Installation and Operation Manual
X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Brooks® Models MT3809G and MT3810G
Metal Tube Variable Area Flowmeters

Model MT3809G, FNPT Connections,
General Purpose Stainless Steel Housing

Model MT3809G, Flanged Connections,
Explosion Proof Housing

Model MT3809G, Flanged Connections,
Intrinsically Safe Housing

Models MT3809G & MT3810G

Essential Instructions
Read before proceeding!

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

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

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

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

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

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

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

European Pressure Equipment Directive (PED)

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

- The Specifications Section of this manual contains instructions related to the PED directive.
- Products described in this manual are in compliance with EN directive 2014/34/EU.
- All Brooks Instrument Flowmeters fall under fluid group 1.
- Products larger than 25mm or 1" (inch) are in compliance with PED category I, II or III.
- Products of 25mm or 1" (inch) or smaller are Sound Engineering Practice (SEP).

European Electromagnetic Compatibility (EMC)

The Brooks Instrument (electric/electronic) equipment bearing the CE mark has been successfully tested to the regulations of the Electro Magnetic Compatibility (EMC directive 2014/30/EU).
Special attention however is required when selecting the signal cable to be used with CE marked equipment.

Quality of the signal cable, cable glands and connectors:

Brooks Instrument supplies high quality cable(s) which meets the specifications for CE certification.
If you provide your own signal cable you should use a cable which is overall completely screened with a 100% shield.
"D" or "Circular" type connectors used should be shielded with a metal shield. If applicable, metal cable glands must be used providing cable screen clamping.
The cable screen should be connected to the metal shell or gland and shielded at both ends over 360 Degrees.
The shield should be terminated to an earth ground.
Card Edge Connectors are standard non-metallic. The cables used must be screened with 100% shield to comply with CE certification.
The shield should be terminated to an earth ground.
For pin configuration : Please refer to the enclosed Instruction Manual.

ESD (Electrostatic Discharge)

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

Handling Procedure:

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

Comments

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

Installation and Operation Manual
X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

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

Figures

Tables

1 Introduction

The Brooks® Models MT3809 and MT3810 are rugged, all metal flowmeters offering reliable operation based on the variable area principle. The Model MT3809 is constructed with stainless steel components for measuring a variety of liquid and gas applications while the Model MT3809 ETFE utilizes an E/TFE lining for aggressive liquid and gas applications. Flow rate indication is provided by means of magnetic coupling where a magnet, encapsulated in the float, is coupled to a rotatable magnet located in the rear of the indicator, thus turning the dial indicator mounted on the meter.

Optional accessories available includes transmitter with 4-20 mA analog output with HART® communications or FOUNDATION™ Fieldbus communications with or without configurable alarms and pulse output for totalization. Also available are front adjustable inductive alarms, high temperature or stainless steel indicator housings, valves, flow controllers and certifications.

1-1 Design Features

The Brooks Model MT3809 has been the “go to” meter for several years and the choice of Engineering Contractor customers (EPC). Brooks is proud to raise the performance of the standard meter by adding these new features and options:

- Transmitter with 4-20mA/HART-7, or transmitter with FOUNDATION™ Fieldbus Communications
- Local Operator Interface with LCD display without removing the cover which means changes can be made even in hazardous areas
- 316SS flameproof housing
- The broadest range of operating temperatures in the industry, the perfect meter for even more applications
- Even lower flow rates with the current lay lengths which means one meter style can be used for very low to high flow rates
- The new meter is designed to ASME B31.3 and gasket sealing surface is per ASME a rugged design that does not require special gaskets at installation
- Weldneck flanges are standard which means full penetration welds that can easily be tested for integrity
- Mechanical and alarm design that meets SIL 2 requirements

1-2 Overview of Meter Specifications

⚠WARNING

Do not operate this instrument in excess of the specifications listed in Table 1-1. Failure to heed this warning can result in serious personal injury and/or damage to the equipment.

⚠ CAUTION

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

Models MT3809G & MT3810G

Table 1-1a Meter Specifications

		MT3809	MT3809 ELF	MT3810	TFE Lined
Measuring Range		See Capacity Tables			
Rangeability		10:1 (most sizes)			
Metering Tube	Standard	316/316L (dual certified stainless steel)			Tefzel® Lined 316/316L (dual certified stainless steel)
	Premium	Alloy 625, Hastelloy® C, Titanium Gr. II	Monel® K-500, Hastelloy C	-	-
Flanges and End Fittings	Standard	316/316L (dual certified stainless steel)		316/316L (dual certified stainless steel)	Tefzel Lined 316/316L (dual certified stainless steel)
	Premium	Alloy 625, Hastelloy C, Titanium Gr. II		-	-
Accuracy		2%, 1%, VDI/VDE class 2.5, 1.6	5%, 3%, VDI/VDE class 4, 2.5	5%, VDI/VDE class 6	2%, VDI/VDE class 2.5
Repeatability		0.25% Full Scale	1% Full Scale	0.25% Full Scale	0.25% Full Scale
Scale type / material		Dark increments with white background / Aluminum			
Installation orientation and location		Vertical (within 5% of true-vertical), bottom inlet, top outlet. Do not locate in proximity of other magnetic interfering components.			
Connections	Flanged:	Weldneck flanges			Slip on flanges
	- to ANSI B16.5	ANSI 1/2" to 4" 150# RF to 600# RF	ANSI 1/2" to 1" 150# RF to 600# RF	ANSI 1/2" to 2" 150# RF to 300# RF	ANSI 1/2" to 2" 150# RF to 300# RF
	- to DIN 2527/2635	DIN PN 40			
	- Flange finish	3.2 - 6.3 Ra			
	Threaded female	1/2" to 2"NPT/Rc-Female	1/2" NPT/Rc-Female	1/2" to 2" NPT-Female	-
	Threaded male	1" to 2-1/2" NPT-Male	1" NPT-Male	-	-
O-ring material	Flanged	None	Kalrez® 4079	None	
	Threaded male	None		-	-
	Threaded female std	Viton® or Teflon®		Viton or Teflon	-
	Threaded female high pressure 2500lbs	Viton Shore 90 + Teflon back-up ring or Kalrez 3018 Shore 90 + Teflon back-up ring		-	-
Floats	Standard	316L stainless steel			Hastelloy C-276 (sizes 7,8) PVDF (sizes 10-13)
	Premium	Alloy 625, Hastelloy C, Titanium Gr. II	Monel K-500, Hastelloy C	-	-
Protection Category	Indicator only	IP67 / NEMA 4X			
	Transmitter ALU	IP64			
	Transmitter SS	IP67 / NEMA 4X			
Indicator Housing & Cover material	Indicator only ALU	Die cast Aluminum (Alloy 380), epoxy paint, glass window			
	Transm/Alarm/HiTemp ALU	Die cast Aluminum (Alloy 380), epoxy paint, glass window			
	Indicator only SS	Cast 316 stainless steel, glass window			
	Transm/Alarm/HiTemp SS	Cast 316 stainless steel, 316 stainless steel hardware, glass window			
Pressure/Temperature		See Pressure/Temperature Tables			
Maximum Fluid Temperature		420°C/788°F (Refer to Temperature Tables)		300°C/570°F	150°C/270°F
Meter Dimensions		Refer to Product Dimension Figures			
Needle Control Valves & Flow Controllers		Valves - Sizes 7 - 12 / FCA Sizes 7,8	Valve/FCA Sizes 0-5	Valves - Sizes 7 - 12 / FCA Sizes 7,8	-
Product Approvals		Refer to Product Approvals Pages			
Transmitter	Current loop 4-20mA/HART®	Refer to Transmitter Section for detailed specifications on 4-20mA/HART-7 transmitter, Hi/Lo-alarm and pulse ouput - N **ot Available 3810G**			
	FOUNDATION™ Fieldbus	Refer to FOUNDATION Fieldbus Section for detailed specifications on FOUNDATION Fieldbus transmitter, Hi/Lo-alarm and pulse ouput - **Not Available 3810G**			
Inductive Alarms		Refer to Inductive Alarm Section - **Not Available 3810G**			Refer to Inductive Alarm Section
Local Operator Interface (incl. LCD)		Refer to Temperature Tables			

Table 1-1b ELF Body/Float Stop/Float/Metering Tube Material Restrictions

ELF BODY MAT'L (#1)	METERING TUBE MAT'L (#6)	OUTLET FLOAT STOP MAT'L (#13)	FLOAT MAT'L (#14) *	INLET FLOAT STOP MAT'L (#17)
316 LSS	316SS	INCONEL 625	316SS	316SS
HASTELLOY C-276	HASTELLOY C-276	HASTELLOY C-276	HASTELLOY C-276	HASTELLOY C-276
INCONEL 625	MONEL	INCONEL 625	MONEL	MONEL
TITANIUM GR2	MONEL	INCONEL 626	TITANIUM GR2	MONEL

***Note: Size 0 float is always TITANIUM GR2 FLOAT**

Table 1-2 Flow Capacities, Pressure Drop and Viscosity Immunity Ceiling Values

Meter type	Meter size	Float code	Float material	water[3] max volume flow	unit	water[3] max mass flow	unit	air[1,2] max volume flow	unit	air[1,2] max volume flow	unit	Pressure drop mbar	Pressure drop inches WC	VIC cSt	Max visc. cSt	PED category
MT3809 ELF	0	0	Titanium	0.96	l/h	0.25	g/h	1.6	scfh	44	l_n/h	12	5	1	5	SEP
	1		SS316	1.3		0.34		2.1		59		12	5	1	10	SEP
	2			3.6		0.96		4.9		130		12	5	1	20	SEP
	3			10		2.8		12		350		12	5	1	35	SEP
	4			21		5.5		23		650		32	13	1	70	SEP
	5			42		11		53		1400		38	15	1	100	SEP
MT3809 / MT3810	7	A		25		0.11		0.49		0.8		30	13	1	40	SEP
		B[4]		65		0.28		1.2		2.1		30	13	1	20	SEP
		C		130		0.59		2.4		3.9		30	13	1	120	SEP
		D[4]		200		0.88		3.7		6.1		35	15	1	20	SEP
	8	A		250		1.1		5.2		8.5		45	19	2	250	SEP
		B		400		1.7		7.7		12		55	23	1	180	SEP
		C		650		2.8		11		19		60	25	2	475	SEP
		D		1000		4.4		21		35		130	53	1.5	250	SEP
	10	A		1200		5.2		19		31		60	25	5	300	CAT I, II or III
		B		1500		6.6		31		51		70	29	1.5	300	CAT I, II or III
		C		2400		10		41		68		85	35	7	300	CAT I, II or III
		D		3500		15		65		100		155	63	4	300	CAT I, II or III
	12	A		4000		17		67		100		50	21	50	300	CAT I, II or III
		B		6000		26		95		150		60	25	30	300	CAT I, II or III
		C		8000		35		150		240		150	61	2	300	CAT I, II or III
		D		10000		46		210		340		300	121	2	300	CAT I, II or III
	13	A		6500		28		100		160		50	21	50	300	CAT I, II or III
		B		9500		41		160		260		60	25	50	300	CAT I, II or III
		C		12000		55		200		330		100	41	2.5	300	CAT I, II or III
		D		20000		88		390		650		300	121	1	300	CAT I, II or III
	15	A		20000		88		390		640		110	45	8	300	CAT I, II or III
		B		30000		130		550		900		140	57	7	300	CAT I, II or III
		C		40000		170	g/m	750	scfm	1200	m_n^3/h	280	113	5	300	CAT I, II or III
	16	A		49000		210		N/A		N/A		160	65	15	300	CAT I, II or III
		B		70000		300		N/A		N/A		210	85	10	300	CAT I, II or III
		C		100000		440		N/A		N/A		300	121	5	300	CAT I, II or III
MT3809 TFE Lined[5]	7	GA	Hastel-C	110		0.48		2.2		3.7		25	11	1	2	SEP
		GB		170		0.75		3.5		5.8		50	21	1	2	SEP
	8	A		250		1.1		5.1		8.3		30	13	1	2	SEP
		B		420		1.8		8.5		13		45	19	1	2	SEP
		C		500		2.2		9.9		16		40	17	1	2	SEP
		D		850		3.7		18		30		130	53	1	2	SEP
	10	A	PVDF	1400		6.2		27		45		45	19	2	3	CAT I, II or III
		B		2000		8.8		39		63		106	43	2	3	CAT I, II or III
		C		2400		10		47		77		90	37	2	3	CAT I, II or III
		D		3000		13		58		95		130	53	2	3	CAT I, II or III
	12	A		3000		13		58		95		50	21	2	3	CAT I, II or III
		B		4000		18		73		120		75	31	2	3	CAT I, II or III
		C		5000		22		94		150		85	35	2	3	CAT I, II or III
		D		6000		26		110		180		120	49	2	3	CAT I, II or III
	13	A		6000		26		110		180		95	39	2	3	CAT I, II or III
		B		8000		35		150		250		125	51	2	3	CAT I, II or III
		C		12000		53		220		370		200	81	2	3	CAT I, II or III
		D		15000		66		280		470		225	91	2	3	CAT I, II or III

Notes: 1. Air flows in scfm or scfh are given at 70°F and 14.7 psia
2. Air flows in mn3/h or ln/h are given at 0°C and 1.013 bar(a)
3. Water flows in l/h, gph and gpm are given at 70°F
4. Minimum operating pressure required 7 psig / 0.48 bar(g)
5. For TFE lined gas applications operating pressure must be greater than 29 psia / 2 bar(a)

1-3 Pressure Ratings

Please reference Tables 1-3, 1-4 and 1-5.

Table 1-3 Model MT3809/MT3810 Pressure Ratings, Flanged

Flanged - 150LBS, ANSI*

Temperature		316/316L		Titanium Gr.2		Alloy C-276/625	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	275	19.0			290	20.0
-75	-59	275	19.0	234	16.1	290	20.0
100	38	275	19.0	234	16.1	290	20.0
212	100	235	16.2	200	13.8	257	17.7
392	200	199	13.7	139	9.6	200	13.8
572	300	148	10.2	88	6.1	148	10.2
617	325			81	5.6		
752	400	94	6.5			94	6.5

Flanged - 300LBS, ANSI*

Temperature		316/316L		Titanium Gr.2		Alloy C-276/625	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	720	49.6			750	51.7
-75	-59	720	49.6	612	42.2	750	51.7
100	38	720	49.6	612	42.2	750	51.7
212	100	612	42.2	521	35.9	747	51.5
392	200	518	35.7	363	25.0	701	48.3
572	300	458	31.6	276	19.0	622	42.9
617	325			268	18.5		
752	400	426	29.4			529	36.5

Flanged - 600LBS, ANSI*

Temperature		316/316L		Titanium Gr.2		Alloy C-276/625	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	1440	99.3			1500	103.4
-75	-59	1440	99.3	1224	84.4	1500	103.4
100	38	1440	99.3	1224	84.4	1500	103.4
212	100	1224	84.4	1040	71.7	1494	103.0
392	200	1034	71.3	724	49.9	1403	96.7
572	300	917	63.2	550	37.9	1243	85.7
617	325			538	37.1		
752	400	854	58.9			1063	73.3

*** Meter sizes 15 and 16 have a Minimum Temperature of -150°F/-101°C**

Note: Flanged ELF O-ring is Kalrez 4079.

Flanged - PN16, EN-1092*

Temperature		316/316L		Titanium Gr.2		Alloy C-276/625	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	232	16.0			232	16.0
-75	-59	232	16.0	197	13.6	232	16.0
100	38	232	16.0	197	13.6	232	16.0
212	100	196	13.5	167	11.5	232	16.0
392	200	160	11.0	112	7.7	232	16.0
572	300	139	9.6	84	5.8	223	15.4
752	400	129	8.9			173	11.9

Flanged - PN40, EN-1092*

Temperature		316/316L		Titanium Gr.2		Alloy C-276/625	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	580	40.0			580	40.0
-75	-59	580	40.0	493	34.0	580	40.0
100	38	580	40.0	493	34.0	580	40.0
212	100	490	33.8	416	28.7	580	40.0
392	200	400	27.6	280	19.3	580	40.0
572	300	348	24.0	209	14.4	557	38.4
752	400	322	22.2			431	29.7

Flanged - 10K, JIS B2220*

Temperature		316/316L		Titanium Gr.2		Alloy C-276/625	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	203	14.0			203	14.0
-75	-59	203	14.0	173	11.9	203	14.0
100	38	203	14.0	173	11.9	203	14.0
212	100	203	14.0	173	11.9	203	14.0
392	200	174	12.0	122	8.4	174	12.0
572	300	145	10.0	87	6.0	145	10.0

Flanged - 20K, JIS B2220*

Temperature		316/316L		Titanium Gr.2		Alloy C-276/625	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	493	34.0			493	34.0
-75	-59	493	34.0	419	28.9	493	34.0
100	38	493	34.0	419	28.9	493	34.0
212	100	493	34.0	419	28.9	493	34.0
392	200	450	31.0	315	21.7	450	31.0
572	300	421	29.0	252	17.4	421	29.0
752	400	334	23.0			334	23.0

Table 1-4 Model MT3809/MT3810 Pressure Ratings, NPT Female

NPT - Female - Standard Design (Teflon O-rings)									
316/316L									
Temperature		#7/8		#10		#12		#13	
°F	°C	psi	Bar	psi	Bar	psi	Bar	psi	Bar
-58 to 100	-50 to 38	2567	177	2321	160	1929	133	1740	120
212	100	2190	151	1973	136	1653	114	1479	102
392	200	1842	127	1668	115	1392	96	1247	86
482	250	1726	119	1552	107	1291	89	1160	80

NPT - Female - ELF - 2500LBS Design			
316/316L			
Temperature		ELF	
°F	°C	psi	Bar
-58 to 100	-50 to 38	6000	414
212	100	5100	351.6
392	200	4311	297.2
572	300	3822	263.5

NPT - Female - 7-12 - 2500LBS Design			
316/316L			
Temperature		#7-12	
°F	°C	psi	Bar
-31 to 100	-35 to 38	6000	413.7
212	100	5100	351.6
392	200	4311	297.2
550	288	3822	263.5

NPT - Female - Standard Design (Teflon O-rings)									
Titanium Gr. 2									
Temperature		#7/8		#10		#12		#13	
°F	°C	psi	Bar	psi	Bar	psi	Bar	psi	Bar
-58 to 100	-50 to 38	2147	148	1929	133	1610	111	1450	100
212	100	1813	125	1639	113	1363	94	1233	85
392	200	1334	92	1204	83	1001	69	899	62
482	250	1160	80	1044	72	870	60	783	54

NPT - Female - ELF - 2500LBS Design			
Titanium Gr. 2			
Temperature		ELF	
°F	°C	psi	Bar
-58 to 100	-50 to 38	5100	352
212	100	4335	298.9
392	200	3017	208.0
572	300	2293	158.1

NPT - Female - 7-12 - 2500LBS Design			
Titanium Gr. 2			
Temperature		#7-12	
°F	°C	psi	Bar
-31 to 100	-35 to 38	5100	351.6
212	100	4335	298.9
392	200	3017	208.0
550	288	2293	158.1

NPT - Female - Standard Design (Teflon O-rings)									
Hastelloy Alloy C-276									
Temperature		#7/8		#10		#12		#13	
°F	°C	psi	Bar	psi	Bar	psi	Bar	psi	Bar
-58 to 100	-50 to 38	3510	242	3162	218	2640	182	2379	164
212	100	3162	218	2857	197	2379	164	2147	148
392	200	2756	190	2480	171	2074	143	1871	129
482	250	2582	178	2335	161	1944	134	1755	121

NPT - Female - ELF - 2500LBS Design			
Alloy C-276/ Alloy 625			
Temperature		ELF	
°F	°C	psi	Bar
-58 to 100	-50 to 38	6250	431
212	100	6228	429.4
392	200	5842	402.8
572	300	5179	357.1

NPT - Female - 7-12 - 2500LBS Design			
Alloy C-276/ Alloy 625			
Temperature		#7-12	
°F	°C	psi	Bar
-31 to 100	-35 to 38	6250	430.9
212	100	6228	429.4
392	200	5842	402.8
550	288	5179	357.1

NPT - Female - Standard Design (Teflon O-rings)									
Inconel Alloy 625									
Temperature		#7/8		#10		#12		#13	
°F	°C	psi	Bar	psi	Bar	psi	Bar	psi	Bar
-58 to 100	-50 to 38	4047	279	3640	251	3046	210	2741	189
212	100	4047	279	3640	251	3046	210	2741	189
392	200	3902	269	3510	242	2930	202	2640	182
482	250	3800	262	3423	236	2857	197	2567	177

Female ELF - 2500LBS Design: O-ring is Kalrez 4079
Female Sizes 7-12 - 2500LBS Design: O-ring is Kalrez 3018

Table 1-5 Model MT3809/MT3810 Pressure Ratings, NPT Male

NPT - Male - Standard Design							
316/316L							
Temperature		#7/8		#10		#12	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	4699	324	3785	261	3684	254
100	38	4699	324	3785	261	3684	254
212	100	4018	277	3234	223	3147	217
392	200	3379	233	2712	187	2654	183
572	300	3002	207	2408	166	2350	162
752	400	2785	192	2248	155	2190	151

NPT - Male - Standard Design							
Hastelloy Alloy C-276							
Temperature		#7/8		#10		#12	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	4989	344	5163	356	5033	347
100	38	4989	344	5163	356	5033	347
212	100	4511	311	4670	322	4540	313
392	200	3931	271	4061	280	3960	273
572	300	3466	239	3597	248	3495	241
752	400	3176	219	3292	227	3205	221

NPT - Male - Standard Design							
Titanium Gr. 2							
Temperature		#7/8		#10		#12	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-75	-59	3046	210	3147	217	3075	212
100	38	3046	210	3147	217	3075	212
212	100	2596	179	2683	185	2611	180
392	200	1900	131	1973	136	1914	132
572	300	1450	100	1494	103	1450	100
617	325	1349	93	1407	97	1363	94

NPT - Male - Standard Design							
Inconel Alloy 625							
Temperature		#7/8		#10		#12	
°F	°C	psi	Bar	psi	Bar	psi	Bar
-325	-198	5758	397	5961	411	5802	400
100	38	5758	397	5961	411	5802	400
212	100	5758	397	5961	411	5802	400
392	200	5540	382	5729	395	5584	385
572	300	5279	364	5453	376	5323	367
752	400	5062	349	5236	361	5105	352

NPT - Male - ELF - 2500LBS Design*			
316/316L			
Temperature		ELF	
°F	°C	psi	Bar
-58 to 122	-50 to 50	6000	414
212	100	5100	351.6
392	200	4311	297.2
572	300	3822	263.5

NPT - Male - ELF - 2500LBS Design*			
Titanium Gr. 2			
Temperature		ELF	
°F	°C	psi	Bar
-58 to 122	-50 to 50	5100	352
212	100	4335	298.9
392	200	3017	208.0
572	300	2293	158.1

NPT - Male - ELF - 2500LBS Design*			
Alloy C-276/ Alloy 625			
Temperature		ELF	
°F	°C	psi	Bar
-58 to 122	-50 to 50	6250	431
212	100	6228	429.4
392	200	5842	402.8
572	300	5179	357.1

* ELF 2500# Design (Kalrez 4079)

1-4 Temperature Ratings

Please reference Table 1-6.

Table 1-6 Temperature Cut-off Tables

Meter with 316 SS Mechanical Indicator

	Process Temperature		Ambient Temperature	
Connection type	°C	°F	°C	°F
Flanged / MNPT	-198 to 420	-325 to 788	-55 to 75	-67 to 167
Threaded female	-50 to 300*	-58 to 572*	-55 to 75	-67 to 167
ETFE lined	-30 to 150	-22 to 302	-30 to 40	-22 to 104

Meter with Aluminum Mechanical Indicator

	Process Temperature		Ambient Temperature	
Connection type	°C	°F	°C	°F
Flanged / MNPT	-198 to 300	-325 to 572	-55 to 75	-67 to 167
Threaded female	-50 to 300*	-58 to 572*	-55 to 75	-67 to 167
ETFE lined	-30 to 150	-22 to 302	-30 to 40	-22 to 104

Ambient Temperatures with Electrical Components

Option	°C	°F
Transmitter	-40 to 70	-40 to 158
Transmitter w/display	-20 to 70	-4 to 158
Inductive switches	-40 to 70	-40 to 158

Insulation required when process temperatures are greater than 300°C/572°F.

Meter with Electrical Components - Ambient Temperature 30°C / 86°F

	Process Temperature	
Connection type	°C	°F
Transmitter	-198 to 420	-325 to 788
Transmitter w/display	-198 to 420	-325 to 788
Inductive switches	-198 to 420	-325 to 788

Meter with Electrical Components - Ambient Temperature 60°C / 140°F

	Process Temperature	
Connection type	°C	°F
Transmitter	-198 to 200	-325 to 392
Transmitter w/display	-198 to 175	-325 to 350
Inductive switches	-198 to 200	-325 to 392

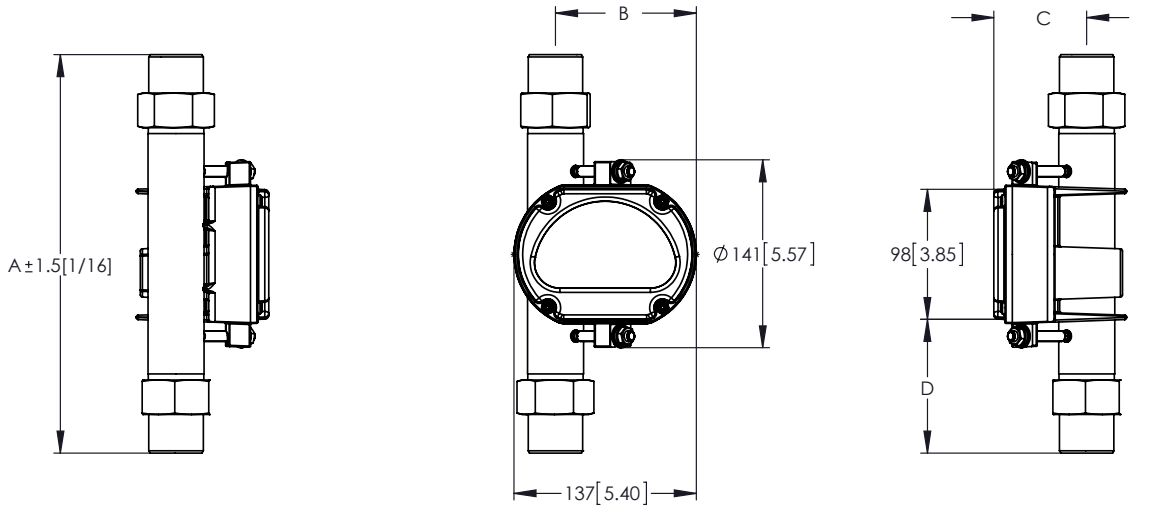
*

Elastomer Materials	Minimum Temperature °F	Minimum Temperature °C	Maximum Temperature °F	Maximum Temperature °C
Kalrez 4079	-58	-50	572	300
Kalrez 3018	-31	-35	550	288
Teflon PTFE	-58	-50	482	250
Viton A	5	-15	400	204
Teflex (Viton core, FEP jacket)	5	-15	400	204

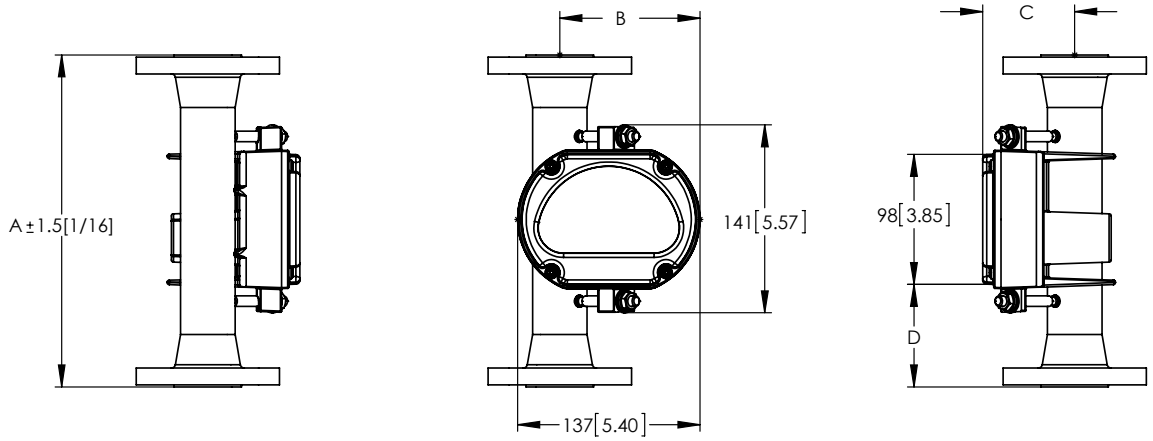
1-5 Outline and Dimensions

Please reference Figures 1-1, 1-2 and 1-3 on the following pages.

Model 3809 & 3810 General Purpose Indicator Housing with Threaded Female Connections mm [inches]



Model 3809 & 3810 General Purpose Indicator Housing with Flanged Connections mm [inches]

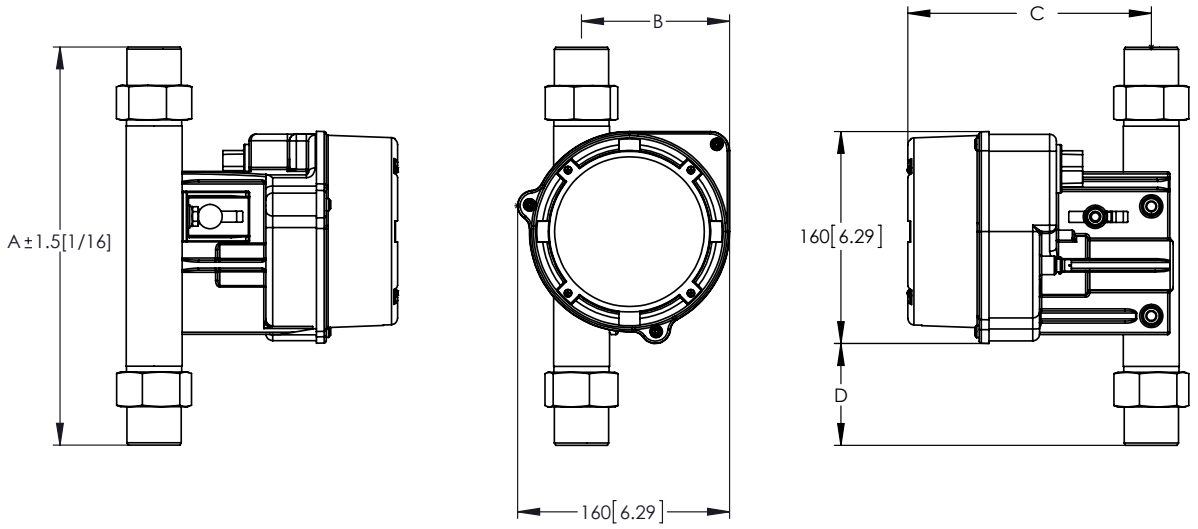


Meter Size	Connection	A	B	C	D	Weight (Approx.)*
0-5	1/2" Threaded Female	225 [8.85]	99 [3.90]	63 [2.56]	61 [2.40]	2.7 kg [6 lbs.]
	1" Threaded Male	200 [7.87]	100 [3.94]	65 [2.56]	48 [1.89]	2.7 kg [6 lbs.]
7 & 8	1/2" Threaded Female	225 [8.85]	99 [3.90]	63 [2.56]	61 [2.40]	2.7 kg [6 lbs.]
	3/4" Threaded Female	225 [8.85]	99 [3.90]	63 [2.56]	61 [2.40]	2.7 kg [6 lbs.]
	1" Threaded Male	200 [7.87]	100 [3.94]	65 [2.56]	48 [1.89]	2.7 kg [6 lbs.]
10	1" Threaded Female	300 [11.81]	107 [4.21]	71 [2.80]	98 [3.86]	4.5 kg [10 lbs.]
	1-1/2" Threaded Male	250 [9.84]	108 [4.25]	72 [2.83]	73 [2.87]	4.5 kg [10 lbs.]
12	1-1/2" Threaded Female	300 [11.81]	116 [4.57]	80 [3.15]	98 [3.86]	6.8 kg [15 lbs.]
	2-1/2" Threaded Male	250 [9.84]	118 [4.65]	83 [3.27]	73 [2.87]	6.8 kg [15 lbs.]
13	2" Threaded Female	300 [11.81]	122 [4.78]	86 [3.39]	98 [3.86]	7.7 kg [17 lbs.]
0-5	Flanged (ANSI, DIN and JIS)	250 [9.84]	99 [3.90]	63 [2.48]	73 [2.87]	4.1 kg [9 lbs.] - 6.5 kg [14 lbs.]
7 & 8		250 [9.84]	99 [3.90]	63 [2.48]	73 [2.87]	4.1 kg [9 lbs.] - 11.9 kg [12 lbs.]
10		250 [9.84]	106 [4.13]	70 [2.76]	73 [2.87]	7.7 kg [17 lbs.] - 14.5 kg [32 lbs.]
12		250 [9.84]	115 [4.53]	79 [3.11]	73 [2.87]	12.2 kg [27 lbs.] - 17.7 kg [39 lbs.]
13		250 [9.84]	122 [4.80]	85 [3.35]	73 [2.87]	14.1 kg [31 lbs.] - 28 kg [62 lbs.]
15		250 [9.84]	139 [5.47]	103 [4.06]	73 [2.87]	20.0 kg [44 lbs.] - 45 kg [99 lbs.]
16		350 [13.78]	154 [6.06]	118 [4.65]	123 [484]	37.6 kg [83 lbs.] - 58.6 kg [129 lbs.]

