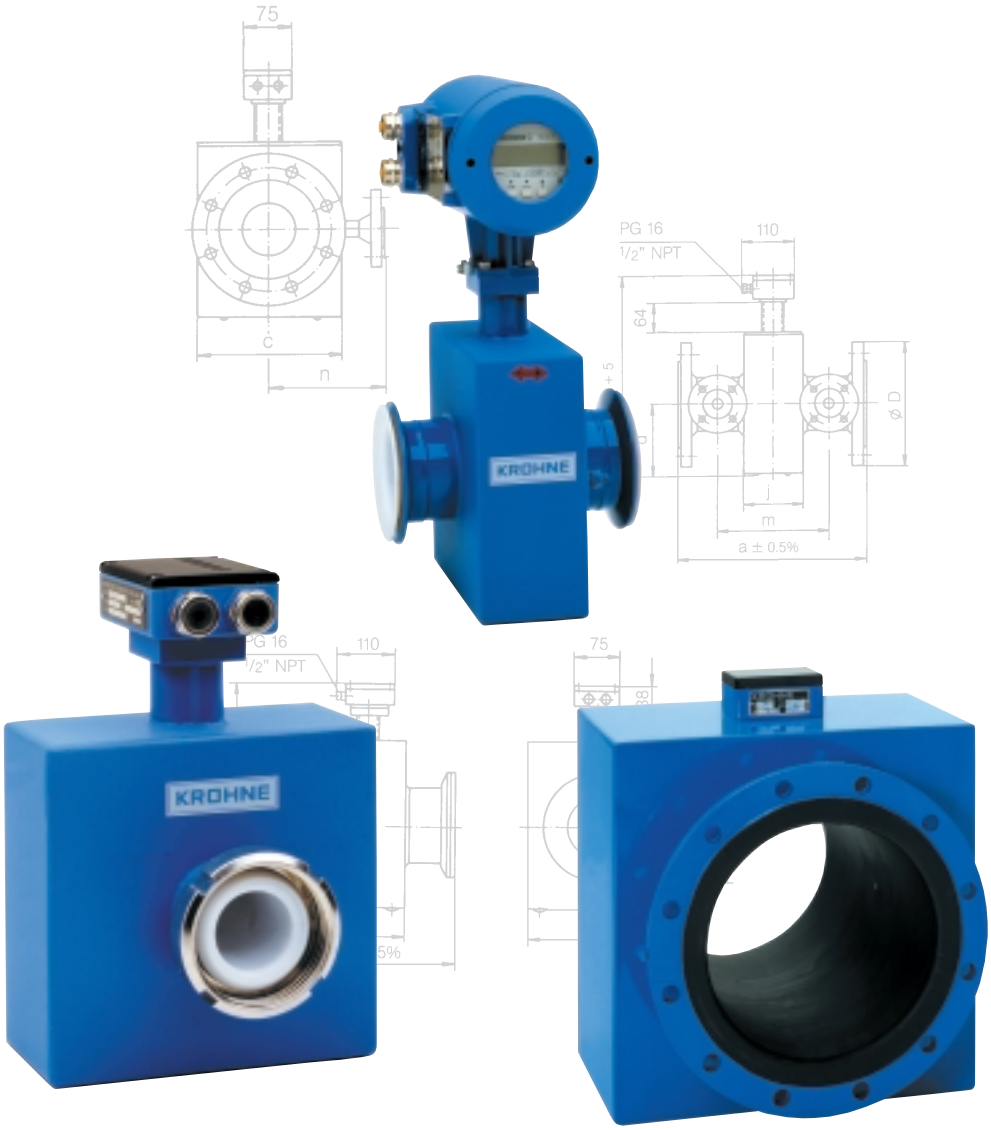
 D 31 AL90 02 E

GR/PRINTO

ALTOFLUX M 900
Electromagnetic Flowmeters



- The 'expert' for special applications and measurements.
- Connections, e.g. 6" Tri Clamp, DIN flanges in PN 160 or 3" Halliburton Clamp 1500 bar
- Electrodes replaceable under pressurized conditions (measuring service)

ALTOFLUX M 900 Electromagnetic Flowmeters

The measuring tube of the **ALTOFLUX M 900** is made of non-magnetic stainless steel and fitted with an electrically insulating liner.

