DS-VA-MT3809G-eng
July, 2014

MT3809G General Purpose Housing

MT3809G Series

Variable Area

Metal Tube Variable Area Flowmeters

Overview

Brooks MT3809 meter operation is based on the variable area principle. The all metal meter is ideal for a variety of gas, liquid and steam applications. These meters are indispensable where high pressure and/or high temperature operating conditions exist.

The primary meter is available in 316/316L stainless steel as well as with a PTFE liner. But a wide range of corrosion resistant materials of construction are available which makes it a perfect fit for metering of aggressive applications.

A broad range of connection sizes and types such as ASME, DIN and JIS flange choices along with several threaded options provide for flexible installations.

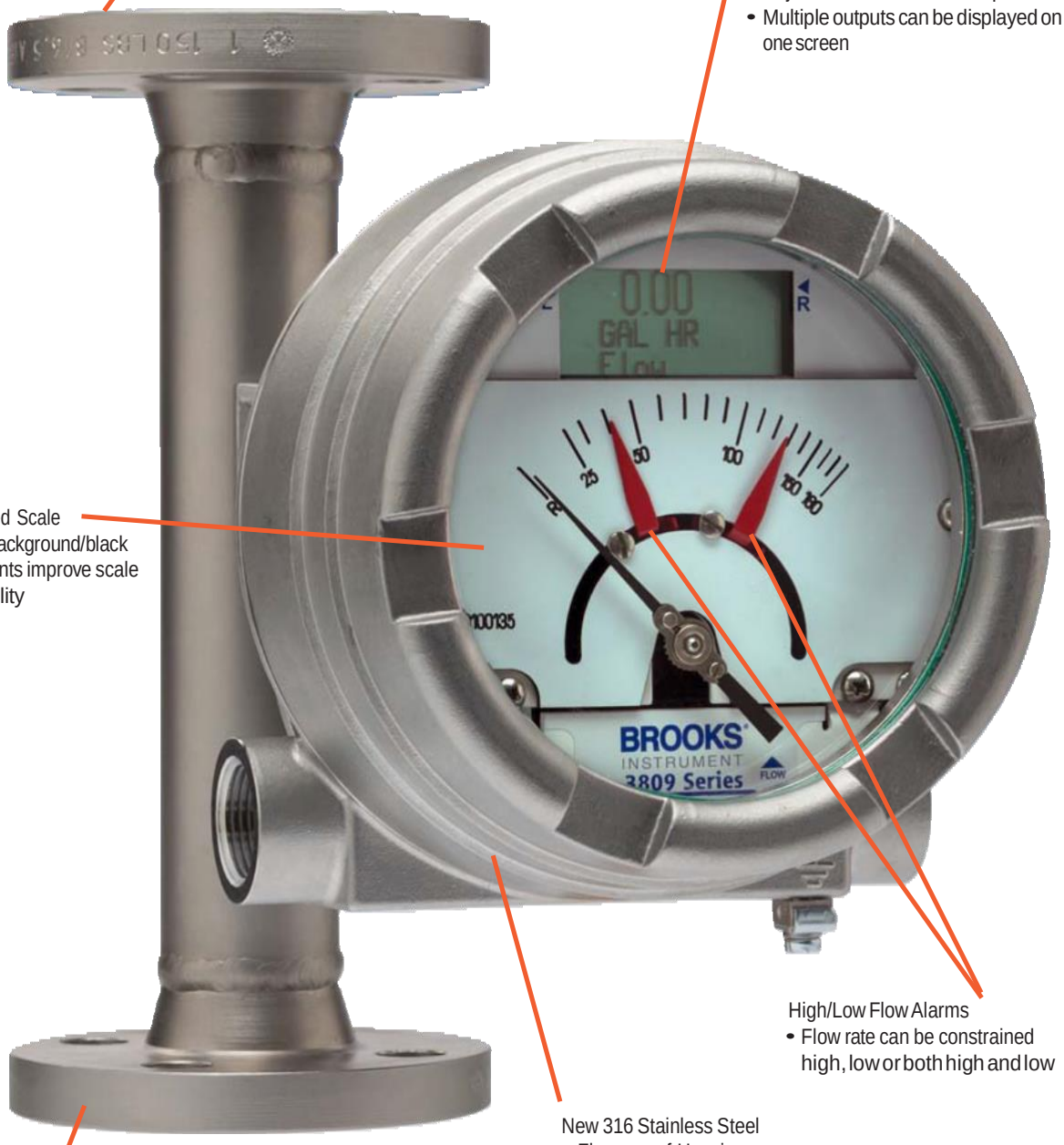
The very popular mechanical indicator option does not require power which reduces installation costs and is a cost-effective solution for flow measurement in hazardous areas. Certified transmitters and alarms both flameproof and instrinsically safe are available for hazardous installations anywhere in the world.

Product Description

The Brooks Model MT3809 has been the "go to" meter for several years and the choice of Engineering & Procurement Contractors (EPC) and major industrial customers. Brooks is proud to raise the performance of the standard meter by adding these new features and options:

- Alarm function that meets SIL 2 requirements, the perfect product for safety applications
- LCD display with local operator interface without removing the cover which means changes can be made even in hazardous areas
- 316SS flameproof housing that meets IIC/Class 1 Div 1 to handle the toughest hazardous applications
- The broadest range of operating temperatures in the industry, the perfect meter for difficult applications
- 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 the gasket sealing surface is per ASME, a rugged design that does not require special gaskets at installation
- Weldneck flanges are standard for MT3809 and MT3810 which means full penetration welds that can easily be tested for integrity

Features and Benefits



Improved Gasket Sealing Surface
- Gasket sealing surface meets ASME, special gaskets are not required

LCD Display
- Three line display
- Adjust with/without cover in place
- Multiple outputs can be displayed on one screen

Redesigned Scale
- White background/black increments improve scale readability

High/Low Flow Alarms
- Flow rate can be constrained high, low or both high and low

New 316 Stainless Steel Flameproof Housing
- Meets IIC/Class 1 Division 1 hazardous area rating
- Broadest operating temperature of any VA meter

Weldneck Flanges
- Full penetration welds which can be examined for integrity

Product Description

316 SS Flameproof Housing

The 3809 flameproof housing has been redesigned and improved. The option is made of 316 stainless steel. This includes housing, cover, bracket and hardware. The new option now meets ATEX gas group IIC/NA class 1 Division 1. This is the highest gas protection rating available. Now this option can be used in more hazardous area applications. This option also has the broadest operating temperature range of any Variable Area meter. The new 3809 can be used in applications from -198°C to +420°C (-325°F to +788°F).

LCD Display

The 4-20 mA output transmitter is still available with remote analog output but now a LCD display is a new option. The LCD display supplies additional information locally such as totalization, alarm signals and the ability to make parameter changes. The changes can be made by removing the housing cover which is possible in a non-hazardous area. But in a hazardous area the display can be accessed with the cover in place using a supplied magnet.