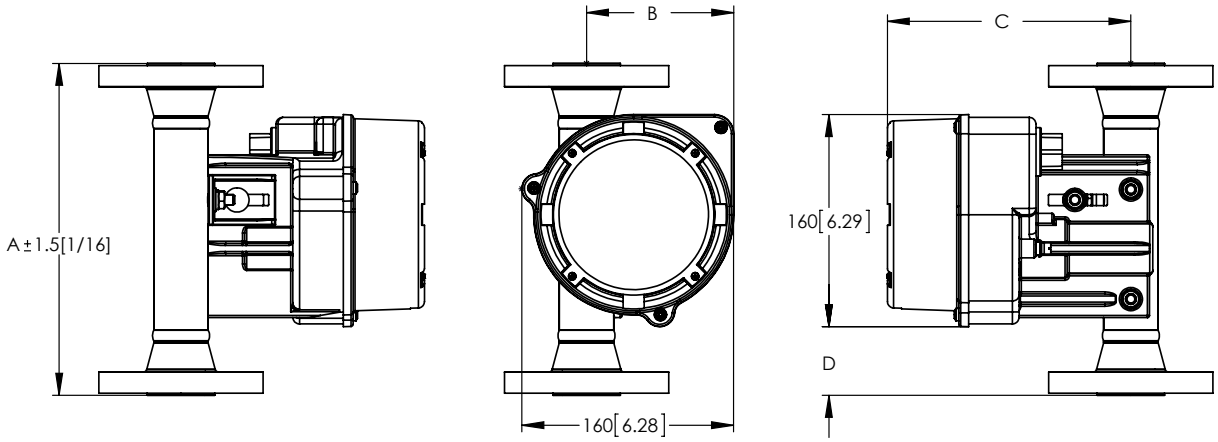
*Weights shown for aluminum indicator. Add 1.8 [4 lbs.] for steel indicator housing

Figure 1-1 Model MT3809 and MT3810 Dimensional Drawings (mm/in) and Weights (kg/lbs) - General Purpose Housing

Model 3809 Intrinsically Safe Indicator Housing with Threaded Female Connections mm [inches]



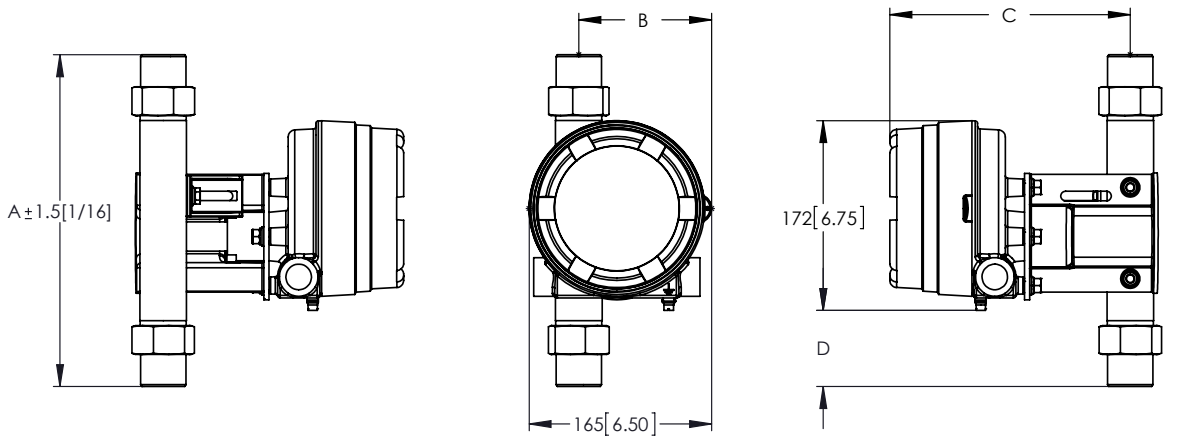
Model 3809 Intrinsically Safe Indicator Housing with Flanged Connections mm [inches]



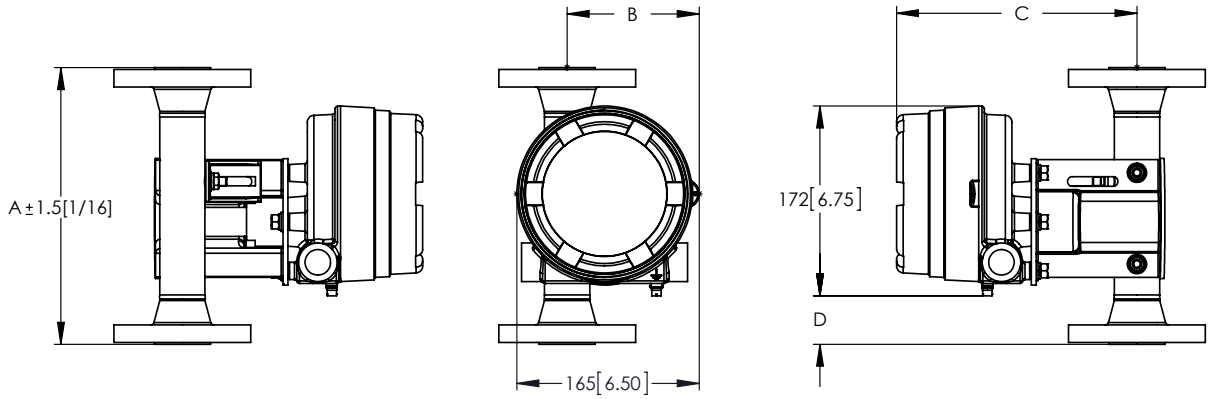
Meter Size	Connection	A	B	C	D	Weight (Approx.)*
0-5	1/2" Threaded Female	225 [8.85]	104 [4.10]	183 [7.20]	40 [1.57]	5.4 kg [12 lbs.]
	1" Threaded Male	200 [7.87]	105 [4.13]	183 [7.20]	27 [1.06]	5.4 kg [12 lbs.]
7 & 8	1/2" Threaded Female	225 [8.85]	104 [4.10]	183 [7.20]	40 [1.57]	5.4 kg [12 lbs.]
	3/4" Threaded Female	225 [8.85]	104 [4.10]	183 [7.20]	40 [1.57]	5.4 kg [12 lbs.]
	1" Threaded Male	200 [7.87]	105 [4.13]	183 [7.20]	27 [1.06]	5.4 kg [12 lbs.]
10	1" Threaded Female	300 [11.81]	121 [4.76]	183 [7.20]	77 [3.03]	7.3 kg [16 lbs.]
	1-1/2" Threaded Male	250 [9.84]	113 [4.45]	183 [7.20]	52 [2.05]	7.3 kg [16 lbs.]
12	1-1/2" Threaded Female	300 [11.81]	121 [4.76]	183 [7.20]	77 [3.03]	9.5 kg [21 lbs.]
	2-1/2" Threaded Male	250 [9.84]	120 [4.72]	183 [7.20]	52 [2.05]	9.5 kg [21 lbs.]
13	2" Threaded Female	300 [11.81]	127 [5.00]	183 [7.20]	77 [3.03]	10.4kg [23 lbs.]
0-5	Flanged (ANSI, DIN and JIS)	250 [9.84]	104 [4.10]	183 [7.20]	52 [2.05]	6.8 kg [15 lbs.] - 9.2 kg [20 lbs.]
7 & 8		250 [9.84]	104 [4.10]	183 [7.20]	52 [2.05]	6.8 kg [15 lbs.] - 14.6 kg [32 lbs.]
10		250 [9.84]	111 [4.37]	183 [7.20]	53 [2.05]	10.4 kg [23 lbs.] - 17.2 kg [38 lbs.]
12		250 [9.84]	120 [4.72]	183 [7.20]	54 [2.05]	15 kg [33 lbs.] - 20.5 kg [45 lbs.]
13		250 [9.84]	126 [4.96]	183 [7.20]	55 [2.05]	16.8 kg [37 lbs.] - 30.7 kg [68 lbs.]
15		250 [9.84]	144 [5.67]	183 [7.20]	56 [2.05]	22.7 kg [50 lbs.] - 47.7 kg [105 lbs.]
16		350 [13.78]	159 [6.26]	183 [7.20]	57 [2.05]	40.4 kg [89 lbs.] - 61.4 kg [135 lbs.]

Figure 1-2 Model MT3809 and MT3810 Dimensional Drawings (mm/in) and Weights (kg/lbs) - Intrinsically Safe Housing

Model 3809 Explosion Proof Indicator Housing with
Threaded Female Connections mm [inches]



Model 3809 Explosion Proof Indicator Housing with
Flanged Connections mm [inches]



Meter Size	Connection	A	B	C	D	Weight (Approx.)*
0-5	1/2" Threaded Female	225 [8.85]	113 [4.45]	218 [8.58]	41 [1.61]	11.8 kg [26 lbs.]
	1" Threaded Male	200 [7.87]	114 [4.49]	218 [8.58]	28 [1.10]	11.8 kg [26 lbs.]
7 & 8	1/2" Threaded Female	225 [8.85]	113 [4.45]	218 [8.58]	41 [1.61]	11.8 kg [26 lbs.]
	3/4" Threaded Female	225 [8.85]	113 [4.45]	218 [8.58]	41 [1.61]	11.8 kg [26 lbs.]
	1" Threaded Male	200 [7.87]	114 [4.49]	218 [8.58]	28 [1.10]	11.8 kg [26 lbs.]
10	1" Threaded Female	300 [11.81]	120 [4.72]	218 [8.58]	78 [3.07]	13.6 kg [30 lbs.]
	1-1/2" Threaded Male	250 [9.84]	121 [4.76]	218 [8.58]	53 [2.09]	13.6 kg [30 lbs.]
12	1-1/2" Threaded Female	300 [11.81]	129 [5.08]	218 [8.58]	78 [3.07]	15.9 kg [35 lbs.]
	2-1/2" Threaded Male	250 [9.84]	131 [5.16]	218 [8.58]	53 [2.09]	15.9 kg [35 lbs.]
13	2" Threaded Female	300 [11.81]	135 [5.31]	218 [8.58]	78 [3.07]	16.8kg [23 lbs.]
0-5	Flanged (ANSI, DIN and JIS)	250 [9.84]	113 [4.45]	218 [8.58]	53 [2.09]	13.2 kg [29 lbs.] - 15.6 kg [34 lbs.]
7 & 8		250 [9.84]	113 [4.45]	218 [8.58]	53 [2.09]	13.2 kg [29 lbs.] - 21 kg [46 lbs.]
10		250 [9.84]	120 [4.72]	218 [8.58]	53 [2.09]	16.8 kg [37 lbs.] - 23.6 kg [52 lbs.]
12		250 [9.84]	129 [5.08]	218 [8.58]	53 [2.09]	21.3 kg [47 lbs.] - 26.8 kg [59 lbs.]
13		250 [9.84]	135 [5.31]	218 [8.58]	53 [2.09]	23.1 kg [51 lbs.] - 37 kg [81 lbs.]
15		250 [9.84]	153 [6.02]	218 [8.58]	53 [2.09]	29 kg [64 lbs.] - 54 kg [119 lbs.]
16		350 [13.78]	168 [6.61]	218 [8.58]	103 [4.06]	46.7 kg [103 lbs.] - 67.7 kg [149 lbs.]

Figure 1-3 Model MT3809 and MT3810 Dimensional Drawings (mm/in) and Weights (kg/lbs) - Explosion Proof Housing

1-6 Optional Valves and Flow Controllers

Needle valves and flow controllers may be externally piped into the inlet or outlet side of the instrument. Needle valves can be supplied up to size 12 1-1/2" maximum 10000 l/hr / 46 gpm water equivalent. Needle valves and flow controllers will be supplied separately with the flanged meter.

1-7 Optional Electronic Features

Electronic equipment available with the Model MT3809 includes:
- Current loop 4-20mA/HART Transmitter with Alarms and Pulse Output
- FOUNDATION Fieldbus Transmitter with Alarms and Pulse Output
- Inductive Alarms; stand-alone or in combination with above transmitters

Refer to the table below for the model code nomenclature for the electronics options. All models are designed to be either intrinsically safe or explosion proof.

Nomenclature and Type Designation

MT3809	…	B	…
I-IV		XV	

XV	Electronics configuration	B, C	Indicator with inductive alarm, 1 or 2 switches
		D … L	Transmitter, 4 – 20 mA / Hart, with optionally: - pulse output - inductive alarm contact(s) - LOI or combinations thereof.
		M … U	Transmitter, FOUNDATION Fieldbus, with optionally: - pulse output - inductive alarm contact(s) - LOI or combinations thereof.

1-7-1 Current Loop 4-20 mA with HART Transmitter, with Alarms, Display and Pulse Output

Design Features

- 4-20 mA analog output for flowrate
- Bell-202 modulated HART digital communication over the 4-20 mA signal
- Current loop powered 2-wire connection
- User selectable 0% and 100% analog output ranges with optional smoothing
- Flexible (mix & match) units of measure for flowrates, totals, temperatures, densities, etc.
- Two flow totalizers: Resettable and inventory totalization
- User configurable, scalable pulse output for various engineering units
- Hi- and Lo-flow alarm output

Description

The 4-20 mA with HART transmitter is a compact microprocessor device designed to interface directly with the Model MT3809. This transmitter includes a Hi- and Lo alarm switch output and a pulse output.
The HART digital communication signals are superimposed on top of the 4-20 mA signal, allowing communication of more than just the process variable.
The transmitter is HART-programmable or for numerous variables such as flow rate, totalization, calibration factors, and high-low alarm parameters. It is programmable with easy-to-use hand held configurators. Prior to shipment, commonly used default values are programmed by Brooks to ensure ease of operation and quick startup. However, parameters may be reprogrammed by the user if needed. Flow rate information may be viewed locally at the meter scale, LCD display or displayed remotely.

Table 1-7 4-20 mA with HART Transmitter Description Table

Power supply voltage	21 to 30 Vdc: (2-wire current loop transmitter)
Loop current / current consumption range	3.8 to 22.0 mA.
Hi- and Lo-alarm outputs	Open collector alarm output Optically isolated outputs assignable to alarms. • Max. off-state voltage: 30 Vdc • Max. off-state current: 0,05 mA • Max. on-state voltage: 1.2 Vdc • Max. on-state current: 20 mA
Pulse Output	Optically isolated. Scalable to a variety of engineering unit systems (pulses per liter, gallons, etc.). • Range: 1 Hz to 1 kHz • Max. off-state voltage: 30 Vdc • Max. off-state current: 0.05 mA • Max. on-state voltage: 1.2 Vdc • Max. on-state current: 20 mA
Temperature Specification	See Temperature Cut-off Table
Electrical Connector	M20 x 1,5 according to ISO (1/2" NPT, 3/4” NPT (F) or cable gland optional) • Brass/Nickel plated cable gland cable diameter range 8-11 mm (Aluminum housing) • Stainless steel cable gland cable diameter range 7-10.5 mm (SS housing)
Linearity	Less than 1% at max. current.
Temperature influence	Less than 0.04% per °C.
Voltage influence	Less than 0.002% / Vdc.
Load resistance influence	± 0.1% full scale.
HART Revision	HART-7

1-7-2 FOUNDATION Fieldbus Transmitter, with Alarms and Pulse Output

Design Features

- FOUNDATION™ Fieldbus digital communication network interface
- Ease of wiring and installation with a single 2-wire bus connection
- Powered over 2-wire FOUNDATION™ Fieldbus connection
- Flexible (mix & match) units of measure for flowrates, totals, temperatures, densities, etc.
- Two flow totalizers: Resettable and inventory totalization
- User configurable, scalable pulse output for various engineering units
- Hi- and Lo-flow alarm output

Description

The FOUNDATION™ Fieldbus transmitter is a compact microprocessor device designed to interface directly with the Model MT3809.
The transmitter communicates over the 2-wire network per the international FOUNDATION™ Fieldbus standard for access to numerous variables such as flow rate, totalization, calibration factors, and high-low alarm parameters.

Table 1-8 FOUNDATION Fieldbus Transmitter Description Table

Power supply voltage	9-32Vdc
Power supply protection	Protected against reverse polarity
Current consumption	12 mA Entire transmitter is powered from 2-wire bus
Hi- and Lo-alarm outputs	Open collector alarm output Optically isolated outputs assignable to alarms. • Max. off-state voltage: 30 Vdc • Max. off-state current: 0,05 mA • Max. on-state voltage: 1.2 Vdc • Max. on-state current: 20 mA
Pulse Output	Optically isolated. Scalable to a variety of engineering unit systems (pulses per liter, gallons, etc.). • Range: 1 Hz to 1 kHz • Max. off-state voltage: 30 Vdc • Max. off-state current: 0.05 mA • Max. on-state voltage: 1.2 Vdc • Max. on-state current: 20 mA
Temperature Specification	See Temperature Cut-off Table
Electrical Connector	M20 x 1,5 according to ISO (1/2" NPT, 3/4” NPT (F) or cable gland optional) • Brass/Nickel plated cable gland cable diameter range 8-11 mm (Aluminum housing) • Stainless steel cable gland cable diameter range 7-10.5 mm (SS housing)
Linearity	Less than 1%
Temperature Influence	Less than 0.04% per °C
Voltage influence	Less than 0.002% / Vdc
FOUNDATION Fieldbus Revision	ITK6

1-7-3 Inductive Alarms

Design Features

- 1 or 2 normally open inductive limit switches
- Optional intrinsically safe power supply/amplifier/relay unit
- For low or high limit signaling/switching
- Front adjustable
- Optional Relay Power Supply – recommended

Description

One or two electronic limit switches can be installed in the indicator housing to allow signaling or switching functions on a preset flow value. The limit switch operates as a slot initiator that is inductively actuated by a disc mounted on the pointer shaft. Any flow value can be used for setting the limit value by sliding the initiator along the indicator scale. Minimum setting distance between two limit switches is approximately 40% full scale. The position of the initiator also serves to visually indicate the signaling set value. Settings can be adjusted by removing the indicator cover, loosening, moving and retightening of the alarm indication needle, and replacement of the indicator front cover. Refer to Section 2-5-1.

Table 1-9 Inductive Alarms Description Table

Power supply voltage	5 - 25 Vdc: (8 Vdc nominal)
Impedance	- Approximately 1 kohm with cam absent - Approximately 8 kohm with cam present
Ambient and process temperature	See Temperature Cut-off Table
Electrical Connector	M20 x 1,5 according to ISO (1/2" NPT, 3/4” NPT (F) or cable gland optional) • Brass/Nickel plated cable gland cable diameter range 8-11 mm (Aluminum housing) • Stainless steel cable gland cable diameter range 7-10.5 mm (SS housing)

1-8 Product Approvals Overview

Table 1-10 Product Approvals

Declarations	Mark	Meter Options				Standards/Directives/Marking	Declaration/Certificate
		Mechanical	HART Transmitter	Foundation Field Bus Transmitter	Inductive Alarm		
EU Declaration of Conformity	CE		✓	✓	✓	EMC Directive (2014/30/EU)	Declaration
		✓	✓	✓	✓	RoHS Directive (2011/65/EU)	Declaration
		✓	✓	✓	✓	Pressure Equipment Directive (2014/68/EU)	Declaration
SIL Declaration					✓	IEC 61508-2: 2010	Declaration
NAMUR Declaration			✓			NAMUR NE21, NE43	Declaration
IP66/67			✓	✓	✓	IEC 60529 (Stainless Steel Enclosure)	DEKRA Certificate
IP64			✓	✓	✓	IEC 60529 (Aluminum Enclosure)	DEKRA Certificate
IP66/67		✓				IEC 60529 (Stainless Steel or Aluminum Enclosure)	DEKRA Certificate
Explosion safety "Flame Proof" For temperature limits, see Table: Process and ambient temperature limits Flame Proof / Ex-d	ATEX IECEX		✓	✓	✓	II 2 G Ex db IIC T6…T1 Gb II 2 D Ex tb IIIC T85°C…T450°C Db	DEKRA 13ATEX0086X
						Ex db IIC T6…T1 Gb Ex tb IIIC T85°C…T450°C Db	IECEx DEK13.0027X
						Standards used for evaluation: (13ATEX0086X and IECEx DEK13.0027X) EN 60079-0:2012+A11:2013, EN 60079-1:2014, EN 60079-31:2014 IEC 60079-0:2011 mod + Cor.:2012 + Cor.:2013, IEC 60079-1:2014, IEC 60079-31:2013 **Special conditions for safe use:** For information regarding the dimension of the flameproof joints the manufacturer shall be contacted. **Electrical Connections Conditions:** For application in environments requiring EPL Gb the threaded entries of the enclosure shall be sealed with plugs, cable entry devices such as glands or conduit entry devices which are Ex db IIC Gb approved. For application in environments requiring EPL Db the threaded entries of the enclosure shall be sealed with plugs, cable entry devices such as glands or conduit entry devices which are Ex tb IIIC Db approved. For application in environments requiring EPL Gb or EPL Db, in case the optional surge protector is used, the surge protector shall be installed with a high strength locking compound on the mounting thread.	
Explosion safety "Constructional safety (c)"	ATEX	✓				II 2GD c IIC TX	MBID 022
						Special conditions for safe use: Enclosure contains glass & painted aluminum parts. If it is mounted in an area where the use of category 2G or 2D apparatus is required, it must be installed such that ignition source due to propagating brush discharge sparks are excluded. The actual maximum surface temperature of the equipment depends not on the equipment itself, but on operating conditions of the process fluid/gas flowing through the equipment. The equipment by itself does not generate heat. Due to this reason the temperature class is marked as TX. The maximum permitted ambient and process temperature limits can be found in the operating instructions. At start up especially for gas applications, ensure that the pressure is gradually increased through the piping system. A sudden pressure spike situation may result in a fast movement of the float within the VA flowmeter & the float may hit hard against the float stop.	

Table continued on next page

Table 1-10 Product Approvals (Continued)

Declarations	Mark	Meter Options: Mechanical	Meter Options: HART Transmitter	Meter Options: Foundation Field Bus Transmitter	Meter Options: Inductive Alarm	Standards/Directives/Marking	Declaration/Certificate
Explosion safety "Intrinsic Safety (ia)" "Non-sparking (nA)" "Enclosure Dust (tc)" For temperature limits, see Table: Process and ambient temperature limits Intrinsic Safety / Non-Sparking / Enclosure dust	ATEX IECEX		✓	✓	✓		DEKRA 13ATEX0086X IECEx DEK13.0027X

Option	Enclosure Type	M1	M2	M1 = Apparatus with Transmitter only M2 = Apparatus with Inductive Alarm
Unit without Digital Display	Aluminum	✓ ✓	✓ ✓	II 2 G Ex ia IIC T6…T4 Gb II 2 D Ex ia IIIC T85 °C…T135 °C Db II 3 G Ex nA IIC T6…T4 Gc II 3 D Ex tc IIIC T85 °C…T135 °C Dc II 3 G Ex ic IIC T6…T4 Gc II 3 D Ex ic IIIC T85 °C…T135 °C Dc
	Stainless Steel	✓ ✓	✓ ✓	II 1 G Ex ia IIC T6…T3 Ga II 2 D Ex ia IIIC T85 °C…T200 °C Db II 3 G Ex nA IIC T6…T3 Gc II 3 D Ex tc IIIC T85 °C…T200 °C Dc II 3 G Ex ic IIC T6…T3 Gc II 3 D Ex ic IIIC T85 °C…T200 °C Dc
	Stainless Steel High Temperature	✓ ✓	✓ ✓	II 1 G Ex ia IIC T6…T2 Ga II 2 D Ex ia IIIC T85 °C…T300 °C Db II 3 G Ex nA IIC T6…T2 Gc II 3 D Ex tc IIIC T85 °C…T300 °C Dc II 3 G Ex ic IIC T6…T2 Gc II 3 D Ex ic IIIC T85 °C…T300 °C Dc
Unit with Digital Display	Aluminum	✓ ✓	✓ ✓	II 2 G Ex ia IIC T4 Gb II 2 D Ex ia IIIC T135 °C Db II 3 G Ex nA IIC T4 Gc II 3 D Ex tc IIIC T135 °C Dc II 3 G Ex ic IIC T4 Gc II 3 D Ex ic IIIC T135 °C Dc
	Stainless Steel	✓ ✓	✓ ✓	II 1 G Ex ia IIC T4…T3 Ga II 2 D Ex ia IIIC T135 °C…T200 °C Db II 3 G Ex nA IIC T4…T3 Gc II 3 D Ex tc IIIC T135 °C…T200 °C Dc II 3 G Ex ic IIC T4…T3 Gc II 3 D Ex ic IIIC T135 °C…T200 °C Dc
	Stainless Steel High Temperature	✓ ✓	✓ ✓	II 1 G Ex ia IIC T4…T2 Ga II 2 D Ex ia IIIC T135 °C…T300 °C Db II 3 G Ex nA IIC T4…T2 Gc II 3 D Ex tc IIIC T135 °C…T300 °C Dc II 3 G Ex ic IIC T4…T2 Gc II 3 D Ex ic IIIC T135 °C…T300 °C Dc

Standards used for evaluation: (13ATEX0086X and IECEx DEK13.0027X)
EN 60079-0:2012+A11:2013, EN 60079-11:2012, EN 60079-15:2010, EN 60079-31:2014
IEC 60079-0:2011 modified + Cor.:2012 + Cor.:2013, IEC 60079-11:2011 + Cor.:2012, IEC 60079-15:2010, IEC 60079-31:2013

Special conditions for safe use:

• In case the aluminium housing is mounted in an area where the use of EPL Gb (Category 2 G) or EPL Gc (Category 3 G) apparatus is required, the transparent cover must be installed such, that ignition sources due to electrostatic discharge sparks are excluded.

• In case the aluminium housing or painted housing is mounted in an area where the use of EPL Db (Category 2 D) or EPL Dc (Category 3 D) apparatus is required, the transparent cover and the painted parts must be installed such, that danger of ignition due to propagating brush discharges is excluded.

• For models marked with material code M, Titanium Grade II, the installation instructions contain the specification of the alloy, allowing the user determine the suitability of the equipment for the particular application.

• From the safety point of view the circuits shall be assumed to be connected to earth.

• On units with digital display the programming function through the LCD display shall only be done outside the hazardous area.

• In case the surge protector is used in application with protection techniques Ex nA and Ex tc, the surge protector shall be installed with a high strength locking compound on the mounting thread.

Table continued on next page

Table 1-10 Product Approvals (Continued)

Declarations	Mark	Meter Options				Standards/Directives/Marking	Status/Certificate
		Mechanical	HART Transmitter	Foundation Field Bus Transmitter	Inductive Alarm		
Explosion safety "Intrinsic Safety (ia)" "Non-sparking (nA)" "Enclosure Dust (tc)"	UL		✓		✓	Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III Hazardous Locations Class I, Division 2, Groups A, B, C, and D; Class II, Division 2, Groups F and G; Class III Hazardous Locations Class I, Zone 1, AEx ia IIC T2/T3/T4/T5/T6 Gb Zone 21, AEx ia IIIC T85°C/T100°C/T135°C/T200°C/T300°C Db Class I, Zone 2, AEx nA IIC T2/T3/T4/T5/T6 Gc Zone 22, AEx tc IIIC T85°C/T100°C/T135°C/T200°C/T300°C Dc For temperature limits, see Table: Process and ambient temperature limits Intrinsic Safety / Non-Sparking / Enclosure dust	E73889
Explosion safety "Flame Proof"	CSA		✓	✓	✓	Ex d IIC T6 Gb / Class I, Div.1 Group A, B, C and D Ex tb IIIC T85 Db / Class II, Div.1, Groups E, F, and G Class I, Zone 1, AEx d IIC T6 Gb / Zone 21, AEx tb IIIC T85 Db For temperature limits, see Table: Process and ambient temperature limits Flame Proof / Ex-d	14.2628516
NEMA 4X - Watertight			✓	✓	✓	NEMA 250 (Stainless Steel Enclosure)	CSA Certificate 14.2628516
NEMA 4X - Watertight		✓				NEMA 250 (Stainless Steel or Aluminum Enclosure)	DEKRA Certificate
CRN		✓	✓	✓	✓	ASME 31.3	CRN Registration Number

Declarations	Mark	Meter Options				Standards/Directives/Marking	Status/Certificate
		Mechanical	HART Transmitter	Foundation Field Bus Transmitter	Inductive Alarm		
Customs Union - Russia Declaration	EAC	✓	✓		✓	TR CU 032/2013 “On safety of the equipment operating under excessive pressure”	TC N RU Д-U.АУ04.В.05988
	EAC		✓		✓	Customs Union & Russia TR CU 012/2011 1 Ex d IIC «T6…T1» GbX : Ex tb IIIC «T85°C…T400°C» Db X	RU C- HU.ГБ08.В.00741
Explosion safety "Intrinsic Safety (ia)" "Non-sparking (nA)" "Enclosure Dust (tc)"	EAC		✓		✓	Customs Union & Russia TR CU 012/2011 Zone 1 / Zone2 - Intrinsic safety ia/ic, Zone 2 non-sparking (nA)	RU C- HU.ГБ08.В.00741
Explosion safety "Flame Proof"	NEPSI		✓		✓	Exd IIC T6..T1 Gb : Ex tb IIIC T85°C…T400°C Db	GYJ14.1304X
	CCOE		✓		✓	Exd IIC T6..T1 Gb : Ex tb IIIC T85°C…T400°C Db	CCEs P349406/1
	KOSHA		✓		✓	Exd IIC T6..T1 Gb : Ex tb IIIC T85°C…T400°C Db	15-AV4BO-0353
Explosion safety "Intrinsic Safety (ia)" "Non-sparking (nA)" "Enclosure Dust (tc)	NEPSI		✓		✓	Zone 1 - Intrinsic safety (ia), Zone 2 non-sparking (nA/ic)	GYJ15.1039X GYJ15.1040X

Table 1-11 Process and Ambient Temperature Limits

			Maximum Process Temperature (°C)					
	Temperature Class		T6	T5	T4	T3	T2	T1
Approval type	Meter type	Ambient Temperature (°C)						
Flame-proof / Ex-d CSA / ATEX/IECex	Flanged and Male Threaded versions	-40 to 32.5	85	100	135	200	300*	420*
		-40 to 47	85	100	135	200	300*	N/A
		-40 to 58	85	100	135	200	N/A	N/A
		-40 to 65	85	100	135	N/A	N/A	N/A
		-40 to 70	85	100	N/A	N/A	N/A	N/A
	ELF and Female Threaded versions	-40 to 47	85	100	135	200	300*	N/A
		-40 to 58	85	100	135	200	N/A	N/A
		-40 to 65	85	100	135	N/A	N/A	N/A
		-40 to 70	85	100	N/A	N/A	N/A	N/A
	ETFE Lines versions	-40 to 64	85	100	135	150	N/A	N/A
		-40 to 65	85	100	135	N/A	N/A	N/A
		-40 to 70	85	100	N/A	N/A	N/A	N/A
	NOTE	* For application with process temperature equal to or greater than +300 °C heat shield and custom installation required. Refer to installation manual for details.						