Magnetic coils generate a magnetic field inside the tube that is perpendicular to the direction of flow. A flow-proportional signal voltage is induced in the flowing liquid and picked up by the “wetted” electrodes.

Fields of application

- chemical and pharmaceutical
- high pressure
- Teflon®-PTFE liners ensure extremely high abrasion resistance
- chemically resistant to alkaline solutions and acids:
  no restriction with Teflon®-PTFE liners
  (materials for electrodes and grounding rings to be selected for process compatibility)

Calibrated on **EN 45 001** certified calibration rigs, accuracy of calibration better than 99.97% of the measured value.

Food versions

Various connections are available for use in the food and beverage industry:

- sanitary connection to DIN 11851,
  meter size DN 10-125, pressure rating PN 10
- clamp connection, nominal dia. of measuring tube 1”-4”
- SMS connection on request

Available for remote or integral systems with PTFE (Teflon) liner, stainless steel electrodes, and housing made of steel or stainless steel.

CIP (cleaning in place) using water, steam or various chemicals, acids and alkalis, temperature up to 140 °C or 284 °F.

High-pressure version

The ALTOFLUX M 900 primary heads can be designed for operating pressures up to 1500 bar or 20000 psig.

Liner, process connection and dimensions on request.

M 900 HJ with heating jacket

ALTOFLUX M 900 primary heads can be fitted with a heating jacket, for example to prevent the liquid product from crystallizing out. The heating medium can be a liquid or vapor, max. operating pressure 10 bar, equivalent to 150 psig, max. temperature depending on the measuring tube liner and the insulation class of the field coils. Nominal diameter of the measuring tube DN 10-100 or $^{3}/_{8}$-4”, flange connections for the heating system DN 15 / PN 40 or $^{1}/_{2}$”/ 150 lbs / RF.

ALTOFLUX M 900 HJ primary heads are only available for remote systems with IFC 110 F signal converter.

Highlights

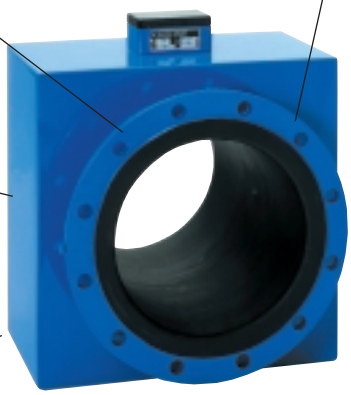
Sanitary connections to DIN 11 851,
SMS screw connections and Tri Clamp joints

Suitable for a wide variety of applications due to
the wide choice of materials for the wetted parts

CIP and SIP cleaning with various chemicals,
acids and alkaline solutions up to 180 °C (356 °F)

Meter sizes DN 10 - 300 or 3/8" - 12"

Available with heating jacket to prevent
crystallizing of the process product



High-pressure version up to 1500 bar

Can be operated together with all remote
KROHNE signal converters, except for IFC 010

