Data Sheet DS-VA-MT3809-3819-eng-eu April, 2008

Models MT 3809 & 3819

# **Brooks® Models MT 3809 and 3819** Metal Tube Variable Area Flowmeters



Models MT 3809 and 3819



#### **DESIGN FEATURES**

- Broad range of flow capacities
- Accuracy class 1.6 acc. VDE/VDI 3513
- Versatile construction for all gas, liquid, steam applications
- Operable under high temperatures and pressures
- Flanged, female and male NPT connections
- Optional 4-20 mA and HART® programmable microprocessor transmitter (SMM) with or without alarms and pulse output for totalization
- Optional transmitter 4-20 mA only (M420)
- Electronics designed with either Intrinsically safe, Non Incendive or Explosion proof constructions:
  II 2 G and II 2 GD EEx ia IIC T4 or T6 (IP67)
  II 3 G and II 2 D EEx nA II T4 or T6 (IP67)
  II 2 GD EEx d IIB T4 (IP65)
  Designs comply also with the Pressure

Equipment Directive (PED) 97/23/EC. For North America cUL and cCSAus certified. The 3800 series flowmeters comply with ATEX

directive 94/9EC annex VIII, clause 3.

#### DESCRIPTION

The Brooks models MT 3809 and MT 3819 variable area flowmeters are rugged, all metal flowmeters offering class 1.6 accuracy. The MT 3809 is constructed with stainless steel components for measuring a variety of gas, liquid and steam applications while the model MT 3819 utilizes a 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 include 4-20 mA output with HART microprocessor transmitter with or without configurable alarms and pulse output for totalization. The microprocessor electronics are based on the proprietary Smart Meter Manager (SMM) technology utilized as the basis for an array of Brooks products. Also available are front adjustable inductive alarms, high temperature or stainless steel indicator housings, valves, flow controllers, steam jacket and material certifications.

#### **OPTIONAL ACCESSORIES**

Needle control valves and flow controllers (available on the MT 3809 only).

For flow rate control, needle control valves or flow controllers may be externally piped into the inlet or outlet side of the instrument. Needle control valves and flow controllers can be supplied up to size 10 (1") maximum 1700 l/hr (7,5 gpm) water equivalent. Sight flow indicators are available for all flanged meters and up to size 13 (2") NPT meters.

#### **OPTIONAL ELECTRONIC EQUIPMENT**

Electronic equipment available with the models MT 3809 and MT 3819 include the SMM transmitter, SMM transmitter/alarm/pulse output for totalization, inductive alarms and SMM transmitter with inductive alarms, refer to pages 6 through 12 for additional information. All models are designed to be either intrinsically safe (aluminium or stainless steel housing) or explosion proof (aluminium housing only). All electronic accessories, except the explosion proof execution options are available for high temperature applications. Refer to table 3 to determine the appropriate model for your application.

### Data Sheet

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## Models MT 3809 & 3819

SPECIFICATIONS METER		
Instrument type		MT 3809/3819
Measuring range		
Water at 20 °C		25 - 100.000 l/h
Air at 1,013 bar abs., 20 °C		0,78 - 1.404 m³,/h
Select measuring range from:		flow table 1A and 1B on page 4
Rangeability		10 : 1
Accuracy class to VDE/VDI 3513		1.6
Repeatability		0,25% full scale
Metering tube		
MT 3809 standard		316/316L SS, WNR 1.4401/1.4404 (dual certified)
MT 3809 optional		Alloy 625, Hastelloy C tm, Titanium Gr. II
MT 3819 standard		316L SS / 316 SS (dual certified) with E/TFE lining
Scales		, , ,
Standard		Detachable aluminium plate (single or dual scales)
Inscriptions		Choice of direct reading units or percentage of maximum flow
Flanges and end fittings		
MT 3809 standard		316/316L SS. WNR 1,4401/1,4404 (dual certified)
MT 3809 optional		Allov 625. Hastellov C tm. Titanium Gr. II
• MT 3819 standard		316LSS / 316 SS with E/TEE lining PVDE inserts
Connections		
• MT 3809 standard - flanges to	n DIN2527/2635	DN15 - DN100
- flanges tr	0 ANSI B16 5	1/4" to 4" 150 lbs RE/300 lbs RE/600 lbs RE
	beck flanges	
- weiding i		1/4" to 11/2" NPT female
- threaded	connection	1" to 21/" NPT male
- Illeaueu		
• WI So I 9 Standard - Hanges to		
- Ildiyes (	J ANSI D 10.5	
		5.2 - 0.3 Rd
FIGUES		216L steinless steel
• MT 3809 Standard		Allow 625 Hostellow C tm Titenium Cr. II
• MT 3809 Optional		Alloy 625, Hastelloy C (III, Hianium Gr. II
• MT 3819 standard - Size 7 ar	10 8	
- Size 10,	12 and 13	PVDF
• MIT 3819 optional		Alloy 625, Monel K-500 tm, or Titanium Gr. II (all sizes) all PTFE
		Internals sizes 10, 12 and 13 only
O-rings (NP1-temale design only)		
MI 3809 standard		Viton
MI 3809 optional		PIFE
• MT 3819		None
Protection category to DIN 40050/I	EC 144	IP67 or NEMA 4x (IP65 for EExd)
Indicator housing and cover		
<ul> <li>MT 3809 and MT 3819 standard h</li> </ul>	ousing	Die cast aluminium (Alloy 380), standard or epoxy paint with
		glass window.
MT 3809 and MT 3819 optional ho	ousing	316 stainless steel (gritblast finished) and glass window.
Maximum fluid temperature		Refer to table 3 on page 5
Meter dimensions		Refer to figure 3 on page 11
Model code		Refer to pages 12-15
Pressure Equipment Directive (PE	D) 97/23/EC	Flow meter complies under Sound Engineering Practices (SEP),
		or categories I, II or III.
ATEX for construction		The 3800 series flow meters comply with EN 13463 part 4,
		December 2001 (inherent safety) refer the ATEX directive
		94/9EC annex VIII, clause 3.