			Maximum Process Temperature (°C)					
	Meter Option		Without Digital Display			With or without Digital Display		
	Temperature Class		T6	T6	T5	T4	T3	T2
Approval type	Housing type	Ambient Temperature (°C)	Without Inductive Alarm	With Inductive Alarm	With or without Inductive Alarm	With or without Inductive Alarm	With or without Inductive Alarm	With or without Inductive Alarm
Intrinsic Safety / Non-Sparking / Enclosure dust ATEX/IECex	Aluminum	-40 to +35	85	85	100	135	N/A	N/A
		-40 to +40	85	85	100	126	N/A	N/A
		-40 to +45	85	85	100	115	N/A	N/A
		-40 to +50	85	85	100	104	N/A	N/A
		-40 to +55	85	84	94	94	N/A	N/A
		-40 to +60	84	76	84	84	N/A	N/A
		-40 to +65	76 **	69 **	76	76	N/A	N/A
		-40 to +70 *	69 **	N/A	69	69	N/A	N/A
	Stainless Steel	-40 to +40	85	85	100	135	200	N/A
		-40 to +45	85	85	100	135	194	N/A
		-40 to +50	85	85	100	135	167	N/A
		-40 to +55	85	85	100	135	138	N/A
		-40 to +60	85	85	100	110	110	N/A
		-40 to +65	85 **	69 **	86	86	86	N/A
		-40 to +70 *	69 **	N/A	69	69	69	N/A
	Stainless Steel High Temp	-40 to +35	85	85	100	135	200	300
		-40 to +40	85	85	100	135	200	267
		-40 to +45	85	85	100	135	200	221
		-40 to +50	85	85	100	135	182	182
		-40 to +55	85	85	100	135	149	149
		-40 to +60	85	85	100	119	119	119
		-40 to +65	85 **	69 **	91	91	91	91
		-40 to +70 *	69 **	N/A	69	69	69	69
	NOTE	* Maximum Ambient Temperature for Inductive alarm = +66 °C ** Not Applicable/Available for Foundation Field Transmitter. (Model code XV = M...U)						

Table continued on next page

Table 1-11 Process and Ambient Temperature Limits (continued)

			Maximum Process Temperature (°C)					
	Meter Option		Without Digital Display			With or without Digital Display		
	Temperature Class		T6	T6	T5	T4	T3	T2
Approval type	Housing type	Ambient Temperature (°C)	Without Inductive Alarm	With Inductive Alarm	With or without Inductive Alarm	With or without Inductive Alarm	With or without Inductive Alarm	With or without Inductive Alarm
Intrinsic Safety / Non-Sparking / Enclosure dust cULus	Aluminum	-40 to 40	85	85	100	126	N/A	N/A
		-40 to 45	85	85	100	115	N/A	N/A
		-40 to 50	85	85	100	104	N/A	N/A
		-40 to 55	85	84	94	94	N/A	N/A
		-40 to 60	84	76	84	84	N/A	N/A
		-40 to +65	76	69	76	76	N/A	N/A
		-40 to +70 *	69	N/A	69	69	N/A	N/A
	Stainless Steel	-40 to 40	85	85	100	135	200	N/A
		-40 to 45	85	85	100	135	194	N/A
		-40 to 50	85	85	100	135	167	N/A
		-40 to 55	85	85	100	135	138	N/A
		-40 to 60	85	85	100	110	110	N/A
		-40 to +65	85	69	86	86	86	N/A
		-40 to +70 *	69	N/A	69	69	69	N/A
	Stainless Steel High Temp	-40 to 40	85	85	100	135	200	267
		-40 to 45	85	85	100	135	200	221
		-40 to 50	85	85	100	135	182	182
		-40 to 55	85	85	100	135	149	149
		-40 to 60	85	85	100	119	119	119
		-40 to +65	85	69	91	91	91	91
		-40 to +70 *	69	N/A	69	69	69	69
	NOTE * Maximum Ambient Temperature for Inductive alarm = +66 °C							

Table 1-12 Electrical Data Intrinsic Safety

Electronics configuration	Function / signal	Ui,V	Ii, mA	Pi, mW	Ci, nF	Li, µH	Recommended Barrier #
4-20mA / HART	Signal 4-20mA (J1 terminals 12+ and 13-)	28	75	525	2,2	0.365	Stahl Type : 9001/01-280-075-101
	Pulse output (J1 terminals 7+ and 8-)	28	84	660	≈0	≈0	Stahl Type : 9002/77-280-094-001
	Alarm circuits A (J1 terminals 1+ and 2-)	10,6	19,1	51	≈0	≈0	Pepperl & Fuchs: KFA5-SR2-EX2.W KFA6-SR2-EX2.W
		10,5	13	34	≈0	≈0	Pepperl & Fuchs: KFD2-SR2-EX2.W
	Alarm circuits B (J1 terminals 4+ and 5-)	10,6	19,1	51	≈0	≈0	Pepperl & Fuchs: KFA5-SR2-EX2.W KFA6-SR2-EX2.W
		10,5	13	34	≈0	≈0	Pepperl & Fuchs: KFD2-SR2-EX2.W
		Uo,V	**Io, mA**	**Po, mW**	**Co, µF**	**Lo, mH**	**Notes**
	Remote zero loop signal (J1 terminals 10+ and 11-)	28	2,83	80	0.083	44	

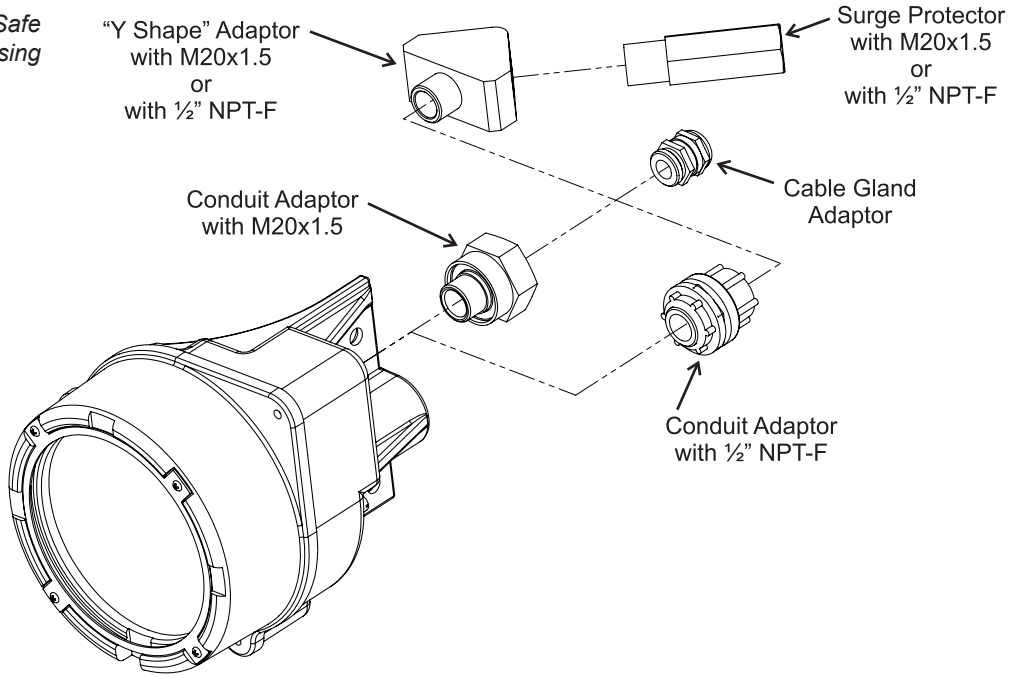
		Ui,V	Ii, mA	Pi, mW	Ci, nF	Li, mH	Recommended Barrier #
Foundation Fieldbus	FOUNDATION Fieldbus loop (J1 terminals 10+/11+ and 12-/13-)	24	380	5320	0	0	FISCO barrier
	Pulse output (J1 terminals 5+ and 6-)	10,6	19,1	51	≈0	≈0	Pepperl & Fuchs: KFA5-SR2-EX2.W KFA6-SR2-EX2.W
		10,5	13	34	≈0	≈0	Pepperl & Fuchs: KFD2-SR2-EX2.W
	Alarm circuits A (J1 terminals 1+ and 2-)	10,6	19,1	51	≈0	≈0	Pepperl & Fuchs: KFA5-SR2-EX2.W KFA6-SR2-EX2.W
	Alarm circuits B (J1 terminals 3+ and 4-)	10,6	19,1	51	≈0	≈0	Pepperl & Fuchs: KFA5-SR2-EX2.W KFA6-SR2-EX2.W
		Uo,V	**Io, mA**	**Po, mW**	**Co uF**	**Lo mH**	**Notes**
	Remote zero loop signal (J1 terminals 8+ and 9-)	8,03	0,81	6,5	8,4	1215	

		Ui,V	Ii, mA	Pi, mW	Ci, nF	Li, µH	Recommended Barrier #
Inductive Alarms	Inductive High Alarm circuits (terminals «+» and «-») – for connection of circuits Pepperl+Fuchs mod. SJ 3,5-SN type 2	10,6	19,1	51	30	100	Pepperl & Fuchs:KFA5-SR2-EX2.W or KFA6-SR2-EX2.W
	Inductive Low Alarm circuits (terminals «+» and «-») – for connection of circuits Pepperl+Fuchs mod. SJ 3,5-SN type 2	10,6	19,1	51	30	100	Pepperl & Fuchs:KFA5-SR2-EX2.W or KFA6-SR2-EX2.W

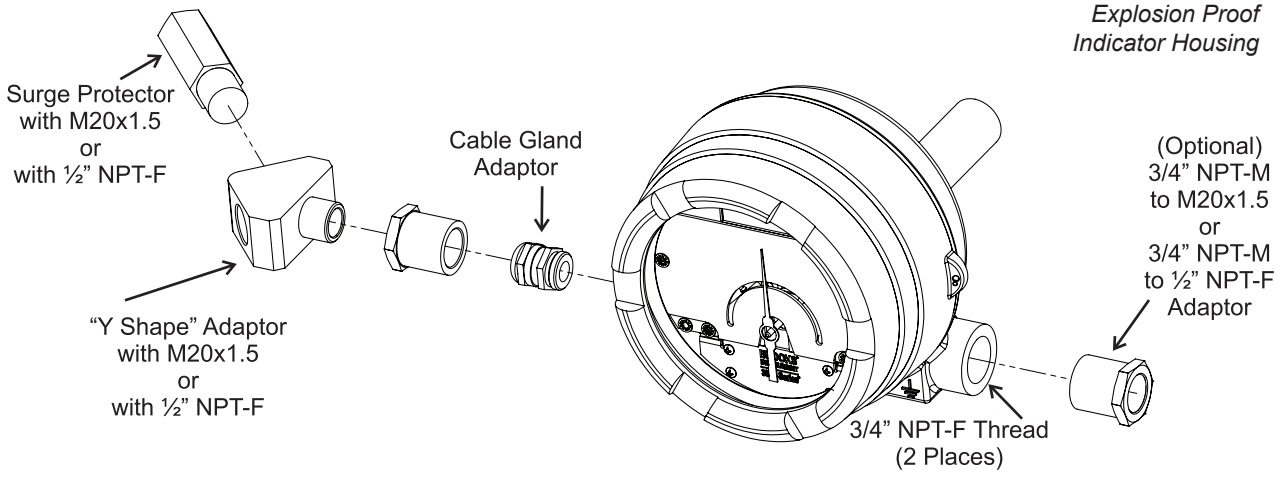
Table 1-13 Electrical Entries

	ATEX/IECEx		CSA	UL
Protection Concept / Electrical Connection Entry	Ex db/Ex tb	Ex ia, Ex ic Ex nA, Ex tc	Ex db/Ex tb	Ex ia, Ex ic Ex nA, Ex tc
3/4" NPT - F	X	X	X	X
3/4" NPT-M to M20 X 1.5 (Adaptor)	X	X	X	X
3/4" NPT-M to 1/2" NPT - F (Adapter)	X	X		X
Cable Gland (Adapter)		X		
M20 X 1.5 (Y Shape Adaptor)	X	X		
1/2" NPT-F (Y Shape Adaptor)	X	X		
M20 X 1.5 (Surge Protector)	X	X		
1/2" NPT-F (Surge Protector)	X	X		

MT3809G
Instrinsically Safe
Indicator Housing



MT3809G
Explosion Proof
Indicator Housing



In case the surge protector is used in application with protection techniques Ex db, Ex tb, Ex nA and Ex tc, the surge protector shall be installed with a high strength locking compound on the mounting thread.

2-1 General

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

2-2 Receipt of Equipment

When the equipment is received, the outside packing case should be checked for damage incurred during shipment. If the packing case is damaged, the local carrier should be notified at once regarding his liability. A report should be submitted to the nearest Brooks Instrument location listed on the Global Service Network page on our website: BrooksInstrument.com/GlobalSupportCenters

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

2-3 Recommended Storage Practices

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

a. Within the original shipping container.
b. Stored in a sheltered area, preferably a warm, dry, heated warehouse.
c. Ambient temperature of 21°C (70°F) nominal, 43°C (110°F) maximum, 7°C (45°F) minimum.
d. Relative humidity 45% nominal, 60% maximum, 25% minimum.

Upon removal from storage, a visual inspection should be conducted to verify the condition of equipment is "as received".

2-4 Return Shipment

Prior to returning any instrument to the factory for any reason, visit our website for instructions on how to obtain a Return Materials Authorization Number (RMA #) and complete a Decontamination Statement to accompany it: BrooksInstrument.com/Service. All instruments returned to Brooks also require a Material Safety Data Sheet (MSDS) for the fluid(s) used in the instrument. Failure to provide this information will delay processing of the instrument.
Instrument must have been purged in accordance with the following:

⚠WARNING

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

2-5 Installation of Flowmeter

⚠WARNING

If the inlet and outlet valves adjacent to the indicator are to be closed for any reason, the indicator must be completely drained. Failure to do so may result in thermal expansion of the liquid which can rupture the meter and cause possible personal injury.

⚠CAUTION

Meters weighing more than 40 pounds/18 kilograms are labeled and should be handled with care to prevent personal injury. The product can be lifted by the meter flange or meter pipe. The caution label is shown below.

⚠WARNING

The meter is capable of process fluids to 750°F/400°C with specific options. It is recommended that user install label(s) indicating hot surfaces.

Recommended installation for Models MT3809 and MT3810 is as follows:

a. Carefully remove the covers from each end of the flowmeter. The float may be fixed to avoid damage during transport. These plugs must be removed before use.

b. Install the flowmeter with the inlet at the bottom and the outlet at the top.

⚠CAUTION

Since this is a magnetically activated device, strong magnetic fields and materials with magnetic properties may cause faulty operation when in close proximity to the flowmeter. This includes steel pipes, steel conduit, motors and transformers.

⚠CAUTION

Flowmeters with a transmitter must be mounted at least 0.5 meters (18 inches) apart to prevent the interaction of adjacent float magnets and transmitter.

c. When installing the flowmeter in the process line, follow accepted plumbing practices.

i. **For flanged meters (without lining):**
Select bolts and gaskets (customer supply) in keeping with the flange pressure rating or the operating pressure. Also note corrosion resistance and thermal stability.
Align gasket and tighten nuts using the torques specified for the relevant pressure ratings. Advised bolting acc. ASTM A307 Grade B

ii. **For threaded meters:**
Follow the applicable installation instructions for threaded connections.
Important: ensure that thread sealing material does not get into the

flow path. Loose pieces can cause obstruction inside the measurement section of the meter, and potentially even blockage of the measurement float within the measurement tube.

iii. **For ETFE lined meters:**
Select bolts and gaskets (customer supply) in keeping with the flange pressure rating or the operating pressure. Also note corrosion resistance and thermal stability.
Important: the inside diameter of the flanges deviates from the standard dimensions. Enlarge the flange gaskets to the appropriate size.Align gasket and tighten nuts using the torques specified in Table 2-1
Important: PTFE is deformable under pressure in the cold state. Do not exceed maximum torque.

d. Install the flowmeter within 5° of true vertical. Use of a level is recommended to determine the proper alignment.

e. When the process temperature is 300°C / 572°F or above insulation is required on the meter body and flanges. The insulation is installed between the indicator housing and the body and flanges. Do not wrap the indicator with insulation.

Recommended insulation materials are calcium silicate, cellular glass or mineral wool with a thermal conductivity of .083 W/m-K at 300°C / 572°F.

Table 2-1 Maximum Torques Model MT3809 ETFE

Connection size				Stud bolts			Max. torque	
DIN		ASME		DIN	ASME			
DN	PN	inch	lb		150lb	300lb	Nm	ft.lbs
15	40	1/2"	150/300	4x M12	4x 1/2"	4x 1/2"	3.4	2.5
25	40	1"	150/300	4x M12	4x 1/2"	4x 5/8"	6.5	4.8
40	40	1,5"	150/300	4x M16	4x 1/2"	4x 3/4"	13.6	10
50	40	2"	150/300	4x M16	4x 5/8"	8x 5/8"	23.6	17.4

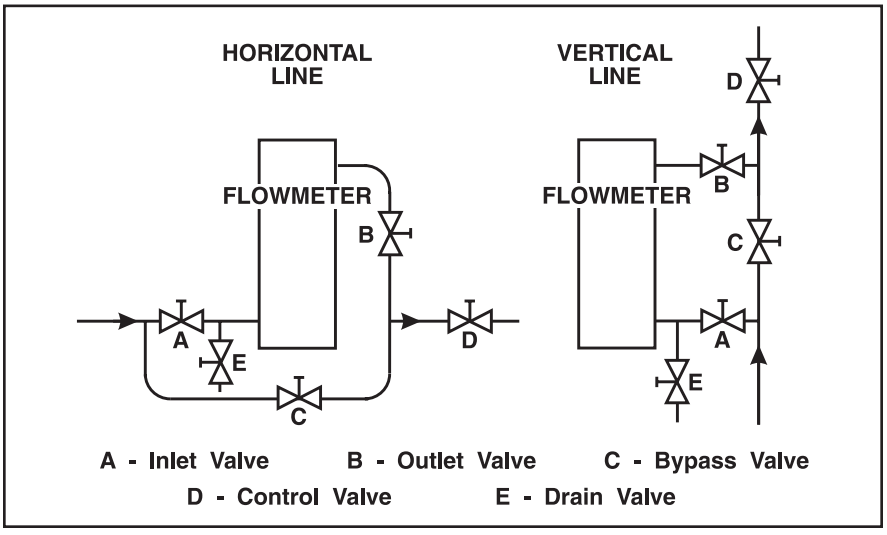


Figure 2-1 Typical Bypass Installation

2-5-1 How to Remove and Reinstall GP Housing Indicator Covers

Directions to remove and reinstall the GP Housing Cover and adjust the Pointer:

1. To begin, make sure the float is at rest and there isn't flow going through the meter.
2. Using a T20 TORX tool loosen the 4 cover screws. Note, the screws will stay attached to the cover.
3. Remove the cover from the housing. The gasket should still be attached to the cover in the gasket groove. If not, place the gasket into the groove of the cover.
4. Using a flat blade screwdriver with a 1/8" blade, hold the pointer and turn the screw to align with the "R" on the scale. It may take a few adjustments to get the pointer on the "R".
5. To replace the cover, place the cover against the housing and tighten the 4 screws using a T20 TORX tool. Tighten to 45 in-lbs or 5.08 N-m to keep a watertight seal.

2-5-2 How to Remove and Reinstall IS Housing Indicator Covers

⚠ WARNING

If it becomes necessary to service or remove the instrument from the system, power to the device is disconnected at the power supply.

Directions to remove and reinstall the IS Housing Indicator Cover, adjust Alarms and the Pointer:

1. To begin make sure the float is at rest and there isn't flow going through the meter.
2. Using a T20 TORX tool loosen the 3 cover screws. Note, the screws will stay attached to the cover.
3. Remove the cover from the housing. The gasket should still be attached to the cover in the gasket groove. If not place the gasket into the groove of the cover.
4. Using a flat blade screwdriver with a 1/8" blade, hold the red alarm pointer and turn the screw counterclockwise to loosen the pointer, slide it to desired position on scale and tighten screw.
5. Using a flat blade screwdriver with a 1/8" blade, hold the pointer and turn the screw to align with the "R" on the scale. It may take a few adjustments to get the pointer on the "R".
6. To replace the cover, place the cover against the housing and tighten the 3 screws using a T20 TORX tool. Tighten to 45 in-lbs or 5.08 N-m to keep a watertight seal.

2-5-3 How to Remove and Reinstall XP Housing Indicator Covers

⚠ WARNING

If it becomes necessary to service or remove the instrument from the system, power to the device is disconnected at the power supply.

Directions to remove and reinstall the XP Housing Indicator Cover, adjust Alarms and the Pointer:

1. To begin make sure the float is at rest and there isn't flow going through the meter.
2. Using your hands or a strap wrench turn the cover counter clockwise to remove the cover from the housing
3. Remove the cover from the housing. The gasket should stay attached to the groove in the housing
4. Using a flat blade screwdriver with a 1/8" blade, hold the red alarm pointer and turn the screw counterclockwise to loosen the pointer, slide it to desired position on scale and tighten screw.
5. Using a flat blade screwdriver with a 1/8" blade, hold the pointer and turn the screw to align with the "R" on the scale. It may take a few adjustments to get the pointer aligned to the "R".
6. To replace the cover, place the cover against the housing and turn the cover clockwise. Note, it will take several rotations to tighten the cover and the cover must be in contact with the gasket to keep a watertight seal.

2-6 Electrical Connections to MT3809 with 4-20 mA/HART Transmitter, Alarms and Pulse Output

⚠ WARNING

If it becomes necessary to service or remove the instrument from the system, power to the device is disconnected at the power supply.

a) Before electrical connection, install the meter into the pipeline as described in previous Section 2.5.

b) The electrical installation practice for conventional 4-20 mA and wired HART devices is generally the same:

i. To avoid electrical interference and to meet the Electro Magnetic Compatibilty (EMC directive) requirements, use individually shielded twisted pair cable, either in single pair or multi-pair varieties. The minimum conductor size is 0.51mm diameter (#24 AWG) for cable runs less than 1,500 meters (@ 5,000 ft.) and 0.81mm diameter (#20 AWG) for longer distances.

ii. In case of installation into explosion hazardeous environments it is important to eliminate a potential incentive level of circulating current through the cable shield in the event that there are local differences in chassis ground potential between the two ends of the cable. Therefore, able shields shall be connected to chassis ground (earth) in accordance with the applicable national & regional installation codes and regulations. A terminal screw inside the device allows for shield to chassis connection in case the applicable installation regulation requires earthing at the transmitter end.

iii. To prevent external interference, the signal loop should be grounded at one point only. The single ground point will usually be at or near the host (e.g. at the control system).

iv. Ensuring a properly specified power supply. Power for a two-wire instrument loop is typically 24 Vdc. The voltage must be sufficient to provide the necessary minimum voltage at the transmitter terminal. Take into account voltage drops in the cable and load resistor, as well as from any intrinsic safety barrier present. The transmitter could take up to 22 mA to indicate an alarm condition. Use this value to calculate the worst loop voltage drop.

The maximum resistance of the loop resistor, the associated cable and the barrier is determined by the power supply voltage and is shown graphically in Figure 2-2.

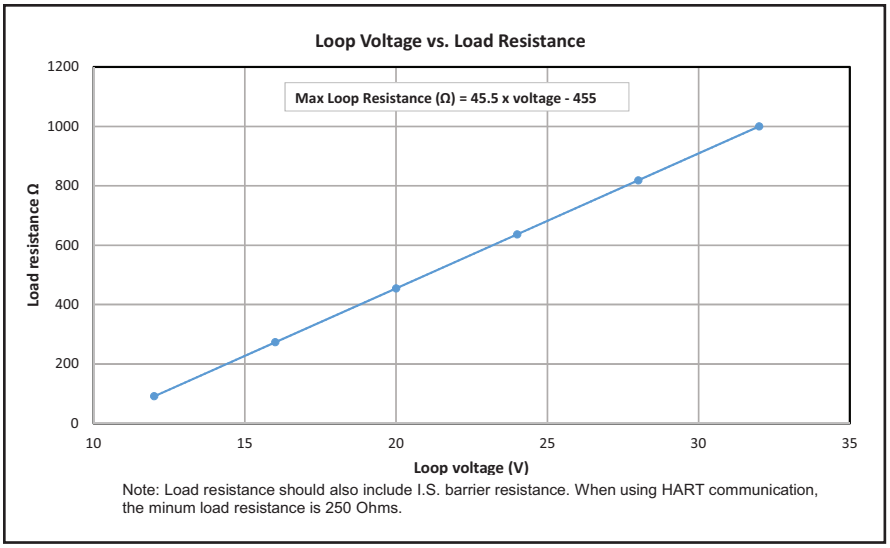


Figure 2-2 Power Supply vs. Maximum Load Resistance

v. Staying below the maximum allowable cable length which depends upon the cable capacitance and the number of network devices. Most installations are well within the 3000 meter (10,000 ft) theoretical limit for HART communication. However, the electrical characteristics of the cable (primarily its capacitance) and the number of connected devices can affect the maximum allowable cable length. Detailed information for determining the maximum cable length for any HART network configuration can be found in the HART Physical Layer Specifications.

c) The housing of the transmitter should be grounded in accordance with the applicable installation regulations. When the device is not sufficiently grounded via the process cables, a grounding terminal screw is available on the transmitter housing for earth connection.

d) Transmitter wiring connection diagrams are given in Sections 2-6-1. (4-20 mA/HART Transmitter Instrinsically Safe Installation), 2-6-2. (4-20mA/HART Transmitter Division 2 Installation) and 2-6-3. (4-20mA/HART Transmitter Flameproof Installation). Ensure that the installation complies with given hazardeous area protection requirements.

i. Intrinsically safe installations require the use of barriers, power supply limits and cable parameters as shown in the installation diagram. All connections are made in the transmitter housing.

ii. If the area classification is Division 2, barriers are not required and cable parameters are not applicable. However, the electrical code will require the use of conduit for wire protection.

iii. For flameproof installation the optional explosion proof enclosure is required and explosion proof installation methods must be followed

iv. For both Division 1 explosion proof and Division 2 non-incendive installations, the barriers shown in the installation drawings are optional.

⚠WARNING

To prevent ignition of hazardous atmospheres and serious personal injury, proper installation methods must be used as defined in Article 505 of the National Electrical Code, and the Canadian Electrical Code and ISA Standard 12.6 and in accordance with Cenelec regulations.

Transmitter with alarm and pulse output wiring connections

The alarm contact and pulse output digital signals are electrically identical, independent, optically coupled transistor outputs. Wiring will be as required by the external driven system - Prover, DCS/PLC, terminal-automation system, batch controller etc. These can be wired as an open collector or open signal on the high or low side of voltage-rail within the receiving equipment, depending upon the signal needs. When interfacing to external electronics, be careful to work within the voltage/current polarity and limits as specified in Section 1.

e) Common transmitter parameters are set during manufacturing at Brooks Instrument based on order information, meter configuration or defaults inherent to the transmitter. Further detailed configurations as well as on-line monitoring can be done through standard HART or FOUNDATION™ Fieldbus communication protocol, see Section 3-3. for details.

The float is constructed with an integral magnet that activates a magnetic sensor that is part of the transmitter. This same float magnet also drives the mechanical pointer. The flow rate is scaleable by setting independent high and low range parameters. The analog output (AO) transmitter parameters, AO Hi-Range and AO Lo-Range span the 4-20 mA signal. For example, if flow rate is normally between 100 and 500 gpm, the AO Hi-Range parameter is set at 500 and the AO Lo-Range is set at 100.

f) Typically applications require only the use of the 2 wire loop analog signal. In some applications where transmitters and actuators are widely separated (e.g. tank farms), devices are wired in a multi-drop configuration to save wiring costs. Each unit is given an individual HART address to distinguish each unit during communications over a common wire pair. In this configuration, the 4-20 mA output signal cannot be used. Follow the general HART foundation instructions for setting up a multi-drop configuration.

g) After installation and powering of the loop, the transmitter must be zeroed, both electrically and mechanically. This operation will compensate for any stray magnetic effects in the vicinity of the transmitter.

Important: The zero adjusting of the pointer influences the transmitter indication, but not the other way around. Therefore, first adjust the pointer at the zero flow position, then the transmitter must be zeroed.

i. Flow must be verified to be zero during the entire zeroing.

ii. With the flow at zero and the float at the zero flow position, adjust the mechanical indicator to point to the ‘R’ (reference line) using the adjustment screw on the face of the pointer, next to the hub.

Using a flat blade screwdriver with a 1/8" blade, hold the pointer and turn the screw to align with the “R” on the scale.

It may take a few adjustments to get the pointer on the “R”.

Figure 2-3 Mechanical Indicator Zero

iii. Then, zero the transmitter shorting the two pins at the terminal block. Reference Figure 2-4 below.

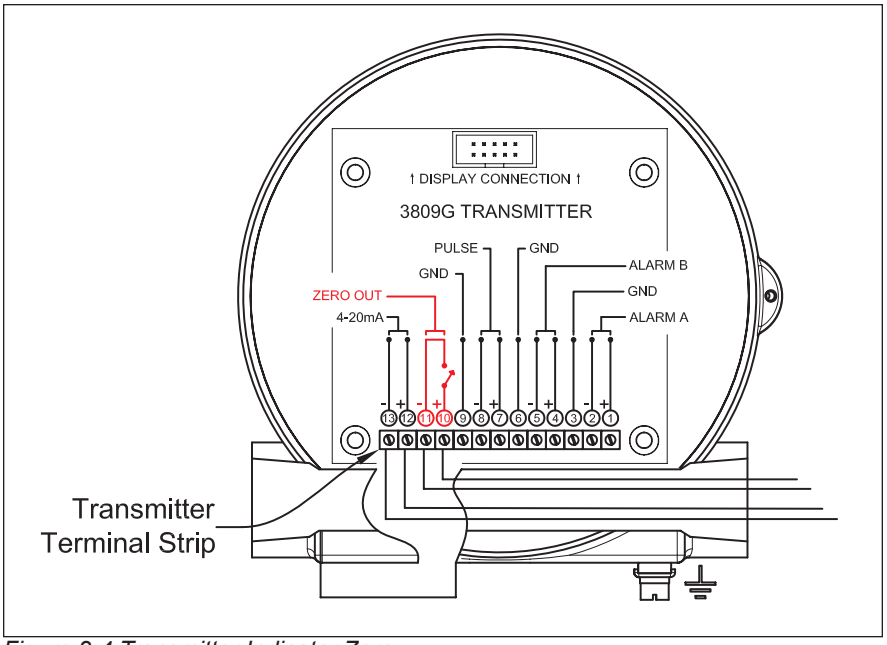


Figure 2-4 Transmitter Indicator Zero

Note: The zero function may be activated as part of a periodical maintenance check. If desired, a zero switch can be remotely mounted and wired to these terminals. The hazardous area classification will determine the wiring methods used for this switch.

h) Under actual flow conditions, verify that the transmitter output matches the mechanical pointer position. If a discrepancy is noted, the HART communications channel can be used to verify or adjust the transmitter settings.