Improved Transmitter and Alarm Option

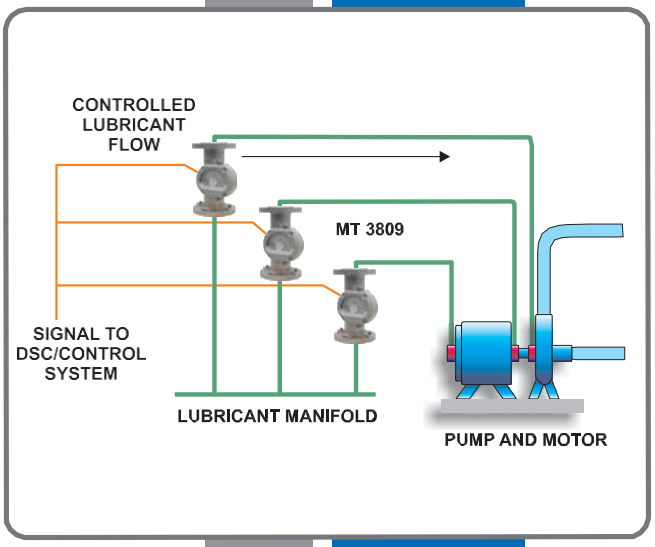
The transmitter and alarm options can be used in applications from -198°C to +420°C (-325°F to +788°F). Every transmitter has HART Revision 7 capability. The transmitter and alarm options will have worldwide approvals including CSA (North America), ATEX (Europe), KOSHA (Korea), NEPSI (China) and GOST (Russia). The alarm function has a safety certification of SIL 2. This option can be used in the toughest applications including safety systems.

Product Applications

Rotating Equipment

Large rotating equipment requires effective and reliable flow monitoring on a number of fluid supplies – like lubrication fluids, coolants, and dry gas seal gasses – to ensure efficient and safe operation.

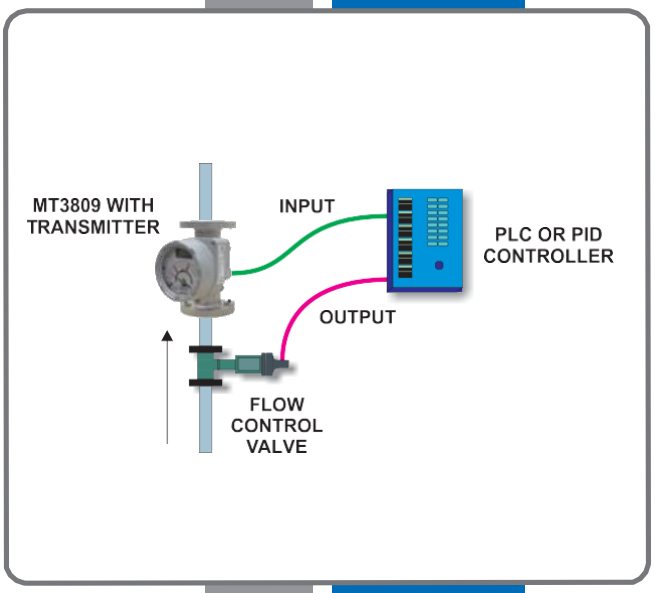
Brooks variable area meters – such as the MT3809 shown – are commonly used to monitor lube oil and coolant flows. The optimum solution is using a 4-20 mA transmitting variable area meter so that flow can be continuously monitored.



Basic Flow Control

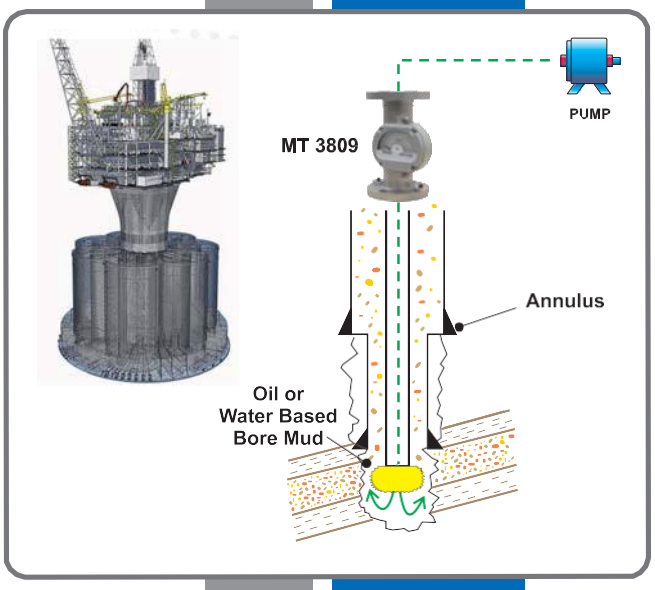
Many industrial processes require reliable, accurate,and repeatable gas and liquid flow measurement and control. Brooks variable area meters are exceptionally versatile, and are ideal for monitoring process flow, instrument impulse lines, purge gas flows, flows of flushing or cooling media, make-up flows, and reactor gas and liquid feeds.

Many Brooks variable area meters offer flow switches, alarms, or continuous electronic output to allow flow conditions to be monitored and controlled remotely. A variety of valves is also available for setting a flow set-point, and electronic pressure controllers are offered to provide constant flow under varying pressure conditions.



Offshore/High Pressure

Operators of offshore platforms require reliable products that operate under extreme conditions such as high pressure and difficult environmental conditions. Common offshore applicatons involve injecting a fluid (many times a proprietary fluid) into the high pressure extraction fluid to either prevent corrosion, freezing of the extraction fluid or adding lubrication. In all cases the goal is to provide local monitoring of the extraction process which improves the overall process yield. The Model 3809 variable area meter is an excellent choice because it is simple, proven, reliable (only one moving part) and is available for operating pressures to 20,000 PSIG/ 1350 bar.