Table 1A - Model MT 38	309 Capacities
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SIZE	CONNE	ECTION ZF	FLOAT		FLOAT MATERIAL STAINLESS STEEL 316L SS					P.E.D.	
JIZE	DIN	ANSI	CODE	WA	TER	AIR	1) 2)	Press. Drop	Viscosity Imm. Ceiling	Max. Viscosity	Legory
	DN mm	inches		l/h	gpm	m³"/h	scfm	30	(cSt) <sup>3)</sup>	(cSt) <sup>3)</sup>	Care
			А	25	0,11	0,8	0,5	30	1	40	
_	45	1/"	В*	65	0,29	2,0	1,3	30	1	20	
	15	/2	С	135	0,59	3,8	2,4	35	1	120	
			D *	200	0,88	5,9	3,7	45	1	20	l a:
			А	250	1,1	8,3	5,3	55	2	250	
	. <b>-</b>	171	В	400	1,7	12,2	7,7	60	1	180	0
8	15	1/2	С	650	2,8	18,6	11,8	130	2	600	
			D	1.000	4,4	33,8	21,4	60	1,5	250	
			А	1.200	5,3	31	19,4	70	5	600	
		4"	В	1.500	6,6	50	31,6	85	1,5	400	
10	25	I	С	2.400	10,5	66	41,7	155	7	800	
			D	3.500	15,4	95	60,1	50	4	500	
			А	4.000	17,6	106	67	60	50	800	1
10	1	40 1½"	В	6.000	26,4	150	95	150	30	800	
12	40		С	8.000	35,2	239	151	300	2	500	
			D	10.500	46,2	335	212	50	2	500	≡
			А	6.500	29	162	102	60	50	800	5
10	50	0"	В	9.500	42	255	161	100	50	800	l =
13	50	2	С	12.500	55	319	202	300	2,5	500	Ľ,
			D	20.000	88	620	392	110	1	500	0
45	00	2"	А	20.000	88	620	392	140	8	600	] <u>B</u>
15	80	3	В	30.000	132	870	550	280	7	550	Cal
			С	40.000	176	1.186	750	160	5	500	
10	100	4"	А	50.000	220			210	15	600	1
16	100	4	В	70.000	308	N/A for ga	as service	300	10	550	
			С	100 000	440				5	500	1

Notes 1) Air flows in scfm converted to 70°F and 14,7 psia when the meter is operated at 68°F and 14,7 psia

2) Air flows in m<sup>3</sup><sub>n</sub>/h (converted to normal conditions: 0°C and 1,013 bar abs.) when the meter is operated at 1,013 bar abs. and 20 °C

3) Viscosity ceilings are based within 2% of max. flow water (for sizing between these limits contact factory)

All meters have a 10:1 turndown 4)

5) 6)