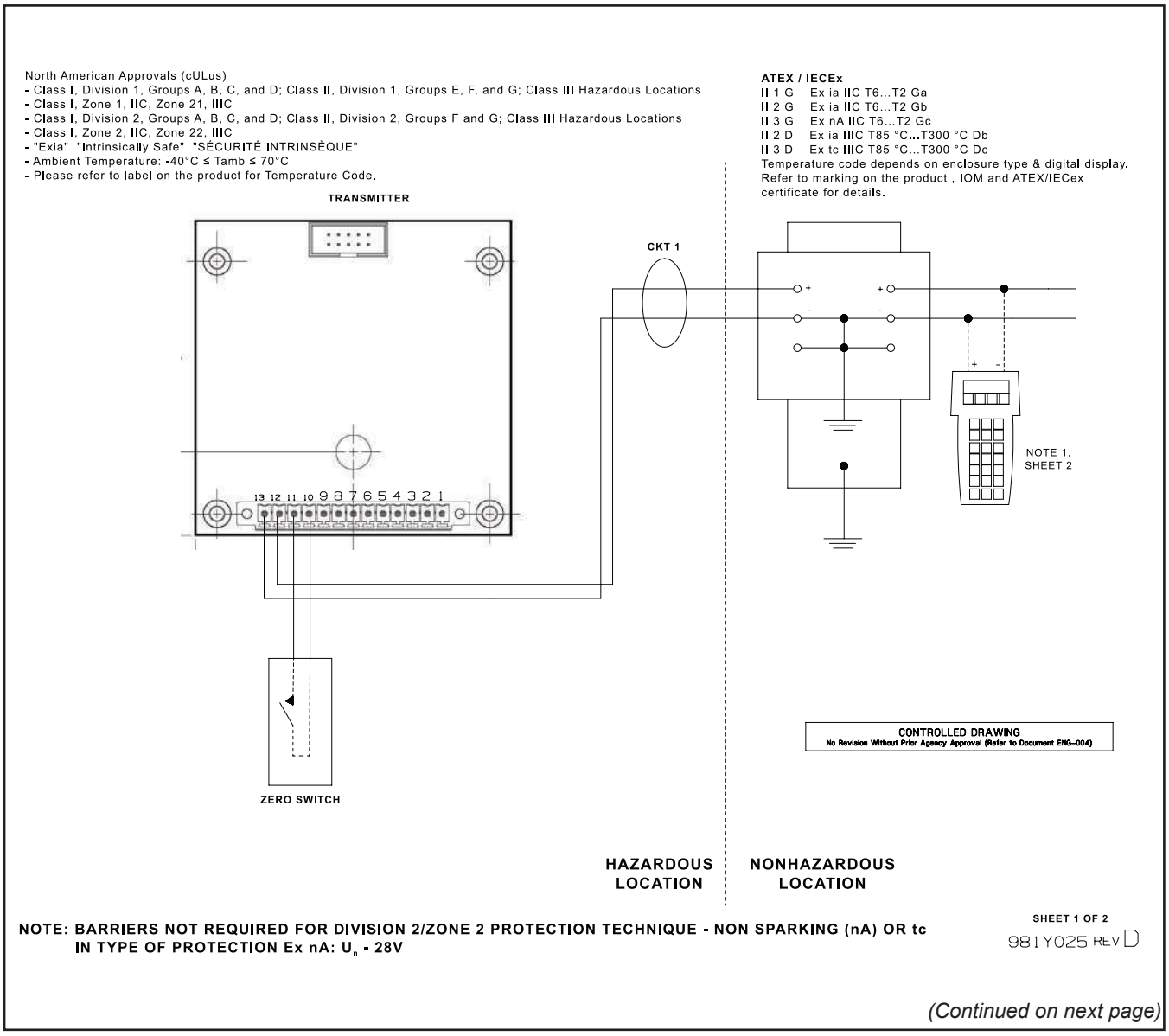
repositioning the pointers.

2-9 Installation of the Model MT3809 Flowmeter with Transmitter and Digital Display and Inductive Alarms

a. Install the meter as described in Section 2-5
b. Install the transmitter as described in Section 2-6
c. Install the inductive alarms as indicated below Section 2-8

2-6-1 4-20 mA/HART Transmitter Intrinsically Safe Installation

For intrinsically safe installation, intrinsic safety barrier selection, cable parameters, and power supply limits must be in accordance with the entity parameters shown in Figure 2-5a/2-5b. Alternatively, the optional intrinsically safe power supply available from Brooks may be used. Cable parameters for inductance and capacitance still apply.
Note: To ensure full EMC protection the ferrite core included with the meter must be installed to the input power I/O cable at the supply end of



(Continued on next page)

Figure 2-5a Wiring Diagram, Model MT3809 Transmitter, 4-20 mA

1. This device is a Rosemount hand held communicator.
2. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY, AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE
3. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. AVERTISSMENT – RISQUE D'EXPLOSION. NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.
4. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS (AS APPLICABLE) OR NON-HAZARDOUS LOCATIONS ONLY. CET EQUIPEMENT CONVIENT POUR UTILISATION CLASSE I, DIVISION 2, GROUPES (TOUS) OU LOCATIONS NON-DANGEREUSES SEULEMENT.
5. WARNING – ENCLOSURE CONTAINS ALUMINUM. PRECAUTIONS MUST BE TAKEN TO AVOID IGNITION DUE TO IMPACT. AVERTISSEMENT- LE BOÎTIER CONTIENS DE L'ALUMINIUM. DES PRÉCAUTIONS S'APPLIQUENT POUR ÉVITER L'IGNITION PAR IMPACT.
6. WARNING – FROM A SAFETY POINT OF VIEW THE CIRCUITS SHALL BE ASSUMED TO BE CONNECTED TO EARTH AVERTISSEMENT: PAR SÉCURITÉ LES CIRCUITS DEVRAIENT ÊTRE RELIÉS À LA MISE À LA TERRE.
7. Note for cULus approvals units: For devices using cable gland at field installation the following cable gland shall be used - American IP67 cable gland for the aluminum housing and an American rated IP68 cable gland for the Stainless steel and high temperature housings.
8. Entity Parameters:
   In type of protection Ex ia IIC/IIIC or Ex ic IIC/IIIC, only for connection to a certified intrinsically safe circuit, with following maximum values.

	Ui,V	Ii, mA	Pi, mW	Ci, nF	Li, µH	Recommended Barrier #
Signal 4-20mA (J1 terminals 12+ and 13-)	28	75	525	2.2	0.365	Stahl Type : 9001/01-280-075-101
	Uo,V	Io, mA	Po, mW	Co, µF	Lo, mH	Notes
Remote zero loop signal (J1 terminals 10+ and 11-)	28	2,83	80	0.083	44	

CONTROLLED DRAWING
No Revision Without Prior Agency Approval (Refer to Document ENG-004)

Note: The Recommended barrier listed above is not part of this UL certification.

9. The intrinsically safe device does not provide 500 V isolation with respect to earth.
   Associated apparatus used must be galvanically isolated or dual channel shunt zener diode barriers with linear outputs used channel to channel.
10. Selected associated apparatus must be third party listed as providing intrinsically safe circuits for the application, and have Voc or Vt not exceeding Vmax (or Uo not exceeding Ui), Isc or It not exceeding Imax (or Io not exceeding Ii), and the Po of the associated apparatus must be less than or equal to the Pmax or Pi of the intrinsically safe equipment, as shown in Table 1.
11. Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in Table 1. Cable capacitance, Ccable, plus intrinsically safe equipment capacitance, Ci, must be less than the marked capacitance, Ca (or Co), shown on any associated apparatus used. The same applies for inductance (Lcable, Li and La or Lo, respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft., Lcable = 0.2 µH/ft.

TABLE 1:

I.S. Equipment		Associated Apparatus
V max (or Ui)	≥	Voc or Vt (or Uo)
I max (or Ii)	≥	Isc or It (or Io)
Pmax (or (Pi)	≥	Po
Ci + Ccable	≤	Ca (or Co)
Li + Lcable	≤	La (or Lo)

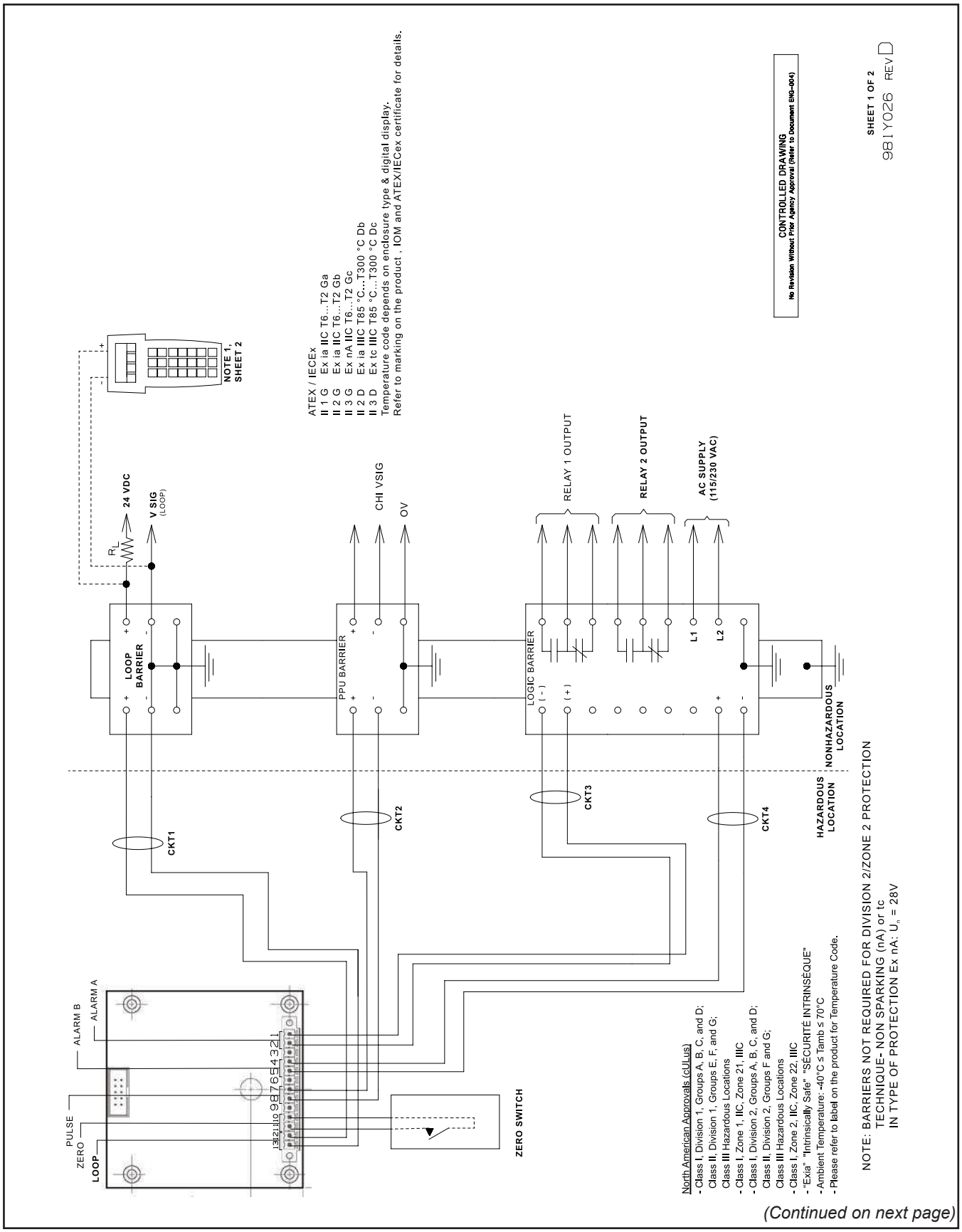
If Po of the associated apparatus is not known, it may be calculated using the formula Po = (Voc * Isc)/4 = (Uo * Io)/4.

12. Associated apparatus must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electrical Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada.
13. When required by the manufacturer's control drawing, the associated apparatus must be connected to a suitable ground electrode per the National Electrical Code (ANSI/NFPA 70), the Canadian Electrical Code, or other local installation codes, as applicable. The resistance of the ground path must be less than 1 ohm.
14. Where multiple circuits extend from the same piece of intrinsically safe equipment to associated apparatus, they must be installed in separate cables or in one cable having suitable insulation. Refer to Article 504.30(B) of the National Electrical Code (ANSI/NFPA 70) and Instrument Society of America Recommended Practice ISA RP12.6 for installing intrinsically safe equipment.
15. Associated apparatus must not be used in combination unless permitted by the associated apparatus certification.
16. Control equipment must not use or generate more than 250 V rms or dc with respect to earth.
17. Standards use for evaluation:
    US Standards: UL 913 - Ed 8, UL 60079-31 - Ed 2, UL 60079-15 - Ed 4, UL 60079-11 - Ed 6, UL 60079-0 - Ed 6, ISA 12.12.01
    Canadian Standards: CSA C22.2 NO. 157 - Ed 3, CSA C22.2 NO. 213-M1987 - Ed 1, CSA C22.2 NO. 60079-0:11 - Ed 2, CSA C22.2 NO. 60079-11:14 - Ed 2, CSA C22.2 NO. 60079-15:12 - Ed 1, CSA C22.2 NO. 60079-31:12 - Ed 1

SHEET 2 OF 2
98 1Y025 REV D

(Continued from previous page)

Figure 2-5b Wiring Diagram, Model MT3809 Transmitter, 4-20 mA (continued)



(Continued on next page)

Figure 2-6a Wiring Diagram, Model MT3809, 4-20 mA Transmitter, One or Two Optical Alarms and PPU

1. This device is a Rosemount hand help communicator.
2. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE
3. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.
   AVERTISSMENT – RISQUE D'EXPLOSION. NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.
4. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS (AS APPLICABLE) OR NON-HAZARDOUS LOCATIONS ONLY. CET EQUIPEMENT CONVIENT POUR UTILISATION CLASSE I, DIVISION 2, GROUPES (TOUS) OU LOCATIONS NON-DANGEREUSES SEULEMENT.
5. WARNING – ENCLOSURE CONTAINS ALUMINUM. PRECAUTIONS MUST BE TAKEN TO AVOID IGNITION DUE TO IMPACT.
   AVERTISSEMENT- LE BOÎTIER CONTIENS DE L'ALUMINIUM. DES PRÉCAUTIONS S'APPLIQUENT POUR ÉVITER L'IGNITION PAR IMPACT.
6. WARNING – FROM A SAFETY POINT OF VIEW THE CIRCUITS SHALL BE ASSUMED TO BE CONNECTED TO EARTH
   AVERTISSEMENT: PAR SÉCURITÉ LES CIRCUITS DEVRAIENT ÊTRE RELIÉS À LA MISE À LA TERRE.
7. Note for cULus approvals units: For devices using cable gland at field installation the following cable gland shall be used - American IP67 cable gland for the aluminum housing and an American rated IP68 cable gland for the Stainless steel and high temperature housings.
8. Entity Parameters:
   In type of protection Ex ia **IIC/IIIC** or Ex ic **IIC/IIIC**, only for connection to a certified intrinsically safe circuit, with following maximum values.

	Ui,V	Ii, mA	Pi, mW	Ci, nF	Li, µH	Recommended Barrier #
Signal 4-20mA (J1 terminals 12+ and 13-)	28	75	525	2,2	0.365	Stahl Type : 9001/01-280-075-101
Pulse output (J1 terminals 7+ and 8-)	28	84	660	~0	~0	Stahl Type : 9002/77-280-094-001
Alarm circuits (J1 terminals 1+ and 2-)	10,6	19,1	51	~0	~0	Pepperl & Fuchs: KFA5-SR2-EX2.W or KFA6-SR2-EX2.W
	10,5	13	34	~0	~0	Pepperl & Fuchs: KFD2-SR2-EX2.W
Alarm circuits (J1 terminals 4+ and 5-)	10,6	19,1	51	~0	~0	Pepperl & Fuchs: KFA5-SR2-EX2.W or KFA6-SR2-EX2.W
	10,5	13	34	~0	~0	Pepperl & Fuchs: KFD2-SR2-EX2.W
	Uo,V	Io, mA	Po, mW	Co, µF	Lo, mH	Notes
Remote zero loop signal (J1 terminals 10+ and 11-)	28	2,83	80	0.083	44	

CONTROLLED DRAWING
No Revision Without Prior Agency Approval (Refer to Document ENG-004)

Note: The Recommended barriers listed above are not part of this UL certification.

9. The intrinsically safe device does not provide 500 V isolation with respect to earth. Associated apparatus used must be galvanically isolated or dual channel shunt zener diode barriers with linear outputs used channel to channel.
10. Selected associated apparatus must be third party listed as providing intrinsically safe circuits for the application, and have Voc or Vt not exceeding Vmax (or Uo not exceeding Ui). Isc or It not exceeding Imax (or Io not exceeding Ii), and the Po of the associated apparatus must be less than or equal to the Pmax or Pi of the intrinsically safe equipment, as shown in Table 1.
11. Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in Table 1. Cable capacitance, Ccable, plus intrinsically safe equipment capacitance, Ci, must be less than the marked capacitance, Ca (or Co), shown on any associated apparatus used. The same applies for inductance (Lcable, Li and La or Lo, respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft., Lcable = 0.2 µH/ft.

TABLE 1:

I.S. Equipment		Associated Apparatus
V max (or Ui)	≥	Voc or Vt (or Uo)
I max (or Ii)	≥	Isc or It (or Io)
Pmax (or Pi)	≥	Po
Ci + Ccable	≤	Ca (or Co)
Li + Lcable	≤	La (or Lo)

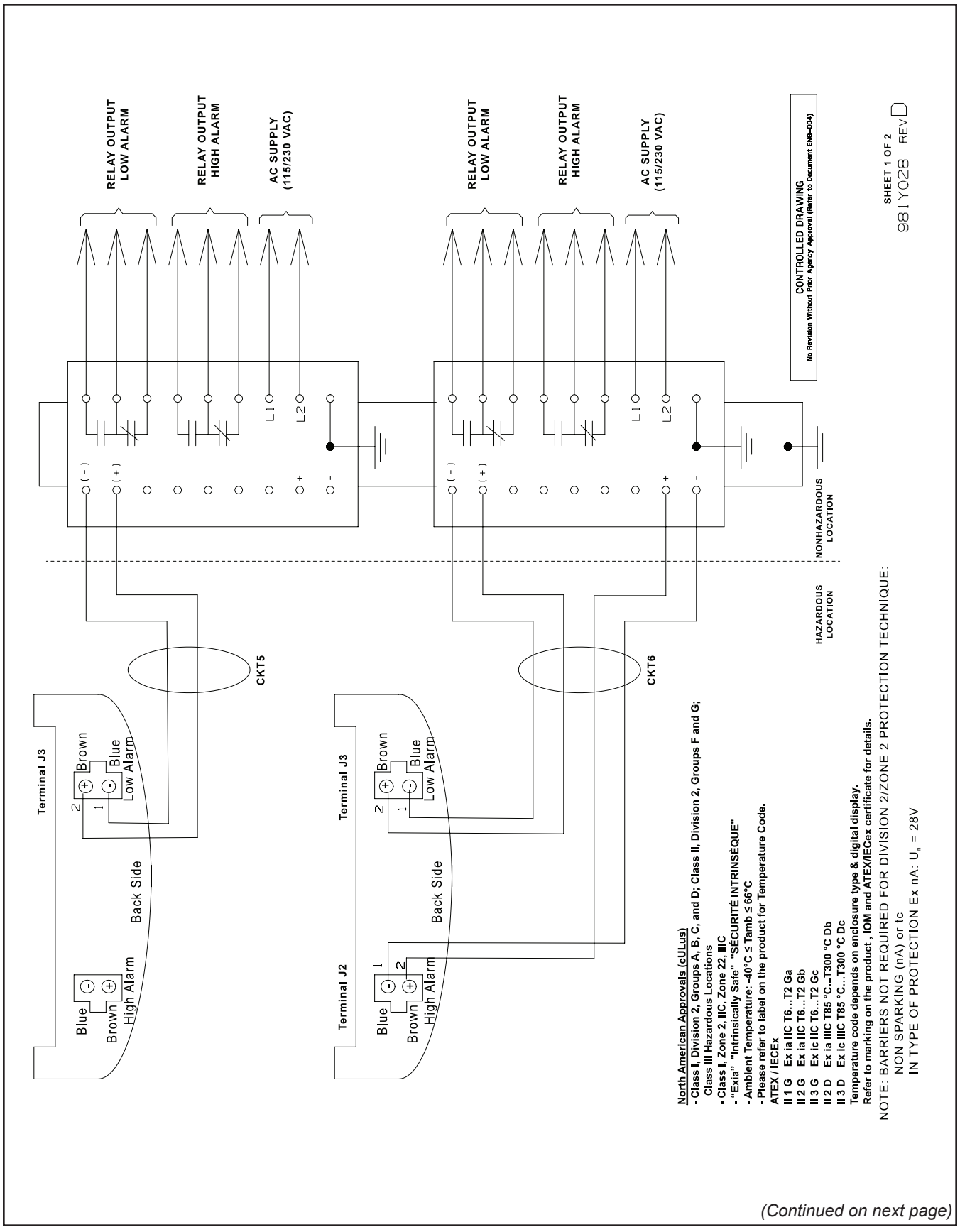
If Po of the associated apparatus is not known, it may be calculated using the formula Po = (Voc * Isc)/4 = (Uo * Io)/4.

12. Associated apparatus must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electrical Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada.
13. When required by the manufacturer's control drawing, the associated apparatus must be connected to a suitable ground electrode per the National Electrical Code (ANSI/NFPA 70), the Canadian Electrical Code, or other local installation codes, as applicable. The resistance of the ground path must be less than 1 ohm.
14. Where multiple circuits extend from the same piece of intrinsically safe equipment to associated apparatus, they must be installed in separate cables or in one cable having suitable insulation. Refer to Article 504.30(B) of the National Electrical Code (ANSI/NFPA 70) and Instrument Society of America Recommended Practice ISA RP12.6 for installing intrinsically safe equipment.
15. Associated apparatus must not be used in combination unless permitted by the associated apparatus certification.
16. Control equipment must not use or generate more than 250 V rms or dc with respect to earth.
17. Standards use for evaluation:
    US Standards: UL 913 - Ed 8, UL 60079-31 - Ed 2, UL 60079-15 - Ed 4, UL 60079-11 - Ed 6, UL 60079-0 - Ed 6, ISA 12.12.01
    Canadian Standards: CSA C22.2 NO. 157 - Ed 3, CSA C22.2 NO. 213-M1987 - Ed 1, CSA C22.2NO. 60079-0:11 - Ed 2,
    CSA C22.2 NO. 60079-11:14 - Ed 2, CSA C22.2 NO. 60079-15:12 - Ed 1, CSA C22.2 NO. 60079-31:12 - Ed 1

SHEET 2 OF 2
9B1Y026 REV D

(Continued from previous page)

Figure 2-6b Wiring Diagram, Model MT3809, 4-20 mA Transmitter, One or Two Optical Alarms and PPU (continued)



(Continued on next page)

Figure 2-7a Wiring Diagram, Model MT3809, One or Two Inductive Alarms

1. This device is a Rosemount hand help communicator.
2. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE
3. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.
   AVERTISSMENT – RISQUE D'EXPLOSION. NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION A MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.
4. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS (AS APPLICABLE) OR NON-HAZARDOUS LOCATIONS ONLY.
   CET EQUIPEMENT CONVIENT POUR UTILISATION CLASSE I, DIVISION 2, GROUPES (TOUS) OU LOCATIONS NON-DANGEREUSES SEULEMENT.
5. WARNING – ENCLOSURE CONTAINS ALUMINUM. PRECAUTIONS MUST BE TAKEN TO AVOID IGNITION DUE TO IMPACT.
   AVERTISSEMENT- LE BOÎTIER CONTIENS DE L'ALUMINIUM. DES PRÉCAUTIONS S'APPLIQUENT POUR ÉVITER L'IGNITION PAR IMPACT.
6. WARNING – FROM A SAFETY POINT OF VIEW THE CIRCUITS SHALL BE ASSUMED TO BE CONNECTED TO EARTH
   AVERTISSEMENT: PAR SÉCURITÉ LES CIRCUITS DEVRAIENT ÊTRE RELIÉS À LA MISE À LA TERRE.
7. Note for cULus approvals units: For devices using cable gland at field installation the following cable gland shall be used - American IP67 cable gland for the aluminum housing and an American rated IP68 cable gland for the Stainless steel and high temperature housings.
8. Standards use for evaluation:
   US Standards: UL 60079-31 - Ed 2, UL 60079-15 - Ed 4, UL 60079-0 - Ed 6, ISA 12.12.01
   Canadian Standards: CSA C22.2 NO. 213-M1987 - Ed 1, CSA C22.2 NO. 60079-0:11 - Ed 2,
   CSA C22.2 NO. 60079-15:12 - Ed 1, CSA C22.2 NO. 60079-31:12 - Ed 1

   Notes 9 through 12 are not applicable for cULus certification

CONTROLLED DRAWING
No Revision Without Prior Agency Approval (Refer to Document ENG-0041)

9. Entity Parameters:
   In type of protection Ex ia IIC/IIIC or Ex ic IIC/IIIC, only for connection to a certified intrinsically safe circuit, with following maximum values.

	Ui,V	Ii, mA	Pi, mW	Ci, nF	Li, µH	Recommended Barrier #
Inductive High Alarm circuits (terminals «+» and «-») – for connection of circuits Pepperl+Fuchs mod. SJ 3.5-SN type 2	10,6	19,1	51	30	100	Pepperl & Fuchs: KFA5-SR2-EX2.W or KFA6-SR2-EX2.W
Inductive Low Alarm circuits (terminals «+» and «-») – for connection of circuits Pepperl+Fuchs mod. SJ 3.5-SN type 2	10,6	19,1	51	30	100	Pepperl & Fuchs: KFA5-SR2-EX2.W or KFA6-SR2-EX2.W

10. The intrinsically safe device does not provide 500 V isolation with respect to earth. Associated apparatus used must be galvanically isolated or dual channel shunt zener diode barriers with linear outputs used channel to channel.
11. Selected associated apparatus must be third party listed as providing intrinsically safe circuits for the application, and have Voc or Vt not exceeding Vmax (or Uo not exceeding Ui), Isc or It not exceeding Imax (or Io not exceeding Ii), and the Po of the associated apparatus must be less than or equal to the Pmax or Pi of the intrinsically safe equipment, as shown in Table 1.
12. Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in Table 1.
    Cable capacitance, Ccable, plus intrinsically safe equipment capacitance, Ci, must be less than the marked capacitance, Ca (or Co), shown on any associated apparatus used.
    The same applies for inductance (Lcable, Li and La or Lo, respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft., Lcable = 0.2 µH/ft.

TABLE 1:

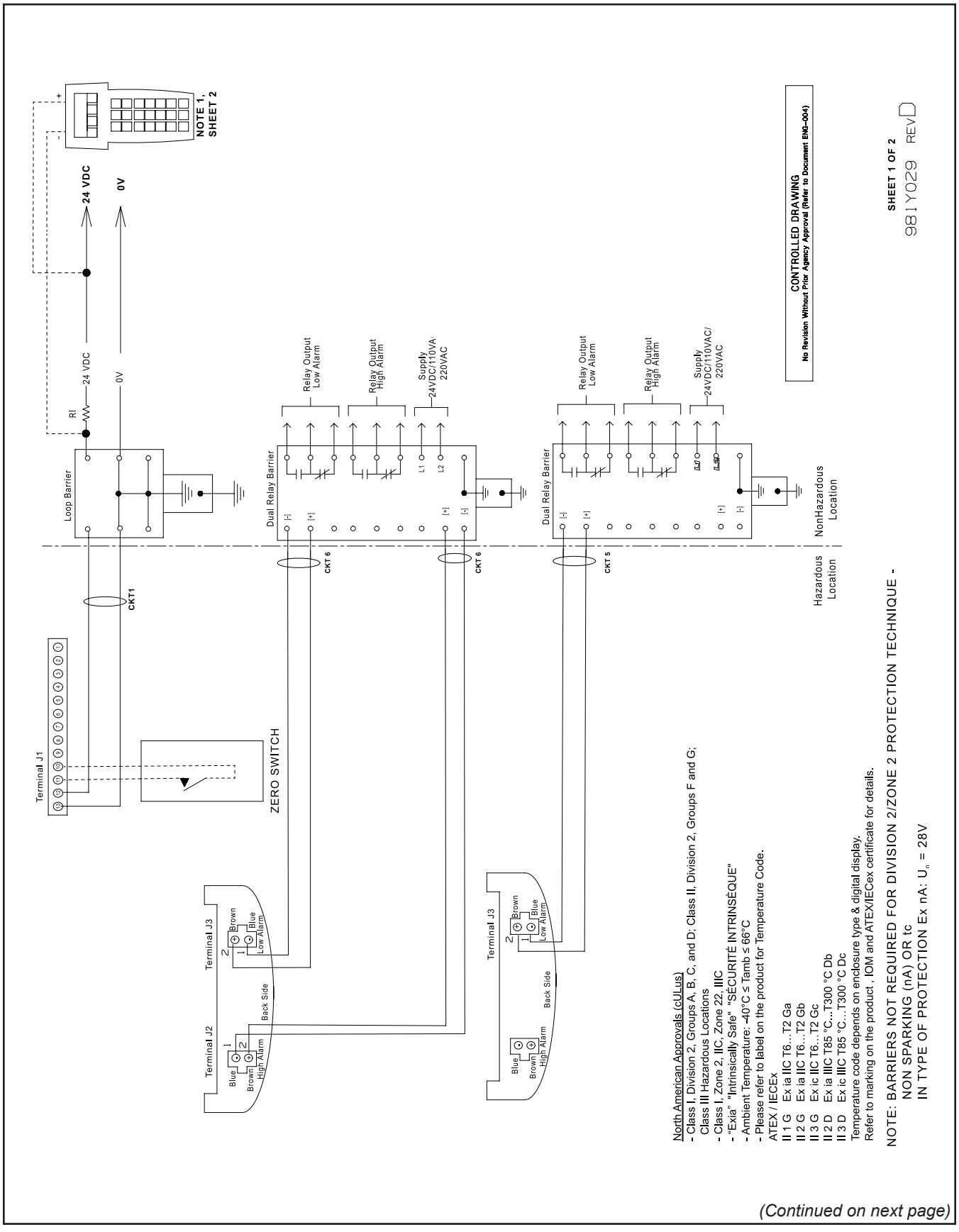
I.S. Equipment		Associated Apparatus
V max (or Ui)	≥	Voc or Vt (or Uo)
I max (or Ii)	≥	Isc or It (or Io)
Pmax (or (Pi)	≥	Po
Ci + Ccable	≤	Ca (or Co)
Li + Lcable	≤	La (or Lo)

If Po of the associated apparatus is not known, it may be calculated using the formula Po = (Voc * Isc)/4 = (Uo * Io)/4.

