DIN A4: 7.10028.31.00
US size: 7.10028.71.00

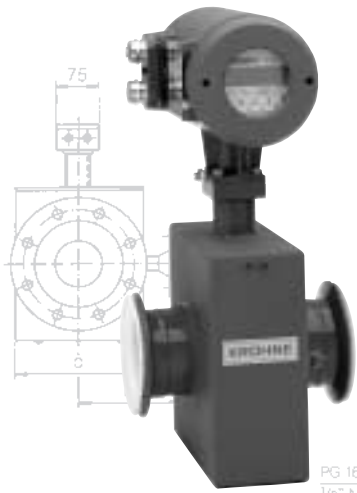
GR

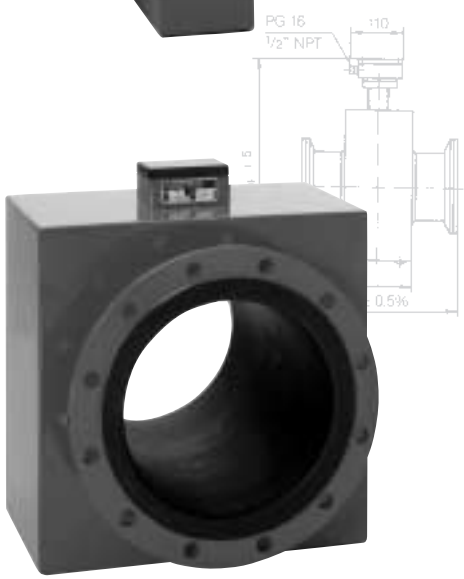
Installation instructions

ALTOFLUX M900
ALTOFLUX 3080 K

Electromanetic flowmeters for particulary applications

- **Primary head**
- **Compact flowmeters**





How to use these Instructions

The flowmeters are supplied ready for operation.

The primary head must be installed in the pipeline as described in the installation instructions inside the packing of the primary head.

Contents

System description

ALTOFLUX electromagnetic flowmeters are precision measuring instruments designed for the linear flow measurement of process liquids.

The process liquids must be electrically conductive: $\geq 20\ \mu S/cm$

The **full-scale range $Q_{100\%}$** can be set as a function of the **meter size**:
ALTOFLUX M900:
DN 10 - 300 / $^3/_8$" - 12" $Q_{100\%}$ = 0.1 - 3050 m^3/hr = 0.37 – 13 440 US GPM

ALTOFLUX 3080 K:
DN 10 - 300 / $^3/_8$" - 12" $Q_{100\%}$ = 0.1 - 3050 m^3/hr = 0.37 – 13 440 US GPM

This is equivalent to a flow velocity of 0.3 - 12 m/s, or 1 – 40 ft/s.

Product liability and warranty

ALTOFLUX electromagnetic flowmeters are designed solely for measuring the volumetric flowrate of electrically conductive, liquid process products.

Flowmeters with ALTOFLUX primary heads are not certified for use in hazardous locations. Other flowmeters series are available for such applications.

Responsibility as to suitability and intended use of these electromagnetic flowmeters rests solely with the operator.

Improper installation and operation of the flowmeters (systems) may lead to loss of warranty.

In addition, the ”General conditions of sale” forming the basis of the purchase contract are applicable.

If ALTOFLUX flowmeters need to be returned to Krohne, please note the information given on the last-but-one page of this manual. Krohne regret that they cannot repair or check your flowmeter(s) unless accompanied by the completed form sheet.

Standards and approvals

Please refer to the installation and operating instructions for the signal converter.

Items included with supply

ALTOFLUX M900
primary heads

- Primary head in the size as ordered
- Connecting wires for grounding, refer to Section 7 “Grounding”
- Certificate of calibration data
- Grounding rings (optional), if ordered
- Installation instructions

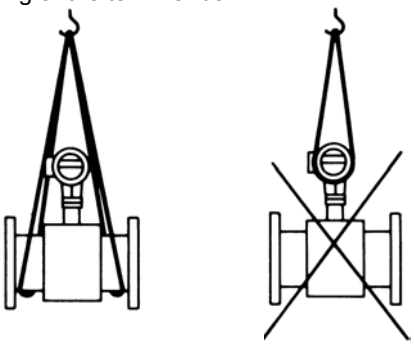
ALTOFLUX 3080 K
compact flowmeters

- Compact flowmeter in the size as ordered
- Connecting wires for grounding, see Section 7 “Grounding”
- Certificate of calibration data
- Grounding rings (optional), if ordered
- Installation instructions
- Installation and operating instructions for the signal converter