For use in hazardous locations with IFC 090
and IFC 110 F signal converters

Technical data

Meter sizes / Available versions	
... with flanged connections	DN 10–300 and $^3/_8$"–12"
... with heating jacket (remote systems only)	Meter sizes DN 10 – 100 and $^3/_8$"–4" Heating jacket connections: DN 15 / PN 40 or $^1/_2$" / Class 150 lb / RF
... for food & beverage industry	
Sanitary connection to DIN 11851	Meter sizes DN 10–125, pressure rating PN 10
Tri clamp connection	Measuring tube nominal dia. 1"–4"
SMS connection	on request
Connection flanges	
... to DIN 2501 (= BS 4504)	DN 10–50 and DN 80 / PN 40 DN 65 and DN 100–150 / PN 16 DN 200–300 / PN 10
... to ANSI B 16.5	$^3/_8$"–12" / Class 150 lb / RF
Special versions	higher pressure ratings and other standards – on request
Electrical conductivity	
	≥ 5 µS/cm (≥ mho/cm) ≥ 20 µS/cm (≥ mho/cm) for demineralized cold water
Ambient temperature	
... for < 60°C or < 140°F product temperature	– 25 to + 60°C or – 13 to + 140°F
... for > 60°C or > 140°F product temperature	
Separate systems	– 25 to + 60°C or – 13 to + 140°F
Compact systems	– 25 to + 40°C or – 13 to + 104°F
... for hazardous-duty versions	– 20 to + 40°C or – 4 to + 104°F
Product temperature	
... for remote systems	– 60 to + 180°C or – 76 to + 356°F } see Tables on page 7
... for integral systems	– 60 to + 140°C or – 76 to + 274°F } see Tables on page 7
... for hazardous-duty versions	– 20 to + 180°C or – 4 to + 356°F } see Tables on page 7
Max. permissible operating data	
Product temperature and operating pressure	see Tables 1 + 2 on page 7
Vacuum load factor of liner	see Table 3 on page 7
Insulation class of field coils / product temperature	
Standard	E / ≤ 120°C or ≤ 248°F
Special version	H / ≤ 180°C or ≤ 356°F (always required for hazardous-duty version)
Electrode design	
Standard DN 10 – 300 and $^3/_8$" – 12"	flat-elliptical electrodes, solidly fitted, surface-polished
Special version DN 50 - 300 and 4" – 12"	field replaceable electrodes WE
Field coil power supply	< 60 V from signal converter
Grounding rings	available as option
Protection category (IEC 529 / EN 60 529)	
Compact systems	IP 67, equivalent to NEMA 6
Separate systems	
Standard	IP 65, equivalent to NEMA 4 and 4X
Special versions	IP 67 or IP 68, equivalent to NEMA 6

Materials

Measuring tube		Stainless steel 1.4301 (or higher material number) equivalent to SS 304
Liner		
Standard		Hard rubber, PTFE (Teflon)
Special versions		Irathane, neoprene and soft rubber, others on request
Food version		PTFE (Teflon)
Electrodes		
Standard		Hastelloy C4
Special versions		Stainless steel 1.4571 or SS 316 Ti, Hastelloy B2, titanium, tantalum, platinum, others on request
Food version and field replaceable electrodes WE		Stainless steel 1.4571 or SS 316 Ti
Connection flanges*		
to DIN:	DN 10 – 50, DN 80 ($^3/_8$" – 2" and 3")	Steel 1.0402 (C22) or AISI: C1020
	DN 65, DN 100 – 300 (1 $^1/_2$", 4" – 12")	Steel 1.0501 (RST 37.2) or AISI: C 1035 } others on request
to ANSI		Steel ASTM A 105 N
Housing*		
Standard:	DN 10 – 40 and $^3/_8$" – 1 $^1/_2$"	Sheet steel
	DN 100 – 300 and 4" – 12"	Sheet steel
Food version		optional stainless steel 1.4571 or SS 316 Ti
Terminal box* (remote system only)		
Standard		Diecast zinc
Food version		as option stainless steel 1.4301 or SS 304, without paint finish
Grounding rings (option)		Stainless steel 1.4571 or SS 316 Ti, others on request

* with polyurethane finish

Application information

Grounding rings

For process flow measurement reasons the product must be grounded. Such a grounding system is lacking in pipes upstream and downstream of the primary head which feature a corrosion-resistant internal coating or liner, or are made entirely of plastics material. In such cases, grounding rings must be fitted on both sides of the primary head.

Grounding ring No. 1
3 mm/0.10" thick
(tantalum: 0.5 mm/0.02" thick)

Protective ring No. 2
3 mm/0.10" thick
for PTFE liner.

On primary heads with PTFE liner, protective rings No. 2 prevent damage to the flanges during transportation and installation. These rings can also be used as grounding rings.

Grounding ring No. 3
with cylindrical neck
30 mm/1.25" long
3 mm/0.10" thick

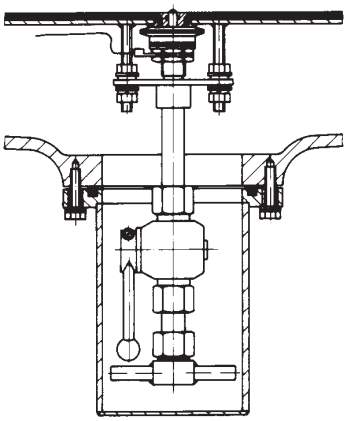
Where abrasive liquids are concerned, grounding rings No. 3 with cylindrical neck should be used for the inlet side of the primary head to prevent damage to the inlet edge.