SHEET 2 OF 2
98190028 REV D

(Continued from previous page)

Figure 2-7b Wiring Diagram, Model MT3809, One or Two Inductive Alarms (continued)



(Continued on next page)

Figure 2-8a Wiring Diagram, Model MT3809, 4-20 mA Transmitter, One or Two Inductive Alarms

1. This device is a Rosemount hand help communicator.
2. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY, AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE
3. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.
   AVERTISSMENT – RISQUE D'EXPLOSION. NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.
4. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS (AS APPLICABLE) OR NON-HAZARDOUS LOCATIONS ONLY.
   CET EQUIPEMENT CONVIENT POUR UTILISATION CLASSE I, DIVISION 2, GROUPES (TOUS) OU LOCATIONS NON-DANGEREUSES SEULEMENT.
5. WARNING – ENCLOSURE CONTAINS ALUMINUM. PRECAUTIONS MUST BE TAKEN TO AVOID IGNITION DUE TO IMPACT.
   AVERTISSEMENT- LE BOÎTIER CONTIENS DE L'ALUMINIUM. DES PRÉCAUTIONS S'APPLIQUENT POUR ÉVITER L'IGNITION PAR IMPACT.
6. WARNING – FROM A SAFETY POINT OF VIEW THE CIRCUITS SHALL BE ASSUMED TO BE CONNECTED TO EARTH
   AVERTISSEMENT: PAR SÉCURITÉ LES CIRCUITS DEVRAIENT ÊTRE RELIÉS À LA MISE À LA TERRE.
7. Note for cULus approvals units: For devices using cable gland at field installation the following cable gland shall be used - American IP67 cable gland for the aluminum housing and an American rated IP68 cable gland for the Stainless steel and high temperature housings.
8. Standards use for evaluation:
   US Standards: UL 60079-31 - Ed 2, UL 60079-15 - Ed 4, UL 60079-0 - Ed 6, ISA 12.12.01
   Canadian Standards: CSA C22.2 NO. 213-M1987 - Ed 1, CSA C22.2 NO. 60079-0:11 - Ed 2,
   CSA C22.2 NO. 60079-15:12 - Ed 1, CSA C22.2 NO. 60079-31:12 - Ed 1

   Notes 9 through 12 are not applicable for cULus certification

9. Entity Parameters:
   In type of protection Ex ia IIC/IIIC or Ex ic IIC/IIIC, only for connection to a certified intrinsically safe circuit, with following maximum values.

	Ui,V	Ii, mA	Pi, mW	Ci, nF	Li, µH	Recommended Barrier #
Signal 4-20mA (J1 terminals 12+ and 13-)	28	75	525	2,2	0.365	Stahl Type : 9001/01-280-075-101
Inductive High Alarm circuits (terminals «+» and «-») – for connection of circuits Pepperl+Fuchs mod. SJ 3,5-SN type 2	10,6	19,1	51	30	100	Pepperl & Fuchs: KFA5-SR2-EX2.W or KFA6-SR2-EX2.W
Inductive Low Alarm circuits (terminals «+» and «-») – for connection of circuits Pepperl+Fuchs mod. SJ 3,5-SN type 2	10,6	19,1	51	30	100	Pepperl & Fuchs: KFA5-SR2-EX2.W or KFA6-SR2-EX2.W
	Uo,V	Io, mA	Po, mW	Co, µF	Lo, mH	Notes
Remote zero loop signal (J1 terminals 10+ and 11-)	28	2,83	80	0.083	44	

10. The intrinsically safe device does not provide 500 V isolation with respect to earth. Associated apparatus used must be galvanically isolated or dual channel shunt zener diode barriers with linear outputs used channel to channel.
11. Selected associated apparatus must be third party listed as providing intrinsically safe circuits for the application, and have Voc or Vt not exceeding Vmax (or Uo not exceeding Ui), Isc or It not exceeding Imax (or Io not exceeding Ii), and the Po of the associated apparatus must be less than or equal to the Pmax or Pi of the intrinsically safe equipment, as shown in Table 1.
12. Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in Table 1.
    Cable capacitance, Ccable, plus intrinsically safe equipment capacitance, Ci, must be less than the marked capacitance, Ca (or Co), shown on any associated apparatus used. The same applies for inductance (Lcable, Li and La or Lo, respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft., Lcable = 0.2 µH/ft.

TABLE 1:

I.S. Equipment		Associated Apparatus
V max (or Ui)	≥	Voc or Vt (or Uo)
I max (or Ii)	≥	Isc or It (or Io)
Pmax (or (Pi)	≥	Po
Ci + Ccable	≤	Ca (or Co)
Li + Lcable	≤	La (or Lo)

If Po of the associated apparatus is not known, it may be calculated using the formula Po = (Voc * Isc)/4 = (Uo * Io)/4.

CONTROLLED DRAWING
No Revision Without Prior Agency Approval (Refer to Document ENG-004)

SHEET 2 OF 2
981Y029 REV D

(Continued from previous page)

Figure 2-8b Wiring Diagram, Model MT3809, 4-20 mA Transmitter, One or Two Inductive Alarms (continued)

2-6-2 4-20 mA/HART Transmitter Division 2 Installation

If the area classification is Division 2, a barrier is not required and cable parameters are not applicable. The electrical code will require the use of conduit for wire protection. Refer to Figure 2-5a/2-5b.

2-6-3 4-20 mA/HART Transmitter Flameproof Installation

For flameproof installation, the optional explosion proof enclosure is required and explosion proof installation methods must be followed. Refer to Figure 2-9.

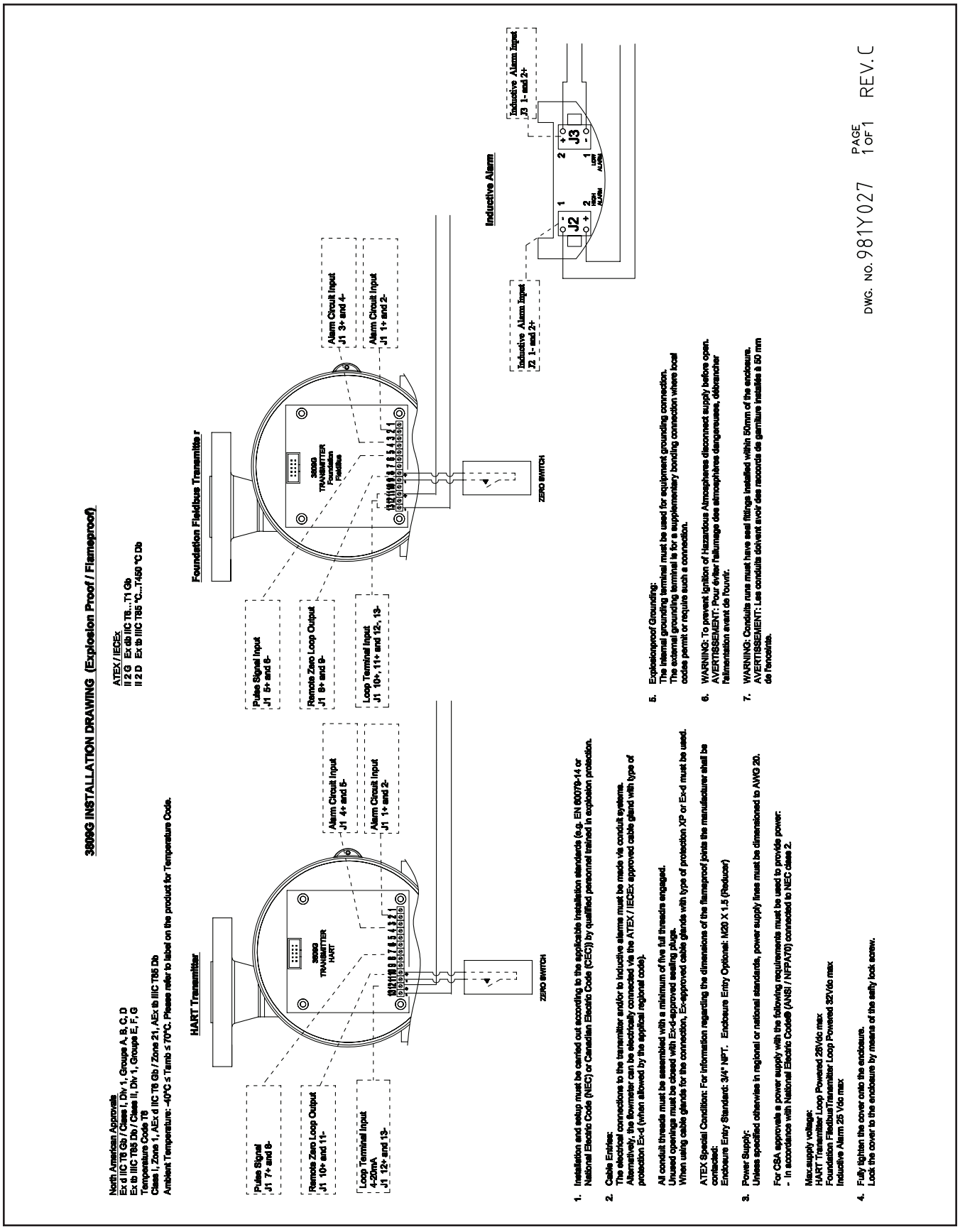


Figure 2-9 Wiring Diagram, Model MT3809 Explosion Proof with Transmitter and/or Inductive Alarm

2-7 Electrical Connections to MT3809 with FOUNDATION Fieldbus Transmitter, Alarms and Pulse Output

⚠ WARNING

If it becomes necessary to service or remove the instrument from the system, power to the device is disconnected at the power supply.

a) Before electrical connection, install the meter into the pipeline as described in previous Section 2-5.

b) For electrical installation follow the general FOUNDATION Fieldbus practices and take the following into account:

i. To avoid electrical interference and to meet the Electro Magnetic Compatibilty (EMC directive) requirements, use shielded twisted pair cables.

ii. In case of installation into explosion hazardeous environments it is important to eliminate a potential incentive level of circulating current through the cable shield in the event that there are local differences in chassis ground potential between the two ends of the cable. Therefore, cable shields shall be connected to chassis ground (earth) in accordance with the applicable regional & local installation code. A terminal screw inside the device allows for shield to chassis connection in case the applicable installation regulation requires earthing at the transmitter end.

iii. Ensuring a properly specified power supply:
- Bus supply voltage 9 .. 32 Vdc
- Nominal current 12mA

iv. Use cables as specified in IEC 61158-2. Stay below the maximum allowable cable length which depends upon the cable specifications, the number of network devices and the network topology. Connect the transmitter to the network following IEC 61158-2.

c) The housing of the transmitter should be grounded in accordance with the applicable installation regulations. When the device is not sufficiently grounded via the process cables, a grounding terminal screw is available on the transmitter housing for earth connection.

d) Transmitter wiring connection diagrams are given in Section 2-7-1 Ensure that the installation complies with given hazardous area protection requirements.

e) Transmitter wiring connection diagrams are given is Section 2-7-1. Ensure that installation complies with given hazardous area protection requirements.

i. Intrinsically safe installations require the use of barriers, power supply limits and cable parameters as shown in the installation diagram. All connections are made in the transmitter housing.
Refer to Figures 2-5a/2-5b and 2-8a/2-8b.

ii. If the area classification is Division 2, barriers are not required and cable parameters are not applicable. However, the electrical code will require the use of conduit for wire protection.
Refer to Figures 2-5a/2-5b and 2-8a/2-8b.

iii. For flameproof installation the optional explosion proof enclosure is required and explosion proof installation methods must be followed.
Refer to Figure 2-9.

⚠ WARNING

To prevent ignition of hazardous atmospheres and serious personal injury, proper installation methods must be used as defined in Article 505 of the National Electrical Code, and the Canadian Electrical Code and ISA Standard 12.6 and in accordance with Cenelec regulations.

f) Common transmitter parameters are set during manufacturing at Brooks Instrument based on order information, meter configuration or defaults inherent to the transmitter. Further detailed configurations as well as on-line monitoring can be done through the FOUNDATION Fieldbus communication protocol.See Foundation Fieldbus supplemental manual (X-DPT-FF-MT3809G-Alarms-eng).

g) After installation and power up of the transmitter, the transmitter must be zeroed, both electrically and mechanically. This operation will compensate for any stray magnetic effects in the vicinity of the transmitter.

Important: The zero adjusting of the pointer influences the transmitter indication, but not the other way around. Therefore, first adjust the pointer at the zero flow position, then the transmitter must be zeroed.

i. Flow must be verified to be zero during the entire zeroing.
ii. With the flow at zero and the float at the zero flow position, adjust the mechanical indicator to point to the ‘R’ (reference line) using the adjustment screw on the face of the pointer, next to the hub. See Figure 2-10.

Using a flat blade screwdriver with a 1/8" blade, hold the pointer and turn the screw to align with the “R” on the scale.

It may take a few adjustments to get the pointer on the “R”.

Figure 2-10 Mechanical Indicator Zero

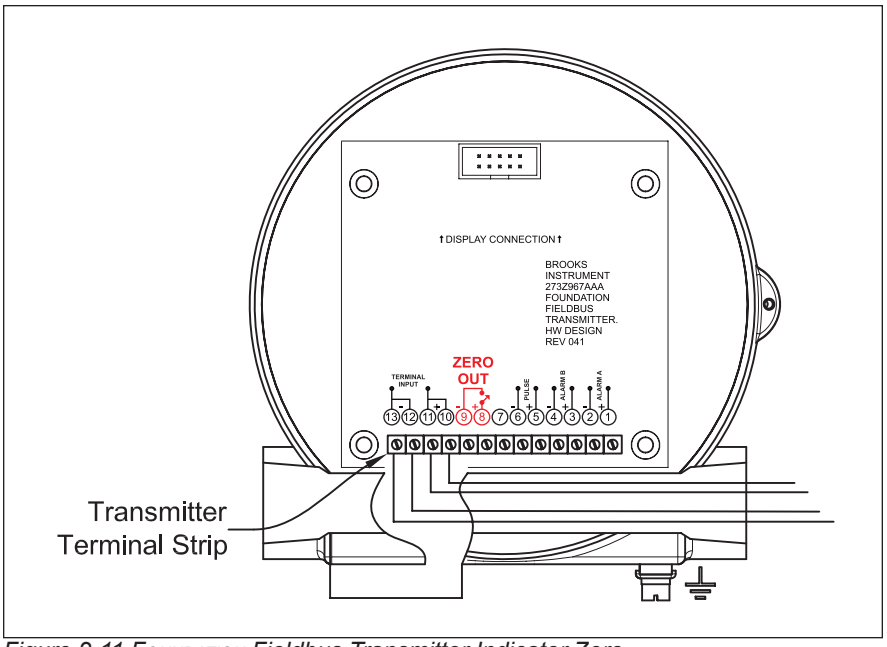


Figure 2-11 FOUNDATION Fieldbus Transmitter Indicator Zero

iii. Then, zero the transmitter shorting the two pins at the terminal block, See Figure 2-11.
Note: The zero function may be activated as part of a periodical maintenance check. If desired, a zero switch can be remotely mounted and wired to these terminals. The hazardous area classification will determine the wiring methods used for this switch.

h) Under actual flow conditions, verify that the transmitter output matches the mechanical pointer position. If a discrepancy is noted, the FOUNDATION Fieldbus communication can be used to verify or adjust the transmitter settings.

Transmitter with alarm and pulse output wiring connections:
The alarm contact and pulse output digital signals are electrically identical, independent, optically coupled transistor outputs. Wiring will be as required by the external driven system - Prover, DCS/PLC, terminal-automation system, batch controller etc. These can be wired as an open collector or open signal on the high or low side of voltage-rail within the receiving equipment, depending upon the signal needs. When interfacing to external electronics, be careful to work within the voltage/current polarity and limits as specified in Section 1.

To install the typical transmitter alarms and/or pulse digital outputs configuration:

i. Intrinsically safe installations require the use of barriers, power supply limits and cable parameters. All connections are made in the transmitter housing.
Refer to Table 1-12 in approvals section and Figures 2-5a/2-5b and 2-8a/2-8b.

ii. If the area classification is Division 2, barriers are not required and cable parameters are not applicable. However, the electrical code will require the use of conduit for wire protection.

Refer to Figures 2-5a/2-5b and 2-8a/2-8b.

iii. For flameproof installation the optional explosion proof enclosure is required and explosion proof installation methods must be followed. Refer to Figure 2-9.

a. The shielded cable must be used for hook up. In case of installation into explosion hazardeous environments it is important to eliminate a potential incentive level of circulating current through the cable shield in the event that there are local differences in chassis ground potential between the two ends of the cable. Therefore, cable shields shall be connected to chassis ground (earth) in accordance with the applicable regional & local installation code. A terminal screw inside the device allows for shield to chassis connection in case the applicable installation regulation requires earthing at the transmitter end.
b. The pulse and alarm outputs function as isolated switch closures (optically isolated open collector) and must be supplied with a power source, as shown in wiring diagram, Figure 2-6a/2-6b. Observe polarity and do not exceed 30 volts for the supply and limit load current to 20 mA for each output.

2-7-1 FOUNDATION Fieldbus Transmitter Intrinsically Safe Installation

For intrinsically safe installation, intrinsic safety barrier selection, cable parameters, and power limits, follow Figures 2-12 through 2-15.

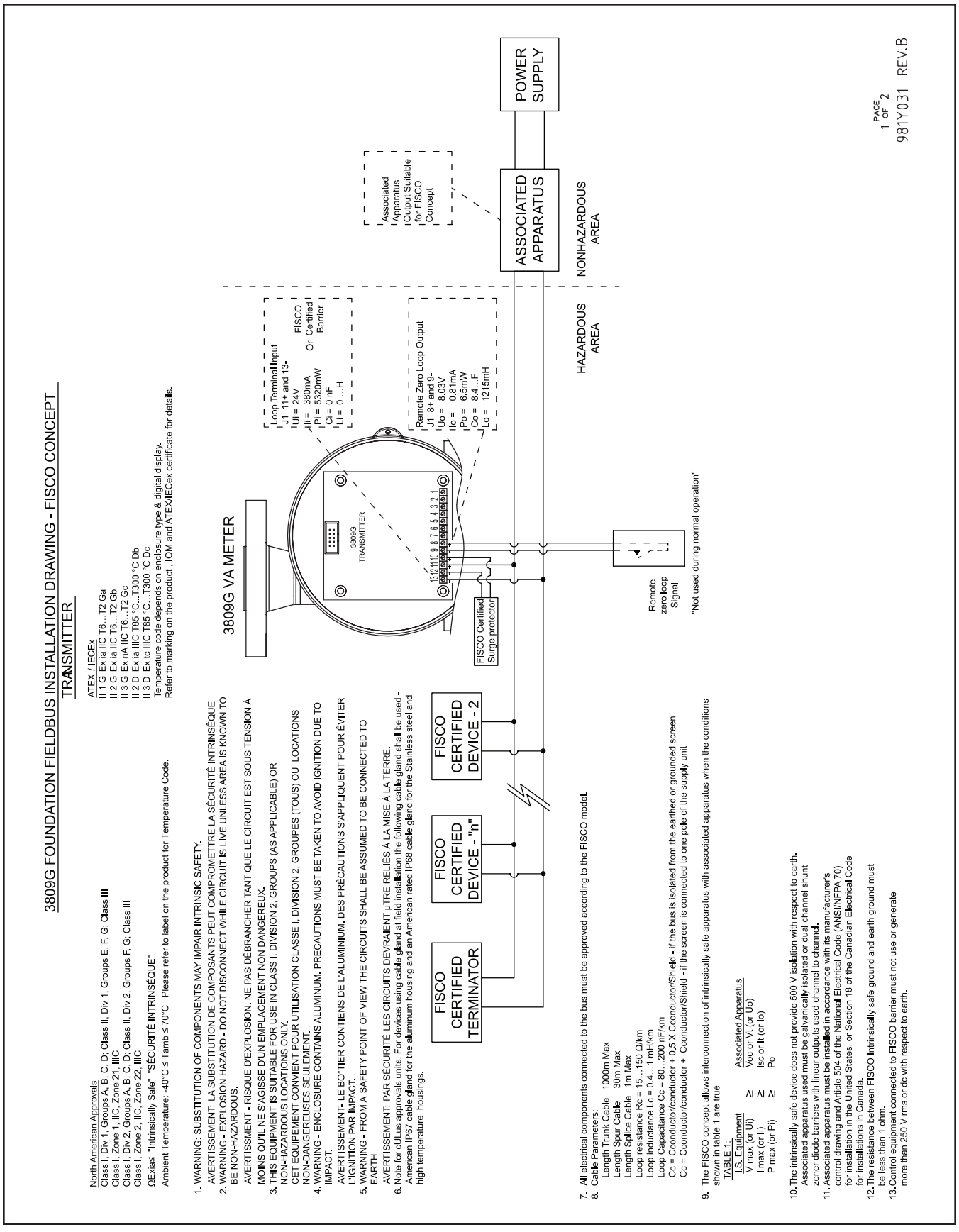


Figure 2-12 Wiring Diagram, Model MT3809, Foundation Fieldbus - FISCO Concept - Transmitter

3809G FOUNDATION FIELDBUS INSTALLATION DRAWING - ENTITY CONCEPT

TRANSMITTER

North American Approvals
Class I, Div 1, Groups A, B, C, D; Class II, Div 1, Groups E, F, G; Class III
Class I, Zone 1, IIC, Zone 21, IIIC
Class I, Div 2, Groups A, B, C, D; Class II, Div 2, Groups F, G; Class III
Class I, Zone 2, IIC, Zone 22, IIIC
ΩExia≤ "Intrinsically Safe" "SÊCURITÊ INTRINSÉQUE"
Ambient Temperature: -40°C ≤ Tamb ≤ 70°C Please refer to label on the product for Temperature Code.

ATEX / IECEx
II 1 G Ex ia IIC T6…T2 Ga
II 2 G Ex ia IIC T6…T2 Gb
II 3 G Ex nA IIC T6…T2 Gc
II 2 D Ex ia IIIC T85 °C...T300 °C Db
II 3 D Ex tc IIIC T85 °C…T300 °C Dc
Temperature code depends on enclosure type & digital display.
Refer to marking on the product , IOM and ATEX/IECex certificate for details.

1. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
   AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÊCURITÊ INTRINSÊQUE
2. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.
   AVERTISSMENT - RISQUE D'EXPLOSION. NE PAS DÊBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.
3. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS (AS APPLICABLE) OR NON-HAZARDOUS LOCATIONS ONLY.
   CET EQUIPEMENT CONVIENT POUR UTILISATION CLASSE I, DIVISION 2, GROUPES (TOUS) OU LOCATIONS NON-DANGEREUSES SEULEMENT.
4. WARNING - ENCLOSURE CONTAINS ALUMINUM. PRECAUTIONS MUST BE TAKEN TO AVOID IGNITION DUE TO IMPACT.
   AVERTISSEMENT- LE BO"TIER CONTIENS DE L'ALUMINIUM. DES PRÊCAUTIONS S'APPLIQUENT POUR ÊVITER L'IGNITION PAR IMPACT.
5. WARNING - FROM A SAFETY POINT OF VIEW THE CIRCUITS SHALL BE ASSUMED TO BE CONNECTED TO EARTH
   AVERTISSEMENT: PAR SÊCURITÊ LES CIRCUITS DEVRAIENT µTRE RELIÊS À LA MISE À LA TERRE.
6. Note for cULus approvals units: For devices using cable gland at field installation the following cable gland shall be used - American IP67 cable gland for the aluminum housing and an American rated IP68 cable gland for the Stainless steel and high temperature housings.
7. Selected associated apparatus must be third party listed as providing intrinsically safe circuits for the application.
8. The entity concept allows interconnection of intrinsically safe apparatus with associated apparatus when the conditions shown in table 1 are true

TABLE 1:

I.S. Equipment		Associated Apparatus
V max (or Ui)	≥	Voc or Vt (or Uo)
I max (or Ii)	≥	Isc or It (or Io)
P max (or Pi)	≥	Po
Ci + Ccable	≥	Ca (or Co)
Li + Lcable	≤	La (or Lo)

Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft., Lcable = 0.2 µH/ft. If Po of the associated apparatus is not known, it may be calculated using the formula Po = (Voc * Isc)/4 = (Uo * Io)/4.

9. The intrinsically safe device does not provide 500 V isolation with respect to earth. Associated apparatus used must be galvanically isolated or dual channel shunt zener diode barriers with linear outputs used channel to channel.
10. Associated apparatus must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electrical Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada.
11. The resistance between Intrinsically safe ground and earth ground must be less than 1 ohm.
12. Where multiple circuits extend from the same piece of intrinsically safe equipment to associated apparatus, they must be installed in separate cables or in one cable having suitable insulation. Refer to Article 504.30(B) of the National Electrical Code (ANSI/NFPA 70) and Instrument Society of America Recommended Practice ISA RP12.6 for installing intrinsically safe equipment.
13. Control equipment connected to barrier must not use or generate more than 250 V rms or dc with respect to earth.
14. "nA": non-sparking/non-incendive / "tc": protection by enclosure (Division 2 / Zone 2).
    Install per National Electrical Code (NEC) or applicable regional electrical code.
    Intrinsic safety barrier not required.
    Max.supply voltage 32V

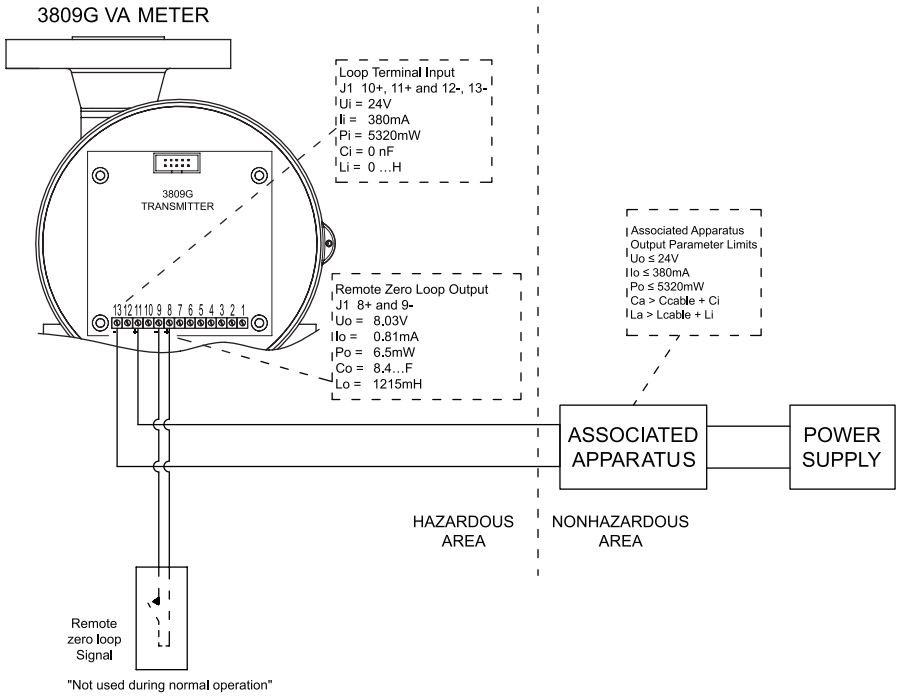


Figure 2-13 Wiring Diagram, Model MT3809, Foundation Fieldbus - Entity Concept - Transmitter

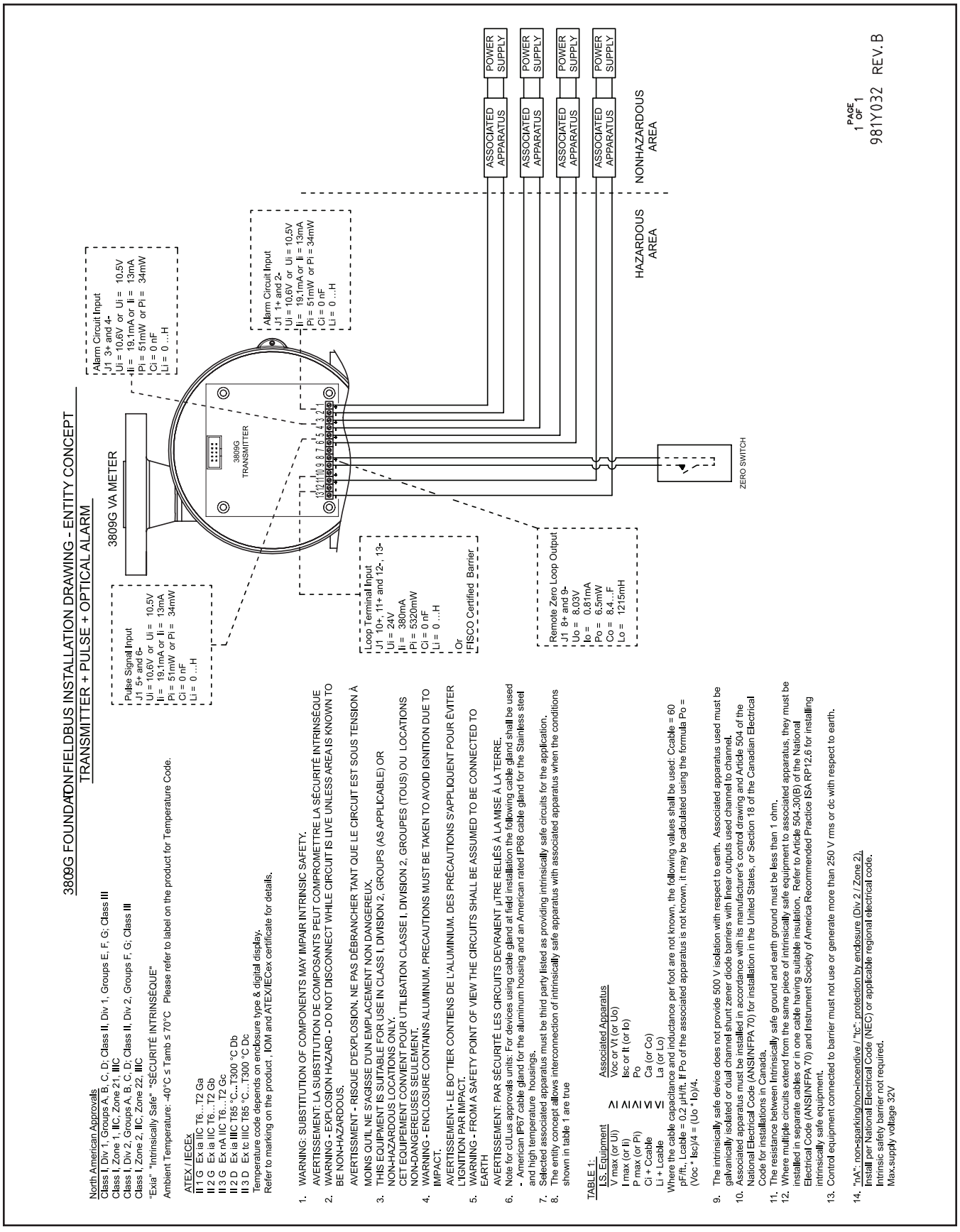


Figure 2-14 Wiring Diagram, Model MT3809, Foundation Fieldbus - Entity Concept - Transmitter - Pulse - Alarm Contacts

3809GFOUNDATION FIELDBUS INSTALLATION DRAWING - ENTITY CONCEPT
TRANSMITTER + INDUCTIVE ALARMS

North American Approvals
Class I, Div 1, Groups A, B, C, D; Class II, Div 1, Groups E, F, G; Class III
Class I, Zone 1, IIC, Zone 21, IIIC
Class I, Div 2, Groups A, B, C, D; Class II, Div 2, Groups F, G; Class III
Class I, Zone 2, IIC, Zone 22, IIIC
"Exia" "Intrinsically Safe" "SÉCURITÉ INTRINSÈQUE"
Ambient Temperature: -40°C ≤ Tamb ≤ 70°C. Please refer to label on the product for Temperature Code.