N/A=Not applicable \* Minimum operating press required 7 PSI 0,48 bar

Table 1B - Model MT 3819 E/TFE Lined Capacities

METER	CONNE		FLOAT	STANDARD FLOA		T MATERIAL	P.E.D.					
SIZE			CODE	WATER		AIR	1) 2) 4)		nort			
	DN mm	inches		l/h	gpm	m³"/h	scfm	Press. Drop mbar	Cate S			
7	15	1/"	A	110	0,48	3,2	2,0	25				
, ,	15	/2	В	170	0,75	5,0	3,2	50				
			A	250	1,10	7,3	4,6	30				
8	15	1/"	В	420	1,85	12,2	7,7	45	<u>a</u> :			
0	15	/2	С	500	2,20	14,5	9,2	40	щ			
			D	850	3,74	24,6	15,6	130	S			
						A	1400	6,2	41	26	45	
10	25	4"	В	2000	8,8	58	37	106				
10	20		С	2400	10,6	70	44	90				
			D	3000	13,2	87	55	130				
			A	3000	13	87	55	50	<b>┐</b> _ │			
12	40	11/4"	В	4000	18	116	74	75	-			
12	40	172	С	5000	22	145	92	85	<u>`</u>			
			D	6000	26	174	110	120				
			A	6000	26	174	110	95	2			
13	50	2"	2"	2"	В	8000	35	232	147	125	l og	
			C	12000	53	348	221	200	ate			
			D	15000	66	435	276	225	Ü			

Notes: 1) For gas application operating pressure must be above 2 bar (a). 2) Air flows in m<sup>3</sup><sub>n</sub>/h (converted to normal conditions:0°C and 1,013 bar abs.) when the meter is operated at 1,013 bar abs. and 20 °C

3) Sizes 7 & 8 floats are Hastelloy C, Sizes 10, 12 & 13 are PVDF

4) Air flows in scfm converted to 70°F and 14,7 psia when the meter is operated at 68°F and 14,7 psia

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	316 St	ainless Steel (bar	at indicated tempe	erature)
Flange Rating	21 °C	93 °C	204 °C	315 °C
150 lb.	19	16,5	13,4	9,7
300 lb.	49,5	43	35,5	31
600 lb.	99	86	70,7	62,1
DIN PN40	40	38	31	27

#### Table 2 - Model MT 3809 Pressure Ratings

	316 Stainles	s Steel (bar at indicated	temperature)
Threaded NPT female	21 °C	93 °C	204 °C
7 & 8	173	150	124
10	156	135	112
12	131	113	94

	316 St	ainless Steel (bar	at indicated tempe	erature)
Threaded NPT male	21 °C	93 °C	204 °C	315 °C
7 & 8	325	281	232	205
10	235	203	168	148
12	232	201	166	146

#### Table 3 - Minimum and Maximum Fluid Temperatures at 40 °C Ambient

	Indicator only		Indicator with alarm <sup>1)</sup>		Indicator with	transmitter <sup>1) 2)</sup>
size	standard	heatshield	standard	heatshield	standard	heatshield
				MT 3809		
7 & 8	-50° thru 215°	325°	-30° thru 160°	230°	-30° thru 90°	150°
10	-50° thru 215°	325°	-30° thru 160°	325°	-30° thru 90°	200°
12	-50° thru 215°	325°	-30° thru 160°	325°	-30° thru 90°	200°
13	-50° thru 215°	325°	-30° thru 160°	325°	-30° thru 90°	200°
15	-50° thru 215°	325°	-30° thru 160°	325°	-30° thru 90°	200°
16	-50° thru 215°	325°	-30° thru 160°	325°	-30° thru 90°	200°
		·		MT 3819		
All	-30 thru 150°	150°	-30 thru 150°	150°	-30 thru 90°	150°

Note 1) High Temperature execution not available in EEx d Note 2) For both, SMM and M420 transmitter

#### Minimum/Maximum Ambient Temperature in °C

Meter	Indicator only	Inductive alarm and or transmitter <sup>1)</sup> for both Eexi and Eexd execution
MT3809	-50 thru 65°	-30 thru 65°
MT3819	-50 thru 65°	-30 thru 65°

Note 1) For both, SMM and M420 transmitter

METER	CODE	FLANC	GED	THREADE	THREADED NPT-F or NPT-M		
SIZE		CONNECTION	LENGTH	CONNECTION	LENGTH	CONNECTION	LENGTH
7	1	1/2" FLANGED	250 mm	1/2" FEMALE	225 mm	1" MALE	200 mm
8	2	1/2" FLANGED	250 mm	1/2" FEMALE	225 mm	1" MALE	200 mm
10	3	1" FLANGED	250 mm	1" FEMALE	300 mm	1½" MALE	250 mm
12	4	11/2" FLANGED	250 mm	1 <sup>1</sup> / <sub>2</sub> " FEMALE	300 mm	21/2" MALE	250 mm
13	5	2" FLANGED	250 mm				
15	6	3" FLANGED	250 mm				
16	7	4" FLANGED	350 mm				
		OVERS	IZED				
7	A	1" FLANGED	250 mm				
8	В	1" FLANGED	250 mm				
10	С	11/2" FLANGED	250 mm				
12	D	2" FLANGED	250 mm				
13	E	3" FLANGED	250 mm				
15	F	4" FLANGED	250 mm				

