin vaatimukset.			

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

Suojaus päättyy maadoitukseen.

Napojen järjestys: Katso liitteenä oleva käyttöopas.

Elektrostaattinen purkaus (ESD)

A VAROITUSI: 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 suojavarustuksella ennen piirilevyn tai muun sisäosan asennusta, poistamista tai korjaamista.
- 3. Piirilevyt kuljetetaan konduktiivisessa pakkauksessa. Piirilevyt puretaan paketista juuri ennen asennusta. Poistettu piirilevy on heti pakattava soveltuvaan suojapakkaukseen kuljettamista, varastoimista tai palautusta varten.

Huomautukset:

Tuotteen herkkyys elektrostaattiselle purkaukselle (ESD) ei ole epätavallista. Suurin osa elektroniikkatuotteista sisältää komponentteja jotka hyödyntävät metallioksiditekniikkaa (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 !

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. • 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.

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.

· 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.
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.

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.

Directive européenne « équipements sous pression » (PED)

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)

L'équipement Brooks Instrument (électrique / électronique) portant le marquage CE répond à la réglementation en matière de compatibilité électromagnétique (directive CEM 2004/108/EC).

Il faut cependant prêter une grande attention au choix du câble d'interconnexion à utiliser avec l'équipement marqué CE.

Qualité du câble d'interconnexion, des presse-étoupes et connecteurs :

Brooks Instrument fournit un ou des câbles de qualité supérieure qui répondent aux spécifications exigées pour la certification CE.

Si vous utilisez votre propre câble d'interconnexion, ce câble doit être protégé par un blindage intégral.

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.

L'écran du câble doit être raccordé à l'enveloppe métallique ou au presse-étoupe et blindé aux deux extrémités sur 360 degrés.

Le blindage doit s'achever sur une prise de terre.

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.

Le blindage doit s'achever sur une prise de terre.

En ce qui concerne la configuration des broches, veuillez vous reporter au manuel d'utilisation joint

ESD (décharge électrostatique)

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. Procédure de manipulation :

1. L'alimentation électrique de l'appareil doit être coupée.

2. 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.

3. Les cartes de circuits imprimés doivent être transportées dans un récipient conducteur. Les cartes ne doivent 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.

Observations

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.

Brooks[®] 9000 Series

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.
- · 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.

Durchflussmessgeraete 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 1in (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.

Messgeräte, die in diesem Handbuch beschrieben sind, erfüllen die europäische Richtlinie 97/23/EG.

- Alle Durchflussmesser von Brooks Instrument fallen unter die Fluidgruppe 1.
- Messgeräte, die größer als 25 mm oder 1" (inch) sind, erfüllen die Kategorien I, II oder III der Druckgeräterichtlinie (PED).
- Messgeräte 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 (Elektrostatische 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:

- Trennen Sie das Gerät von der Stromversorgung.
- Das Personal ist vor dem Einbau, Ausbau oder der Einstellung von Platinen oder anderen internen Komponenten durch ein entsprechendes Armband mit dem 2. 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 Schutzbehälter 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

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. Α 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.
- 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 βεβαίωθείτε ότι γραμμή εργασίας έχει τεθεί εκτός πιέσεως. 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.

Α 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.
- Οι μετρητές που περιγράφονται στο παρόν εγχειρίδιο συμμορφώνονται με την ευρωπαϊκή Οδηγία 97/23/ΕΚ.
- Όλα τα ροόμετρα της Brooks Instrument ανήκουν στην ομάδα ρευστών 1.
- Μετρητές μεγαλύτεροι από 25 mm ή 1 ίντσα συμμορφώνονται με τις κατηγορίες Ι, ΙΙ και ΙΙΙ της Οδηγίας PED.
- Μετρητές μεγέθους 25 mm ή 1 ίντσας ή και μικρότεροι κατασκευάζονται σύμφωνα με τους κανόνες της τέχνης (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/EC 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 στυπιοθλίπτες καλωδίων για τη στερέωση της θωράκισης.