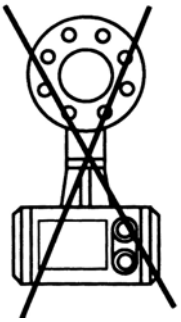
Fitting accessories (stud bolts, nuts, gaskets, etc.) **are not supplied with the flowmeter, to be provided by customer!**

Handling

Do not lift flowmeter by the signal converter housing or the terminal box.



Do not set flowmeter down on signal converter housing or terminal box.



PLEASE NOTE
the temperature limits for storage and transport, see Page 4.

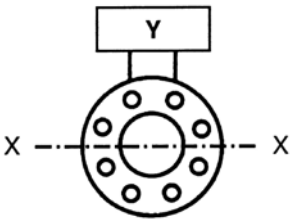
1 Important information for installation: PLEASE NOTE !

- **Temperatures**
  Refer to Section 11 “Limits” for operating pressure and vacuum load based on flange standards and type of tube liner.

	Ambient temperature	**Process temperature**
Compact system 3080 K	-25 to +**60** °C (-13 to +**140** °F)	-25 to ≤ +**60** °C (-13 to ≤ +**140** °F)
	-25 to +**40** °C (-13 to +**104** °F)	-25 to > +**60** °C (-13 to ≤ +**194** °F)
ALTOFLUX M900	-25 to +60 °C (-13 to +140 °F)	-25 to > +**60** °C (-13 to > +**140** °F)
In storage	-20 to +60 °C (- 4 to +140 °F), (Neoprene liner) -25 bis +60 °C (all other liners) avoid moisture and sunlight.	
Transport	- 5 to +50 °C (- 4 to +140 °F), (Neoprene liner) -25 bis +60 °C (all other liners) avoid moisture and sunlight.	

- **Location and position as required,**
  but electrode axis
  X – • – • – • – X
  must be approximately horizontal in a horizontal pipe run.

  Y terminal box or converter housing



- **Measuring tube must be completetly filled at all times.**

- **Direction of flow is arbitrary.** Arrow on flowmeter can normally be ignored. For exceptions, refer to Section “Factory settings” in the installation and operating instructions for the signal converter.

- **Stud bolts and nuts:** to fit, make sure there is sufficient room next to the pipe flanges.

- **Vibration:** support the pipeline on both sides of the compact flowmeter. Level of vibration in conformity with IEC 068-2-34: below 2.2g for compact flowmeters in the frequency range of 20-150 Hz with the IFC 090 K.

- **Do not expose to direct sunlight,** fit a sunshade if necessary, not included with flowmeter, to be provided by customer.

- **Large meter sizes (≥ DN 200 / ≥ 8”),** use adapter pipes to allow axial shifting of the counterflanges and to facilitate installation.

- **Strong electromagnetic fields,** avoid in vicinity of flowmeter

- **Straight inlet run minimum of 5 × DN and outlet run minimum of 2 × DN,**
  (DN = meter size), measured from the electrode axis.

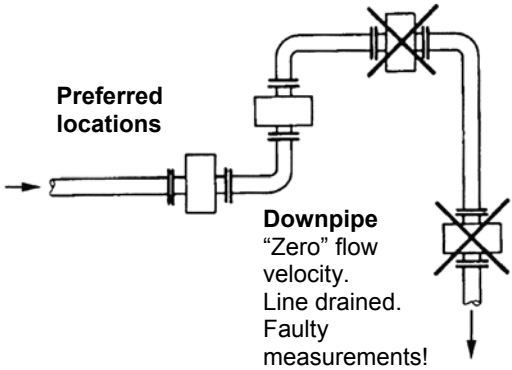
- **Vortex and corkscrew flow:** increase length of inlet and outlet runs or install flow conditioners.
- **Mixing different process liquids:** install flowmeter upstream of mixing point or at an adequate distance downstream (minimum of 30 × DN), otherwise display may be unsteady.
- **Plastic pipes and internally coated metal pipelines:** grounding rings required, see Section 7 “Grounding”.
- **Insulated pipeline:** do not insulate flowmeter.
- **Zero setting not necessary.** To check, it should be possible to set “zero” flow velocity in the completely filled measuring tube. Shutoff valves should therefore be provided either downstream of the flowmeter or upstream and downstream of the flowmeter.