#### Table 4 - Meter & Connection Size

#### Table 5 - Connection Type

CODE	CONNECTION TYPE
1	NPT-female with Viton O-rings
2	NPT-female with Teflon O-rings
3	NPT-male no O-rings oversized
4 *	Rc-female (ISO R7, JIS B0203) with Viton O-Rings
5 *	Rc-female (ISO R7, JIS B0203) with Teflon O-Rings
6 *	R-male (ISO R7, JIS B0203) no O-Rings oversized

Rc-female is interchangeable with Britisch Standard Pipe

CODE	CONNECTION TYPE
А	ANSI 150# RF
В	ANSI 300# RF
С	ANSI 600# RF (not for oversized)
D	DIN PN40 RF

threads (	BSP1)		

#### Table 6 - Accessories Series 3809

Note: \*

CODE	DESCRIPTION	MAX. FLOW AT WATER EQUIVALENT
A	None	
В	High temperature design	
D	8802 Flow controller	
E	8805 Flow controller	= 88 l/h
F	8902 Flow controller	
G	8905 Flow controller	
Н	8812 Flow controller	
J	8815 Flow controller	= 570 l/h
К	8912 Flow controller	
L	8915 Flow controller	
М	8830 Flow controller	= 1.820 l/h
N	1/4" valve on inlet	
Р	1/4" valve on outlet	= 260 l/h *
Q	1/2" valve on inlet	
R	1/2" valve on outlet	= 1000 l/h *
S	1" valve on inlet	
Т	1" valve on outlet	= 3.500 l/h *
W	1 <sup>1</sup> / <sub>2</sub> " valve on inlet	
Х	1 <sup>1</sup> / <sub>2</sub> " valve on outlet	= 10.500 l/h *

Note : Valves and flow controllers not with male connection

Note \* : Max. T 210°C (Optional Temperature: Consult Factory)

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## **OPTIONAL ELECTRONIC EQUIPMENT**

## SMM TRANSMITTER WITH OR WITHOUT ALARMS AND PULSE OUTPUT

#### **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: resetable and inventory totalization
- User configurable, scaleable pulse out put for various engineering units
- Comprehensive alarms for both process flow and internal diagnostic checks
- Easily configured and compatible with other plant equipment
- Unique magnetic pick-up sensor

"Smart Inside" best defines the Brooks transmitter with optional alarms and pulse output for totalization. The transmitter (with or without the alarms and pulse output) is a compact microprocessor device designed to interface directly with the models MT 3809 and MT 3819 flowmeters. The microprocessor electronics are based on the Brooks Smart Meter Manager (SMM<sup>™</sup>) technology common to other Brooks flowmeters. The SMM 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 such as the HART communicator. Prior to shipment, commonly used default values are programmed by Brooks to ensure ease of operation and quick startup. However, parameters can be reprogrammed by the user if needed. The 2-wire electronics system is easy to install and interface with other existing equipment, such as process management systems or maintenance control packages, refer to figure 1.

In operation the SMM transmitter converts the measured process flow rate into a 4-20 mA output with HART communication data. The float is constructed with an integral magnet that activates a patented magnetic sensor that is part of the transmitter. This same float magnet also drives the mechanical pointer. Flow rate information may be viewed locally at the meter scale or displayed remotely (along with other flow data) as a function of external support systems through analog/pulse outputs or multiple digital communications.

In addition to transmitter features, this unit can also be ordered with optional alarms and pulse output provided by open collector switches. One or two alarms may be programmed prior to shipment of the unit or at the customer site with a hand-held communicator.

#### **TRANSMITTER ACCESSORIES**

General purpose and intrinsically safe HART compatible power supplies are available in 24Vdc, 110Vac and 220Vac.



Figure 1 Typical SMM transmitter analog output and power wiring

### SPECIFICATIONS TRANSMITTER

Transmitter type		SMM Transmitter with or without alarm and pulse output
Electrical classification		
Certified		CE Mark; EMC Directive 89/336/EEC
		EEx ia Intrinsically Safe
	$\frown$	KEMA 01ATEX1235X
	(Ex)	II 2 G EEx ia IIC T4 IP 67
		II 2 D T135C
		EEx nA Non Incendive
		KEMA 01ATEX1236
	(X3)	II 3 G EEx nA II T4 IP 67
		II 2 D T135C
		EEx d Flame-proof / Explosion-proof
	<u></u>	KEMA 01ATEX2207X
	<u>(x</u> )	II 2 G EEx d II B T4 IP 65
		II 2 D T135C
		UL/cUL listed Intrinsically Safe
		Division 1, Class I, II and III, Groups A, B, C, D, E, F, G for all enclosure options.
		Enclosure 4X.
		UL/cUL listed - non - incendive
		Division 2, Class I, II and III, Groups A, B, C, D, E, F, G for all enclosure options.
		Enclosure 4X.
		III /-III listed llamondave la settione, such size and f
		OL/CUL listed Hazardous locations, explosion proof
		Class I, Division 1, Groups C, D, Class II, Division 1, Groups E, F, G, Class III.
		Enclosure 4X, for optional explosion proof housing.
Power supply		21 to 30 Vdc:
		(2-wire current loop transmitter)
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		Optically isolated outputs assignable to alarms.
(open collector)		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		Optically isolated. Scaleable to a variety of engineering unit systems (pulses per liter,
(open collector)		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	n	See table 3
Electrical connector		M20 x 1,5 according to ISO (1/2" NPT (F) or cable gland 8-12 mm optional)
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	e	± 0,1% tull scale.