ATEX / IECEx
II 1 G Ex ia IIC T6…T2 Ga
II 2 G Ex ia IIC T6…T2 Gb
II 3 G Ex ic IIC T6…T2 Gc
II 2 D Ex ia IIIC T85 °C...T300 °C Db
II 3 D Ex ic IIIC T85 °C…T300 °C Dc
Temperature code depends on enclosure type & digital display.
Refer to marking on the product , IOM and ATEX/IECex certificate for details.

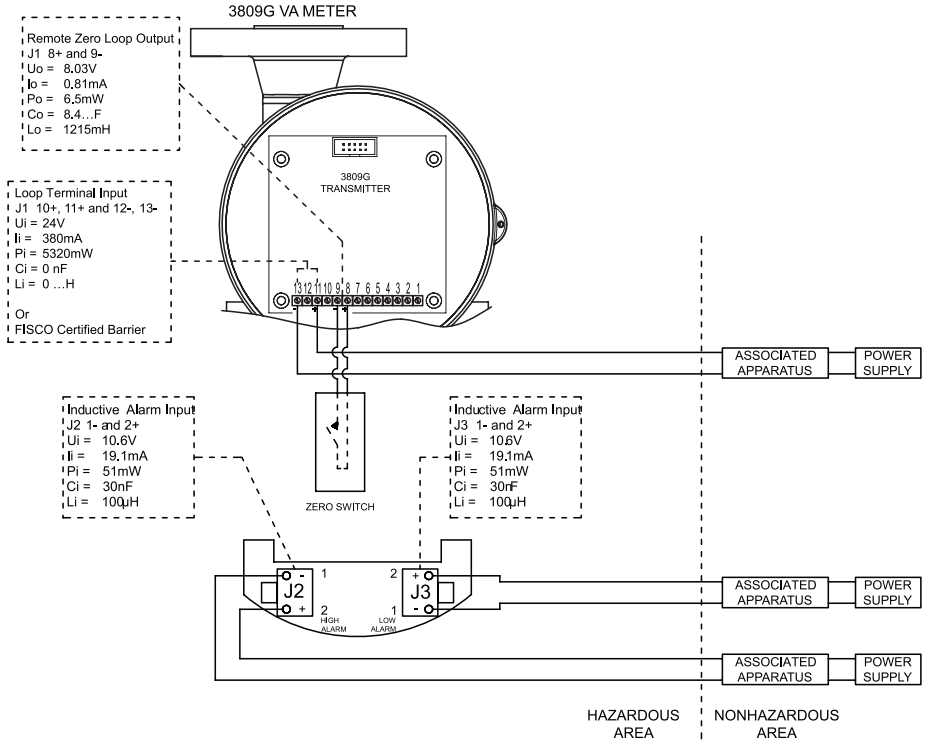
1. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
   AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÊCURITÊ INTRINSÊQUE
2. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.
   AVERTISSMENT - RISQUE D'EXPLOSION. NE PAS DÊBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.
3. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS (AS APPLICABLE) OR NON-HAZARDOUS LOCATIONS ONLY.
   CET EQUIPEMENT CONVIENT POUR UTILISATION CLASSE I, DIVISION 2, GROUPES (TOUS) OU LOCATIONS NON-DANGEREUSES SEULEMENT.
4. WARNING - ENCLOSURE CONTAINS ALUMINUM. PRECAUTIONS MUST BE TAKEN TO AVOID IGNITION DUE TO IMPACT.
   AVERTISSEMENT- LE BO"TIER CONTIENS DE L'ALUMINIUM. DES PRÊCAUTIONS S'APPLIQUENT POUR ÊVITER L'IGNITION PAR IMPACT.
5. WARNING - FROM A SAFETY POINT OF VIEW THE CIRCUITS SHALL BE ASSUMED TO BE CONNECTED TO EARTH
   AVERTISSEMENT: PAR SÊCURITÊ LES CIRCUITS DEVRAIENT µTRE RELIÊS À LA MISE À LA TERRE.
6. Note for cULus approvals units: For devices using cable gland at field installation the following cable gland shall be used - American IP67 cable gland for the aluminum housing and an American rated IP68 cable gland for the Stainless steel and high temperature housings.
7. Selected associated apparatus must be third party listed as providing intrinsically safe circuits for the application.
8. The entity concept allows interconnection of intrinsically safe apparatus with associated apparatus when the conditions shown in table 1 are true

TABLE 1:

I.S. Equipment		Associated Apparatus
V max (or Ui)	≥	Voc or Vt (or Uo)
I max (or Ii)	≥	Isc or It (or Io)
P max (or Pi)	≥	Po
Ci + Ccable	≥	Ca (or Co)
Li + Lcable	≥	La (or Lo)

Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft., Lcable = 0.2 µH/ft. If Po of the associated apparatus is not known, it may be calculated using the formula
Po = (Voc * Isc)/4 = (Uo * Io)/4.

9. The intrinsically safe device does not provide 500 V isolation with respect to earth. Associated apparatus used must be galvanically isolated or dual channel shunt zener diode barriers with linear outputs used channel to channel.
10. Associated apparatus must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electrical Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada.
11. The resistance between Intrinsically safe ground and earth ground must be less than 1 ohm.
12. Where multiple circuits extend from the same piece of intrinsically safe equipment to associated apparatus, they must be installed in separate cables or in one cable having suitable insulation. Refer to Article 504.30(B) of the National Electrical Code (ANSI/NFPA 70) and Instrument Society of America Recommended Practice ISA RP12.6 for installing intrinsically safe equipment.
13. Control equipment connected to barrier must not use or generate more than 250 V rms or dc with respect to earth.
14. "nA": non-sparking/non-incendive / "tc": protection by enclosure (Div 2 / Zone 2).
    Install per National Electrical Code (NEC) or applicable regional electrical code.
    Intrinsic safety barrier not required.
    Max.supply voltage Alarm 25 Vdc max; Transmitter Loop Powered 32Vdc max



PAGE 1 OF 1
981Y033 REV. B

Figure 2-15 Wiring Diagram, Model MT3809, Foundation Fieldbus - Entity Concept - Transmitter - Inductive Alarms

2-8 Installation of the Model MT3809 Flowmeter with Inductive Alarms (1 or 2 switches)

⚠ WARNING

If it becomes necessary to service or remove the instrument from the system, power to the device is disconnected at the power supply.

⚠ WARNING

To prevent ignition of hazardous atmospheres and serious personal injury, proper installation methods must be used as defined in Article 505 of the National Electrical Code, and the Canadian Electrical Code and ISA Standard 12.6 and in accordance with Cenelec regulations.

a. Install the meter as described in Section 2-5

b. Install the inductive alarms (1 or 2 switches) following the wiring instructions given in Section 2-6 or 2-7, depending on the configuration (with or without HART or FOUNDATION™ Fieldbus transmitter)

c. Intrinsically safe installations require the use of relay isolators for the alarms and a barrier for the transmitter, if equipped. Power supply limits and cable parameters must be as shown in the applicable installation diagram from Section 2-6. or 2-7.

d. If the area classification is Division 2, the transmitter barrier and cable parameters are not applicable. However for proper operation of the inductive alarms, the relay isolators must be used. The electrical code will require the use of conduit for wire protection.

e. For flameproof installation the optional explosion proof enclosure is required and explosion proof installation methods must be followed. For proper operation of the inductive switches, the relay isolators must be used.

f. The shielded cable must be used for hook up. The shields should beconnected to chassis ground at the transmitter/alarm end and should be taped up and not connected at the receiver end. The taping and insulation of the shields at the receiving end is especially important for intrinsically safe installations.

g. The relay isolator has built in power handling contacts. Refer to the specifications for these ratings.

h. The pointer must be adjusted to the reference line on the scale using the adjustment screw on the face of the pointer, next to the hub. See Figure 2-16.

i. Proper operation of the inductive alarms can be determined by manually rotating the mechanical pointer and observing the status lights on the relay isolator. The small alarm pointers indicate the alarm trip points. Changes to the set points can be made by loosening the pointer screws and repositioning the pointers.

Using a flat blade screwdriver with a 1/8" blade, hold the pointer and turn the screw to align with the “R” on the scale.

It may take a few adjustments to get the pointer on the “R”.

Figure 2-16 Mechanical Indicator Zero

3 Operation

3-1 Start-up and Operation of Flowmeter

⚠WARNING

Operating Procedure: Do not operate this instrument in excess of the specifications listed in Section 1. Before bringing the unit into operation, make sure that all fluid connections have been correctly tightened and that all electrical connections where applicable have been made. Failure to heed this warning can result in serious personal injury and/or damage to the equipment.

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

b. Check for leaks around the meter inlet and outlet connections. If no leaks are present, bring the system up to operating pressure.

⚠ CAUTION

Any sudden change in system pressure may cause mechanical damage to elastomer materials. Damage can occur when there is a rapid expansion of fluid that has permeated elastomer materials. The user must take the necessary precautions to avoid such conditions.

c. At no flow condition the indicator pointer should align with the “R” mark on the scale. If necessary, adjust the pointer as per directions in the Maintenance Section 4.

3-2 Operation of the Model MT3809 Flowmeter with a Transmitter with or without Optional Alarms and Pulse Output for Totalization

***** Start-up the meter as described in Section 3-1.
* Programming performed prior to shipment (parameters).
The transmitter with or without alarms and pulse output is preprogrammed prior to shipment for the following parameters based on the order information, meter configuration and application. If parameters are not specified in the customer purchase order, the defaults inherent to the electronics will be as shown in (parenthesis).

Transmitter only pre-programmed parameters	**Transmitter plus alarms and pulse output preprogrammed parameters**
Model Number	Alarm LoLimit (0% FS flow)
Serial Number	Alarm HiLimit (100% FS flow)
Tag Name (blank)	Pulse output units (1 ppl)
Flow Rate units of measure (lpm)	Resettable totalizer units of measure (lit.)
Low Flow cutoff (8% FS flow) (lit.)	Inventory totalizer units of measurement
Calibration factor (% scales only)	
Analog Output LoRange (4 mA @ 0% flow)	
Analog Output HiRange (20 mA @ 100% flow)	

* Manual programming or reprogramming of the electronics.
Programming of the transmitter with or without alarms and pulse output may also be done locally via an HART or FOUNDATION Fieldbus Communicator. Please refer to the manual of the communicator for detailed description.

***** Recalibration of transmitter output (spanning high and low)
At any time after factory calibration, shipment, installation, or service, the transmitter can be recalibrated by overwriting any of the previous calibration point-pairs, assuming that the user can provide a series of accurate rates of flow through the meter. If preferred, the meter with transmitter may be returned for recalibration at the Brooks service department for a fee.

***** Basic transmitter setup parameters
These are meter identification parameters set prior to shipment of the meter.
Flowmeter identification: Model number, serial number, tag name.
Flowmeter configuration: Low flow cutoff, calibration factor, flow rate units of measure.
Transmitter analog output: Analog output HiRange, analog output LoRange.

***** Optional programmable alarm and pulse output parameters and features

Alarm contact output: HiLimit, LoLimit
Latching or non-latching option shall be added for contact outputs.

3-3-1 Communication with HART Transmitter using Device Descriptor

The structure of the device descriptor for the HART transmitter is given in Figures 3-1 and 3-2.
The alarms may be set at the minimum and maximum flow rate or at any

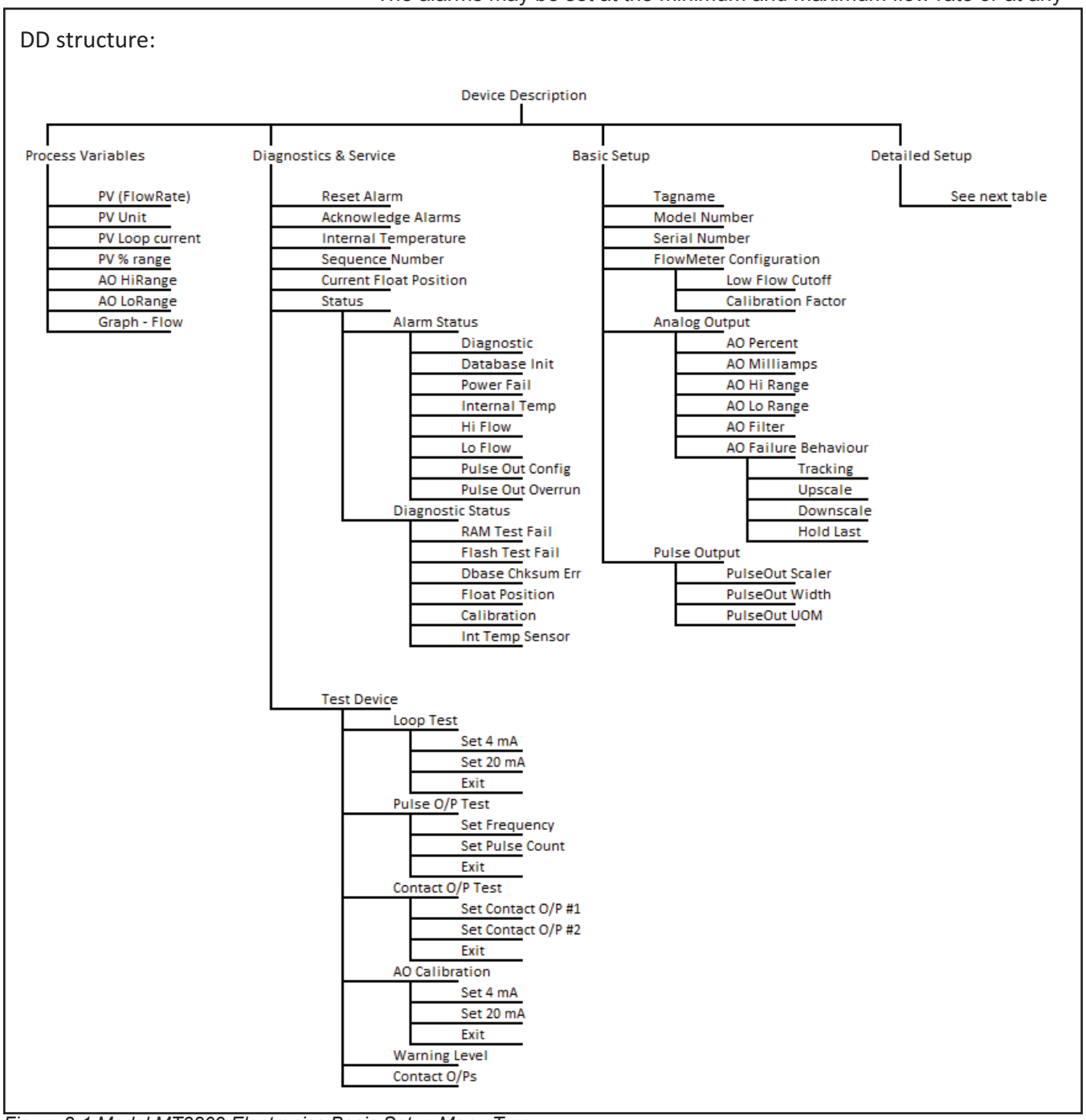


Figure 3-1 Model MT3809 Electronics Basic Setup Menu Tree

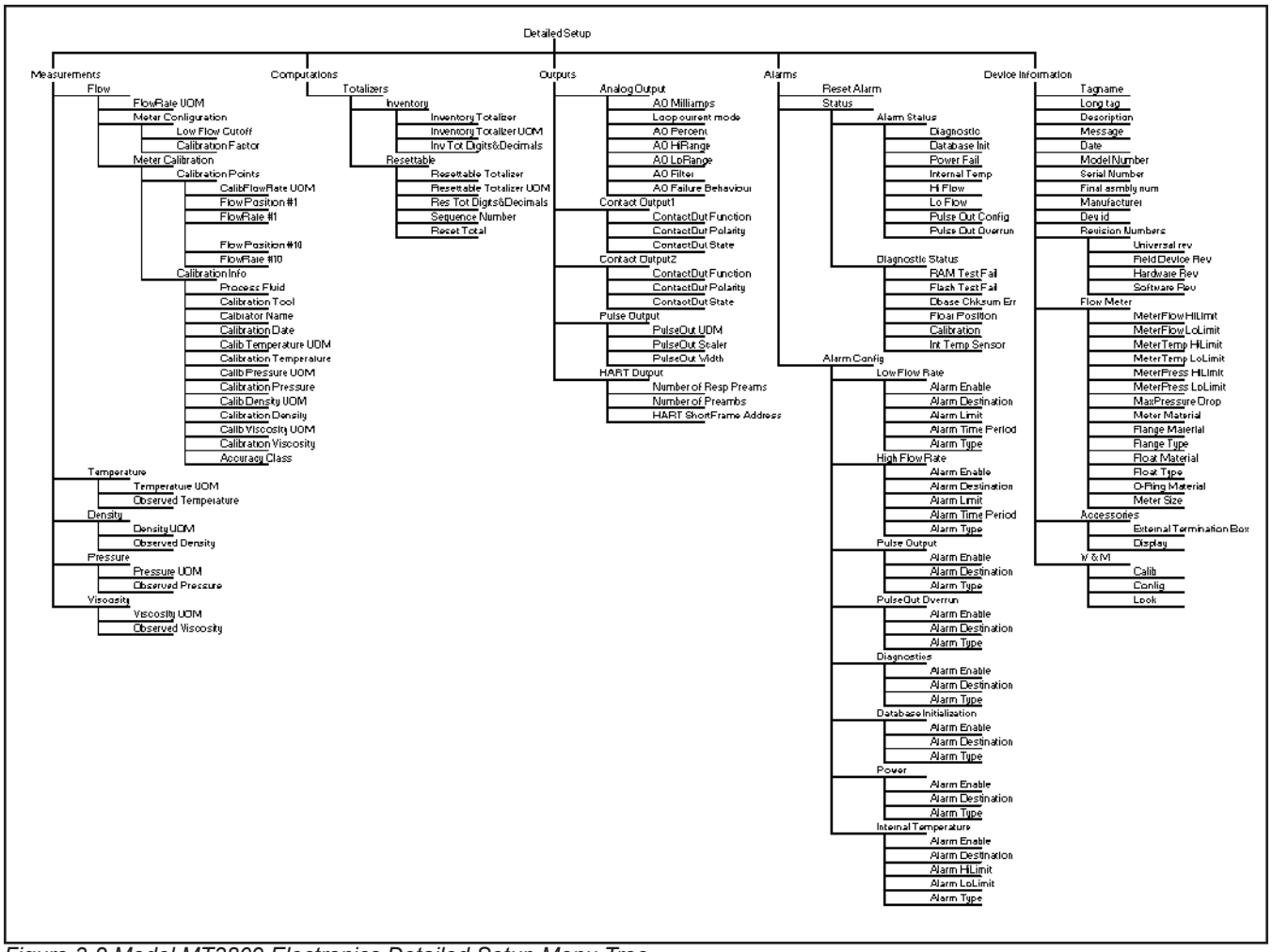


Figure 3-2 Model MT3809 Electronics Detailed Setup Menu Tree

other preferred high and low limits. The units of measure of the alarm limits are the same units of measure as the process variable itself.

Computations: Totalization
Totalizers are available in both resettable and inventory options. Resettable totalization is used for batching while inventory totalization measures the total volume over time. Units of measure are set independently for each of these options.

Pulse output: Pulse out scaler, pulse out width
The transmitter has a pulse output channel that indicates flow rate as a variable frequency and therefore can pass information to many types of external equipment such as batch controllers, automation systems or provers. The output pulse width default is 1 millisec but may be user-configured since certain external receiving equipment cannot keep up with high incoming frequency.

Low flow cutoff warning for pulse output and totalization
The low flow cutoff parameter can be programmed to signal when the flow level is below which the process is intended. Below this level, the totalizer will assume that the flow rate is actually zero and that no data should be accumulated by the totalizers.

Pulse output overrun alarm
If a larger than acceptable output pulse width is configured, totalizer pulses may be delayed or queued. No loss of pulses will occur. The totalizer output pulses will to be sent until the queue is empty. Under these circumstances, an alarm message will be sent to the control station. However, the alarm can be disabled if not required.

Optional alarm configurations- enable, destination, alarm type (latching)
Three additional parameters may be programmed for process and diagnostic alarms to control functionality- enable, destination, and alarm type (latching). ‘Enable’ allows alarms to be enabled and disabled depending on use of the alarm. For example, if output pulses are being used it may be normal practice to delay (e.g. queue up) output pulses because of a slow receiving end-device that requires a wide pulse-width. The ‘enable’ parameter allows the user to *disable* the pulse output overrun alarm and not send an alarm when in fact pulse outputs are delayed by choice. Some critical diagnostic alarms, such as database initialization, can not be disabled or turned off. When an alarm occurs, it can be posted through the defined ‘destination’ digital contact closure outputs #1, #2 both or neither. Therefore the alarms may be managed according to local operating practices and the need to notify upstream control/safety systems.

An alarm may be posted at a designated destination only when the alarm situation is occurring or posted until the alarm is acknowledged by the operator. The decision to ‘latch or unlatch’ the alarm is controlled by setting the ‘alarm type’ parameter. By utilizing this optional parameter, the operator can see that there is an alarm as it is occurring (unlatched) or even after the fact, in the case when the operator did not directly observe the unit alarm (latched).

3-3-2 Communication with Foundation Fieldbus Transmitter

For details on the Foundation Fieldbus interface, refer to the supplemental manual (X-DPT-FF-MT3809G-Alarms-eng), also available on BrooksInstrument.com/Documentation

3-3-3 Communication with Transmitter using Local Operator Interface with LCD Display

The LCD display is a three line liquid crystal display. It can easily be programmed to provide basic information such as flow rates and product totalization. Configuration adjustments to upper/lower range values can also be performed using the display. Access to the display can be accomplished by removing the cover or by using the supplied magnet with the cover in place. Refer to Figure 3-4 for the menu tree for more details.

3-3-4 Adjusting Inductive Alarms (1 or 2 switches)

To modify the alarm set points, remove the front cover with gasket of the indicator housing by removing the four screws.
Set the alarm position by loosening the two pointer screws, moving the pointer to the desired alarm setting and tightening the screws.
Replace the indicator housing cover with gasket and secure with the four screws.

3-3-5 Simulate

Foundation Fieldbus specs require that the customer be able to access and enable/disable physical "simulate", this can be done by creating a short between Pin 9 and Pin 7 on the terminal strip. See Figure 3-3 below.

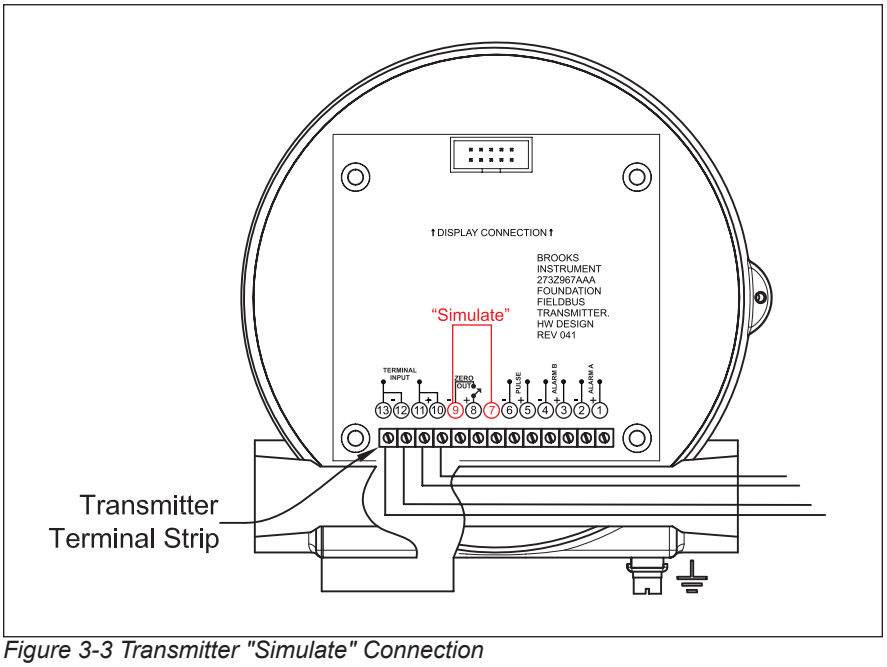


Figure 3-3 Transmitter "Simulate" Connection

Left LOI button = Scroll through options.
Right LOI button = Activate option.

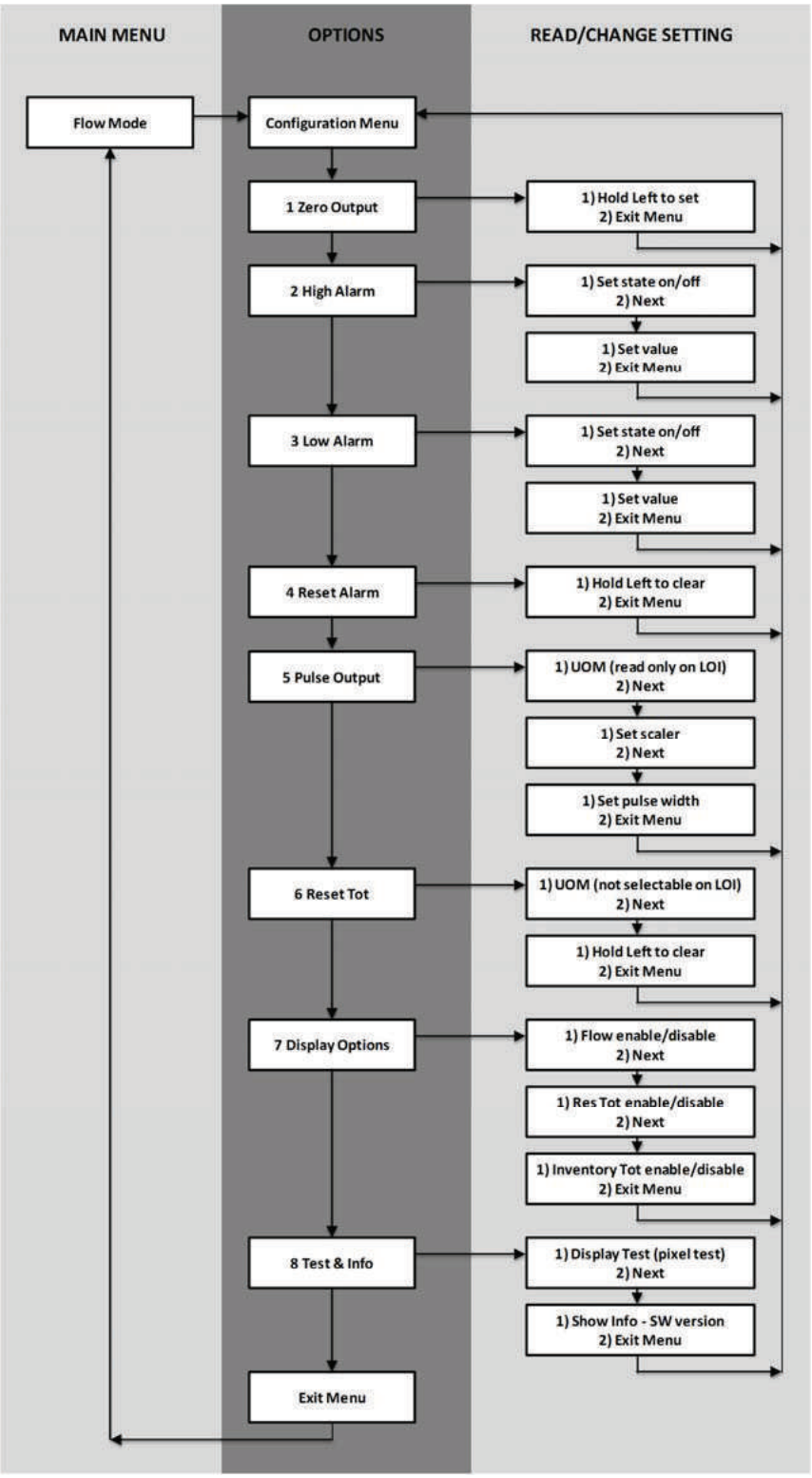


Figure 3-4 Model MT3809 Electronics LOI Chart Menu

4-1 General Service Information

There is no routine maintenance required for the Models MT3809 and MT3810 flowmeters. However should it become necessary to replace, adjust or remove components of the flowmeter, specific recommendations must be followed.

⚠ CAUTION

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

⚠ WARNING

If this equipment is not properly serviced, serious personal injury and/or damage to the equipment can result from potentially high operating pressures. Process line pressure should be removed prior to servicing.

⚠ WARNING

METER SEAL COMPATIBILITY

It is the "user's" responsibility to select gasket materials that are corrosion resistant and compatible with their process and process conditions. Using materials that are not compatible with the process or process conditions could result in the Meter 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 on a regular schedule to ensure that it is leak free as both metal and elastomeric seals, gaskets and O-rings may change with age, exposure to process fluid, temperature, and /or pressure.

⚠ WARNING

If it becomes necessary to remove the instrument from the system power to the device is disconnected at the power supply.

⚠ WARNING

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

4-2 Meter Float Cleaning (MT3809 & MT3810)

Float replacement procedures are dependent on the meter size, connection type and fluid (gas vs. liquid) application. Please refer to the appropriate section below for instructions along with Figures 4-1 thru 4-4.

1. FLANGED CONNECTION

a. Size 0 to 5 (½") flanged, liquid or gas service

1. It is NOT recommended to disassemble these meters. Contact Service for repair.

b. Size 7 (½") flanged, liquid or gas service

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Remove the gasket support ring. A bearing puller of the correct size is recommended to remove the gasket support ring.
3. Push the entire float assembly slowly downward and out of the meter inlet by pushing from the top with a round bar stock (3/4" or 19 mm diameter).
4. Remove the float snap-ring to clean individual float assembly parts.
5. Reassemble the meter by reassembling the float assembly and inserting it into the bottom of the meter. Replace the spiral retaining ring in the meter inlet.

c. Size 8 (½") flanged, liquid service

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Remove the gasket support ring. A bearing puller of the correct size is recommended to remove the gasket support ring
3. Loosen the float assembly with two screwdrivers one on each end of the meter and turn to loosen the inlet and outlet screws. Remove inlet screw at the bottom of the meter.
4. Remove the guide vane at the bottom of the meter and gently push the float assembly up and out the top/outlet side.
5. Reassemble by inserting the float assembly into the top of the meter. Replace the guide vane and secure the float assembly by tightening the inlet and outlet screws. Replace the spiral retaining ring in the meter inlet.

d. Size 8 (½") flanged, gas service

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Remove the gasket support ring. A bearing puller of the correct size is recommended to remove the gasket support ring.
3. Secure the damper from turning by inserting a 1/8” pin through the top guide cartridge. While holding the damper in place, remove the top/outlet screw.
4. Push the float assembly out through the inlet/bottom.