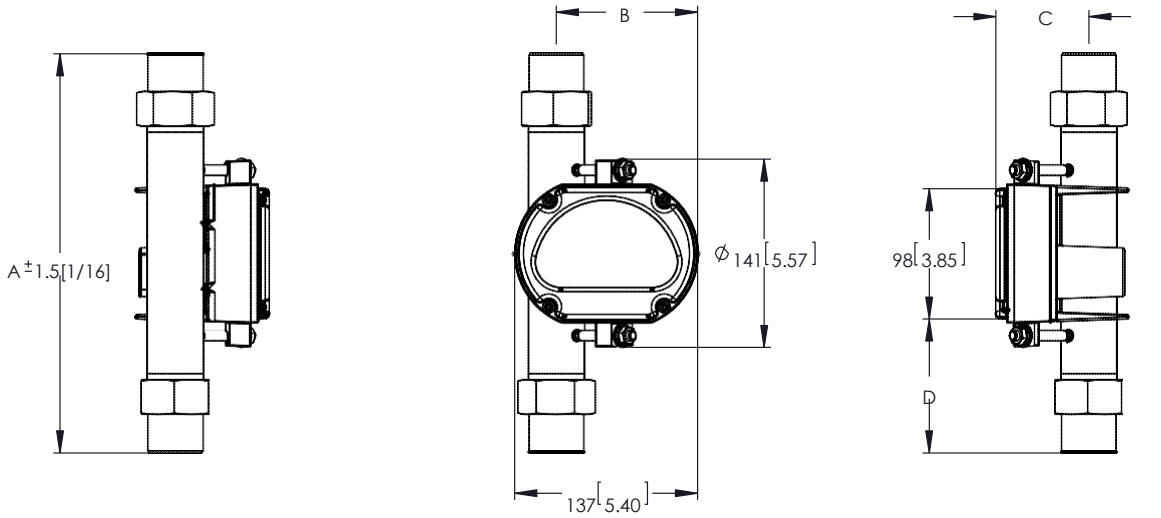


Product Specifications - Meter

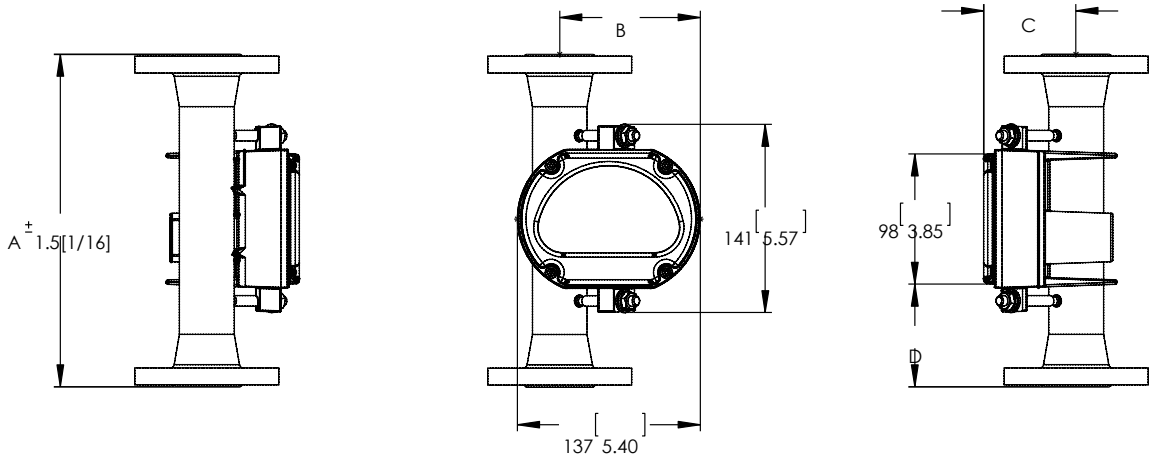
Specifications	MT3809	MT3809 ELF	TFE Lined	MT3810
Measuring Range	See Capacity Tables on page 11			
Rangeability	10:1 (most sizes)			
Metering Tube	316/316L (dual certified stainless steel)		316/316L (dual certified stainless steel) w/Tefzel Lining	316/316L (dual certified stainless steel)
	Alloy 625, Hastelloy C, Titanium Gr. II	Monel K-500, Hastelloy C		
Flanges and End Fittings	316/316L (dual certified stainless steel)		316/316L (dual certified stainless steel) w/Tefzel Lining	316/316L (dual certified stainless steel)
	Alloy 625, Hastelloy C, Titanium Gr. II			
Accuracy	2%, 1%, VDI/VDE class 1.6	5%, 3%, VDI/VDE class 4, 2.5	2%, VDI/VDE class 1.6	5%, VDI/VDE class 6
Repeatability	0.25% Full Scale	1% Full Scale	0.25% Full Scale	0.25% Full Scale
Scale	Black increments with white background - Plastic Material Silver increments with black background - Aluminum Material			
Connections	Weldneck flanges to ANSI B16.5, DIN 2527/2635		Flanges to ANSI B16.5, DIN 2527/2635	Weldneck flanges to ANSI B16.5, DIN 2527/2635
	1/2" to 2" NPT/Rc-Female	1/2" NPT/Rc-Female		1/2" to 2" NPT-Female
	1" to 2-1/2" NPT-Male	1" NPT-Male		
Flange Rating	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
	DIN PN 40		DIN PN40	
Standard Flange Finish	3.2 - 6.3 Ra			
Floats	316L stainless steel	316L stainless steel/Titanium	Hastelloy C-276 (sizes 7,8)	316L stainless steel
	Alloy 625, Hastelloy C Titanium Gr. II	Monel K-500, Hastelloy C	PVDF (sizes 10-13)	
O-rings	Viton	Kalrez 4079	None	Viton
	Teflon	Kalrez 3018	None	Teflon
Protection Category	IP67 / NEMA 4X			
Indicator Housing & Cover	Die cast Aluminum (Alloy 380), epoxy paint, glass window (general purpose)			
	Die cast Aluminum (Alloy 380), epoxy paint, glass window (Intrinsic Safe)			
	Cast 316 stainless steel, glass window (general purpose)			
	Cast 316 stainless steel, 316 stainless steel hardware, glass window (flameproof)			
Pressure/Temperature	See Pressure/Temperature Tables on pages 9 and 10			
Maximum Fluid Temperature	420°C/788°F (refer to page 9, 10)		150°C/270°F	300°C/570°F
Meter Dimensions	Refer to figures on pages 6, 7 and 8			
Model Code	Refer to pages 15, 16, 17 and 18			
Pressure Equipment Directive (PED) 97/23/EC	Flowmeter complies under Sound Engineering Practices (SEP) or categories I, II, III			
Needle Control Valves	Sizes 7-12	Sizes 0-5	None	Sizes 7-12
Flow Controllers	Sizes 7-8	Sizes 0-5	None	Sizes 7 & 8
Inductive Alarm Switches	1 or 2 inductive switches (Relay power supply recommended)			
Transmitter	4-20 mA output with HART Rev. 7 communications			
Transmitter and Inductive Alarm Switches	4-20 mA output with HART Rev. 7 communications and 1 or 2 inductive switches (Relay power supply recommended)			
Transmitter, LCD Display and Inductive Switches	4-20 mA output with HART Rev. 7 communications with digital display plus 1 or 2 inductive switches (Relay power supply recommended)			
Transmitter LCD Display Pulse Output	4-20 mA output with HART Rev. 7 communications and pulse output plus digital display			
General Purpose & Intrinsically Safe Power Supplies for Transmitter	24 Vdc, 110 Vac, 220 Vac			
Intrinsically Safe Power Supply/Relay for Alarms - Recommended	24 Vdc, 110 Vac, 220 Vac			
Agency Approvals	Refer to Page 14			
Other Approvals	SIL 2 Alarms			
EMC Protection	The device complies with EU Directive 2004/108/EC, FCC Part 15, subpart B, Industry Canada, 1 CES-003 Recommendations NE21			