### OPTIONAL ELECTRONIC EQUIPMENT INDUCTIVE ALARM SWITCHES

#### **DESIGN FEATURES**

- 1 or 2 normally open inductive sleeve initiators
- Optional intrinsically safe power supply/amplifier/ relay unit
- · For low or high limit signalling/switching
- Front adjustable

One or two electronic limit switches can be installed in the indicator housing to allow initiation of signalling 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 40% of 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 cover.

#### Alarm Accessories

Amplifier power supply (approved isolated barrier) 1 or 2 channel approved for intrinsically safe application, remotely mounted, 110 or 220 Vac power. Single pole with double throw (SPDT) relay standard. For other configurations, consult factory.

#### **Specifications Alarm Switches**

Alarm type	Inductive
Electrical classification	EMC Directive 89/336/EEC
Certified	<u>EEx ia</u> Intrinsically Safe KEMA 01ATEX1235X II 2 G EEx ia IIC T6 IP 67 II 2 D T135C
Æx>	<u>EEx nA</u> Non Incendive KEMA 01ATEX1236 II 3 G EEx nA II T6 IP 67 II 2 D T135C
(Ex)	<u>EEx d</u> Flame-proof / Explosion-proof KEMA 01ATEX2207X II 2 G EEx d II B T4 IP 65 II 2 D T135C
	UL\cUL listed Intrinsically Safe Division 1, Class I, II and III, Groups A, B, C, D, E, F, G For all enclosure options. Enclosure 4X.
	UL\cUL listed - non - incendive Division 2, Class I, II and III, Groups A, B, C, D, E, F, G For all enclosure options. Enclosure 4X.
	UL\cUL listed Hazardous locations, explosion proof Class 1, Diviosion 1, Groups C, D, Class II, Division 1, Groups E, F, G; Class III Enclosure 4X, for optional explosion proof housing.
Power supply	5 - 25 Vdc (8 Vdc nominal)
Impedance	- Approximately 1 kohm with cam absent
Ambient and Operating temperature	- Approximately 8 kohm with cam present
Amplem and Operating temperature	See lable S
	(1/2" NPT (F) or cable gland 8-12 mm optional)

## Optional Electronic Equipment SMM Transmitter with Inductive Alarms

This combined system provides both the sophistication of the SMM transmitter along with the simplicity of one or two alarms. Specifications for the transmitter and the front adjustable inductive alarms are as stated previously. The combined system has the great advantage to have two indepent signalling systems (fail safe system).

## Optional Cable Glands:

M20 x 1,5 threaded x 8-12 mm cord (brass or stainless steel). EEx d housing: Reducing adapter to 1/2" NPT and M20 x 1,5 Female are available.

### Optional Electronic Equipment Basic Analogue Transmitter M420

#### Transmitter 3809 and 3819

The transmitter provides accurate magnet angle detection and conversion to a 4-20 mA industry standard output signal, based on the position of a float assembly in the flowmeter. This rugged,

compact, microprocessor driven device is capable of providing accurate flow information to your external support systems. The patented magnetic sensor with automatic gain control enables an extremely high dynamic capture range without sacrificing accuracy.



Figure 2 - Wiring Diagram

#### **Specifications Transmitters**

Transmitter type	M420
Electrical Certification	E.M.C. Directive 89/336/EEL according to EN 61326 (1997)
Certified	EEx ia Intrinsically Safe
	KEMA 01ATEX1235X
ار المراجع الم المراجع المراجع	II 2 G EEx ia IIC T4 IP 67
	II 2 D T70C
	EEx nA Non Incendive
	KEMA 01ATEX1236
	II 3 G EEx nA II T4 IP 67
(Łx)	II 2 D T70C
	CSA Approval
(SP.)	Class I, II, III Division I Groups A thru G Ex ia IIC T6; Class I, zone 0 and 1
150464	Class I, II, III Division 2 Groups A thru G Ex nA IIC T6; Class I Zone 2
Power supply	8 - 28 Vdc
Transmitter output	4 - 20 mA analog
Temp. spec.	See table 3
Electrical connector	M20 x 1,5 according to ISO or cable gland optional