Field replaceable electrodes WE

for meter sizes ≥ DN 350 and ≥ 14".

If the properties of the process product are not known in the project phase, it is advisable to use replaceable electrodes particularly where larger meter sizes are involved.

The electrodes can be removed at system operating pressure for efficient cleaning of their surface.



Hazardous-duty (Ex) versions

European Standard

ALTOFLUX M 900-Ex signal converters are approved in conformity with European Standard
EEx e ib IIC T3 – T6
PTB No. Ex-80/2009.

The following certified signal converters with integrated buffer stage are available for the remote primary heads:

- **IFC 090 F-Ex signal converters** in rotatable field housing for use in hazardous areas.
- **IFC 110 F-Ex** (field housing) and **signal converters** for use outside hazardous areas.

Additional information on the signal converters is provided in the relevant Data Sheets.

FM Approvals

The **K 380 integral flowmeters** are FM (Factory Mutual) approved for use in division 2, Groups A, B, C, D hazardous locations with SC 80 signal converters. FM No.: J.I. 1R5A4.AX.

The **M 900 primary heads** are FM approved for use in installations with remote signal converters in Division 2, Groups A, B, C, D locations. FM No.: J.I. 1J1A1.AX.

Additional information on the signal converters is provided in the relevant Data Sheets.

Limits

Table 1: Limits for Teflon®-PTFE

Liner	Flange standard	Nominal diameter of measuring tube and flanges	Flange pressure rating or class	S = Standard O = Option	Max. operating pressure in bar (and psig) at a product temperature of ...							
					≤ 40°C (≤ 105°F)	≤ 60°C (≤ 140°F)	≤ 70°C (≤ 158°F)	≤ 90°C (≤ 195°F)	≤ 100°C (≤ 210°F)	≤ 120°C (≤ 250°F)	≤ 140°C (≤ 285°F)	≤ 180°C (≤ 355°F)
Teflon®-PTFE	DIN 2501	DN 10-50, DN 80	PN 40	S	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	on request
		DN 65, DN 100-150	PN 16	S	16 (230)	16 (230)	16 (230)	16 (230)	16 (230)	16 (230)	16 (230)	16 (230)
		DN 200-300	PN 10	S	10 (150)	10 (150)	10 (150)	10 (150)	10 (150)	10 (150)	10 (150)	10 (150)
		DN 65, DN 100-150	PN 40	O	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	on request
		DN 200-300	PN 16	O	16 (230)	16 (230)	16 (230)	16 (230)	16 (230)	16 (230)	16 (230)	16 (230)
	ANSI B 16.5	3/8"-12"	150 lb	S	19.6 (284)	19.0 (275)	18.7 (271)	18.1 (262)	17.7 (256)	17.0 (246)	16.2 (235)	14.7 (213)
		3/8"-12"	300 lb	O	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	on request

Table 2: Limits for neoprene, irathane, hard and soft rubber

Liner	Flange standard	Nominal diameter of measuring tube and flanges	Flange pressure rating or class	S = Standard O = Option	Max. operating pressure in bar (and psig) at max. possible product temperature of ...							
					Soft rubber ≤ 40°C (≤ 105°F)		Neoprene ≤ 60°C (≤ 140°F)		Irathane ≤ 70°C (≤ 158°F)		Hard rubber ≤ 90°C (≤ 195°F)	
Neoprene, Irathane, hard and soft rubber	DN 2501	DN 25-50, DN 80	PN 40	S	40	(580)	40	(580)	40	(580)	40	(580)
		DN 65, DN 100-150	PN 16	S	16	(230)	16	(230)	16	(230)	16	(230)
		DN 200-300	PN 10	S	10	(150)	10	(150)	10	(150)	10	(150)
		DN 25-300	PN 16-1500	O	**16-64	(150-920)	**16-100	(150-1450)	**16-1500	(150-20000)	**16-80	(150-1160)
	ANSI B 16.5	1"-12"	150 lb	S	*** ≤ 19.6	(≤ 284)	*** ≤ 19.0	(≤ 275)	*** ≤ 18.7	(≤ 271)	*** ≤ 18.1	(≤ 262)
		1"-12"	300 lb	O	*** ≤ 50.8	(≤ 737)	*** ≤ 49.2	(≤ 714)	*** ≤ 48.4	(≤ 702)	*** ≤ 46.8	(≤ 679)
		1"-12"	600 lb	O	≤ 64	(≤ 920)	≤ 100	(≤ 1450)	≤ 100	(≤ 1450)	≤ 80	(≤ 1160)
	API 6 BX	≥ 1"	20000 psig	O	-		-		≤ 1500	(≤ 20000)	-	