Product Dimensions - General Purpose Housing

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



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

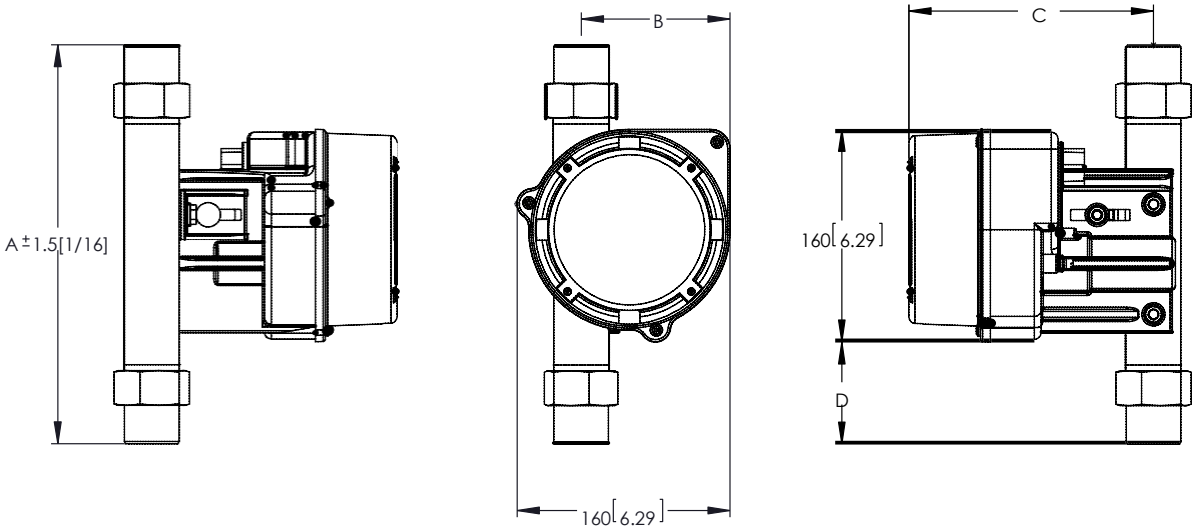


Meter Size	Connection	A	B	C	D	Weight (Approx.)**
0-5	1/2" Threaded Female St'd	225 [8.85]*	99 [3.90]	63 [2.48]	76 [2.98]	2.7 kg [6 lbs.]
7 & 8	1/2" Threaded Female St'd	225 [8.85]*	99 [3.90]	63 [2.48]	76 [2.98]	2.7 kg [6 lbs.]
10	1" Threaded Female St'd	300 [11.81]*	107 [4.21]	71 [2.80]	76 [2.98]	4.5 kg [10 lbs.]
12	1-1/2" Threaded Female St'd	300 [11.81]*	116 [4.57]	80 [3.15]	76 [2.98]	6.8 kg [15 lbs.]
13	2" Threaded Female St'd	300 [11.81]*	122 [4.78]	86 [3.39]	76 [2.98]	7.7 kg [17 lbs.]
0-5	1/2" Flange	250 [9.84]	99 [3.90]	63 [2.48]	76 [2.98]	4.1 kg [9 lbs.]
7 & 8	1/2" Flange	250 [9.84]	99 [3.90]	63 [2.48]	76 [2.98]	4.1 kg [9 lbs.]
10	1" Flange	250 [9.84]	106 [4.18]	70 [2.76]	76 [2.98]	7.7 kg [17 lbs.]
12	1-1/2" Flange	250 [9.84]	115 [4.54]	79 [3.12]	76 [2.98]	12.2 kg [27 lbs.]
13	2" Flange	250 [9.84]	121 [4.63]	85 [3.36]	76 [2.98]	14.1 kg [31 lbs.]
15	3" Flange	250 [9.84]	139 [5.46]	103 [4.05]	76 [2.98]	20.0 kg [44 lbs.]
16	4" Flange	350 [13.78]	152 [5.98]	118 [4.65]	126 [4.95]	37.6 kg [83 lbs.]

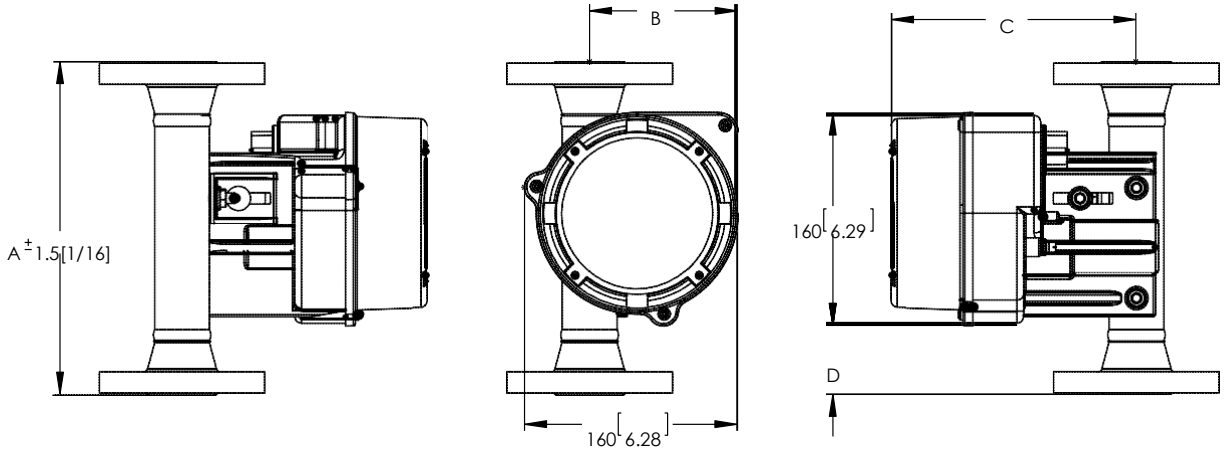
* Dimensions apply to threaded female standard connections only.
** Weights shown for aluminum indicator. Add 1.8 kg [4 lbs.] for steel indicator housing.

Product Dimensions - Intrinsically Safe Housing

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



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

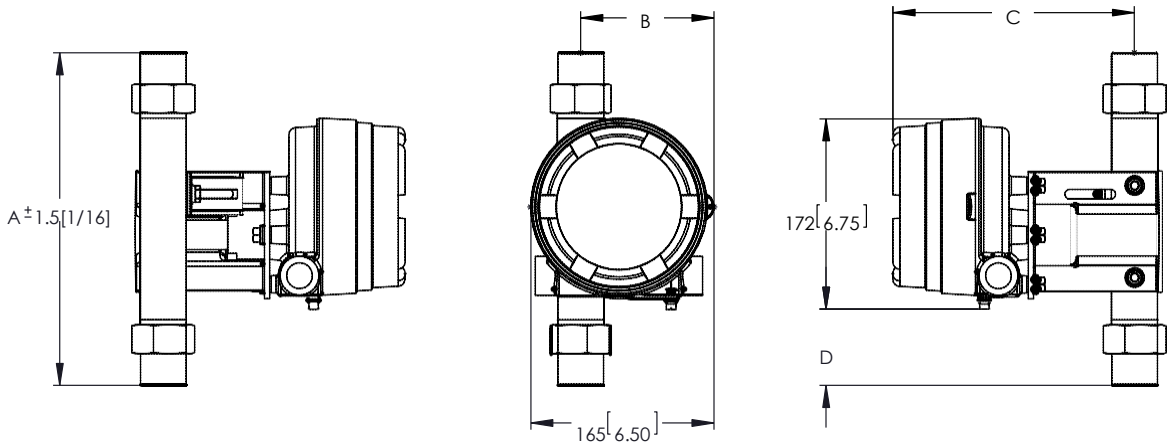


Meter Size	Connection	A	B	C	D	Weight (Approx.)
0-5	1/2" Threaded Female St'd	225 [8.85]*	104 [4.09]	182 [7.17]	52 [2.04]	5.4 kg [12 lbs.]
7 & 8	1/2" Threaded Female St'd	225 [8.85]*	104 [4.09]	182 [7.17]	52 [2.04]	5.4 kg [12 lbs.]
10	1" Threaded Female St'd	300 [11.81]*	112 [4.41]	182 [7.17]	52 [2.04]	7.3 kg [16 lbs.]
12	1-1/2" Threaded Female St'd	300 [11.81]*	121 [4.76]	182 [7.17]	52 [2.04]	9.5 kg [21 lbs.]
13	2" Threaded Female St'd	300 [11.81]*	127 [5.00]	182 [7.17]	52 [2.04]	10.4 kg [23 lbs.]
0-5	1/2" Flange	250 [9.84]	104 [4.09]	182 [7.17]	52 [2.04]	6.8 kg [15 lbs.]
7 & 8	1/2" Flange	250 [9.84]	104 [4.09]	182 [7.17]	52 [2.04]	6.8 kg [15 lbs.]
10	1" Flange	250 [9.84]	111 [4.37]	182 [7.17]	52 [2.04]	10.4 kg [23 lbs.]
12	1-1/2" Flange	250 [9.84]	120 [4.73]	182 [7.17]	52 [2.04]	15.0 kg [33 lbs.]
13	2" Flange	250 [9.84]	126 [4.97]	182 [7.17]	52 [2.04]	16.8 kg [37 lbs.]
15	3" Flange	250 [9.84]	144 [5.67]	182 [7.17]	52 [2.04]	22.7 kg [50 lbs.]
16	4" Flange	350 [13.78]	159 [6.26]	182 [7.17]	102 [4.00]	40.4 kg [89 lbs.]