Figure 3 - Models MT 3809 and MT 3819 dimensions

### Model code MT 3809

MODEL NUMBER							DESCRIPTION						
3809/E							METAL TUBE FLOWMETER (VERTICAL INLET, VERTICAL OUTLET)						
							MATERIAL OF	CONSTRUCT	ION				
1	1						316 L SS						
Α							316 L SS WITH DIN 2.2 CERTIFICATION						
В							316 L SS WITH	H DIN 3.1.B CEF	RTIFICATION				
							METER & COI	NNECTION SIZ	E				
	X						TO BE SELEC	TED FROM TA	BLE 4				
							FLOAT (MAX	IMUM FLOW W	ATER)				
	ĺ	х					TO BE SELEC	TED FROM TAI	BLE 1A				
							CONNECTION	ІТҮРЕ					
		ſ	Х				TO BE SELEC	TED FROM TAE	BLE 5				
		-					METER	SCALE	FLUID				
				Α			1 6 VDI	% - SCALE					
				B			1.6 VDI	DR - SCALE					
				C			1.6 VDI	% - SCALE	GAS				
				D			1.6 VDI	DB - SCALE	GAS				
				E			1.6 VDI	% - SCALE	VISC. INFLUE	ENCE			
				F			1.6 VDI	DR - SCALE	VISC. INFLUE	INCE			
			I	· · · · · · · · · · · · · · · · · · ·									
							HOUSING	MATERIAL	FINISH	INDICATOR FUNCTION			
					A		"	ALUMINIUM	STANDARD	INDICATOR ONLY			
					в		"	"	"	INDUCTIVE ALARM, 1 SWITCH (P&F)			
					С		II.	"	"	INDUCTIVE ALARM, 2 SWITCHES (P&F)			
					D		н	"	п	$\mu$ P SMM TRANSMITTER 4 - 20 mA / HART COMPATIBLE			
					Е		н	п	п	$\mu$ P SMM TRANSMITT. 4 - 20 mA / HART COMP./ 1 ALARM			
					F		н	"	п	$\mu$ P SMM TRANSMITT. 4 - 20 mA / HART COMP./ 2 ALARM			
					X		н	"	п	μΡ M420 TRANSMITTER 4 - 20 mA			
					н		н	ALUMINIUM	EPOXY	INDICATOR ONLY			
					J		н	"	н	INDUCTIVE ALARM, 1 SWITCH (P&F)			
					к		"	"	"	INDUCTIVE ALARM, 2 SWITCHES (P&F)			
					L		н	"	п	$\mu$ P SMM TRANSMITTER 4 - 20 mA / HART COMPATIBLE			
					М		Ш	II	II.	$\mu$ P SMM TRANSMITT. 4 - 20 mA / HART COMP./ 1 ALARM			
					Ν		н	"	п	$\mu$ P SMM TRANSMITT. 4 - 20 mA / HART COMP./ 2 ALARM			
					Y		п	"	п	$\mu$ P M420 TRANSMITTER 4 - 20 mA			
					Q		п	ST. STL.	GRIT BLAST	INDICATOR ONLY			
					R		п	"	"	INDUCTIVE ALARM, 1 SWITCH (P&F)			
					s		n	"	"	INDUCTIVE ALARM, 2 SWITCHES (P&F)			
					Т		"	"	"	$\mu$ P SMM TRANSMITTER 4 - 20 mA / HART COMPATIBLE			
					U		п	n	"	$\mu$ P SMM TRANSMITT. 4 - 20 mA / HART COMP./ 1 ALARM			
					V		п	n	"	$\mu$ P SMM TRANSMITT. 4 - 20 mA / HART COMP./ 2 ALARM			
					8		"	"	"	$\mu$ P M420 TRANSMITTER 4 - 20 mA			