** depends on flange pressure rating *** depends on product temeprature

Table 3: Vacuum load

Liner	Meter size		Max. allowed vacuum load in mmbar abs. (and psia) at a product temperature of ...							
	DN mm	inches	≤ 40°C (≤ 105°F)	≤ 60°C (≤ 140°F)	≤ 70°C (≤ 158°F)	≤ 90°C (≤ 195°F)	≤ 100°C (≤ 210°F)	≤ 120°C (≤ 250°F)	≤ 140°C (≤ 285°F)	≤ 180°C (≤ 355°F)
Teflon®-PTFE	10 - 20	3/8 - 1/2	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	500 (7.3)	750 (9.7)	1000 (15.0)
	25 - 150	1 - 6	at vacuum load use IFS 4000 or IFS 5000							
	200 - 300	8 - 12	500 (7.3)	750 (9.7)	1000 (15.0)	1000 (15.0)	1000 (15.0)	1000 (15.0)	1000 (15.0)	1000 (15.0)
Neoprene	25 - 300	1 - 12	400 (5.6)	400 (5.6)	-	-	-	-	-	-
Irathane	25 - 300	1 - 12	500 (7.3)	-	-	-	-	-	-	-
Hard rubber	25 - 300	1 - 12	250 (3.6)	400 (5.8)	400 (5.8)	400 (5.8)	-	-	-	-
Soft rubber	25 - 300	1 - 12	500 (7.3)	-	-	-	-	-	-	-

Please note!

- The limits specified in the Tables for temperature and pressure allow for liner and flange standard.
- **Compact flowmeters** can only be used up to a **process temperature** of max. **140°C (285°F)**, with ambient temperatures of less, than/equal to 40°C (105°F)
- With **insulation class E** of the field coils, the **maximum** permissible **process temperature is 120°C (250°F)**. **Insulation class H** is required for **temperatures above 120°C (250°F)**.

Dimensions and weights

M 900 primary head and
IFM 3080 K integral flowmeter (standard)

Flanged connections — **Dimensions in mm and (inches)**

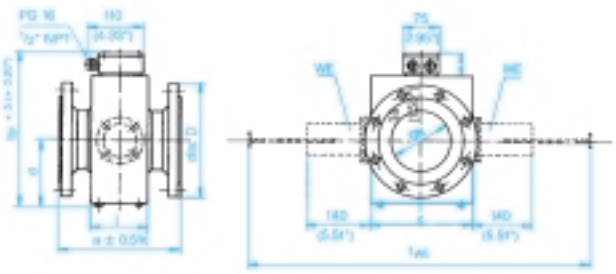
... DIN 2501 (= BS 4504) / DN 10–300 / PN 40, 16 or 10: see Table
... ANSI B 16.5 / 3/8"–12" / Class 150 lb / RF: see Table
... ANSI B 16.5 / 3/8"–12" / Class ≥ 300 lb / RF: dimensions on request

Dimension a without flange gaskets: Not supplied with flowmeter, to be provided by customer.
*** For integral flowmeters:** Weight as specified in Table plus approx. 2.2 kg or 4.9 lb
*** Meter size 3/8":** Flanged connection 1/2"