Να συνδεθεί η θωράκιση του καλωδίου στο μεταλλικό κέλυφος ή στυπιοθλίπτη 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.
- Φροντίστε για τη γείωση του προσωπικού με περικάρπιο 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 περίβλημα 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 κά.). 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 πρώιμη αστοχία.

Hungarian

Alapvető utasítások		
Először olvassa el ezeket!		
A Brooks Instrument olyan módon tervezi, gyártja és teszteli 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. Örizze meg ezt a kézikönyvet későbbi		
tájékoztatásként.		
A FIGYELEM: Ne működtesse a berendezést az üzemeltetési utasításban megadott üzemi tartományokon túl. Ennek megsértése súlyos személyi sérüléshez vagy a berendezés meghibásodásához vezethet.		
 Amennyiben a gépkönyv 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 utasítás. 		
 A medfelelő 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 áramlásingadozás elkerülése érdekében. (2)		
Ellenőrizze, nincs-e szivárgás az áramlásmérő be-, és kimeneti bekötéseinél. Ha nincs szivárgás, töltse fel a rendszert az üzemi nyomásra.		
Szervizelés előtt mindenképpen ellenőrizze, hogy az üzemi vezeték nincs-e nyomás alatt. Amennyiben cserealkatrészekre van szükség, 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		
alkatrészek es tevekenysegek berolyasolnaljak a termek teljesítmenyet, metve veszelyeztetnetik a biztonságos uzemettetest. A pusztan nasomo 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.		
A 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 gépkönyv "Műszaki adatok" fejezete tartalmaz a PED irányelvre vonatkozó utasításokat.
- A gépkönyvben megadott mérőeszközök megfelelnek a 97/23/EK EU irányelvnek.
- Minden Brooks átfolyásmérő az 1-es folyadékcsoportba tartozik.
- A 25 mm-nél vagy 1 hüvelyknél nagyobb mérőeszközök megfelelnek a PED I, II, vagy III kategóriának.
- A 25 mm-es illetve 1 hüvelykes vagy kisebb mérőeszközök 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 Insturment magas minőségű kábeleket kínál, melyek megfelelnek a CE minősítés követelményeinek.

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

A "D" vagy "kör alaku" 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 fémesek. Az alkalmazott kábeleknek 100%-és 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:

- A személyt földelni kell csuklópánttal vagy egyéb biztonságos és a célra alkalmas eszközzel, mielőtt áramköri kártyát vagy egyéb belső eszközt telepítene, venne ki, vagy állítana be.
- A nyomtatott áramköri kártyákat vezetőképes csomagolásban kell szállítani. A kártyák kizárólag közvetlenül a behelyezés előtt vehetők ki a védőburkolatból. A kiszerelt kártyát haladéktalanul el kell helyezni a mozgatásra, 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 tönkreteheti ezeket az eszközöket. A károsodott alkatrészek, még ha látszólag megfelelően működnek is, kezdődő hibára utalnak.

A berendezést áramtalanítani kell.

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.

A 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.
- 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.

A 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.

- Gli strumenti di misura descritti nel presente manuale sono conformi alla Direttiva UE 97/23/CE.
- Ogni flussimetro Brooks appartiene al gruppo di fluidi 1.
- Gli strumenti di misura maggiori di 25 mm o di 1 pollice sono conformi alla categoria I, II o III della PED.
- Gli strumenti 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)

- A 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.
- 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[®] 9000 Series

Latvian

Svarīga instrukcija Pirms turpināt izlasiet!