Model code MT	3809	(continued)
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						HOUSING	MATERIAL	FINISH	INDICATOR FUNCTION	
	1					Ex. PROOF	ALUMINIUM	EPOXY	INDUCTIVE ALARM, 1 SWITCH (P&F)	
	2					"	=	"	INDUCTIVE ALARM, 2 SWITCHES (P&F)	
	3				"	=	"	$\mu$ P SMM TRANSMITTER 4 - 20 mA / HART COMPATIBLE		
	4					н	=	"	$\mu$ P SMM TRANSMITT. 4 - 20 mA / HART COMP./ 1 ALARM	
	5				н	н	"	$\mu$ P SMM TRANSMITT. 4 - 20 mA / HART COMP./ 2 ALARM		
					I.S. RELAY / P	I.S. RELAY / POWER SUPPLY OPTIONS				
	A				NONE					
		В				I.S. POWER SU	JPPLY RELAY	UNIT, 1 CHAN	NEL, 230 VAC (For inductive alarm only) (KFA6-SR2-Ex1-W)	
		С				I.S. POWER SI	JPPLY RELAY	UNIT, 2 CHAN	NEL, 230 VAC (For inductive alarm only) (KFA6-SR2-Ex2-W)	
		D				I.S. POWER SI	JPPLY RELAY	UNIT, 1 CHAN	NEL, 115 VAC (For inductive alarm only) (KFA5-SR2-Ex1-W)	
		Е				I.S. POWER SI	JPPLY RELAY	UNIT, 2 CHAN	NEL, 115 VAC (For inductive alarm only) (KFA5-SR2-Ex2-W)	
		F				GENERAL PUF	GENERAL PURPOSE POWER SUPPLY, 24 VDC INPUT (For 4-20 mA x-mitter only) (811-11-B 00000)			
		G				GENERAL PURPOSE POWER SUPPLY, 115 VAC INPUT (For 4-20 mA x-mitter only) (811-12-B 00000)				
		Н				GENERAL PURPOSE POWER SUPPLY, 230 VAC INPUT (For 4-20 mA x-mitter only) (811-12-B-00000)				
		J				I.S. POWER SUPPLY UNIT, 24 VDC INPUT (For 4-20 mA/HART x-mitter only) (9303/15-22-11)				
		К				I.S. POWER SUPPLY UNIT, 115 VAC INPUT (For 4-20 mA/HART x-mitter only) (244 1B-120 VAC)				
		L				I.S. POWER SUPPLY UNIT, 230 VAC INPUT (For 4-20 mA/HART x-mitter only) (244 1B-240 VAC)				
						CERTIFICATIO	DNS			
		[	1			NONE				
		[	Е			ZONE 1, ATEX	, EEx ia , (Intrin	sically Safe), IF	P 67	
		[	F			ZONE 2, ATEX	, EEx nA (non li	ncendive), IP 6	7	
		[	К			ZONE 1, ATEX	, EEx d , (Flame	e proof / Explos	sion proof), IP 65	
		[	L			UL / cUL or CS	SA APPROVAL	(Intrinsically Sa	afe, non Incendive, or, Explosion proof)	
		-				ACCESSORIES	S			
				Х		TO BE SELEC	TED FROM TAE	BLE 6		
			-			SOFTWARE R	EVISION			
					1	NONE				
					А	INITIAL RELEA	SE (SMM ONL)	Y)		
ZZZZZ	Ζ	Ζ	Ζ	Ζ	Ζ	SELECT "Z" IF	SPECIAL AND	SPECIFY		
3809 / E 1 1 D A B A	A 1	D 1	= T	YPIC	AL	MODEL NUMB	ER			

### Model code MT 3819

MODEL NUMBER						DESCRIPTION							
3819/B						METAL TUBE FLOWMETER (VERTICAL INLET, VERTICAL OUTLET)							
						MATERIAL OF	CONSTRUCTI	ON					
1						316 L SS / E	E/TFE LINED						
Α						316 L SS / E	E/TFE LINED WI	TH DIN 2.2 CE	ERTIFICATION				
В						316 L SS / E/TFE LINED WITH DIN 3.1.B CERTIFICATION							
						METER & CO	NNECTION SIZE	E					
	1					METER SIZE	7, 1/2" (DN15) F	LANGED					
	2					METER SIZE	8, 1/2" (DN15) F	LANGED					
	3					METER SIZE	10, 1" (DN25) FL	ANGED					
	4					METER SIZE	12, 1½" (DN40)	FLANGED					
	5					METER SIZE	13, 2" (DN50) FL	ANGED					
'						FLOAT (MAX	IMUM FLOW W	ATER )					
		х				TO BE SELEC	TED FROM TAE	BLE 1B					
						CONNECTION	І ТҮРЕ						
		ľ	А			ANSI 150 LBS	RF						
		ľ	в			ANSI 300 LBS	RF						
		ľ	D			DIN PN 40 RF							
						METER	SCALE	FLUID					
				^									
				A D			% - SCALE						
			ŀ				M- SCALE						
			ł	F O			DR - SCALE		INCE				
				G		2.5 VDI	% - SCALE						
			-	-		2.5 VDI	DR - SCALE						
			ŀ			2.5 VDI	% - SCALE						
			l	IVI			2.5 VDI UR - SCALE VISC. INFLUENCE						
						HOUSING							
					A	STANDARD		STANDARD					
					в				INDUCTIVE ALARM, 1 SWITCH (P&F)				
									INDUCTIVE ALARM, 2 SWITCHES (P&F)				
									μΡ SMM TRANSMITTER 4 - 20 mA / HART COMPATIBLE				
					E				μΡ SMM TRANSMITT. 4 - 20 mA / HART COMP./ 1 ALARM				
					F				μΡ SMM TRANSMITTER 4 - 20 mA / HART COMP./ 2 ALARM				
					×			FROM	μρ M420 TRANSMITTER 4 - 20 mA				
					н								
					J				INDUCTIVE ALARM, 1 SWITCH (P&F)				
					n l				INDUCTIVE ALARM, 2 SWITCHES (P&F)				
									μΡ SMM TRANSMITT. 4 - 20 mA / HART COMP./ 1 ALARM				
						 			μΡ SMM I RANSMITT. 4 - 20 mA / HART COMP./ 2 ALARM				
					Y				$\mu$ P M420 TRANSMITTER 4 - 20 mA				