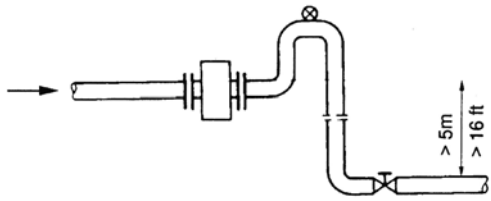
2 Suggestions for installation

To avoid measuring errors due to gas/air inclusion or to pipe running empty, please observe the following:

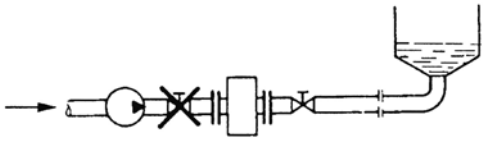
Highest point of pipe run
(Air bubbles collect in measuring tube - faulty measurements!)

Downpipe over 5 m (16 ft) length
Install air valve ⊠ downstream of flowmeter.

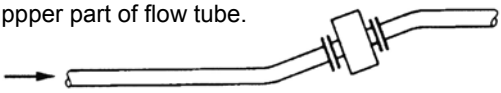




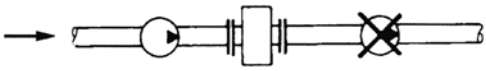
Long pipeline
Always install control and shutoff valves downstream of flowmeter.



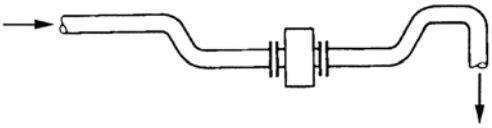
Horizontal pipe run
Install in slightly ascending pipe section. If not possible, assure adequate velocity to prevent air, gas or vapor from collecting in uppper part of flow tube.



Pumps
Never install flowmeter on pump suction side.



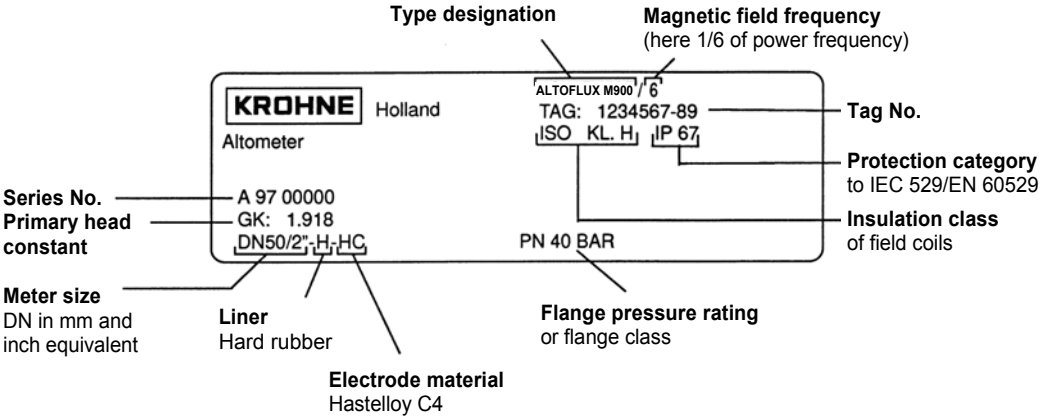
Open feed or discharge
Install meter in low section of pipe.



open discharge

3 Instrument nameplate

ALTOFLUX M900
separate primary head



Liner materials	
H	Hard rubber
NE	Neoprene
PUI	Irathane
T	Teflon®-PTFE
W	Soft rubber

Electrode materials	
HB	Hastelloy B2
HC	Hastelloy C4
PT	Platinum
TA	Tantalum
TI	Titanium
V4A	Stainless steel 1.4571 / SS 316-Ti

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Instrument nameplate for compact flowmeters
see installation and operating instructions for the signal converter.