"Brooks Instrument" projektē, ražo un pārbauda savus ražojumus 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 jāiekļauj 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. 🔺 BRĪDINĀJUMSI Nelietot instrumentu ārpus Instrukciju un lietošanas rokasgrāmatā norādītajiem parametriem. Šī brīdinājuma
- neievērošanas rezultātā var rasties traumas un / vai aprīkojuma bojājumi.
- Ja jūs nesaprotat kādu no instrukcijām, sazinieties ar "Brooks Instrument" pārstāvi un lūdziet izskaidrot to.
- levērojiet visus brīdinājumus, piesardzības mērus un instrukcijas, kas norādīti uz izstrādājuma vai piegādāti kopā ar to. Uzstādiet aprīkojumu 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 ieplūdes un izplūdes savienojumiem. Ja noplūdes nav, uzstādiet sistēmā darba spiedienu.
- Pārliecinieties par to, lai pirms instrumenta tehniskās apkopes būtu likvidēts procesa līnijas spiediens. Ja ir nepieciešams veikt kādu daļu nomaiņu, nodrošiniet, lai tiktu izmantotas "Brooks Instrument" norādītās daļas un daļu nomaiņu veiktu kvalificēts personāls. Neatļautu daļu un procedūru izmantošana var ietekmēs ražojuma sniegumu un samazināt procesa drošību. Līdzīgu, bet ne identisku daļu nomaiņas lietošana var izraisīt ugunsgrēka, 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 ieplūdes un izplūdes vārstus kāda iemesla dēļ ir jāaizver, no ierīcēm ir jāizlaiž 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 mērītāji 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 mērītājiem attiecas labas inženierijas prakse (SEP).
- 25 mm jeb 1" (collu) mazi vai mazāki mērītāji 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 signālkabeli, kas tiks lietots kopā ar CE marķējuma iekārtu, ir jāievēro īpaša uzmanībaSignālkabeļa, kabeļa blīvslēgu un savienotāju kvalitāte:

"Brooks Instrument" piegādā augstas kvalitātes kabeļus, kas atbilst CE sertifikācijas tehniskajiem parametriem. Ja jūs lietojat pats savu signālkabeli, tam ir jābūt pilnībā, 100% ekranizētam.

"D" un "apaļā" tipa savienotājiem ir jābūt aprīkotiem 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 kēdes plates un ierīces vai kā citādi darbojoties ar tām, ir jāievēro noteikta darba kārtība. Darba kārtība:

lekārta iāatslēdz no barošanas. 1.

- Pirms jebkādas drukātas shēmas kartes vai citas iekšējās ierīces uzstādīšanas, izņemšanas vai regulēšanas personālam, kas veiks šos darbus, ir jābūt 2 iezemētam, piem., izmantojot aproces 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 no izņemtās plāksnes ir nekavējoties jāievieto aizsargiepakojumā.

Komentāri

Instruments nav unikāls tajā aspektā, ka tas satur pret ESD (elektrostatisko izlādi) jutīgus komponentus. Vairums 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 ātrākai atteicei.

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" produktus.

- Siekiant užtikrinti tinkamą veikimą, montuoti, eksploatuoti, naujinti, programuoti ir prižiūrėti gaminį turi tik kvalifikuoti darbuotojai.
- Perskaitykite visus nurodymus prieš montuodami, eksploatuodami ir prižiūrėdami gaminį. Jei gavote netinkamą instrukciją, galiniame jos viršelyje žiūrėkite vietinės prekybos atstovybės kontaktinę informaciją. Išsaugokite šią instrukciją pasižiūrėjimui ateityje.
- ISPĖJIMAS: nenaudokite šio prietaiso viršydami instrukcijoje ir eksploatacijos vadove nurodytus techninius duomenis. Nesilaikydami šio įspėjimo galite sunkiai susižeisti ir (arba) sugadinti įrangą.
- Jei nesuprantate kokių nors nurodymų, kreipkitės į "Brooks Instrument" atstovą, kad paaiškintų.
- Paisykite visų įspėjimo, perspėjimų ir nurodymų, pažymėtų ant gaminio arba pateiktų su juo.
- Įrangą montuokite taip, kaip nurodyta atitinkamos instrukcijos montavimo nurodymuose arba taikomuose vietiniuose ar nacionaliniuose kodeksuose. Visus gaminius junkite prie tinkamų elektros ir slėgio šaltinių.
- Eksploatacija: (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 būtinai pašalinkite slėgį proceso linijoje. Jei reikia pakeisti dalis, užtikrinkite, kad kvalifikuoti darbuotojai naudotų "Brooks Instrument" nurodytas pakaitines dalis. Netinkamos dalys ir procedūros gali pakenkti gaminio veikimui ir kelti pavojų saugiai jūsų proceso eksploatacijai. Tik panašiai atrodantys pakaitalai gali sąlygoti gaisrą, elektros pavojus ar netinkamą veikimą.
- Užtikrinkite, kad visos įrangos durelės 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 colis, yra reglamentuojama slėginės įrangos direktyvos