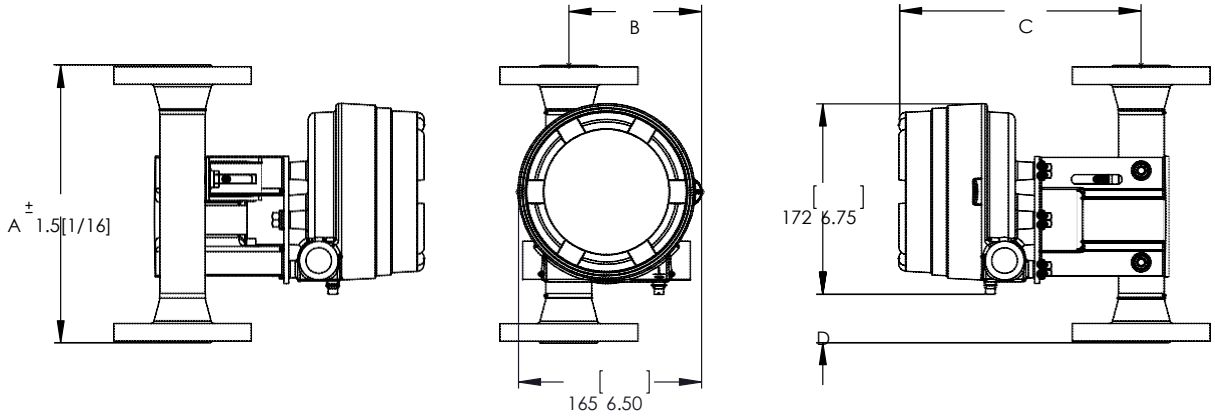
* Dimensions apply to threaded female standard connections only.

Product Dimensions - Explosion Proof Housing

Model 3809 Explosion Proof Indicator Housing with
Threaded Female St'd 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 St'd	225 [8.85]*	112 [4.41]	218 [8.57]	44 [1.72]	11.8 kg [26 lbs.]
7 & 8	1/2" Threaded Female St'd	225 [8.85]*	112 [4.41]	218 [8.57]	44 [1.72]	11.8 kg [26 lbs.]
10	1" Threaded Female St'd	300 [11.81]*	120 [4.73]	218 [8.57]	44 [1.72]	13.6 kg [30 lbs.]
12	1-1/2" Threaded Female St'd	300 [11.81]*	129 [5.08]	218 [8.57]	44 [1.72]	15.9 kg [35 lbs.]
13	2" Threaded Female St'd	300 [11.81]*	135 [5.31]	218 [8.57]	44 [1.72]	16.8 kg [37 lbs.]
0-5	1/2" Flange	250 [9.84]	113 [4.45]	218 [8.57]	44 [1.72]	13.2 kg [29 lbs.]
7 & 8	1/2" Flange	250 [9.84]	113 [4.45]	218 [8.57]	44 [1.72]	13.2 kg [29 lbs.]
10	1" Flange	250 [9.84]	120 [4.73]	218 [8.57]	44 [1.72]	16.8 kg [37 lbs.]
12	1-1/2" Flange	250 [9.84]	129 [5.08]	218 [8.57]	44 [1.72]	21.3 kg [47 lbs.]
13	2" Flange	250 [9.84]	135 [5.31]	218 [8.57]	44 [1.72]	23.1 kg [51 lbs.]
15	3" Flange	250 [9.84]	153 [6.02]	218 [8.57]	44 [1.72]	29.0 kg [64 lbs.]
16	4" Flange	350 [13.78]	168 [6.61]	218 [8.57]	94 [3.69]	46.7 kg [103 lbs.]

* Dimensions apply to threaded female standard connections only.

Product Specifications - Pressure/Temperature Ratings Tables

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
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
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

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

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
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

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
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
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
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
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

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	413.7
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	351.6
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	430.9
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

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

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

Product Specifications - Pressure/Temperature Ratings Tables (continued)

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	413.7
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	351.6
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	430.9
212	100	6228	429.4
392	200	5842	402.8
572	300	5179	357.1

* ELF 2500# Design (Kalrez 4079)

Product Specifications - Temperature Cut-off Tables

Meter with Mechanical Indicator

	Process Temperature		Ambient Temperature	
Connection type	°C	°F	°C	°F
Flanged / MNPT	-198 to 420	-325 to 788	-40 to 75	-40 to 167
Threaded female	-50 to 260*	-325 to 500*	-40 to 75	-40 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.
Refer to Instruction Manual for details

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

Product Specifications - Capacity Tables, 3809/3810

METER SIZE	CONNECTION SIZE DIN DN mm	CONNECTION SIZE ANSI inches	FLOAT CODE	FLOAT MATERIAL STAINLESS STEEL 316L, TITANIUM FLOAT METER SIZE 0 WATER [3] l/h	WATER [3] gph	AIR [1,2] scfh	AIR [1,2] nl/h	Press Drop mbar	Press Drop inches WC	VIC (cSt) (cSt)	Max. Visc (cSt)	PED Category
0	15	1/2"	0	0.96	0.25	1.6	44	12	5	1	5	SEP
1			0	1.3	0.34	2.1	59	12	5	1	10	SEP
2			0	3.6	0.96	4.9	130	12	5	1	20	SEP
3			0	10	2.8	12	350	12	5	1	35	SEP
4			0	21	5.5	23	650	32	13	1	70	SEP
5			0	42	11	53	1400	38	15	1	100	SEP

1. Air flows in scfh are given at 70°F and 14.7 psia 2. Air flows in nl/h are given at 0°C and 1.013 bar (a) 3. Water flows in l/h & gpm are given at 70°F

METER SIZE	CONNECTION SIZE DIN DN mm	CONNECTION SIZE ANSI inches	FLOAT CODE	FLOAT MATERIAL STAINLESS STEEL 316L WATER [4] l/h	WATER [4] gpm	AIR [1,2] scfm	AIR [1,2] nm3/h	Press Drop mbar	Press Drop inches WC	VIC (cSt) (cSt)	Max. Visc (cSt)	PED Category
7	15	1/2"	A	25	0.11	0.49	0.8	30	13	1	40	SEP
			B*	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*	200	0.88	3.7	6.1	35	15	1	20	SEP
8	15	1/2"	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	25	1"	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	40	1 1/2"	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	50	2"	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	-	CAT I, II or III
15	80	3"	A	20000	88	390	640	110	45	8	-	CAT I, II or III
			B	30000	130	550	900	140	57	7	-	CAT I, II or III
			C	40000	170	750	1200	280	113	5	-	CAT I, II or III
16	100	4"	A	49000	210	NA	NA	160	65	15	-	CAT I, II or III
			B	70000	300	NA	NA	210	85	10	-	CAT I, II or III
			C	100000	440	NA	NA	300	121	5	-	CAT I, II or III