4 Flowmeter versions

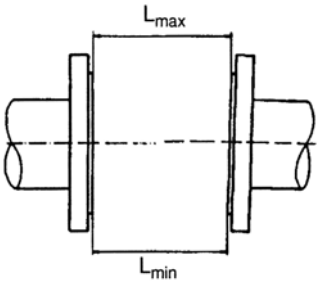
ALTOFLUX M900 — **Separate primary head (F)** electrically connected to the signal converter by signal and field current cables.

ALTOFLUX 3080 K — **Compact flowmeter (K),** IFC 090 K signal converter mounted direct on the primary head.

Versions for hazardous locations
M900 and 3080 K are approved as electrical equipment to the harmonized European Standards and to Factory Mutual (FM).
Test certificate, certificate of conformity and wiring instructions for these devices are attached to the **"Ex" installation instructions,** provided only with hazardous-duty equipment.

5 Installation in the pipeline

- **Installation material not included,** to be provided by customer (stud bolts, nuts, gaskets, etc.)
- **Pipe flanges and operating pressure:** refer to tables on “limits” in Section 11.
- **Distance between pipe flanges**
  see **fitting dimension “a”,** in Section 10 “Dimensions and weights”.
- **Position of flanges**
  Install flowmeter in line with the pipe axis.
  Pipe flange faces must be parallel to each other, max. permissible deviation:
  L_{max} - L_{min} ≤ 0.5 mm
  ≤ 0.02”



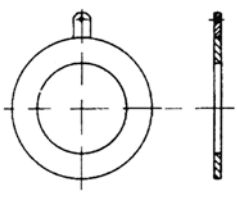
- **Hard rubber liner**
  Please note the table on page 4 for temperature limits of operation, storage and transport.
- **Teflon®-PTFE liner**
  Install at the lowest point of the pipe run to avoid an excessive vacuum condition atthe meter. Do not remove or damage liner, which is formed around the flange edges.
- **Gaskets**
  Use gaskets suitable for the application and appropriate to the liner, not included with flowmeter, to be provided by customer.
- **Grounding rings / protective rings** (option)
  On plastic pipes and internally coated metal pipelines, grounding rings must form the conductive connection with the fluid. Refer to Section 7 “Grounding for electrical connection.

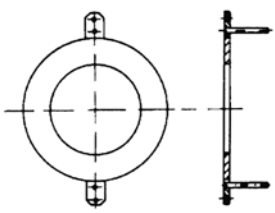
Grounding ring, No. 1

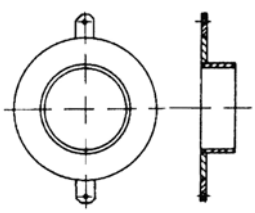
3 mm/0.12” thick

Grounding ring, protective ring No. 2
for flowmeters with Teflon®-PTFE liner, solidly fitted to the flanges, 3 mm/0.12” thick

Grounding ring, protective ring No. 3
with cylindrical neck, to protect the liner particularly at the inlet edge against abrasive products, 3 mm/0.12” thick
Length:
30 mm/1.18”, for ≤ DN 300, ≤ 12“
100 mm/3.94”, for ≥ DN 350, ≥ 14“







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6 Torques

- Tighten **stud bolts** uniformly in diagonally opposite sequence, see table for number and type.
- **Column A,** Torques for Teflon®-PTFE liner.
- **Column B**, Torques for liner made of Polypropylene and hard rubber.
- **10 Nm ~ 1.0 kpm ~ 7.23 ft × lbf**

Meter size	Pressure rating	Bolts	Max. torque Nm (ft × lbf)			
			A		B	
DN mm	PN					
10	40	4 x M 12	7.6	(5.5)	4.6	(3.3)
15	40	4 x M 12	9.3	(6.7)	5.7	(4.1)
20	40	4 x M 12	16	(11.6)	9.6	(6.9)
25	40	4 x M 12	22	(15.9)	11	(8.0)
32	40	4 x M 16	37	(26.8)	19	(13.0)
40	40	4 x M 16	43	(31.1)	25	(18.1)
50	40	4 x M 16	55	(39.8)	31	(22.4)
65	16	4 x M 16	51	(36.9)	42	(30.4)
65	40	8 x M 16	38	(27.5)	21	(15.2)
80	25	8 x M 16	47	(34.0)	25	(18.1)
100	16	8 x M 16	39	(28.2)	30	(21.7)
125	16	8 x M 16	53	(38.3)	40	(28.9)
150	16	8 x M 20	68	(49.2)	47	(34.0)
200	10	8 x M 20	84	(60.7)	68	(49.2)
200	16	12 x M 20	68	(49.2)	45	(32.5)
250	10	12 x M 20	78	(56.4)	65	(47.0)
250	16	12 x M 24	116	(83.9)	78	(56.4)
300	10	12 x M 20	88	(63.7)	76	(54.9)
300	16	12 x M 24	144	(104.2)	105	(75.9)