(PED).

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

Europoje taikomi elektromagnetinio suderinamumo (EMC) reikalavimai

CE ženklu pažymėta "Brooks Instrument" (elektrinė / elektroninė) įranga buvo sėkmingai išbandyta pagal elektromagnetinio suderinamumo reikalavimus (EMC direktyvą 2004/108/EC).

Bet reikia ypatingo demesio renkantis signalizavimo kabelį, kuris bus naudojamas su CE ženklu pažymėta įranga.

Signalizavimo kabelio, kabelių riebokšlių 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 riebokšlius, užtikrinančius kabelio ekrano suspaudimą.

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

Ekranas turi baigtis įžeminimu.

Standartinės kraštinės jungtys yra ne metalinės. Naudojami kabeliai turi būti ekranuoti 100 % ekranu, kad atitiktų CE sertifikavimą. Ekranas turi baigtis įžeminimu. Keturių kontaktų konfigūracija: žr. pridėtą instrukciją.

ESD (elektrostatinis išlydis)

A 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 irenginio maitinima.
- Darbuotojai turi pasirūpinti įžeminimu naudodami riešo juostelę ar kitas saugias tinkamas priemones prieš įdėdami, išimdami ar reguliuodami bet kokią spausdintinės plokštės kortelę ar kitą vidinį komponentą.
- Spausdintinės plokštės korteles reikia transportuoti laidžiame konteineryje. Neleidžiama išimti plokštės iš apsauginio dėklo, nebent prieš pat įdėjimą. Išimtas plokštes reikia nedelsiant įdėti į apsauginį konteinerį transportavimui ar saugojimui arba grąžinti į gamyklą.

Pastabos

Šis instrumentas nėra unikalus dėl jame esančių ESD (elektrostatiniam išlydžiui) 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, anksti nustoja veikti.

Brooks[®] 9000 Series

Polish

Zalecenia wstępne

Prosimy przeczytać przed rozpoczęciem użytkowania!

Brooks Instrument projektuje, wytwarza i testuje swoje produkty tak, aby spełniały wymagania licznych norm krajowych i międzynarodowych. Te produkty muszą być poprawnie instalowane, obsługiwane oraz konserwowane, aby zapewnić ich prawidłowe działanie zgodnie ze specyfikacją techniczną. Podczas instalowania, obsługiwania 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 A 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 postępować biorąc pod uwagę wszystkie ostrzeżenia, uwagi i zalecenia umieszczone na produkcie lub dołączone do niego.
- Instalacje 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 zagrozić 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 obrażeniom 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 jakiegoś 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.
- Mierniki opisane w tej instrukcji są zgodne z dyrektywą EN 97/23/EC.
- Wszystkie mierniki przepływu firmy Brooks Instrument należą do 1-szej grupy cieczy
- Urządzenia pomiarowe o wielkości powyżej 25 mm lub 1 cala należą do kategorii I, II lub III dyrektywy PED.
- Urządzenia pomiarowe 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 spełniania przez nich wymogów kompatybilności elektromagnetycznej (Dyrektywa EMC 2004/108/EC).

Jednakże szczególną 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.

Jażeli 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 postepowania:

Należy odłączyć zasilanie od urządzenia.