1. Air flows in scfm are given at 70°F and 14.7 psia 2. Air flows in nm3/h are given at 0°C and 1.013 bar (a)
3. *Minimum operating pressure required 7 psig / 0.48 bar 4. Water flows in l/h & gpm are given at 70°F

Product Specifications - Capacity Tables, ETFE Lined

METER SIZE	CONNECTION SIZE DIN DN mm	CONNECTION SIZE ANSI inches	TUBE FLOAT CODE	STANDARD FLOAT MATERIAL CAPACITIES (See Note 3) WATER [5] l/h	WATER [5] gpm	AIR [1,2,4] scfm	AIR [1,2,4] nm3/h	Press Drop mbar	Press Drop inches WC	PED Category
7	15	1/2"	GA	110	0.48	2.2	3.7	25	11	SEP
			GB	170	0.75	3.5	5.8	50	21	SEP
8	15	1/2"	A	250	1.1	5.1	8.3	30	13	SEP
			B	420	1.8	8.5	13	45	19	SEP
			C	500	2.2	9.9	16	40	17	SEP
			D	850	3.7	18	30	130	53	SEP
10	25	1"	A	1400	6.2	27	45	45	19	CAT I, II or III
			B	2000	8.8	39	63	106	43	CAT I, II or III
			C	2400	10	47	77	90	37	CAT I, II or III
			D	3000	13	58	95	130	53	CAT I, II or III
12	40	1 1/2"	A	3000	13	58	95	50	21	CAT I, II or III
			B	4000	18	73	120	75	31	CAT I, II or III
			C	5000	22	94	150	85	35	CAT I, II or III
			D	6000	26	110	180	120	49	CAT I, II or III
13	50	2"	A	6000	26	110	180	95	39	CAT I, II or III
			B	8000	35	150	250	125	51	CAT I, II or III
			C	12000	53	220	370	200	81	CAT I, II or III
			D	15000	66	280	470	225	91	CAT I, II or III

1. Air flows in scfm are given at 70°F and 14.7 psia 2. Air flows in nm3/h are given at 0°C and 1.013 bar (a)
3. Sizes 7 & 8 floats are Hastelloy C-276 (Density = 8.94 kg/dm^3), Sizes 10, 12 & 13 are PVDF (Density = 4.22 kg/dm^3)
4. For gas applications operating pressure must be greater than 29 PSIA / 2 bar (a)
5. Water flows in l/h & gpm are given at 70°F

Product Specifications - Transmitter

Design Features

A 2-wire, loop-powered device for ease of wiring and installation

- 4-20 mA analog output for flowrate, with Bell-202 modulated HART communication channel
- 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, scaleable pulse output for various engineering units
- Comprehensive alarms for both process flow and internal diagnostic checks
- Easily configured and compatible with other plant equipment

Description

The transmitter (with or without the alarms, display and pulse output) is a compact microprocessor device designed to interface directly with the Model MT 3809.

The transmitter is HART-programmable 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.

Power Supply Transmitter	21 to 30 Vdc: (2-wire current loop transmitter) 4-20 mA analog output with HART data. Update rate: 4 times per sec. Range: 3.8 to 22.0 mA.
Two Alarm Outputs (open collector)	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
One Pulse Output (open collector)	Optically isolated. Scaleable 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 on page 10
Housing	IP67/NEMA4X
Electrical Connector	M20 x 1.5 according to ISO, 1/2" NPT (F), 3/4" NPT (F)
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.

Product Specifications - Inductive Alarm Switches

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

Relay Power Supply - recommended

Description

One or two electronic limit switches can be installed in the indicator housing to allow initiation of 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 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.

Power Supply	5 - 25 Vdc: (8 Vdc nominal)
Impedence	- Approximately 1 kohm with cam absent - Approximately 8 kohm with cam present
Ambient and Operating Temperature	See Temperature Cut-off Table on page 10
Housing	IP67/NEMA4X
Electrical Connector	M20 x 1.5 according to ISO 1/2" NPT (F) or cable gland 8-11 mm

Approval Certificates for Transmitters and Alarms

Model Type : Flame Proof (Exd)

Ambient -40°C to 70°C, IP66/67, NEMA 4X

Mark	Approvals	Approval Marking	Certificate/Status
	CSA	Ex d IIC T6 Gb : Ex tb IIIC T85 Db (Zone) Class II, Div.1, Groups E, F, and G (Divisions)	14.2628516
		Div 1 – Gas Groups	PENDING
	ATEX	II 2 G Exd IIC T6..T1 Gb II 2 D Ex tb IIIC T85°C…T400°C Db EN 60079-0:2012, EN 60079-1:2007, EN 60079-31:2009	DEKRA 13ATEX0086X
	IECEx	Exd IIC T6..T1 Gb : Ex tb IIIC T85°C…T400°C Db IEC 60079-0:2011, IEC 60079-1: 2007-04, IEC 60079-31:2008	IECEx DEK13.0027X
	TP TC Ex	Exd IIC T6..T1 Gb : Ex tb IIIC T85°C…T400°C Db	PENDING
	NEPSI	Exd IIC T6..T1 Gb : Ex tb IIIC T85°C…T400°C Db	PENDING
	CCOE	Exd IIC T6..T1 Gb : Ex tb IIIC T85°C…T400°C Db	PENDING
	KOSHA	Exd IIC T6..T1 Gb : Ex tb IIIC T85°C…T400°C Db	PENDING

Model Type : Intrinsic safety (ia) / non-sparking (nA)

Ambient -40°C to 70°C, IP66/67

	ATEX IECEx	*Units with Inductive Alarm only* II 2 G Ex ia IIC T6…T3 Gb : II 2 D Ex ia IIIC T 70°C…T200°C Db II 3 G Ex nA IIC T6…T3 Gc : II 3 D Ex ic IIIC T 70°C…T200°C Dc *Units with Transmitter with or without Inductive Alarm* II 2 G Ex ia IIC T6…T4 Gb : II 2 D Ex ia IIIC T 70°C…T135°C Db II 3 G Ex nA IIC T6…T4 Gc : II 3 D Ex ic IIIC T 70°C…T135°C Dc *Units with Digital Display with or without Inductive Alarm* 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 ic IIIC T135°C Dc EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010 IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010	PENDING
	CSA	Class I, Div 1, Groups A, B, C, and D; Class I, Div 2, Groups A, B, C, and D	PENDING
		Class II, Div 1, Groups E, F, and G	
		Class III, Div 1, T4, Hazardous Locations	
	TP TC Ex	Zone I - Intrinsic safety (ia), Zone 2 non-sparking (nA)	PENDING
	NEPSI	Zone I - Intrinsic safety (ia), Zone 2 non-sparking (nA)	PENDING
	CCOE	Zone I - Intrinsic safety (ia), Zone 2 non-sparking (nA)	PENDING
	KOSHA	Zone I - Intrinsic safety (ia), Zone 2 non-sparking (nA)	PENDING