### Model code MT 3819 (continued)

						HOUSING	MATERIAL	FINISH	INDICATOR FUNCTION	
	Q					STANDARD	ST. STL.	GRIT BLAST	INDICATOR ONLY	
	R					н	н	"	INDUCTIVE ALARM, 1 SWITCH (P&F)	
	s					н	"	"	INDUCTIVE ALARM, 2 SWITCHES (P&F)	
	Т					н	н	"	$\mu$ P SMM TRANSMITTER 4 - 20 mA / HART COMPATIBLE	
	U					I		н	μΡ SMM TRANSMITT. 4 - 20 mA / HART COMP./ 1 ALARM	
	V					"	"	н	μΡ SMM TRANSMITT. 4 - 20 mA / HART COMP./ 2 ALARM	
	8					н	н	"	μΡ M420 TRANSMITTER 4 - 20 mA	
	1					Ex. PROOF	ALUMINIUM	EPOXY	INDUCTIVE ALARM, 1 SWITCH (P&F)	
	2					н	п	"	INDUCTIVE ALARM, 2 SWITCHES (P&F)	
	3					u	п	"	μP SMM TRANSMITTER 4 - 20 mA / HART COMPATIBLE	
	4					u	п	"	μΡ SMM TRANSMITT. 4 - 20 mA / HART COMP./ 1 ALARM	
	5					н	п	"	μΡ SMM TRANSMITT. 4 - 20 mA / HART COMP./ 2 ALARM	
						I.S. RELAY / P	OWER SUPPL	Y OPTIONS		
		А			_	NONE				
		В				I.S. POWER S	UPPLY RELAY	UNIT, 1 CHAN	NEL, 230 VAC (For use with inductive alarms only)	
		С				I.S. POWER S	UPPLY RELAY	UNIT, 2 CHAN	NEL, 230 VAC (For use with inductive alarms only)	
		D				.S. POWER SUPPLY RELAY UNIT, 1 CHANNEL, 115 VAC (For use with inductive alarms only)				
		Е				I.S. POWER SUPPLY RELAY UNIT, 2 CHANNEL, 115 VAC (For use with inductive alarms only)				
		F				GENERAL PURPOSE POWER SUPPLY, 24 VDC INPUT (For use with 4-20 mA transmitter only)				
		G				GENERAL PURPOSE POWER SUPPLY, 115 VAC INPUT (For use with 4-20 mA transmitter only)				
		Н				GENERAL PURPOSE POWER SUPPLY, 230 VAC INPUT (For use with 4-20 mA transmitter only)				
		J				I.S. POWER S	UPPLY UNIT, 2	4 VDC INPUT	(For use with 4-20 mA/HART transmitter only)	
		К				I.S. POWER S	UPPLY UNIT, 1	15 VAC INPUT	(For use with 4-20 mA/HART transmitter only)	
		L				I.S. POWER S	UPPLY UNIT, 2	30 VAC INPUT	(For use with 4-20 mA/HART transmitter only)	
						CERTIFICATIO	ONS			
			1			NONE				
			Е			ZONE 1, ATEX	K, EEx ia , (Intrin	sically Safe), IF	° 67	
			F			ZONE 2, ATEX	K, EEx nA (non I	ncendive), IP 6	7	
			Κ			ZONE 1, ATEX	K, EEx d , (Flame	e proof / Explos	sion proof), IP 65	
			Ц			UL/cUL or CS	SA APPROVAL	(Intrinsically Sa	ife, non Incendive, or, Explosion proof)	
						ACCESSORIE	S			
				Α		NONE				
				В		HIGH TEMPER	RATURE DESIG	N WITH PROT	ECTION SHIELD	
						SOFTWARE R	EVISION			
					1	NONE				
					Α	INITIAL RELEA	ASE (SMM ONL	Y)		
ZZZZZ	Ζ	Ζ	Z	Z	Ζ	SELECT "Z" IF	SPECIAL AND	SPECIFY		
3819 / B 1 1 A A B A	A 1	A 1	= T	YPIC	CAL	MODEL NUMB	ER			

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