- Osoba wykonująca czynności musi zostać uziemiona za pomocą opaski na przegubie dłoni lub w inny, bezpieczny sposób, zanim przystąpi do 2. instalacji, wyjęcia lub regulacji obwodów drukowanych lub innych wewnętrznych podzespołów elektronicznych urządzenia.
- Obwody drukowane należy transportować w przewodzącym pojemniku. Płytki drukowane należy wyjmować z opakowania ochronnego 3. 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 tlenków metali (NMOS, SMOS itp.). Jak pokazuje praktyka, nawet niewielkie wyładowanie elektrostatyczne może uszkodzić lub zniszczyć takie urządzenie. Uszkodzone części, nawet jeżeli na pożór 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.
- 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 fluído 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 caudalímetro objecto deste manual satisfaz a directiva 97/23/CE da UE.
- Os caudalímetros Brooks pertencem ao grupo 1 de fluidos.
- Os caudalímetros com calibre superior a 25 mm (1 polegada) pertencem às categorias PED I, II, ou III.
- Os caudalímetros 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, bucins 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 bucins, 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:
 Desligar o equipamento da rede.

 O utilizador, antes de qualquer intervenção que envolva os cartões de circuitos ou outros dispositivos internos, terá que se ligar à terra por meio duma bracelete de pulso ou outro dispositivo adequado.

 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.

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 internați Aceste instalații trebuie amplasate, exploatate și întreținute corespunzător, pentru ca în toate situațiile, domeniul lor de lucru să corespundă c normale. În ceea ce privește instalarea, operarea și întreținerea produselor Brooks Instrument, indicațiile de mai jos trebuie respectate și tret ntroduse in programul de protecția muncii.	perării
Pentru garantarea prestației corecte, instalarea, operarea, actualizarea, programarea și întreținerea produsului poate fi realizată doar de personal calificat.	către
Instrucțiunile de instalare ale produsului trebuie citite integral, înainte de punerea în serviciu și exploatarea sa. În măsura în care ediția a manual nu este cea adecvată, identificați pe ultima copertă coordonatele distribuitorului local și pentru lămuriri suplimentare adresați-vă a Păstrati acest manual pentru referinte ulterioare.	
A ATENȚIE: Nu utilizați instalația în afara intervalului de funcționare indicat în instrucțiunile de operare. Nerespectarea acestui luci poate solda cu răniri grave de persoane sau defectarea instalatiei.	ru se
În măsura în care indicațiile cărții mașinii nu sunt suficient de lămuritoare, luați legătura cu reprezentantul Brooks Instrument pentru clarit problemei.	icarea
Păstrați toate avertismentele, avizele și instrucțiunile livrate odată cu instalația sau inscripționate pe aceasta. Efectuați instalarea echipamentului în conformitate cu indicațiile de instalare corespunzătoare, respectiv cu respectarea prevederilor nați 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) Con dacă nu sunt prelingeri la intrarea sau ieșirea debitmetrului de branșare. Dacă nu sunt scurgeri, presurizați instalația la presiunea de lucr	
Înaintea exploatării/ întreținerii, verificați neapărat dacă conducta uzinală nu este sub presiune. În măsura în care este nevoie de piese d 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 substituire 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 persoane, exceptând situațiile când un specialist efectuează lucrări de întreținere. A ATENȚIE: În cazul instalației or uflux de fluide, dacă din orice motiv este necesară închiderea valvelor de intrare și ieșire, limitro instalației, instalația trebuie complet golită. Neglijarea acestui lucru poate avea ca efect dilatarea termică a fluidului, care poate defe instalație și poate produce răniri de persoane.	ı rănirii de ı fe
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 ncidența normei europene corespunzătoare (PED).)
La capitolul "Date tehnice" din cartea mașinii se găsesc indicațiile corespunzătoare directivei PED.	
Mijloacele de măsurare menționate în cartea mașinii corespund directivei 97/23/EK EU.	
Toate debitmetrele Brooks corespund clasei 1 de fluide.	
Mijloacele de măsurare mai mari de 25 mm sau 1 tol corespund categoriei PED I, II sau III. Mijloacele de măsurare mai mici de 25 mm sau 1 tol se conformează practicii inginerești acceptate (SEP).	
Directiva europeană privitoare la compatibilitatea electromagnetică (EMC).	×1
nstalațiile (electrice /electronice) ce poartă marca Brooks Instrument CE îndeplinesc cu succes cerințele testelor de verificare ale compatibilit electromagnetice (Cf. directivelor europene EMC cu nr. 2004/108/EC).	ații
n 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.	
n 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 mo	ntarea
litelor de cablu.	narca
Filtrul de cablu trebuie conectat la carcasa metalică sau manșon și în ambele cazuri trebuie asigurată ecranarea la 360°. Ecranarea trebuie te	erminată
u o legare la pământ.	
Conform standardului, conectoarele aparținând plăcilor electronice nu sunt metalice. Cablurile folosite trebuie să fie 100% ecranate și prevăz iltre pentru a corespunde clasificării CE.	ute cu
Ecranarea trebuie terminată cu o legare la pământ.	
Configurație de contact: Vezi instrucțiunile de operare atașate.	
Descărcare electrostatică (ESD)	
A ATENȚIE: Instalația include piese care sunt predispuse la defectare sub influența electricității statice. Trebuie respectate metod	ele
corespunzătoare de extragere, instalare sau alte manipulări ale circuitelor electronice. Procedură de manipulare:	
Instalația trebuie scoasă de sub tensiune.	
Înaintea de inserarea, scoaterea sau reglarea vreunei cartele electronice, sau a altui dispozitiv intern, persoana trebuie să se lege la păn	nânt cu
banda pentru articulația mâinii sau alte dispozitive de siguranță disponibile pentru acest scop.	ombolc
 Cartelele cu cablaje electronice imprimate trebuie transportate în ambalaje anti-electrostatice (conductoare). Cartelele se pot scoate din doar nemijlocit înaintea amplasării lor. Cartela demontată trebuie pusă neîntârziat în ambalajul de protecție în vederea transportării, a de sau returnării la producător. 	
Observații: n echinamente se dăsesc adesea componente sensibile la descărcare electrostatică (ESD). Maioritatea echinamentelor moderne includ com	nonont