Meter size to ...			**Dimensions in mm** (inches)														**Approx.* weight**
DIN		**ANSI**															
DN mm	PN	inches	a		b_F		b_K		c		d		j		dia. D_{DIN}		dia. D_{ANSI}		in kg (lb)
10	40	3/8**	200	(7.87)	169	(6.65)	358	(14.09)	92	(3.62)	66	(2.60)	70	(2.76)	90	(3.54)	88.9	(3.50)	10 (22)
15	40	1/2	200	(7.87)	169	(6.65)	358	(14.09)	92	(3.62)	66	(2.60)	70	(2.76)	95	(3.74)	88.9	3.50)	10 (22)
20	40	3/4	200	(7.87)	169	(6.65)	358	(14.09)	92	(3.62)	66	(2.60)	70	(2.76)	105	(4.13)	98.6	(3.89)	10 (22)
25	40	1	200	(7.87)	191	(7.52)	380	(14.96)	96	(3.78)	77	(3.03)	94	(3.70)	115	(4.53)	108.0	(4.25)	11 (24)
32	40	1 1/4	200	(7.87)	191	(7.52)	380	(14.96)	96	(3.78)	77	(3.03)	94	(3.70)	140	(5.51)	117.3	(4.62)	11 (24)
40	40	1 1/2	200	(7.87)	236	(9.29)	425	(16.73)	184	(7.24)	99	(3.90)	94	(3.70)	150	(5.91)	127.0	(5.00)	13 (29)
50	40	2	200	(7.87)	236	(9.29)	425	(16.73)	184	(7.24)	99	(3.90)	94	(3.70)	165	(6.50)	152.4	(6.00)	14 (31)
65	16	2 1/2	200	(7.87)	256	(10.08)	445	(17.25)	184	(7.24)	109	(4.29)	94	(3.70)	185	(7.28)	177.8	(7.00)	15 (33)
80	40	3	200	(7.87)	256	(10.08)	445	(17.25)	184	(7.24)	109	(4.29)	94	3.70)	200	(7.87)	190.5	(7.50)	17 (37)
100	16	4	250	(9.84)	316	(12.44)	505	(19.88)	234	(9.21)	139	(5.47)	125	(4.92)	220	(8.66)	228.6	(9.00)	28 (62)
125	16	5	250	(9.84)	316	12.44)	505	(19.88)	234	(9.21)	139	(5.47)	125	(4.92)	250	(9.84)	254.0	(10.00)	35 (77)
150	16	6	300	(11.81)	336	(13.23)	525	(20.67)	266	(10.47)	149	(5.87)	172	(6.77)	285	(11.22)	279.4	(11.00)	45 (99)
200	10	8	350	(13.78)	396	(15.59)	585	(23.03)	354	(13.94)	179	(7.05)	210	(8.27)	340	(13.39)	342.9	(13.50)	56 (123)
250	10	10	400	(15.75)	456	(17.95)	645	(25.39)	434	(17.09)	209	(8.23)	244	(9.61)	395	(15.55)	406.4	(16.00)	75 (165)
300	10	12	500	(19.69)	532	(20.94)	721	(28.39)	490	(19.29)	247	(9.72)	280	(11.02)	455	(17.52)	482.6	(19.00)	110 (243)

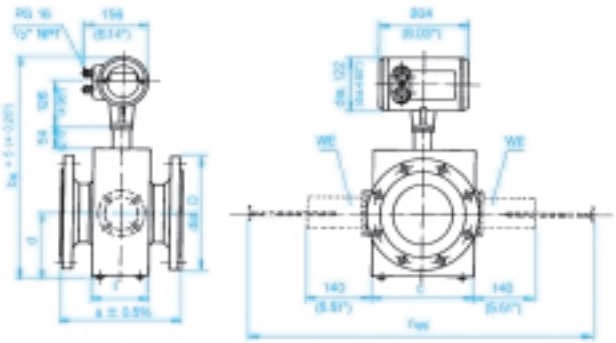
M 900
Primary head

DN 10 – 300
3/8" – 12"



IFM 3080 K
Compact flowmeter

DN 10 – 300
3/8" – 12"



WE = Field replaceable electrodes, optional for meter sizes DN 50–300 and 2"–12"
f_{WE} = Dimension c + 900 mm or c + 35,50" (minimum dimension)