5. To clean the gas damper, unscrew the cylinder head. Then remove the bolt and carefully take out the small piston so as to not damage the critical surfaces.
6. Reassemble the meter by assembling the damper with float assembly. Insert the float assembly with damper into the inlet/bottom of the meter. Secure the inlet/bottom screw. While holding the damper in place with a pin(1/8" diameter), insert and secure the top/outlet screw. Replace the spiral retaining ring.

e. Sizes 10 (1"), 12 (1½"), 13 (2") flanged, liquid service

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Remove the gasket support ring. A bearing puller of the correct size is recommended to remove the gasket support ring.
3. Loosen the inlet and outlet screws. Remove inlet screw at the bottom of the meter.
4. Remove the guide vane at the bottom of the meter and gently push the float assembly up and out the top/outlet side.
5. Reassemble by inserting the float assembly into the top of the meter. Replace the guide vane and secure the float assembly by tightening the inlet and outlet screws.

f. Sizes 10 (1"), 12 (1½"), 13 (2") flanged, gas service

1. Remove the gasket support ring. A bearing puller of the correct size is recommended to remove the gasket support ring.
2. Secure the damper from turning by inserting a 1/8" pin through the top guide cartridge. While holding the damper in place, remove the top/outlet screw.
3. Push the float assembly out through the inlet/bottom.
4. To clean the gas damper, unscrew the cylinder head. Then remove the bolt and carefully take out the small piston so as to not damage the critical surfaces.
5. Reassemble the meter by assembling the damper with float assembly. Insert the float assembly with damper into the inlet/bottom of the meter. Secure the inlet/bottom screw. While holding the damper in place with a pin (1/8" diameter), insert and secure the top/outlet screw. Replace the spiral retaining ring.

g. Sizes 15 and 16 (3" and 4") flanged, liquid or gas service (size 15 only)

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Loosen the float assembly by fixating two pliers one on each end of the float assembly inlet guide cartridge. Turn to loosen with the help of a pin wrench.
3. Carefully remove the complete float assembly and conical taper as well as the spacer bushing (size 16 only) out the inlet/bottom of the meter.
4. Reassemble by inserting the float assembly inside the conical taper (as well as the spacer bushing, size 16 only). Then insert the complete float assembly into the bottom of the meter. Replace the float assembly inlet guide cartridge and tighten the float assembly into place.

2. THREADED CONNECTION

a. Size 0 to 5 (½") threaded, liquid or gas service

1. It is NOT recommended to disassemble these meters. Contact Service for repair.

b. Size 7 (½") Threaded, liquid or gas service

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Unscrew the inlet fitting at the bottom of the meter.
3. Push the entire float assembly slowly downward and out of the meter inlet by pushing from the top with a round bar stock (3/4” or 19 mm diameter).
4. Remove the float snap-ring and clean individual float assembly parts.
5. Reassemble the meter by reassembling the float assembly and inserting it into the bottom of the meter. Reinstall and secure the inlet fitting.

c. Size 8 (½"), 10 (1"), 12 (1½") 13 (2") Threaded liquid service

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Unscrew the inlet fitting at the bottom of the meter.
3. Loosen the float assembly with two screwdrivers one on each end of the meter and turn to loosen the inlet and outlet screws. Remove inlet screw at the bottom of the meter.
4. Remove the guide vane at the bottom of the meter and gently push the float assembly up and out the top/outlet side.
5. Reassemble by inserting the float assembly into the top of the meter. Replace the guide vane and secure the float assembly by tightening the inlet and outlet screws . Reinstall and secure the inlet fitting.

d. Size 8 (½”) Threaded gas service

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Unscrew the outlet fitting at the top/outlet of the meter and remove the gas damper.
3. Unscrew the inlet/bottom fitting and slowly remove the float assembly.
4. To reassemble the meter, insert the float assembly into the inlet/bottom of the meter. Secure the inlet/bottom fitting. Replace the gas damper and secure the outlet/top fitting.

e. Size 10 (1"), 12 (1½"), 13 (2") Threaded, gas service

1. Remove the meter from the process line and lay the meter horizontal on a table.
2. Remove the top/outlet screw.
3. Loosen the float assembly by holding the damper in place with a pin (1/8” diameter) in the top while loosening the inlet/bottom fitting. Gently push the float assembly out through the inlet/bottom.
4. To clean the gas damper, unscrew the cylinder head. Then remove the bolt and take out the small piston carefully so as to not damage the critical surfaces.
5. Reassemble the meter by inserting the float assembly with damper into the inlet/bottom of the meter. Secure the inlet/bottom screw by holding the damper in place with a pin (1/8” diameter). Replace and secure the top/outlet screw. Reinstall and secure the inlet fitting.

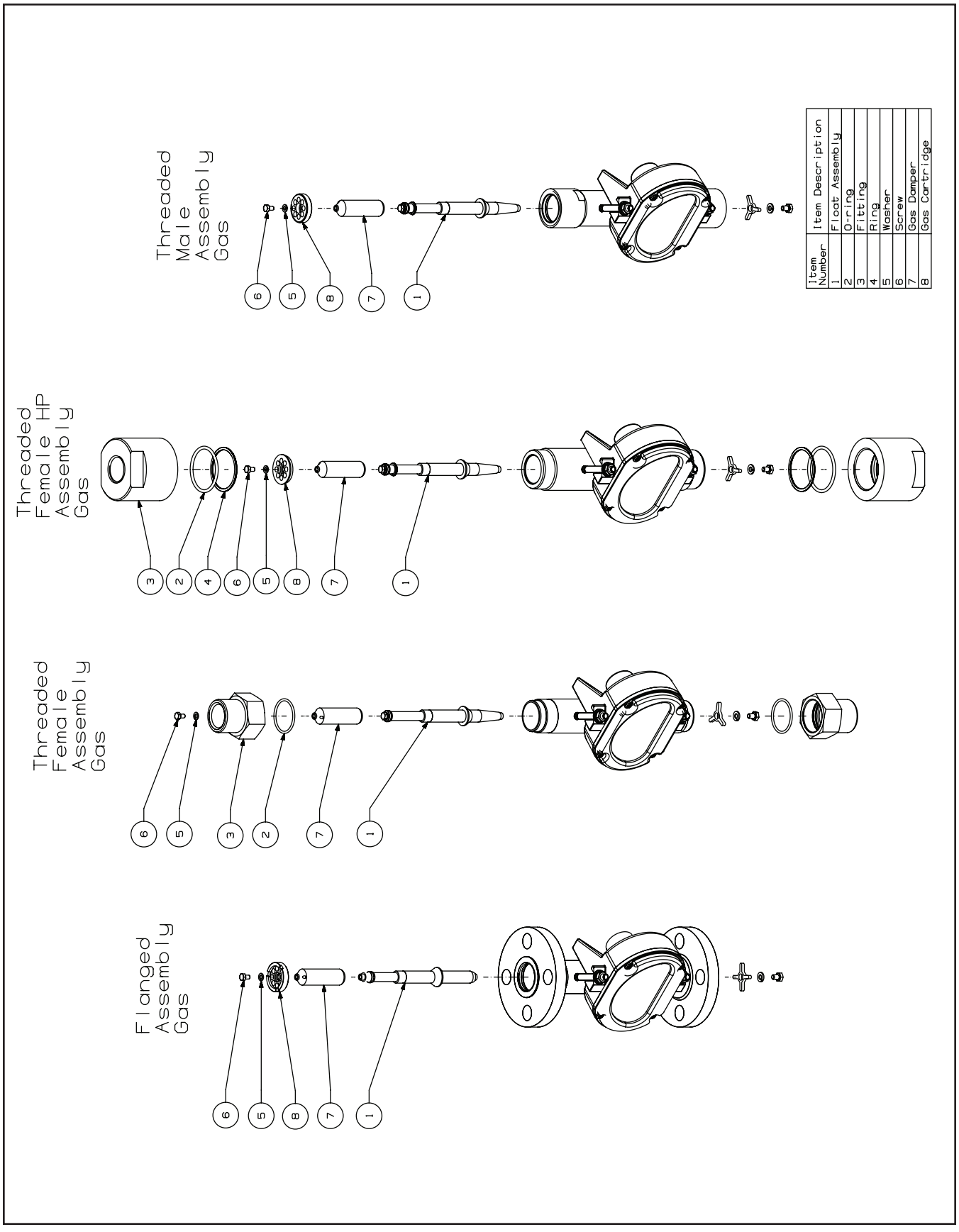


Figure 4-1 Exploded View, Model MT3809G and MT3810G - Gas Service

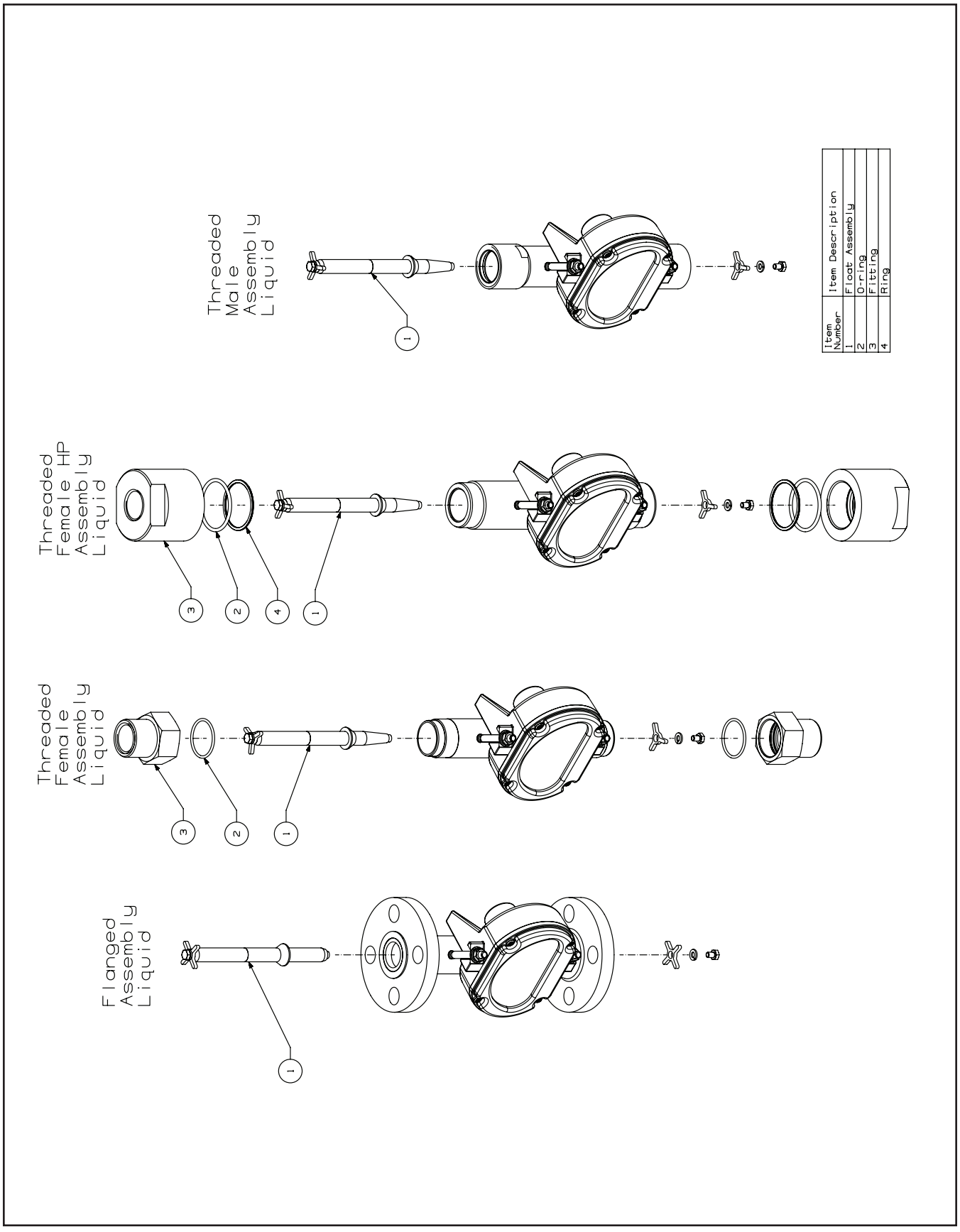


Figure 4-2 Exploded View, Model MT3809G and MT3810G - Liquid Service

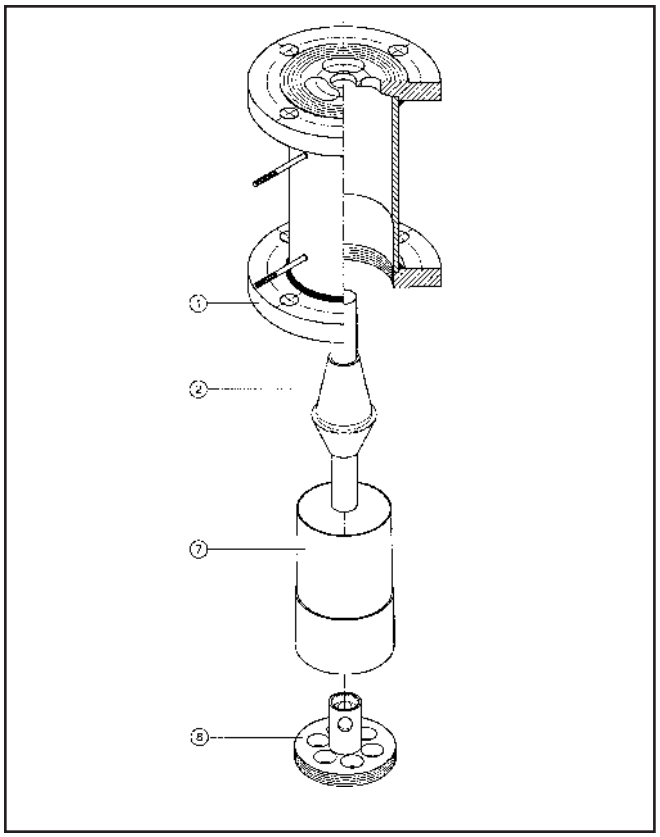


Figure 4-3 Exploded View, Model MT3809G, Size 15 (Gas or Liquid Service)

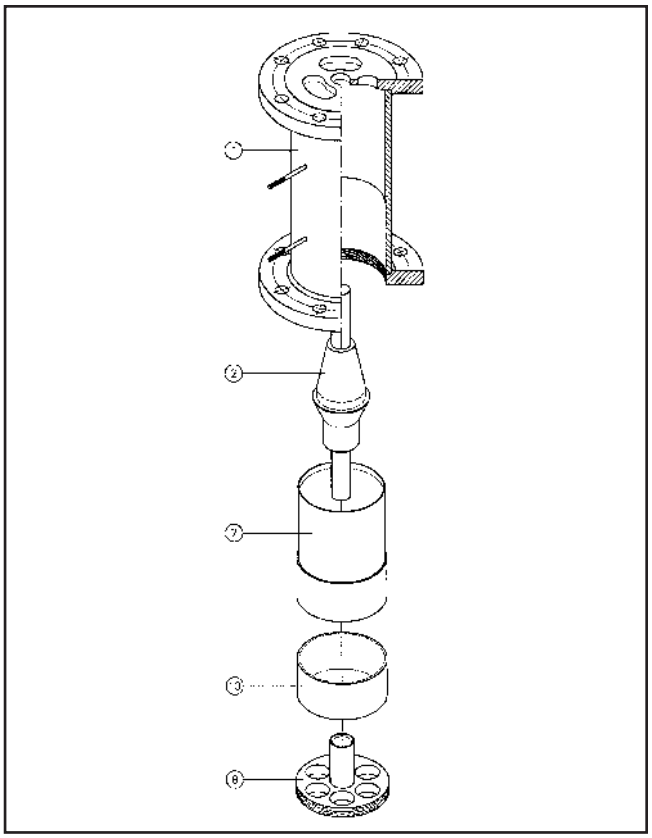


Figure 4-4 Exploded View, Model MT3809G, Size 16 (Liquid Service Only)

4-3 Meter Float Cleaning (MT3809 ETFE Option)

Flanged connections, all sizes, liquid or gas.
a. Flush only. Contact factory.

4-4 Meter Indicator Reference Mark (zero) Adjustment

This adjustment is performed with no process flow with the float resting on the guide vane or the inlet end fitting.
a. Completely stop fluid flow through the flowmeter.
b. See Section 2-5-1 on how to remove indicator housing and expose the pointer assembly.
c. Turn the slotted screw on the bottom of the point until the pointer is in line with the reference (zero) mark on the scale.
d. Replace the indicator housing cover with gasket and secure, see Section 2-5-1 for details.

4-5 Transmitter Replacement with or without Alarms and Pulse Output

All transmitters are self contained units matched specifically to the associated flowmeter. If there is a need to replace, please contact your nearest authorized Brooks service representative.

4-6 Inductive Alarm Replacement

a. Remove the front cover of the indicator housing, refer to Section 2-5-1.
b. The wires from the alarm switch(es) are wired into the alarm terminal connector.
c. Loosen the two screws securing the scale, with the alarm switches attached, and remove the scale.
d. Remove the two screws securing the wire cover.
e. Turn the wire cover over to expose the alarm terminal blocks.
f. Remove the wires from the terminal blocks
g. Turn the scale over and locate the screw centered in the green alarm switch. Remove the screw being careful not to lose the nut on the outside of the alarm set bracket. Remove the alarm switch from support.
h. Place the switch on the bracket with the open end facing towards the center of the scale plate and the wires facing away from the scale plate.
i. Place the switch screw through the opening in the switch, and the support bracket. Use the nut to secure the screw and tighten.
j. Connect the alarm switch wires to the terminal block.
Refer to Alarm Wiring Diagrams Figures 2-6a & 2-6b, 2-7a & 2-7b, 2-8a & 2-8b and 2-9a & 2-9b.
k. Replace the scale and tighten two clamping screws. Make sure that the alarm switch wires do not interfere with the alarm cam. Insure that the pointer is aligned with the ‘R’ or zero mark. If not, refer to Section 4-3, indicator reference mark (zero) adjustment.
l. Set the alarm position, by loosening the two pointer screws, moving the point of the desired alarm setting, and tightening the screws.
m. Connect the field wiring.
n. Replace the indicator housing cover and secure with four screws.

4-7 Transmitter Replacement with Inductive Alarms

The transmitter is a self contained unit matched specifically to the associated flowmeter. If there is a need to replace, please contact your nearest authorized Brooks service representative. However, the inductive alarms may be replaced according to the procedure in Section 4.6

4-8 Digital Display Replacement

If there is a need to replace, please contact your nearest authorized Brooks service representative.

Installation and Operation Manual

X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

Bulgarian

Основни инструкции
Прочетете преди работа!

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

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

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

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

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

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

⚠ 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" (inch), попадат под действието на европейската директива за уреди под налягане (PED).

- Глава „Технически данни" на настоящото ръководство съдържа свързаните с директивата PED инструкции.
- Указаните в настоящото ръководство продукти съответстват на европейската директива 2014/34/EU.
- Всички разходомери на Brooks Instrument се отнасят към флуиди от група 1.
- Продуктите по-големи от 25 mm или 1" (inch) съответстват на I, II или III категория според PED.
- Продуктите с размери 25 mm или 1" (inch), или по-малки, следват добрата инженерна практика (SEP).

Европейска директива за електромагнитна съвместимост (EMC)

Носещото знака CE (електрическо/електронно) оборудване на Brooks Instrument е изпълнило успешно тестовете за проверка на изискванията за електромагнитна съвместимост (директива EMC 2014/30/EU).
Особено внимание трябва да се обръща обаче на избирането на сигналните кабели, използвани с оборудването, носещо знака CE.
Качество на сигналните кабели, кабелните салници и съединители:
Brooks Insturment предлага висококачествени кабели, отговарящи на изискванията на CE сертификацията.
Ако използвате собствен сигнален кабел, трябва да изберете такъв, който е напълно защитен със 100%-ово екраниране.
Съединителите тип „D" или „кръгов" трябва да бъдат екранирани с метален щит. При необходимост за фиксирането на щита на кабела трябва да се използват метални кабелни салници.
Щитът на кабела трябва да се свърже с металното покритие или металния салник и в двата края да се екранира в 360°. Щитът трябва да бъде заземен.
Съединителите за печатни платки са стандартно неметални. Използваните кабели трябва да бъдат защитени със 100%-ово екраниране, за да отговарят на CE сертификацията.
Щитът трябва да бъде заземен.
Конфигурация на контактите: Виж приложената инструкция за експлоатация.

Електростатичен разряд (ESD)

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

Процедура за работа:

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

Забележки:
Не е уникално явление, че този прибор съдържа чувствителни към електростатичния заряд (ESD) компоненти. Болшинството от съвременните електронни прибори съдържат компоненти, изготвени по 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.

Models MT3809G & MT3810G

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.

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

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

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

Evropská směrnice pro tlakové zařízení (PED)

Na veškerá tlaková zařízení s vnitřním tlakem vyšším než 0,5 baru (g) a velikosti větší než 25 mm nebo 1" (palec) se vztahuje platnost směrnice o tlakovém zařízení (PED).
Kapitola „Technické údaje“ v této příručce obsahuje důležité bezpečnostní a provozní pokyny související se směrnicí PED.

- Produkty popsané v této příručce jsou v souladu se směrnicí EN 2014/34/EU.
- Všechny průtokoměry společnosti Brooks Instrument spadají do rámce Kapaliny, skupina I.
- Produkty větší než 25 mm nebo 1" (palec) jsou v souladu se směrnicí PED, kategorii I, II nebo III
- Produkty s velikostí 25 mm nebo 1" (palec) a menší spadají do rámce Správných technických postupů (SEP).

Evropská směrnice pro elektromagnetickou kompatibilitu (EMC)

Elektrické/elektronické zařízení Brooks Instrument nesoucí značku CE bylo úspěšně testováno dle předpisů pro elektromagnetickou kompatibilitu (směrnice EMC č. 2014/30/EU).
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.

Installation and Operation Manual

X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

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.

⚠ 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.

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

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

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

Det Europæiske direktiv for trykudstyr (PED)

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

- I manualen angives instrumenter der er tilpasset direktiv 2014/34/EU.
- Alle Brooks gennemstrømningsmålere tilhører væskegruppe nr. 1.
- Alle instrumenter som er større end 25 mm eller en tomme beskrives i direktivet PED´s kategorier I, II eller III.
- Alle instrumenter som er på 25 mm eller en tomme, eller mindre, beskrives i Sound Engineering Practice (SEP).

Det europæiske direktiv for elektromagnetisk kompatibilitet (EMC)

Alle Brooks instrumenter (elektrisk/elektronisk) som har CE markering er godkendt og testet ifølge om elektromagnetiske kompatibilitets forskrifter (EMC direktiv 2014/30/EU).
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..

Models MT3809G & MT3810G

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.

⚠ WAARSCHUWING: Zorg ervoor dat dit instrument de vereiste goedkeurings-classificatie heeft om te voldoen aan de lokale en nationale standaarden, voordat u het gaat installeren. Het niet naleven van deze waarschuwing kan ernstig letsel en/of schade aan de apparatuur tot gevolg hebben.

- 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 (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 producten die in deze handleiding worden beschreven, voldoen aan de Europese richtlijn 2014/34/EU.
- Alle stromingsmeters van Brooks Instrument vallen in groep 1.
- Producten met een diameter van meer dan 25 mm voldoen aan de categorieën I, II of III van de PED-richtlijn.
- Producten met een diameter van 25 mm of kleiner voldoen aan de regels van goed vakmanschap.

Elektromagnetische compatibiliteit (EMC)

De elektronische apparatuur van Brooks Instrument met de CE-markering is succesvol getest in overeenstemming met de EMC-voorschriften (richtlijn EMC 2014/30/EU).
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.
2. 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.
3. 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.

Estonian

Olulised juhised

Enne kasutamist lugege hoolikalt läbi!

Brooks Instrument konstrueerib, valmistab ja katsetab oma tooteid selliselt, et need vastaksid paljudele riiklikele ja rahvusvahelistele standarditele. Ainult nõuetekohane paigaldamine, kasutamine ja hooldamine tagab toodete katkematu talitluse tavaspetsifikatsiooni raames. Brooks Instrumenti 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 see kasutusjuhend ei vasta teie tootele, pöörduge kohaliku edasimüüja poole, kelle kontaktandmed leiate kasutusjuhendi tagakaanelt. Hoidke see kasutusjuhend edaspidiseks alles.
  ⚠ HOIATUS. Ärge kasutage seda instrumenti väljaspool kasutusjuhendis spetsifitseeritud piirväärtusi. Hoiatuse eiramine võib kaasa tuua raske kehavigastuse ja/või kahjustada seadet.
- Kui te saa mõne juhise mõttest aru, pöörduge selgituste saamiseks kohaliku Brooks Instrumenti edasimüüja poole.
- Järgige kõiki hoiatusi, tähelepanule manitsusi ja juhiseid, mis on tootele peale kantud või tootega kaasa antud.
  ⚠ HOIATUS. Enne paigaldamist veenduge, et see instrument vastaks kohalike ja riiklike määrustega kehtestatud nimiandmetele. Hoiatuse eiramine võib kaasa tuua raske kehavigastuse ja/või kahjustada seadet.
- Seadme paigaldamisel järgige vastavas kasutusjuhendis toodud paigaldusjuhiseid ning asjakohaseid kohalikke ja riiklikke eeskirju. Ühendage tooted nõuetekohaste toite- ja surveallikatega.
- Talitlus. (1) Avage aeglaselt vool süsteemi. Vooluimpulsside vältimiseks avage tööventiilid aeglaselt. (2) Kontrollige, et voolukulumõõturi sisend- või väljundühenduste ümber ei oleks lekkeid. Kui lekkeid ei ole, laske süsteemil saavutada töösurve.
- Enne seadme hooldamist veenduge, et kogu süsteem oleks surve alt vabastatud. Varuosasid tohib vahetada ainult kvalifitseeritud personal, kasutades selleks Brooks Instrumenti heakskiidetud varuosi. Mitteoriginaalvaruosade kasutamine ja ebapädev toimingute tegemine võivad kahjustada toote tööomadusi ja põhjustada riski tootmistegevuse ohutuse tagamisel. Originaalvaruosadele sarnast e osade kasutamine võib põhjustada tule- või elektrilöögiohtu või seadme väärtalitlust.
- Elektrilöögi- ja vigastuseohu vältimiseks peavad seadme luugid olema alati suletud ja kaitsekatted oma kohal, v.a seadme hooldamisel kvalifitseeritud isikute poolt.
  ⚠ HOIATUS. Voolava vedelikuga seadmete kasutamisel – kui seadmega külgnevad sisend- ja väljundklapid on vaja mingil põhjusel sulgeda, tuleb seadmed vedelikust täiesti tühjaks lasta. Vastasel korral võib vedelik soojuse mõjul paisuda niivõrd, et seade puruneb. See võib põhjustada raskeid kehavigastusi.

Euroopa surveseadmete direktiiv (PED)

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

- Selle kasutusjuhendi spetsifikatsiooniosa sisaldab surveseadmete direktiiviga seonduvaid juhiseid.
- Kasutusjuhendis kirjeldatud tooted vastavad EL direktiivi 2014/34/EÜ nõuetele.
- Brooks Instrumenti voolukulumõõturid kuuluvad vedelike 1. gruppi.
- Tooted läbimõõduga üle 25 mm või 1 tolli vastavad surveseadmete direktiivi kategooriale I, II või III.
- Toodetele läbimõõduga alla 25 mm või 1 tolli kohaldatakse häid inseneritavasid.

Euroopa elektromagnetilise ühilduvuse direktiiv (EMÜ)

Brooks Instrumenti (elektrilised/elektroonilised) seadmed, millele on omistatud CE-tähis, on edukalt läbinud asjakohased katsed ja vastavad elektromagnetilise ühilduvuse nõuetele (EMÜ direktiiv 2014/30/EÜ).
Kuid signaalkaabli valimisel on vaja pöörata suurt tähelepanu CE-tähisega seadmetele.

Signaalkaabli, läbiviigutihendite ja konnektorite kvaliteet

Brooks Instrument turustab kõrgekvaliteedilisi kaableid, mis vastavad CE-sertifikaadi nõuetele.
Olemasoleva kaabli kasutamisel jälgige, et kaabel oleks täielikult ümbritsetud varjestusega.
„D"- või „Ring"-tüüpi konnektorid peavad olema varustatud metallvarjestusega. Võimaluse korral tuleb kasutada metallist läbiviike, mis tagavad kaabli varjestuse ühenduse.
Kaabli varjestus ühendatakse metallkesta või läbiviigutihendiga ja on mõlemast otsast kaitstud 360° ulatuses.
Varjestus peab olema maandatud.
Mikroskeemide servaühendused on üldjuhul mittemetallist. Vastavuse tagamiseks CE-sertifikaadi nõuetele peavad kasutatud kaablid olema 100% varjestatud.
Varjestus peab olema maandatud.
Klemmide konfigureerimine: vt komplekti kuuluvat kasutusjuhendit.

Elektrostaatiline laeng

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

Käsitsemisjuhised

1. Lahutage seade toiteallikast.
2. Enne trükkplaadi või mõne muu siseelemendi paigaldamist, eemaldamist või konfigureerimist peab personal olema maandatud läbi randmepaela või mõne muu sobiva vahendi.
3. Trükkplaate 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.

Models MT3809G & MT3810G

Finnish

Perusohjeet
Lue ensin ohjeet huolellisesti!

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

Oikean toiminnan varmistamiseksi vain valtuutettu huoltohenkilö saa asentaa, käynnistää, päivittää, ohjelmoida ja huoltaa laitteita.
Lue kaikki käyttöohjeet koskien tuotteen asennusta, käyttöä ja huoltoa. Jos käyttöohje on puutteellinen, lisätietoja saa paikalliselta jälleenmyyjältä. Yhteystiedot löytyvät oppaan kansilehdestä. Säilytä ohjeet.

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

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

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

- Laittteen asennuksessa on noudatettava erityisiä asennusohjeita sekä voimassa olevia paikallisia ja kansainvälisiä määräyksiä. Laitteet saa yhdistää vain sopivaan sähkö- ja paineverkkoon.
- Asennusohjeita: (1) Päästä virtaus hitaasti järjestelmään. Avaa venttiilit hitaasti, jotta virtaus pysyy tasaisena. (2) Tarkista, ettei virtausmittarin sisään- ja ulosmenon liitoksissa ole vuotoa. Jos järjestelmässä ei ole vuotoa, aseta oikea käyttöpaine.
- Tarkista, että laitteeseen menevä paine on katkaistu ennen laitteen korjaamista välttääksesi loukkaantumisriskin. 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 mahdollisen sähköisku- ja loukkaantumisvaaran.

⚠ **VAROITUS!: 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 rikkoutumiseen ja henkilövahingon vaaraan.**

Eurooppalainen painelaitedirektiivi (PED)

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

- PED direktiiviä koskevat määräykset löytyvät käyttöoppaan ’’Tekniset tiedot” -luvusta.
- Käyttöoppaassa kuvatut tuotteet ovat 2014/34/EU EU-direktiivin mukaisia.
- Kaikki Brooks Instrumentin virtausmittarit kuuluvat ryhmään 1. Laitteet, jotka ovat suurempia, kuin 25 mm tai 1 tuuma, ovat PED I, II, III kategorien mukaisia.
- Mittarit joiden koko on alle 25 mm tai 1 tuuma ovat hyvän konepajakäytännön (SEP) mukaisia.

Eurooppalainen direktiivi sähkömagneettisesta yhteensopivuudesta (EMC)

Brooks Instrumentin CE-merkin saaneet (sähkö/sähköiset) laitteet täyttävät EMC direktiivin vaatimukset ja testit sähkömagneettisesta yhteensopivuudesta (2014/30/EU EMC direktiivi).
Erityistä huomioita on kiinnitettävä CE-merkittyjen laitteiden käytössä olevien kaapelien valintaan.