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 odborne kvalifikovaný personál.
- Pred inštaláciou, prevádzkou a servisu 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.
- A 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.
- 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 prevádzvky 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 poraneniam obsluhy. Výnimku tvorí vykonávanie údržby kvalifikovaným odborníkom.

A 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.
- Meracie prostriedky uvedené v návode na obsluhu vyhovujú smernici 97/23/ES EÚ.
- Všetky prietokomery Brooks patria do 1. skupiny kvapalín.
- Meracie prístroje presahujúce rozmery 25 mm alebo 1 " spĺňajú I., II., alebo III. kategóriu PED.
- Meracie prístroje 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).

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

Kvalita signálnych káblov, káblových spojov a prípojov:

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.

Prípojky "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.

Prípojky vedúce ku kartám podľa noriem sú nekovové. Použité 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)

A 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.
- 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.
- 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 zdanlivo pracujú bez chyby, odkazujú na vznikajúce poruchy.

Slovene

Osnovna navodila

Najprej preberite jih

Brooks Instrument tako konstruira, izdeluje in terstira svoje izdelke, da oni ustrezajo številnim domačim in mednarodnim standardom. Te naprave se morajo ustrezno instalirati, koristiti in vzdrževati, da vsekakor delajo ustrezno normalnom področju funkcioniranja. Naslednjih navodil se mora držati in potrebno je vgraditi v program varstva pri delu pri instaliranju, koriščenju in vzdržavanju izdelkov proizvajalca Brooks Instrument.