Meter size	Body pressure rating	Bolts	Max. torque Nm (ft × lbf)			
			A		B	
inch	psig					
$^3/_8$	580	4 x $^1/_2$"	3.5	(2.5)	3.6	(2.6)
$^1/_2$	580	4 x $^1/_2$"	3.5	(2.5)	3.6	(2.6)
$^3/_4$	580	4 x $^1/_2$"	4.8	(3.5)	4.8	(3.5)
1	580	4 x $^1/_2$"	6.7	(4.8)	4.4	(3.2)
$1^1/_2$	580	4 x $^1/_2$"	13	(9.4)	12	(8.7)
2	580	4 x $^5/_8$"	24	(17.4)	23	(16.6)
3	360	4 x $^5/_8$"	43	(31.1)	39	(28.2)
4	230	8 x $^5/_8$"	34	(24.6)	31	(22.4)
6	230	8 x $^3/_4$"	61	(44.1)	51	(36.9)
8	145	8 x $^3/_4$"	86	(62.2)	69	(49.9)
10	145	12 x $^7/_8$"	97	(70.2)	79	(57.1)
12	145	12 x $^7/_8$"	119	(86.1)	104	(75.2)

Note: Process pressure must not exceed ANSI flange rating. Refer to ANSI Standard B 16.5.

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7 Grounding

- All flowmeters must be properly grounded to avoid personnel shock hazard.
- The ground conductor should not transmit any interference voltages, therefore do not ground any other electrical devices together with this conductor.

ALTOFLUX M900 separate primary head with terminal box

- An **FE functional ground** must always be connected.
- **Signal converter with field power supply > 125 mA / 60 V** a **PE protective conductor** must be connected to the primary head, because of the higher field current from the signal converter. See grounding diagrams below.

ALTOFLUX 3080 K compact systems

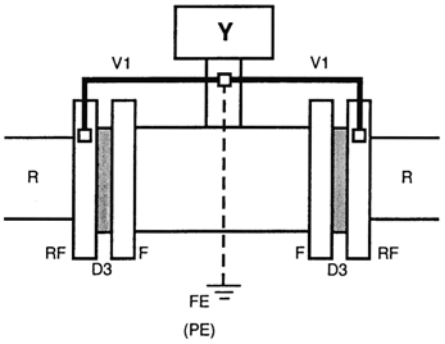
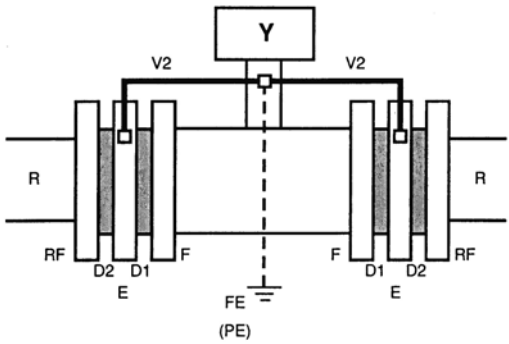
Supply power > 50 V AC

- Grounding is via the **PE protective ground conductor** incorporated in the power supply cable, see also Section "Connection to power" in the installation and operating instructions for the signal converter.
- **EXCEPTION: Do not connect up the PE protective ground conductor in the terminal box** if e.g. compact units are operated in the proximity of electric furnaces, electrolysis plants, etc., and large potential differences occur in the pipeline system. An FE functional ground must simultaneously take over the function of the protective conductor (combined protective/functional ground). Refer to appropriate national codes for specific requirements for this type of installation, which may require the addition of a ground fault detection circuit interrupter.