Kaapelien, kiinnikkeiden ja liittimien laatu:

Brooks Insturmentin kaapelit ovat korkealaatuisia ja täyttävät CE-merkintä direktiivin vaatimukset.
Muun valmistajan kaapelia käytettäessä on käytettävä 100% suojattua kaapelia.
Liittimien tulee olla häiriösuojattua tyyppiä. Tarvittaessa käytetään metallisia kiinnikkeitä kaapelin suojuksen kiinnittämiseen. Kaapelin suojakuoren pitää olla yhdistettynä metallisuojukseen tai laippaan ja sen pitää olla molemmista päistä suojattuna 360°. Suojaus päättyy maadoitukseen.
Standardin mukaan korttien liittimet eivät ole metallisia. Käytettyjen kaapelien suojaus on oltava 100%, jotta se täyttäisi CE-merkinnän direktiivin vaatimukset.
Suojaus päättyy maadoitukseen.
Napojen järjestys: Katso liitteenä oleva käyttöopas.

Elektrostaattinen purkaus (ESD)

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

Asennusohjeet:

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

Installation and Operation Manual

X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

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.

⚠ AVERTISSEMENT: Avant toute installation, vérifier que cet instrument est conformes aux normes locales et nationales.
Le non-respect de cet avertissement peut entrainer des blessures graves et/ou endommager l'équipement.

- 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 2014/34/EU.
- 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 2014/30/EU).
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.

Models MT3809G & MT3810G

German

Wichtige Anweisungen Bitte zuerst lesen!

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

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

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

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

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

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

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

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.
- Produkte die in diesem Handbuch beschrieben sind, erfüllen die europäische Richtlinie 2014/34/EU.
- Alle Durchflussmesser von Brooks Instrument fallen unter die Fluidgruppe 1.
- Produkte die größer als 25 mm oder 1“ (inch) sind, erfüllen die Kategorien I, II oder III der Druckgeräterichtlinie (PED).
- Produkte mit einer Größe von 25 mm oder 1“ (inch) oder kleiner sind Sound Engineering Practice (SEP).

Europäische Verordnung zur elektromagnetischen Verträglichkeit (EMV)

Geräte von Brooks Instrument (elektrischer und elektronischer Art) mit CE-Zeichen haben den Test auf Einhaltung der Verordnung zur elektromagnetischen Verträglichkeit (EMV Richtlinie 2014/30/EU) 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:

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

Installation and Operation Manual
X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

Greek

Βασικές οδηγίες
Διαβάστε πριν συνεχίσετε!

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

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

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

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

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

- Εγκαταστήστε τη συσκευή όπως προβλέπεται στις οδηγίες εγκατάστασης του σωστού εγχειριδίου οδηγιών και στις κείμενες τοπικές και εθνικές διατάξεις. Συνδέστε τα προϊόντα στις εκάστοτε σωστές παροχές ρεύματος και πίεσης.
- Διαδικασία: (1) Αφήστε να ξεκινήσει αργά η ροή στο σύστημα. Ανοίξτε αργά τις βαλβίδες λειτουργίας για να αποφύγετε τις απότομες αυξομειώσεις ροής. (2) Ελέγξτε για διαρροές τις συνδέσεις εισόδου και εξόδου του ροόμετρου. Αν δεν υπάρχουν διαρροές, γεμίστε το σύστημα μέχρι η πίεση να φτάσει την κανονική πίεση εργασίας.
- Πριν από τη συντήρηση βεβαιωθείτε ότι γραμμή εργασίας έχει τεθεί εκτός 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.

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

Ευρωπαϊκή Οδηγία για τον εξοπλισμό υπό πίεση (PED)

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

- Το κεφάλαιο Προδιαγραφές του παρόντος εγχειριδίου περιλαμβάνει οδηγίες σχετικά με την Οδηγία PED.
- Τα προϊόντα που περιγράφονται στο παρόν εγχειρίδιο συμμορφώνονται με την ευρωπαϊκή Οδηγία 2014/34/EU.
- Όλα τα ροόμετρα της Brooks Instrument ανήκουν στην ομάδα ρευστών 1.
- Προϊόντα μεγαλύτερα από 25 mm ή 1 ίντσα συμμορφώνονται με τις κατηγορίες I, II και III της Οδηγίας PED.
- Προϊόντα μεγέθους 25 mm ή 1 ίντσας ή και μικρότερα κατασκευάζονται σύμφωνα με ορθές τεχνικές πρακτικές (SEP).

Ευρωπαϊκή Οδηγία για την ηλεκτρομαγνητική συμβατότητα (EMC)

Ο (ηλεκτρικός/ηλεκτρονικός) εξοπλισμός της Brooks Instrument που φέρει το σήμα CE έχει υποστεί επιτυχώς τις δοκιμές που προβλέπουν οι διατάξεις της Οδηγίας για την ηλεκτρομαγνητική συμβατότητα (Οδηγία 2014/30/EU 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.
2. 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.

Models MT3809G & MT3810G

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. Őrizze meg ezt a kézikönyvet későbbi tájékoztatásként.

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

- Amennyiben a kezikönyv 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.

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

- A megfelelő telepítési utasításban megadott utasítások valamint a hatályos helyi és nemzeti előírások szerint telepítse a berendezést. A termékeket kizárólag a megfelelő elektromos és nyomásellátó forrásra kösse.
- Menete: (1) Lassan helyezze nyomás alá a rendszert. Lassanként nyissa ki az üzemi szelepeket az 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 szakképzett személynek kell kezelnie a Brooks Instrument által meghatározott cserealkatrészeket. A nem engedélyezett alkatrészek és tevékenységek befolyásolhatják a termék teljesítményét, illetve veszélyeztethetik a biztonságos üzemeltetést. A pusztán hasonló alkatrészekkel történő helyettesítés tüzet, áramütésveszélyt vagy elégtelen működést eredményezhet.
- A berendezés összes ajtaja mindenképpen legyen zárva, a védőburkolatok pedig legyenek a helyükön az áramütés és a személyi sérülések elkerülése érdekében, kivéve, ha szakképzett szakember végez rajta karbantartási munkákat.

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

Nyomástartó berendezésekre vonatkozó európai irányelv (PED)

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

- A használati utasítás „Műszaki adatok” fejezete tartalmaz a PED irányelvre vonatkozó utasításokat.
- A használati utasításban megadott termékek megfelelnek a 2014/34/EU EU irányelvnek.
- Minden Brooks átfolyásmérő az 1-es folyadékcsoportba tartozik.
- A 25 mm-nél vagy 1 hüvelyknél nagyobb termékek megfelelnek a PED I, II, vagy III kategóriának.
- A 25 mm-es illetve 1 hüvelykes vagy kisebb termékek az elfogadott mérnöki gyakorlatot (SEP) követik.

Elektromágneses kompatibilitásra vonatkozó európai irányelv (EMC)

A Brooks Instrument CE jelölést kiérdemelt (elektromos/elektronikus) berendezései sikeresen teljesítették az elektromágneses kompatibilitási követelményeket (2014/30/EU 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 alakú” csatlakozóknak fémárnyékolóval árnyékoltnak kell lennie. Szükség esetén fém kábelösszekötőket kell alkalmazni a kábelszűrő rögzítésére.
A kábelszűrőt a fém házhoz vagy hüvelyhez kell csatlakoztatni és mindkét felén 360°-ban le kell árnyékolni. Az árnyékolásnak földelésben kell végződnie.
A kártyákhoz tartozó csatlakozók szabványosan nem 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:

1. A berendezést áramtalanítani kell.
2. 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.
3. 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.

Installation and Operation Manual

X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

Italian

Istruzioni fondamentali Leggerle subito!

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

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

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

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

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

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

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

Direttiva europea relativa alle apparecchiature a pressione (PED)

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

- Il capitolo „Dati tecnici" del manuale contiene le disposizioni relative alla direttiva PED.
- I prodotti di misura descritti nel presente manuale sono conformi alla Direttiva UE 2014/34/EU.
- Ogni flussimetro Brooks appartiene al gruppo di fluidi 1.
- I prodotti di misura maggiori di 25 mm o di 1 pollice sono conformi alla categoria I, II o III della PED.
- I prodotti di misurazione minori di 25 mm o di 1 pollice rientrano nella categoria SEP (Sound Engineering Practice).

Direttiva europea relativa alla compatibilità elettromagnetica (EMC)

Le apparecchiature (elettriche/elettroniche) Brooks Instrument dispongono del marchio CE ed hanno superato positivamente i test per i requisiti di compatibilità elettromagnetica (Direttiva EMC 2014/30/EU).

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

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

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

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

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

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

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

La schermatura deve essere effettuata con messa a terra.

Configurazione pin: Vedi Manuale d'uso allegato.

Scarica elettrostatica (ESD)

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

Procedura di manovra:

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

Note:

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

Models MT3809G & MT3810G

Latvian

Svarīga instrukcija

Pirms turpināt izlasiet!

„Brooks Instrument" projektē, ražo un pārbauda savus izstrādājumus atbilstoši daudziem nacionālajiem un starptautiskajiem standartiem. Lai nodrošinātu šo izstrādājumu turpmāku darbību atbilstoši noteiktajiem parametriem, tie ir pareizi jāuzstāda, jālieto un jāapkopj. Uzstādot, lietojot „Brooks Instrument" izstrādājumus un veicot to apkopi, ir jāievēro šie norādījumi un 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.
  ⚠ BRĪDINĀJUMS! 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.
- Ievērojiet visus brīdinājumus, piesardzības mērus un instrukcijas, kas norādīti uz izstrādājuma vai piegādāti kopā ar to.
  ⚠ BRĪDINĀJUMS. Pirms uzstādīšanas pārliecinieties, ka šim instrumentam ir nepieciešamie apstiprin ājuma novērtējumi, lai atbilstu vietējiem un valsts kodeksiem. Šī brīdinājuma neizlasīšanas rezultātā var rasties nopietni personas savainojumi un/vai aprīkojuma bojājumi.
- 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 izstrādājuma 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 izstrādājumi atbilst EN Direktīvas 2014/34/EU prasībām.
- Visi „Brooks Instrument" plūsmas mērītāji ietilpst 1. šķidrumu grupā.
- Uz 25 mm jeb 1" (collu) maziem un mazākiem izstrādājumiem attiecas labas inženierijas prakse (SEP).
- 25 mm jeb 1" (collu) mazi vai mazāki izstrādājumi atbilst PED kategorijai I, II vai III.

Eiropas elektromagnētiskās savietojamības direktīva (EMS)

„Brooks Instrument" (elektriskās/elektroniskās) iekārtas ar CE zīmi ir izturējušas pārbaudi un atzītas par atbilstošām Eiropas elektromagnētiskās savietojamības direktīvas (EMS) prasībām (EMS 2014/30/EU)

Tomēr, izvēloties signālkabeli, kas tiks lietots kopā ar CE marķējuma iekārtu, ir jāievēro īpaša uzmanība.

Signālkabeļa, kabeļa blīvslēgu un savienotāju kvalitāte:

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

Ja jūs lietojat pats savu 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 ķēdes plates un ierīces vai kā citādi darbojoties ar tām, ir jāievēro noteikta darba kārtība.

Darba kārtība:

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

Komentāri

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

Installation and Operation Manual
X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

Lithuanian

Pagrindinės instrukcijos

Perskaitykite prieš tęsdami!

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

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

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

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

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

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

- Šios instrukcijos dalyje „Techniniai duomenys“ pateikiami nurodymai, susiję su PED direktyva.
- Šioje instrukcijoje aprašyti gaminiai atitinka Europos Sąjungos direktyvą 2014/34/EU.
- Visi „Brooks Instrument“ srauto matuokliai priklauso 1 skysčių grupei.
- Didesni nei 25 mm arba 1 col. gaminiai atitinka PED I, II arba III kategoriją.
- 25 mm arba 1 col. ar mažesni gaminiai atitinka tinkamą inžinerijos praktiką (SEP).

Europoje taikomi elektromagnetinio suderinamumo (EMS) reikalavimai

CE ženklu pažymėta „Brooks Instrument“ (elektrinė / elektroninė) įranga buvo sėkmingai išbandyta pagal elektromagnetinio suderinamumo reikalavimus (EMS direktyvą 2014/30/EU).
Tačiau ypač atidžiai reikia rinktis 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 užsibaigti įžeminimu.
Standartinės kraštinės jungtys yra nemetalinės. Naudojami kabeliai turi būti ekranuoti 100 % ekranu, kad atitiktų CE sertifikavimą.
Ekranas turi užsibaigti įžeminimu.
Keturių kontaktų konfigūracija: žr. pridėtą instrukciją.

ESD (elektrostatinis išlydis)

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

Darbo procedūra:

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

Pastabos

Šis instrumentas nėra unikalus dėl jame esančių ESD (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, greitai sugenda.

Models MT3809G & MT3810G

Polish

Niezbędne zalecenia

Prosimy przeczytać przed rozpoczęciem użytkowania!

Brooks Instrument projektuje, wytwarza i testuje swoje produkty tak, aby spełniały wymagania licznych norm krajowych i międzynarodowych. Produkty te muszą być poprawnie instalowane, obsługiwane oraz konserwowane, aby zapewnić ich prawidłowe działanie zgodnie ze specyfikacją techniczną. Podczas instalowania, 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 może doprowadzić do poważnego zagrożenia życia lub zdrowia personelu i / lub uszkodzenia sprzętu.**

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

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

- Instalację urządzenia należy przeprowadzić zgodnie z zaleceniami zawartymi w instrukcji instalacji oraz z obowiązującymi lokalnymi i narodowymi oznaczeniami. Wszystkie urządzenia można podłączać wyłącznie do odpowiednich źródeł energii elektrycznej oraz ciśnienia.
- Pierwsze czynności obsługowe: (1) Należy powoli włączyć przepływ w instalacji. Następnie powoli otworzyć zawory robocze tak, aby uniknąć wahań przepływu. (2) Należy teraz sprawdzić, czy nie występują nieszczelności przy podłączeniach wejściowym i wyjściowym miernika przepływu. Jeżeli nie ma żadnych nieszczelności, można zwiększyć ciśnienie w instalacji do wartości ciśnienia roboczego.
- Przed przystąpieniem do czynności serwisowych należy upewnić się, że ciśnienie robocze jest odłączone. Jeżeli konieczna jest wymiana części zamiennych, należy zawsze stosować części zamienne specyfikowane przez firmę Brooks Instrument a czynności ich wymiany powinien w każdym przypadku dokonywać przeszkolony personel. Stosowanie nieautoryzowanych części i procedur serwisowych może niekorzystnie wpłynąć na działanie produktu oraz 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.
- Produkty opisane w tej instrukcji są zgodne z dyrektywą EN 2014/34/EU.
- Wszystkie mierniki przepływu firmy Brooks Instrument należą do 1. grupy cieczy.
- Produkty o wielkości powyżej 25 mm lub 1 cala należą do kategorii I, II lub III dyrektywy PED.
- Produkty o wielkości 25 mm lub 1 cala lub mniejsze podlegają zaleceniom „Uznanej Praktyki Inżynierskiej" (SEP).

Europejska dyrektywa dotycząca kompatybilności elektromagnetycznej (EMC)

Urządzenia elektryczne / elektroniczne firmy Brooks Instrument posiadające oznaczenie CE, przeszły pozytywnie testy pod kątem spełniania przez nich wymogów kompatybilności elektromagnetycznej (Dyrektywa EMC 2014/30/EU).
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.
Jeżeli stosuje się własne przewody sygnałowe, to powinny one być w całości w pełni ekranowane.
Złącza typu „D" lub okrągłe powinny zawierać metalowy ekran. Jeśli to możliwe, należy stosować metalowe dławice przewodu zapewniające mocowanie jego ekranu.
Ekran przewodu powinien być połączony z metalową osłoną lub dławicą zapewniając całkowite, dookólne ekranowanie na obu końcach przewodu.
Ekran przewodu powinien być uziemiony.
Złącza krawędziowe są standardowo niemetaliczne. Stosowane przewody muszą być w pełni ekranowane zgodnie z certyfikatem CE.
Ekran przewodu powinien być uziemiony.
Konfiguracja styków jest podana w niniejszej instrukcji obsługi.

Wyładowania elektrostatyczne (ESD)

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

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

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

Installation and Operation Manual

X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

Portuguese

Instruções Básicas
Ler antes de proceder!

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

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

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

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

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

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

⚠ ATENÇÃO: Se por qualquer razão for necessário fechar as válvulas a montante e jusante do equipamento, tenha em atenção que o mesmo deverá ser previamente esvaziado do 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 produto objecto deste manual satisfaz a directiva 2014/34/EU da UE.
- Os caudalímetros Brooks pertencem ao grupo 1 de fluidos.
- Os produtos com calibre superior a 25 mm (1 polegada) pertencem às categorias PED I, II, ou III.
- Os produtos de 25 mm (1 polegada) ou menores seguem as “Boas regras de engenharia” (SEP).

Directiva Europeia sobre Compatibilidade electromagnética (EMC)

Os equipamentos (eléctricos/electrónicos) da Brooks Instrument que têm a marcação CE passaram os testes comprovativos dos requisitos de compatibilidade electromagnética (Directiva EMC número 2014/30/EU).
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:

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

Observações:

Tenha presente que este equipamento poderá não ser o único objecto capaz de ser portador de peças sensíveis a descargas electrostáticas (ESD).
Na maioria dos dispositivos electrónicos Brooks encontram-se peças de tecnologia de óxidos metálicos (NMOS, SMOS, etc.). A experiência mostra que até pequenas quantidades de electricidade estática são capazes de danificar ou destruir esses dispositivos. Os componentes danificados, embora inicialmente funcionem aparentemente bem, acabam por ter falhas prematuramente.

Models MT3809G & MT3810G

Romanian

Indicaţii de referinţă

Citiţi-le întâi pe acestea!

Brooks Instrument îşi proiectează, produce şi testează produsele într-un mod ce respectă un mare număr de standarde autohtone şi internaţionale. Aceste instalaţii trebuie amplasate, exploatate şi întreţinute corespunzător, pentru ca în toate situaţiile, domeniul lor de lucru să corespundă operării normale. În ceea ce priveşte instalarea, operarea şi întreţinerea produselor Brooks Instrument, indicaţiile de mai jos trebuie respectate şi trebuie introduse in programul de protecţia muncii.

- Pentru garantarea prestaţiei corecte, instalarea, operarea, actualizarea, programarea şi întreţinerea produsului poate fi realizată doar de către personal calificat.
- Instrucţiunile de instalare ale produsului trebuie citite integral, înainte de punerea în serviciu şi exploatarea sa. În măsura în care ediţia acestui manual nu este cea adecvată, identificaţi pe ultima copertă coordonatele distribuitorului local şi pentru lămuriri suplimentare adresaţi-vă acestuia. Păstraţi acest manual pentru referinţe ulterioare.

⚠ ATENŢIE: Nu utilizaţi instalaţia în afara intervalului de funcţionare indicat în instrucţiunile de operare. Nerespectarea acestui lucru se poate solda cu răniri grave de persoane sau defectarea instalaţiei.

- În măsura în care indicaţiile cărţii maşinii nu sunt suficient de lămuritoare, luaţi legătura cu reprezentantul Brooks Instrument pentru clarificarea problemei.
- Păstraţi toate avertismentele, avizele şi instrucţiunile livrate odată cu instalaţia sau inscripţionate pe aceasta.

⚠ AVERTISMENT: Înainte de instalare, asiguraţi-vă că valorile nominale ale acestui instrument respectă codurile naţionale. Nerespectarea acestui avertisment poate avea drept rezultat răniri personale grave şi/sau defectarea echipamentelor.

- Efectuaţi instalarea echipamentului în conformitate cu indicaţiile de instalare corespunzătoare, respectiv cu respectarea prevederilor naţionale. Echipamentul se conectează exclusiv la surse de energie electrică şi de presiune corespunzătoare.
- Succesiune: (1) Presurizaţi lent instalaţia. Deschideţi încetul cu încetul supapa de funcţionare pentru evitarea fluctuaţiilor de flux. (2) Controlaţi dacă nu sunt prelingeri la intrarea sau ieşirea debitmetrului de branşare. Dacă nu sunt scurgeri, presurizaţi instalaţia la presiunea de lucru.
- Înaintea exploatării/ întreţinerii, verificaţi neapărat dacă conducta uzinală nu este sub presiune. În măsura în care este nevoie de piese de schimb, este neapărat necesar ca manevrarea pieselor de schimb să fie făcută de personal cu calificare profesională agreat de Brooks Instrument. Utilizarea altor piese de schimb decât cele originale şi licenţiate poate avea efecte asupra performanţelor instalaţiei şi asupra siguranţei sale în exploatare. Utilizarea de piese asemănătoare de substituire poate avea ca rezultat pericol de incendiu şi electrocutare.
- În toate cazurile toate uşile instalaţiei trebuie să fie închise, cuştile de protecţie să fie puse la locurile lor, pentru evitarea electrocutării şi rănirii de persoane, exceptând situaţiile când un specialist efectuează lucrări de întreţinere.

⚠ ATENŢIE: În cazul instalaţiilor cu flux de fluide, dacă din orice motiv este necesară închiderea valvelor de intrare şi ieşire, limitrofe instalaţiei, instalaţia trebuie complet golită. Neglijarea acestui lucru poate avea ca efect dilatarea termică a fluidului, care poate defecta instalaţia şi poate produce răniri de persoane.

Directiva europeană pentru instalaţiile sub presiune (PED)

Toate instalaţiile şi sistemele presurizate ce se află sub presiuni interne ce depăşesc 0,5 mbar (g) şi au mai mult de 25 mm sau 1 ţol, cad sub incidenţa normei europene corespunzătoare (PED).

- La capitolul "Date tehnice" din cartea maşinii se găsesc indicaţiile corespunzătoare directivei PED.
- Produsele menţionate în cartea maşinii corespund directivei 2014/34/EU EU.
- Toate debitmetrele Brooks corespund clasei 1 de fluide.
- Produsele mai mari de 25 mm sau 1 ţol corespund categoriei PED I, II sau III.
- Produsele mai mici de 25 mm sau 1 ţol se conformează practicii inginereşti acceptate (SEP).

Directiva europeană privitoare la compatibilitatea electromagnetică (EMC).

Instalaţiile (electrice /electronice) ce poartă marca Brooks Instrument CE îndeplinesc cu succes cerinţele testelor de verificare ale compatibilităţii electromagnetice (Cf. directivelor europene EMC cu nr. 2014/30/EU).
În acelaşi timp trebuie acordată o atenţie deosebită la alegerea cablurilor de semnalizare utilizate pentru instalaţiile ce poartă marcajul CE.
Calitatea cablurilor de semnalizare, a legăturilor prin cablu şi a conectoarelor:
Brooks Instrument oferă cabluri de calitate ridicată, care corespund cerinţelor calitative ale CE.
În măsura în care folosiţi cabluri proprii, trebuie alese acelea care sunt 100% ecranate şi prevăzute cu filtre.
Conectoarele „D" sau cele „circulare" trebuie sa dispună de ecrane metalice. În caz de nevoie trebuie folosite conectoare metalice pentru montarea filtrelor de cablu.
Filtrul de cablu trebuie conectat la carcasa metalică sau manşon şi în ambele cazuri trebuie asigurată ecranarea la 360°. Ecranarea trebuie terminată cu o legare la pământ.
Conform standardului, conectoarele aparţinând plăcilor electronice nu sunt metalice. Cablurile folosite trebuie să fie 100% ecranate şi prevăzute cu filtre pentru a corespunde clasificării CE.
Ecranarea trebuie terminată cu o legare la pământ.
Configuraţie de contact: Vezi instrucţiunile de operare ataşate.

Descărcare electrostatică (ESD)

⚠ ATENŢIE: Instalaţia include piese care sunt predispuse la defectare sub influenţa electricităţii statice. Trebuie respectate metodele corespunzătoare de extragere, instalare sau alte manipulări ale circuitelor electronice.

Procedură de manipulare:

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

Observaţii:
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.) Experienţa a dovedit că acestea pot fi afectate sau deteriorate chiar de energii electrostatice de slabă intensitate. Componentele defectate, cu toate că în aparenţă sunt funcţionale, duc în timp la defecţiuni incipiente.

Installation and Operation Manual
X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

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.

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

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

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

- Zariadenia inštalujte podľa návodu uvedeného v príkaze na inštaláciu, v súlade s miestnymi a národnými predpismi. Zariadenie pripojte výlučne len na vyhovujúci elektrický a tlakový zdroj
- Postup: (1) Pomaly natlakujte systém. Prevádzkový ventil otvorte pomaly na zamedzenie kolísania prietoku. (2) Prekontrolujte tesnosť vstupného a výstupného zapojenia prietokomeru. Keď nie je presakovanie, spoje sú tesné, naplniť systém na prevádzkový tlak.
- Pred vykonávaním servisných prác kontrolovať, či systém nie je pod tlakom. V prípade, že je potrebná výmena súčiastky, výmenu dielov, určených Brooks Instrument musí vykonať kvalifikovaná osoba. Použitie nepovolených dielov a vykonávanie nepovolených aktivít ohrozujú bezpečnosť 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.

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

Európska smernica vzťahujúca sa na tlakové zariadenia (PED)

- Všetky zariadenia s vyšším vnútorným pretlakom ako 0,5 bar (g), a väčšieho rozmeru ako 25 mm alebo 1 anglický palec, podliehajú pod Európsku smernicu vzťahujúcu sa na tlakové nádoby (PED).
- Kapitola "Technické údaje" návodu na obsluhu obsahuje príkazy vzťahujúce sa na smernicu PED.
- Produkty uvedené v návode na obsluhu vyhovujú smernici 2014/34/EU EÚ.
- Všetky prietokomery Brooks patria do 1. skupiny kvapalín.
- Produkty presahujúce rozmery 25 mm alebo 1 " spĺňajú I., II., alebo III. kategóriu PED.
- Produkty menšie alebo rovné ako 25 mm alebo 1 " zodpovedajú zaužívanej meracej praxi (SEP).

Európska smernica vzťahujúca sa na elektromagnetickú kompatibilitu (EMC)

Elektrické / elektronické zariadenia Brooks Instrument, ktoré si zaslúžili značku CE, úspešne splnili skúšobné testy požiadaviek elektromagnetickej kompatibility (smernica EMC č. 2014/30/EU).
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)

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

Postup ošetrovania:

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

Poznámky:

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

Models MT3809G & MT3810G

Slovene

Osnovna navodila

Preberite jih pred nadaljevanjem.

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

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

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

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

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

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

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

Evropska direktiva o tlačni opreni (PED)

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

- V poglavju »Tehnični podatki« v tem priročniku najdete navodila, ki se nanašajo na direktivo PED.
- Izdelki, opisani v tem priročniku, so skladni z direktivo EN 2014/34/EU.
- Vsi merilniki pretoka družbe Brooks Instrument spadajo v skupino tekočin 1.
- Izdelki, večji od 25 mm ali 1 palca, so skladni s kategrijo I, II, ali III direktive PED.
- Izdelki, katerih velikost je 25 mm ali 1 palec ali manjši izdelki, so skladni z dobro inženirsko prakso (SEP).

Evropska direktiva o elektromagnetni združljivosti (EMC)

Naprave družbe Brooks Instrument (električne/elektronske) z oznako CE so bile uspešno preskušene v sklčadu s predpisi direktive o elektromangnetni združljivosti (Direktiva o elektromagnetni združljivosti 2014/30/EU).
Posebno pozornost morate nameniti izbiri signalnega kabla, ki jih uporabljate za naprave z oznako CE.

Kakaovost signalnih kablov, kabelskih tesnilk in priključkov:

Brooks Insturment ponuja kable visoke kakovosti, ki ustrezajo tehničnim podatkov za pridobitev oznake CE.
Če uporabljate svoj signalni kabel, morate uporabiti kabel, ki je na splošno popolnoma oklopljen s 100 % zaščito.
Priključki tipa »D« ali »krožni« priključki morajo biti zaščiteni s kovinskim ščitom. Po potrebi je treba uporabiti kovinske kabelske tesnilke, ki zagotavljajo vpenjala za zaslon kabla.
Zaslon kabla je treba priključiti na kovinsko ohišje ali tesnilko in ga na obeh koncih popolnoma zaščititi.
Zaščito je treba prekiniti pri ozemljitvi.
Robni priključki običajno niso kovinski. Kable je treba zaščititi s 100 % zaščito, da ustrezajo oznaki CE.
Zaščito je treba prekiniti pri ozemljitvi.
Navodila z konfiguraciju nožic najdete v priloženem uporabniškem priročniku.

Elektrostatična razelektritev (ESD)

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

Postopek ravnanja:

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

Opombe:

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

Installation and Operation Manual

X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July 2018

Models MT3809G & MT3810G

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.

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

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

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

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

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

Directriz Europea de los Equipos de Presión (PED)

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

- El capítulo Datos Técnicos del manual incluye las instrucciones respecto a las directivas de PED
- Los instrumentos de medición indicados en el Manual responden a las EN directivas 2014/34/EU.
- Todos los caudalímetros Brooks pertenecen a la categoría 1 del grupo de fluidos.
- Los instrumentos de medición más grandes que 25 mm o 1 pulgada están en conformidad con las categorías I, II o III de PED
- Los instrumentos de medición más pequeños que 25 mm o 1 pulgada siguen la Práctica Aceptada de Ingeniería (SEP).

Directriz Europea respecto a la Compatibilidad Electromagnética (EMC)

Las instalaciones de Brooks Instrument (eléctricas/electrónicas) merecedores de la categoría CE cumplieron con éxito las pruebas que verifican las exigencias de la compatibilidad electromagnética (directiva de EMC 2014/30/EU).
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.

Models MT3809G & MT3810G

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.

⚠ 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.

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

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

⚠ 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 2014/34/EU.
- Brooks Instruments alla flödesmätare faller under flödesgrupp nr. I.
- Mätare som är större än 25 mm eller 1" (inch) överensstämmer med PED kategorier I, II eller III.
- Mätare på 25mm eller 1" (inch) eller mindre faller under Sound Engineering Practice (SEP) (God Teknisk Praxis).

European Electromagnetic Compatibility (EMC) - Elektromagnetisk kompatibilitet

Brooks Instrument (elektriska/elektroniska) CE-märkta anordningar har redan genomgått ett framgångsrikt prov enligt regleringar under Electromagnetic Compatibility (EMC directive 2014/30/EU). 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.
Om man använder sin egen signalkabel, då bör man använda en kabel som är fullständigt skärmad med en 100% avskärmning.
“D” eller “Cirkelformiga” kontakdon skall vara skärmade med metalliska avskärmningar. Om det är användbart, bör metallpackboxar som ger en bra fastspänning för kabelskärmar användas.
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.

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

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.

Installation and Operation Manual

X-VA-MT3809G-MT3810G-eng
Part Number: 541B182AAG
July, 2018

Models MT3809G & MT3810G

LIMITED WARRANTY

Visit www.BrooksInstrument.com for the terms and conditions of our limited warranty.

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. The primary standard calibration equipment to calibrate our flow products 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.

SEMINARS AND TRAINING

Brooks Instrument can provide seminars and dedicated training to engineers, end users and maintenance persons. Please contact your nearest sales representative for more details.

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

CE ISO 9001 QUALITY SYSTEM

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

Toll-Free (USA): 888-554-FLOW
T: 215-362-3500
F: 215-362-3745
BrooksAM@BrooksInstrument.com

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

BROOKS® INSTRUMENT