Za jemstvo ustreznega učinka naj izključno strokovno osobje opravlja instaliranje, koriščenje, osveženje, programiranje in vzdrževanje izdelka.
Potrebno je prebrati vsa navodila pred instaliranjem, koriščenjem in servisiranjem izdelka. V kolikor ta priročnik ni ustrezna publikacija, na zadnji

strani poiščite lokalnega distributerja in za nadaljnje informacije stopite z njim v kontakt. Prihranite ta priročnik za poznejše informacije. A OPOMBA: Ne koristite napravo izven področja iz navodila za uporabo. Prekršek tega lahko privede do osebnih poškodb ali okvare naprave.

- V kolikor navodila priročnika niso enosmiselna, stopite v kontakt z zastopnikom društva Brooks Instrument, da razčistite problem.
- Držite se vseh opozoril, povabil, navodil, ki so navedena na napravi ali skupaj z njim izporočena.
- Napravo instalirajte shodno navodilom in relevantnim lokalnim in nacionalnim navodilom iz navodila za instalirenje.. Izdelek spojite izključno na ustrezni izvir elektrike in obskrbo tlaka.
- Proces: (1) Počasi položite sistem pod tlak. Počasi odpirajte pogonske ventile zaradi izogibanja nihanju pretoka. (2) Preverjajte, ima li curljanja pri
 povezu vstopa in izstopa merilca toka. Če ni curljanja, naplonite sistem na pogonski tlak.
- Pred servisom vsekakor preverjajte, ali je pogonski vod pod tlakom. Če je potreben rezervni del, svekakor strokovna oseba mora rokovati z
 rezervnimi deli odrejenimi od Brooks Instrument. Nedovoljeni rezervni deli in dejavnosti lahko vplivajo na učinek izdelka, oziroma ugrožavajo
 varnostni pogon. Sprememba samo z podobnimi rezervnimi deli lahko ima za posledico požar, nevarnost elektičnega šoka ali nedovoljno
 funkcioniranje.
- Vsa vrata naprave svekakor morajo biti zaprta, zaščitni ovitki morajo biti na svojem mestu zaradi izogibanja šoku in osebnim poškodbam, razen, če na njej strokovnjak opravlja dela vzdrževanja.

A OPOMBA: V primeru naprave za tok tekočine, če je iz katera koli razloga potrebno zapreti vstopne in izstopne ventile pri napravi, naprava se mora celotno izprazniti. Zamuda tega lahko provzroči toplotno proširjenje tekočine, kar poškoduje napravo in lahko povrzoči osebno poškodbo.

Europske smernice za naprave ohranjanja pritiska (PED)

Vsaka naprava ohranjanja pritiska z notranjim pritiskom več od 0,5 bara (g) in večjim od 25 mm ali 1 palca sodi pod Europskim smernicam za ohranjanje pritiska (PED).

- Poglavje priročnika "Tehnični podatki" vsebuje navodila, ki se nanašajo na smernice PED.
- Merilni instrumenti navajani v priročniku ustrezajo smernicam EU številke 97/23/EK
- Vsaki merilec pretoka Brooks sodi v skupino tekočin številke 1.
- Merilni instrumenti večji od 25 mm ali 1 palca ustrezajo kategriji PED I, II, ali III.
- Merilni instrumenti manjši od 25 mm oziroma 1 palca ali manjši sledijo sprejeti inženjeski praksi (SEP).

Evropska smernica za Elektromagnetno kompatibilnost (EMC)

Naprave Brooks Instrument, ki so zaslužile CE označbo (električni/elektronski) so uspešno izpolnile testove zahteve o elektromangnetni kompatibilnosti (št. 2004/108/EC smernice EMC).

Obenem mora se posebno pozornost posvetiti na izbiro signalnega kabla, ki se uporabljajo za naprave z označbo CE.

Kakaovost signalnih kablov, povezav kablov, priključkov:

Brooks Insturment nuja kabele visoke kakovosti, ki ustrezajo zahtevam kvalificiranja CE.

V kolikor se uporbalja lastni signalni kabel, treba je izbrati, ki za 100 % senco v polni meri filtriran.