Declarations	Model Type	Applicable Standards/ Directives	Certificate/Status
EC Declaration CE	All	EMC Directive (2004/108/EC)	Approved
		RoHS Directive (2011/65/EU)	Approved
		Pressure Equipment Directive (97/23/EC)	Approved
SIL Declaration	Meters with Indictive Alarm	IEC 61508-2: 2010	Approved
SIL Declaration	Meters with Transmitter	IEC 61508-2: 2010	PENDING
NAMUR Declaration	Electrical Meters	NAMUR NE21, NE43	PENDING
IP66/67	Indicator Only Meter	IEC 60529.	Approved
NEMA 4X - Watertight	Indicator Only Meter	NEMA 250	Approved
CRN	All	ASME 31.3	Approved

Model Code

Code Pos.	Applicable for 3809	Applicable for 3810
I-IV		
	x	
		x
V		
	x	x
VI		
	x	x
	x	x
	x	x
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
VII		
	x	x
	x	
	x	
	x	x
	x	
	x	
VIII & IX		
	x	
	x	
	x	
	x	
	x	
	x	
	x	x
	x	x
	x	x
	x	x
	x	x
	x	
	x	

BASE MODEL

	ORIENTATION Inlet	Outlet	Std Accuracy
3809	Vertical	Vertical	2% F.S. or 2.5 VDI
3810	Vertical	Vertical	5% F.S. or 6 VDI

MODEL REVISION

G Redesigned .....

MATERIAL & MATERIAL CERTIFICATION

A 316L SS Dual Cert
B 316L SS Dual Cert w/Material Certificate 3.1
C 316L SS Dual Cert w/Material Certificate 3.1 - CODE 5*
D 316L SS Dual Cert - E/TFE lined
E 316L SS Dual Cert - E/TFE lined w/Material Certificate 3.1
F 316L SS Dual Cert - E/TFE lined w/Material Certificate 3.1 - CODE 5*
G 316L SS Dual Cert - CRN
H 316L SS Dual Cert w/Material Certificate 3.1 - CRN
J 316L SS Dual Cert w/Material Certificate 3.1 - CODE 5* - CRN
K Hastelloy C-276 w/Material Certificate 3.1
L Hastelloy C-276 w/Material Certificate 3.1 - CRN
M Inconel 625 w/Material Certificate 3.1
N Inconel 625 w/Material Certificate 3.1 - CRN
P Titanium Grade II w/Material Certificate 3.1
Q Titanium Grade II w/Material Certificate 3.1 - CRN

* Pressure bound material from Western Europe, Japan, Canada or USA.

CONSTRUCTION

A Flange RF with Std Connection Size
B Flange RF with Oversized Connection
C Flange RF with Connection twice the Std Size
D Threaded Female St'd
E Threaded Female High Pressure 2500LBS Design
F Threaded Male

METER and CONNECTION SIZES

		CONNECTION SIZES							
		3809G						3809G & 3810G	3810G
CODE	METER SIZE	Std Conn Sz NECK FLANGED	Oversized Conn NECK FLANGED	Connection 2x Std Size WELD NECK FLANGED	Lined Meter SLIP-ON FLANGED	THREADED FEMALE NPT HI PRESSURE	THREADED MALE NPT	THREADED FEMALE - ST'D PRESSURE	WELD NECK FLANGED
00	0	1/2"	3/4"	1"		1/2"	1"		
01	1	1/2"	3/4"	1"		1/2"	1"		
02	2	1/2"	3/4"	1"		1/2"	1"		
03	3	1/2"	3/4"	1"		1/2"	1"		
04	4	1/2"	3/4"	1"		1/2"	1"		
05	5	1/2"	3/4"	1"		1/2"	1"		
07	7	1/2"	3/4"	1"	1/2"	1/2"	1"	1/2"	1/2"
08	8	1/2"	3/4"	1"	1/2"	1/2"	1"	1/2"	1/2"
10	10	1"	1.5"		1"	1"	1.5"	1"	1"
12	12	1.5"	2"		1.5"	1.5"	2.5"	1.5"	1.5"
13	13	2"	3"		2"			2"	2"
15	15	3"	4"						
16	16	4"							

Sample Standard Model Code

I-IV	V	VI	VII	VIII & IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX
3809	G	A	B	02										

Model Code (conti n ued)

Code Pos.	Annlicable for 3809	Annlicable for 3810
X		

MAXIMUM FLOW (Based On Water At Standard Conditions for 316SS Meter)

3809G Unlined Meters

CODE	3809	3810	for Low Flow ELF Meter Size 0	Size 1	Size 2	Size 3	Size 4	Size 5	
	x		0.96 l/h	1.3 l/h	3.6 l/h	10 l/h	21 l/h	42 l/h	

CODE	3809	3810	for larger Meter Sizes Size 7	Size 8	Size 10	Size 12	Size 13	Size 15	Size 16
A	x		25 l/h	250 l/h	1200 l/h	4000 l/h	6500 l/h	20.000 l/h	49.000 l/h
B	x		65 l/h	400 l/h	1500 l/h	6000 l/h	9500 l/h	30.000 l/h	70.000 l/h
C	x		130 l/h	650 l/h	2400 l/h	8000 l/h	12.000 l/h	40.000 l/h	100.000 l/h
D	x		200 l/h	1000 l/h	3500 l/h	10.000 l/h	20.000 l/h		

3809G • EITFE Lined Meters

CODE	3809	3810	Size 7	Size 8	Size 10	Size 12	Size 13
A	x		110 l/h	250 l/h	1400l/h	3000 l/h	6000 l/h
B	x		170 l/h	420 l/h	2000 l/h	4000 l/h	8000 l/h
C	x			500 l/h	2400l/h	5000 l/h	12.000 l/h
D	x			850 l/h	3000l/h	6000 l/h	15.000 l/h

3810G

CODE	3809	3810	Size 7	Size ■	Size 10	Size 12	Size 13
A		x	25 1/h	250 l/h	1200l/h	4000 l/h	6500 l/h
B		x	65 1/h	400 l/h	1500l/h	6000 l/h	9500 l/h
C		x	130 l/h	650 l/h	2400l/h	8000 l/h	12.000 l/h
D		x	200 l/h	1000 l/h	3500l/h	10.500 l/h	20.000 l/h

Code Pos.	3809	3810	Code	CONNECTION TYPE
XI	"	"	A	NPT-Female wNiton 0-Rings (High pressure 2500# design has Viton/Tellon 0-rings)
	x	x	B	NPT-Female w/Teflon 0-Rings (High pressure 2500# design has Kalrez 3018/Teflon 0-rings)
	"	x	C	Re-Female wNiton 0-Rings (High pressure 2500# design has Vrton/Tellon 0-rings)
	x	x	D	Re-Female w/Teflon 0-Rings (High pressure 2500# design has Kalrez 3018/Teflon 0-rings)
	"		E	NPT-Male
	x	x	F	ANSI 150L8S RF
	"	x	G	ANSI 300L8S RF
	x		H	ANSI 600L8S RF
	x	x	J	DIN PN40 RF
	x		K	JIS 82220 DIN 10K
	x		L	JIS 82220 DIN 20K
	"		M	ANSI 150L8S RF - Elbow Outlet
	x		N	ANSI 300L8$ RF - Elbow Outlet
	"		P	ANSI 600L8S RF - Elbow Outlet