M 900 HJ primary head with heating jacket

Flange connections for measuring tube — **Dimensions in mm and (inches)**

... DIN 2501 (= BS 4504) / DN 10–100 / PN 40 or 16: see Table

... ANSI B 16.5 / 3/8"–4" / Class 150 lb / RF: see Table

... ANSI B 16.5 / 3/8"–4" / Class ≥ 300 lb / RF: dimensions on request

Flange connections for heating jacket

... DIN 2501 (= BS 4504) / DN 15 / PN 40 / stud bolts 4 x M 12

... ANSI B 16.5 / 1/2" / Class 150 lb / RF / stud bolts 4 x 1/2"

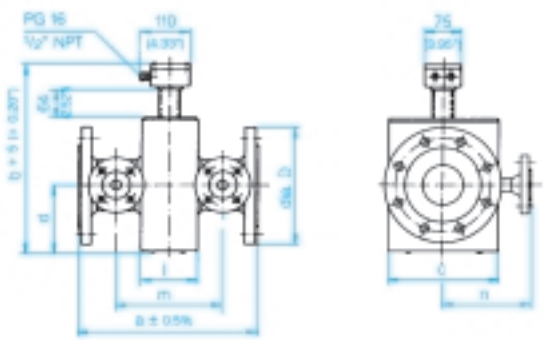
Dimension a without flange gaskets: Not supplied with flowmeter, to be provided by customer.

*** Meter size 3/8":** Flange connection 1/2"

Meter size to ...			**Dimensions** in mm (inches)									**Approx.***
DIN		**ANSI**										**weight**
DN mm	PN	inches	a	b	c	d	j	m	n	dia. D_{DIN}	dia. D_{ANSI}	in kg (lb)
10	40	3/8*	250 (9.84)	233 (9.17)	106 (4.17)	66 (2.60)	70 (2.76)	150 (5.91)	110 (4.33)	90 (3.54)	88.9 (3.50)	18 (40)
15	40	1/2	250 (9.84)	233 (9.17)	106 (4.17)	66 (2.60)	70 (2.76)	150 (5.91)	110 (4.33)	95 (3.74)	88.9 (3.50)	18 (40)
20	40	3/4	250 (9.84)	233 (9.17)	106 (4.17)	66 (2.60)	70 (2.76)	150 (5.91)	110 (4.33)	105 (4.13)	98.6 (3.89)	18 (40)
25	40	1	250 (9.84)	255 (10.04)	109 (4.29)	77 (3.03)	94 (3.70)	150 (5.91)	110 (4.33)	115 (4.53)	108.0 (4.25)	20 (44)
32	40	1 1/4	250 (9.84)	255 (10.04)	109 (4.29)	77 (3.03)	94 (3.70)	150 (5.91)	110 (4.33)	140 (5.51)	117.3 (4.62)	20 (44)
40	40	1 1/2	250 (9.84)	300 (11.81)	198 (7.80)	99 (3.90)	94 (3.70)	150 (5.91)	160 (6.30)	150 (5.91)	127.0 (5.00)	20 (44)
50	40	2	250 (9.84)	300 (11.81)	198 (7.80)	99 (3.90)	94 (3.70)	150 (5.91)	160 (6.30)	165 (6.50)	152.4 (6.00)	21 (47)
65	16	2 1/2	250 (9.84)	380 (14.96)	248 (9.76)	139 (5.47)	125 (4.92)	160 (6.30)	160 (6.30)	185 (7.28)	177.8 (7.00)	22 (49)
80	40	3	250 (9.84)	380 (14.96)	248 (9.76)	139 (5.47)	125 (4.92)	160 (6.30)	160 (6.30)	200 (7.87)	190.5 (7.50)	25 (55)
100	16	4	300 (11.81)	380 (14.96)	248 (9.76)	139 (5.47)	125 (4.92)	180 (7.09)	180 (7.09)	220 (8.66)	228.6 (9.00)	35 (77)

DN 10 – 300

3/8" – 4"



M 900 and IFM 3080 K with sanitary connection to DIN 11851

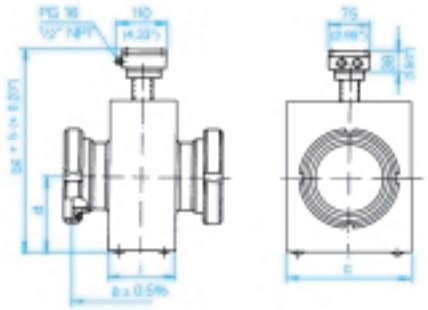
Dimensions in mm and (inches)