Priključki "D" "olika kroga" morajo biti zasenčeni kovonskom sencom. Če bo potrebno, uporabite kovinske povezave za pritrditev filtra kabla

Filtar kabla je treba priključiti na kovinsko ohišje ali plašt in na obe polovici je treba senčiti v 360°. Senčenje mora završiti v ozemljitvi.

Priključki, ki sodijo karitcam normalno nisu kovinskik. Koriščeni kabli moraju biti filtrirani s 100 % senco, da odgovarjajo CE kvalifikaciji.

Sencanje mora imat konec v ozemljitvi.

Konfiguracija stika: Vidi priloženo navodilo za uporabo.

Elektrostatično izpražnjenje (ESD)

- OPOZORILO: Naprava vsebuje take sestavne dele, ki so naklonjeni k poškodbi od statične elektrike. Treba se je držati ustreznih postopkov pri odstranjevanju, vlogu ali drugega rokovanja kartic in sredstev notranjih tokovnih krogov. Posotpek rokovanja:
- 1. napravo je treba izklopiti iz električnega toka.
- 2. Osebo je treba ozemljiti zapestnim paščekom ali z drugim varnostnim in za ta namen primernim sredstvom preden bi instalirala, jemala, ali nastavila kartico za tokovni krog ali drugo notranjo opremo.
- Tiskane kartice tokovnega kroga je treba izporočiti v konduktivni embalaži. Karte so odstranjive izključno neposredno pred vlogom iz zaščitne embalaže ven. Izjemljeno kartico nemudoma staviti v zaščitno embalažo za gibanje, skladiščenje ali pošiljanje nazaj.

Opombe:

Nije poseben pojav, da se v napravi nahajajo občutljivi sestavni deli na elektrostatično pražnjenje (ESD). V većem delu modernih elektronskih sredstev nahajajo se sestavni deli na kovinsko oksidno tehnologijo (NMOS, SMOS itd..). Izkustva potrjujejo, da majhna statična elektrika more poškodovati ali uničiti ta sredstva. Oškodovani rezervni deli, če na videz dobro delajo, nakažejo začetno napako.

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 y 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.

A 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.
- 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 flujómetros 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 terminar 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 conductivo. 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:

Esto 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[®] 9000 Series

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
- A VARNING: 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 klarläggande.
- Följ alla varningar och instruktioner som följer med leveransen av denna produkt.
- 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.

VARNING: 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. l.
- 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 måstre dock ägna särskild uppmärksamhet till valet av signalkabeln som skall används för CE-märkta anordningar.

Signalkablars, packboxars och kontakdons kvalitet: Brooks Instrument levererar högkvalitativa kablar som överensstämmer med specifikation för CE-intygade produkter.

Kabelavsärmningen måste kopplas till den metalliska skärmande anordningen eller packboxen och skärmas vid båda ändar runt omkring. Avskärmningens avspänning måste jordas.

Card Edge Kontaktdon är icke metalliska. För att överensstämma 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. Ström till enheten måste kopplas från. 1.
- 2. Personalen måste jordas med hjälp av ett armband eller något annat säkert medel innan något kretskort eller andra inre anordningar installerras, tas bort eller iusteras
- Kretskort måste transporteras i en speciell förpackning för elektronik. Kort skall ej tas bort från deras skydsskåpa innan man skall installera dem. De 3 borttagna korten bör omedelbart läggas i speciell förpackning för transport, lagring eller återlämnande till fabriken. Anmärkningar:

Dessa instrument är ej unika vad gäller dess ESD (Elektrostatiska urladdningar) - känsliga komponenter. De flesta samtida konstruktioner innehåller komponenter som utnyttjar metalloxid 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.

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

[&]quot;D" eller "Cirkelformiga" kontakdon skall vara skärmade med metalliska avskärmningar. Om det är användbart, bör metallpackboxar som ger en bra fastspänning för kabelskärmar användas.

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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, go to the Global Support Centers page at www.brooksinstrument.com.

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

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