SCALE NSCRIPTION/FLUID

Code Pos.	3809	3810	CODE	><rALE	FLUID
XII	x	x	A	Single-%Scale/Direct	Liquid
	"	"	B	Single-%Scale/Direct	Gas
	x	"	.$;	J!.9Ll!.:.-.!:!!L4! Qr!ct	Lq!J 1J Y.i,i::osity
	"		D	Dual-%and/or Direct	Liquid
	x		E	Dual-%and/or Direct	Gas
	"		F	Dual-%and/or Direct	Liauid, Hi Viscositv

Sample Standard Model Code

I-IV	V	VI	VII	VIII & IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX
3809	G	A	8	02	8	F	C							

Model Code (continued)

Code Pos.	Applicable for 3809	Applicable for 3810
XIII		x
	x	
	x	
		x
	x	
	x	
	x	
	x	
XIV		
	x	x
	x	x
	x	
	x	
	x	
	x	
	x	
	x	
XV		
	x	x
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
XVI		
	x	x
	x	
	x	
	x	
	x	
XVII		
	x	x
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	
	x	

METER ACCURACY

- **A** 5% Full Scale
- **B** 2% Full Scale
- **C** 1% Full Scale
- **D** 6 VDI
- **E** 2.5 VDI
- **F** 1.6 VDI
- **G** 4 VDI
- **H** 3% Full Scale

INDICATOR CONFIGURATION

- **1** Aluminum Housing
- **2** 316SS Housing
- **3** X-proof SS Housing
- **4** Aluminum Housing, High Temperature Design
- **5** 316SS Housing, High Temperature Design
- **6** X-Proof SS Housing, High Temperature Design
- **7** X-Proof SS Housing, Low Ambient Temperature Design(-50°C)
- **8** Al - Housing - Shatterproof Window
- **9** SS - Housing - Shatterproof Window

ELECTRONICS CONFIGURATION

- **A** Indicator only
- **B** Inductive Alarm, 1 Switch
- **C** Inductive Alarm, 2 Switches
- **D** Transmitter, 4 - 20 mA / HART compatible
- **E** Transmitter, 4 - 20 mA / HART compatible w/Pulse Output & Alarm Contacts
- **F** Transmitter, 4 - 20 mA / HART compatible w/ Inductive Alarm 1 Sw*
- **G** Transmitter, 4 - 20 mA / HART compatible w/ Inductive Alarm 2 Sw*
- **H** Transmitter, 4 - 20 mA / HART compatible + LOI (DIGITAL DISPLAY)
- **J** Transmitter, 4 - 20 mA / HART compatible w/Pulse Output & Alarm Contacts + LOI (Digital Display)
- **K** Transmitter, 4 - 20 mA / HART compatible w/ Inductive Alarm 1 Sw + LOI (Digital Display)*
- **L** Transmitter, 4 - 20 mA / HART compatible w/ Inductive Alarm 2 Sw +LOI (Digital Display)*

*Relay Power Supply Recommended

ELECTRICAL CONNECTION

- **0** None
- **1** Cord Connector 8-11 mm
- **2** M20x1.5
- **3** 1/2" NPT-F
- **4** 3/4" NPT-F (X-Proof Housing Only)

CERTS (APPROVAL TYPE)

- **0** None

	ATEX / IECEX	North American Approvals
A	Zone 2, Non-incendive/non-sparking	Div 2 / Zone 2, Non-incendive/non-sparking
B	Zone 1, Intrinsically Safe	Div 1 / Zone 1, Intrinsically Safe
C	Zone 1, Flame-proof XP - IIC	Div 1 / Zone 1, Flame-proof XP

- **D** Nepsi - Zone 2, Non-incendive/non-sparking
- **E** Nepsi - Zone 1, Intrinsically Safe
- **F** Nepsi - Zone 1, Flame-proof XP - IIC
- **G** KOSHA - Zone 2, Non-incendive/non-sparking
- **H** KOSHA - Zone 1, Intrinsically Safe
- **J** KOSHA - Zone 1, Flame-proof XP - IIC
- **K** CCOE - Zone 2, Non-incendive/non-sparking
- **L** CCOE - Zone 1, Intrinsically Safe
- **M** CCOE - Zone 1, Flame-proof XP - IIC
- **N** GOST-R - Zone 2, Non-incendive/non-sparking
- **P** GOST-R - Zone 1, Intrinsically Safe
- **Q** GOST-R - Zone 1, Flame-proof XP - IIC

Sample Standard Model Code

I-IV	V	VI	VII	VIII & IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX
3809	G	A	B	02	B	F	C	C	3	E	4	C			

Model Code (continued)

Code Pos.	Applicable for 3809	Applicable for 3810
XVIII		
	x	x
	x	x
	x	x
	x	x
	x	x
	x	x
	x	x
	x	x
	x	x
	x	x
XIX		
	x	x
	x	
	x	
	x	
	x	
	x	
XX		
	x	x
	x	
	x	
	x	

VALVE / FLOW CONTROLLER

- **0** None
- **A** Valve on Inlet - Viton Seals
- **B** Valve on Inlet - Teflon(Low flow valve Kalrez/Teflon)
- **C** Valve on Outlet - Viton Seals
- **D** Valve on Outlet - Teflon(Low flow valve Kalrez/Teflon)
- **E** Std Press FLOW CONTROLLER on Inlet - Viton Seals
- **F** Std Press FLOW CONTROLLER on Inlet - Teflon/Kalrez Seals
- **G** High Press FLOW CONTROLLER on Inlet - Teflon/Kalrez Seals
- **H** Std Press FLOW CONTROLLER on Outlet - Viton Seals
- **J** Std Press FLOW CONTROLLER on Outlet - Teflon/Kalrez Seals
- **K** High Press FLOW CONTROLLER on Outlet - Teflon/Kalrez Seals

PROCESSES with CERTIFICATES (Group 1)

- **0** None
- **A** Declaration of Compliance 2.1 Positive Material Identification
- **B** Declaration of Compliance 2.1 Positive Alloy Material Identification
- **C** Material Certificate-3.1 & NACE Certificate - 2.1
- **D** Material Certificate-3.1 & NACE Certificate - 2.1 & DoC 2.1 PMI
- **E** Material Certificate-3.1 & NACE Certificate - 2.1 & DoC 2.1 PAMI

PROCESSES with CERTIFICATES (Group 2)

- **0** None
- **A** Radiographic Examination Report 2.1
- **B** Liquid Dye-Penetrant Test Report 2.1
- **C** Radiographic Exam 2.1 & Liquid Dye-Penetrant Test 2.1

Additional Services

1 Clean for Oxygen Service 2.1
2 Hazardous Location Certificate
3 Certificate of Conformance 2.1
4 International Calibration Certificate 2.1
5 Pressure Test Certificate 2.1
6 Commercial Clean

Notes: The CRN approved meters are designed per ASME 31.3, constructed using materials compliant with ASTM/ASME specification and welding according to ASME IX standard.

The CRN approvals are valid for standard model code option and special model code options based on approval granted to the pressure vessel design and no changes to the pressure vessel design.

Sample Standard Model Code

I-IV	V	VI	VII	VIII & IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX
3809	G	A	B	02	B	F	C	C	3	E	4	C	0	A	B

Brooks Service and Support

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

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

START-UP SERVICE AND IN-SITU CALIBRATION

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

CUSTOMER SEMINARS AND TRAINING

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

Please contact your nearest sales representative for more details.

HELP DESK

In case you need technical assistance:

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

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

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