* **For integral flowmeters:** Dimension b + 127 mm or + 5.00”

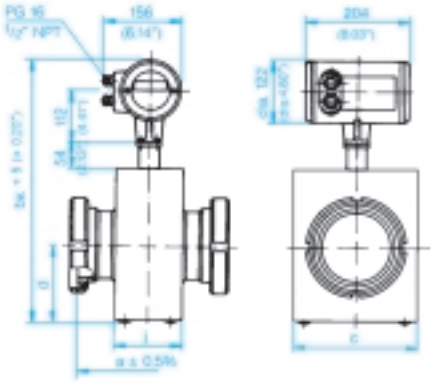
** **For stainless steel housing:** Dimension c + 14 mm or + 0.55”

Meter size	**Dimensions** in mm (inches)										**Weight**
DN mm	a		b*		c**		d		j		in kg (lb)
10 and 20	200	(7.87)	223	(8.78)	92	(3.62)	66	(2.60)	70	(2.76)	10 (22)
25 and 32	200	(7.87)	245	(9.65)	96	(3.78)	77	(3.03)	94	(3.70)	10 (22)
40 and 50	200	(7.87)	290	(11.42)	184	(7.24)	99	(3.90)	94	(3.70)	13 (29)
65 and 80	200	(7.87)	310	(12.20)	184	(7.24)	109	(4.29)	94	(3.70)	16 (36)
100 and 125	250	(9.84)	370	(14.57)	234	(9.21)	139	(5.47)	125	(4.92)	30 (66)

M 900 primary head
with sanitary connection to DIN 11851
DN 10–125 / PN 10



IFM 3080 K integral flowmeter
with sanitary connection to DIN 11851
DN 10–125 / PN 10



M 900 and IFM 3080 K with clamp connection

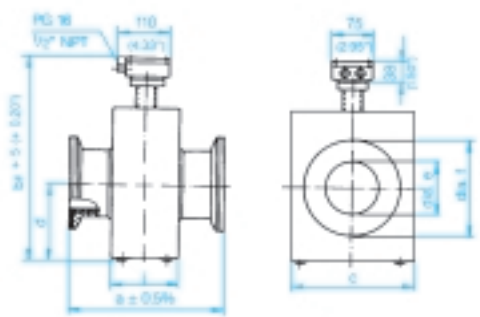
Dimensions in mm and (inches)

* **For integral flowmeters:** Dimension b + 127 mm or + 5.00”

** **For stainless steel housing:** Dimension c + 14 mm or + 0.55”

Meter size	**Dimension** in mm (inches)									**Weight**
inches	a	b*	c**	d	dia. e	dia. f	j	dia k	dia l	m	in kg (lb)
1	200 (7.87)	245 (9.65)	96 (3.78)	77 (3.03)	18 (0.71)	49.6 (1.95)	94 (3.70)	25.5 (1.00)	22.1 (0.87)	25.4 (1.00)	10 (22)
$1^1/_2$	200 (7.87)	245 (9.65)	96 (3.78)	77 (3.03)	28.5 (1.12)	49.6 (1.95)	94 (3.70)	38.2 (1.50)	34.8 (1.37)	25.4 (1.00)	11 (25)
2	200 (7.87)	290 (11.42)	184 (7.24)	99 (3.90)	44 (1.73)	76.6 (3.02)	94 (3.70)	51.0 (2.01)	47.5 (1.87)	25.0 (0.98)	13 (29)
3	200 (7.87)	310 (12.20)	184 (7.24)	109 (4.29)	64 (2.52)	117.7 (4.63)	94 (3.70)	76.3 (3.00)	72.9 (2.87)	25.4 (1.00)	16 (36)
4	250 (9.84)	370 (14.57)	234 (9.21)	139 (5.47)	93 (3.66)	117.7 (4.63)	125 (4.92)	108 (4.25)	97.6 (3.84)	24.3 (0.96)	30 (66)

M 900 primary head
with clamp connection
1”–4”



IFM 3080 K integral flowmeter
with clamp connection
1”–4”