Power supply 24 V AC or DC

- Protective separation (PELV) must be ensured (VDE 0100 / VDE 0106 or IEC 364 / IEC 536 or equivalent national regulations).
- An **FE functional ground conductor** must be connected for measurement reasons.

Grounding diagrams

Metal pipelines, not internally coated grounding without grounding rings	**Metal pipelines, with or without internal coating, and plastic pipelines** grounding with grounding rings
	

D1, D2, D3	Gaskets, not included with supply, to be provided by customer.
E	Grounding rings (option)
F	Flowmeter flanges
FE	Functional ground, wire ≥ 4 mm^2 Cu (10 AWG), not included with flowmeter, to be provided by customer
PE	Protective conductor required if the ALTOFLUX M900 is operated with a signal converter that supplies a field current of **> 125 mA / > 60 V**. Wire ≥ 4 mm^2 Cu (10 AWG), not included with flowmeter, to be provided by customer.
R	Pipeline
RF	Pipe flanges
V1, V2	Interconnecting wires, included with flowmeter
Y	Terminal box or signal converter

8 Replacement of the separate primary head

Switch off power source before commencing work !

1) Note down terminal assignment before dismantling the “old” primary head.

2) Install the new primary head as described in the supplied installation instructions.

3) Make electrical connection at the signal converter as described in the installation and operating instructions for the signal converter.

4) Specific calibration data are defined during factory calibration for each primary head, which are indicated on the instrument nameplate.
This includes the primary constant GK and the magnetic field frequency.
These data need to be reset in the signal converter.

5) If the size of primary head is also different from the old one, the full-scale range $Q_{100\%}$ and the meter size will need to be reset.

6) After resetting the signal converter, carry out a zero point check.

7) If necessary, reset the internal electronic totalizer of the signal converter.

Notes

9 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 DN10–125, pressure rating PN10
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 (≥ 20 µS/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
... for integral systems	– 60 to + 140°C or – 76 to + 274°F } see Tables at chapter 11
... for hazardous-duty versions	– 20 to + 180°C or – 4 to + 356°F
Max. permissible operating data	
Product temperature and operating pressure	see Tables 1 + 2 at chapter 11
Vacuum load factor of liner	see Table 3 at chapter 11
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 } others
	DN 65, DN 100 – 300 ($1\ 1/2$", 4" – 12")	Steel 1.0501 (RST 37.2) or AISI: C 1035 } 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

10 Dimensions and weights

M900 primary head and 3080 K integral flowmeter (standard)

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

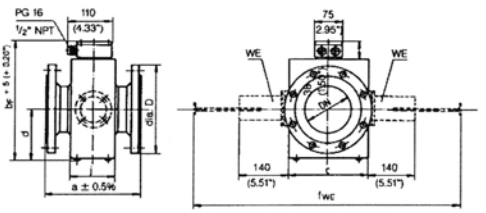
... DIN 2501 (= BS 4504) / DN 10–300 / PN 40, 16 or 10: see Table
... ANSI B 16.5 / 3/8"–12" / Class 150 lb / RF: see Table
... ANSI B 16.5 / 3/8"–12" / Class ≥ 300 lb / RF: dimensions on request

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)

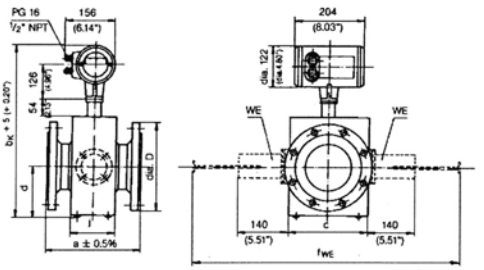
M900
Primary head

DN 10 – 300
3/8" – 12"



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)

M900 HJ primary head with heating jacket

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

... DIN 2501 (= BS 4504) / DN10–100 / PN40 or 16: see Table

... ANSI B 16.5 / 3/8"–4" / Class 150lb / 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"

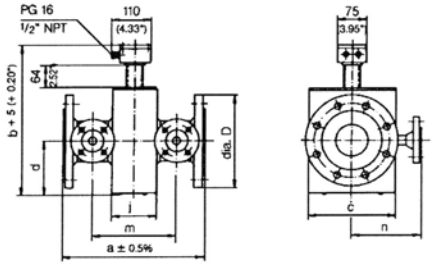
Dimension a without flange gaskets: Not supplied with flowmeter, to be provided by customer.

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

Meter size to ...			**Dimensions** in mm (inches)									**Approx.* weight**
DIN		**ANSI**										
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"



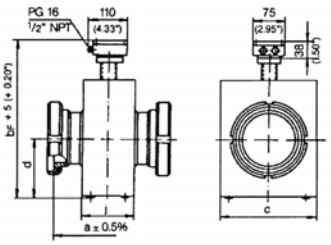
M900 and 3080 K with sanitary connection to DIN 11851

Dimensions in mm and (inches)

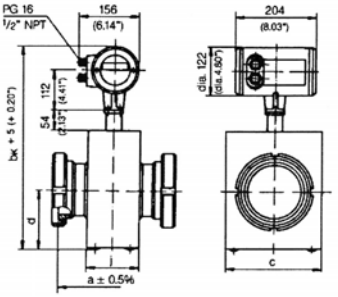
* **For integral flowmeters:** Dimension b + 127 mm or + 5.00"
** **For stainless steel housing:** Dimension c + 14 mm or + 0.55"

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)

M900 primary head
with sanitary connection to DIN 11851
DN 10–125 / PN 10



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



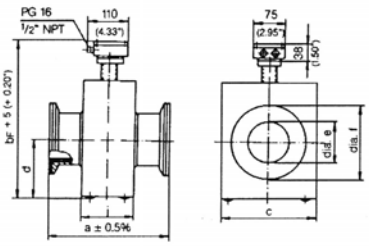
M900 and 3080 K with clamp connection

Dimensions in mm and (inches)

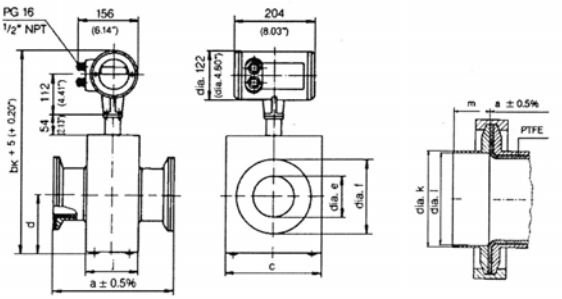
* **For integral flowmeters:** Dimension b + 127 mm or + 5.00"
** **For stainless steel housing:** Dimension c + 14 mm or + 0.55"

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)
1½	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"



11 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)**.

Notes

If you need to return flowmeters for testing or repair to KROHNE

Your electromagnetic flowmeter

- has been carefully manufactured and tested by a company with ISO 9001 certification
- and volumetrically calibrated in one of the world's most accurate test rigs.

If installed and operated in accordance with these operating instructions, your flowmeter will rarely present any problems.

Should you nevertheless need to return a flowmeter for checkout or repair, please pay strict attention to the following points:

Due to statutory regulations concerning protection of the environment and the health and safety of our personnel, Krohne may only handle, test and repair returned flowmeters that have been in contact with liquids if it is possible to do so without risk to personnel and environment. This means that Krohne can only service your flowmeter if it is accompanied by a certificate in line with the following model confirming that the flowmeter is safe to handle.

If the flowmeter has been operated with toxic, caustic, flammable or water-endangering liquids, you are kindly requested

- to check and ensure, if necessary by rinsing or neutralizing, that all cavities in the flowmeter are free from suchdangerous substances.
  (Directions on how you can find out whether the primary head has to be opened and then flushed out or neutralized are obtainable from Krohne on request.)
- to enclose a certificate with the flowmeter confirming that the flowmeter is safe to handle and stating the liquid used.

KROHNE regret that they cannot service your flowmeter unless accompanied by such a certificate.

S P E C I M E N certificate

Company: …….. Address: ……

Department: …….. Name: ……

Tel. No.: ……

The enclosed electromagnetic flowmeter

Type: …….. KROHNE Order No. or Series No ……

has been operated with the following liquid: ……..

Because this liquid is
water-endangering * / toxic * / caustic * / flammable *
we have
– checked that all cavities in the flowmeter are free from such substances *
– flushed out and neutralized all cavities in the flowmeter *
(* delete if not applicable)
We confirm that there is no risk to man or environment through any residual liquid contained in this flowmeter.

Date: …….. Signature: ……..

Company stamp: