KROHNE

02/97

Electromagnetic flowmeters

- **Primary heads**
- **Compact flowmeters**

Installation instructions

ECOFLUX
IFS 1000 F

IFM 1010 K
IFM 1080 K


IFS 1000 F

HAMALL PROCESS INSTRUMENTS,
DEVONPARK MILLS, ALEXANDRA STREET,
TILLICOULTRY, CLACKMANNANSHIRE,
SCOTLAND, UK. FK13 6HP
TEL NO : 44 (0)1259 753753 FAX NO : 44 (0)1259 752770

CONTENTS


IFM 1010 K


IFM 1080 K

3.1M65EA1 029721

Order No. DIN size 7.02146.31.00
US size 7.02146.71.00

Contents

System description

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

The process liquids must be electrically conductive: ≥ 5 µS/cm
≥ 20 µS/cm for demineralized cold water

The **full-scale range $Q_{100\%}$** can be set as a function of the **meter size**:
DN 10 - 150 / $^3/_8$" - 6" $Q_{100\%}$ = 0.1 - 760 m³/hr = 0.4 - 3350 US Gal/min
This is equivalent to a flow velocity of 0.3 - 12 m/s, or 1 - 40 ft/s.

Product liability and warranty

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

Flowmeters with the ECOFLUX primary head are not certified for use in hazardous locations. Other flowmeter 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 ECOFLUX 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

IFS 1000 F
primary head

- primary head
  in the size as ordered
- certificate of calibration data
- installation material as specified
  in the following table
- installation instructions

IFM 1010 K and IFM 1080 K
compact flowmeters

- compact flowmeter
  in the size as ordered
- certificate of calibration data
- installation material as specified
  in the following table
- installation instructions
- installation and operating instructions for the signal converter

Nominal size measuring tube and pipe flanges	**Pressure rating or flange class** of pipe flanges	**Max. allowable operating pressure**		**Supply scope** **S**=standard **O**=option		
				excl. grounding rings	**incl.** grounding rings	**Standard** with centering sleeves (optionaly with stud bolts, see below for type and number
		bar	psig	2)	3)	
. . . DIN 2501 (BS 4504)						
DN 10-15 **1)**	PN 16/PN 40	≤ 16	≤ 230	–	**S**	4 × M12
DN 25	PN 16/PN 40	≤ 16	≤ 230	**S**	**O**	4 × M12
DN 40	PN 16/PN 40	≤ 16	≤ 230	**S**	**O**	4 × M16
DN 50	PN 16/PN 40	≤ 16	≤ 230	**S**	**O**	4 × M16
DN 80	PN 16/PN 40	≤ 16	≤ 230	**S**	**O**	4 × M16
DN 100	PN 16 PN 40	≤ 16	≤ 230	**S**	**O**	8 × M16 8 × M20
DN 150	PN 16 PN 40	≤ 16	≤ 230	**S**	**O**	8 × M20 8 × M24
. . . ANSI B 16.5						
3/8"-1/2" **1)**	150/300 lb	≤ 16	≤ 230	–	**S**	4 × 1/2"
1"	150/300 lb	≤ 16	≤ 230	**S**	**O**	4 × 1/2"
1 1/2"	150/300 lb	≤ 16	≤ 230	**S**	**O**	4 × 5/8"
2"	150 lb 300 lb	≤ 16	≤ 230	**S**	**O**	4 × 5/8" 8 × 5/8"
3"	150 lb 300 lb	≤ 16	≤ 230	**S**	**O**	4 × 5/8" 8 × 5/8"
4"	150/300 lb	≤ 16	≤ 230	**S**	**O**	8 × 5/8"
6"	150 lb 300 lb	≤ 16	≤ 230	**S**	**O**	8 × 3/4" 12 × 3/4"
. . . JIS						
DN 10-15 **1)**	10 K 20 K	≤ 07 ≤ 14	≤ 100 ≤ 200	–	**S**	4 × M12 4 × M12
DN 25	10 K 20 K	≤ 07 ≤ 14	≤ 100 ≤ 200	**S**	**O**	4 × M12 4 × M16
DN 40	10 K 20 K	≤ 07 ≤ 14	≤ 100 ≤ 200	**S**	**O**	4 × M12 4 × M16
DN 50	10 K 20 K	≤ 07 ≤ 14	≤ 100 ≤ 200	**S**	**O**	4 × M12 8 × M16
DN 80	10 K 20 K	≤ 07 ≤ 14	≤ 100 ≤ 200	**S**	**O**	8 × M12 8 × M20
DN 100	10 K 20 K	≤ 07 ≤ 14	≤ 100 ≤ 200	**S**	**O**	8 × M12 8 × M22
DN 150	10 K 20 K	≤ 07 ≤ 14	≤ 100 ≤ 200	**S**	**O**	8 × M16 12 × M22

1) For **DN 10 and 3/8" sizes,** use DN 15 or 1/2" pipe flanges.

2) Ground connecting wires V screwed to housing, supplied without gaskets.

3) **DN 10 - 15 and 3/8" - 1/2":** grounding rings E with inserted D1 gasket, screwed to housing.
D2 gaskets between grounding rings and pipe flanges not included with flowmeter, to be provided by customer.
Use Teflon-type gaskets to DIN 2690/ANSI B 16.21, deformable under pressure, 8 - 16 N/mm^2/1160 - 2320 psi.

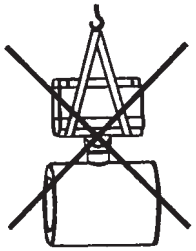
DN 25 - 150 and 1" - 6": grounding ring E (option) supplied loose, ground connecting wires V screwed to housing, gaskets not included in supply.

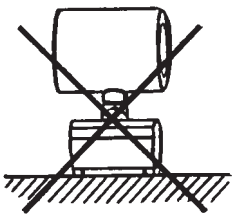
For arrangement of gaskets and connection of wires V, see Section 7 "Grounding".

1 Important information for installation: PLEASE NOTE

- **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.





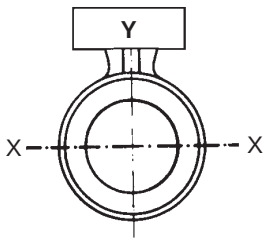
- Use only solventless detergents to **clean** the signal converter housing (polycarbonate).

- **Temperatures**
  For operating pressure and vacuum load based on flange standards, see Section 10 “Technical data“.

	Ambient temperature	**Process temperature**
Compact systems	-25 to +**50** °C (-13 to +**122** °F)	-25 to + **60** °C (-13 to +**140** °F)
	-25 to +**40** °C (-13 to +**104** °F)	-25 to +**120** °C (-13 to +**248** °F)
IFS 1000 F (separate)	-25 to +**60** °C (-13 to +**140** °F)	-25 to +**120** °C (-13 to +**248** °F)
In storage	-25 to +**60** °C (-13 to +**140** °F)	–

- **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 20-50 Hz with the IFC 010 K and 20-150 Hz with the IFC 090 K.

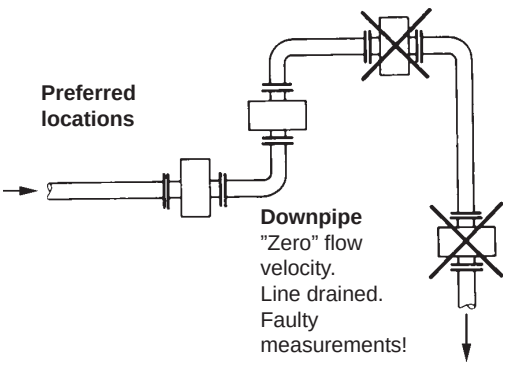
- **Do not expose to direct sunlight,**
  fit a sunshade if necessary, not included with flowmeter, to be provided by customer.

- **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 x 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 downsteam of the flowmeter or upsteam and downstream of the flowmeter.

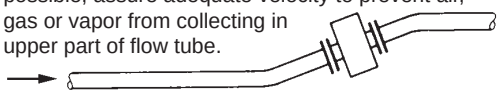
2 Suggestions for installation

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

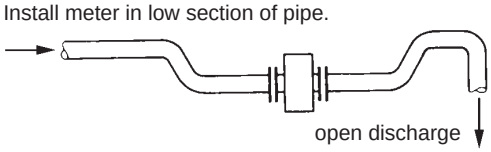
Highest point of pipe run
(Air bubbles collect in measuring tube - faulty measurements!)



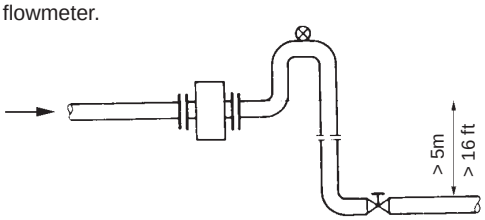
Horizontal pipe run
Install in slightly ascending pipe section. If not possible, assure adequate velocity to prevent air, gas or vapor from collecting in upper part of flow tube.



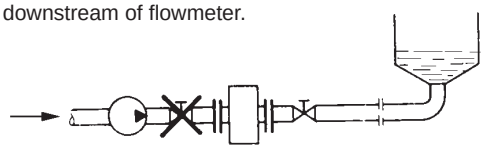
Open feed or discharge
Install meter in low section of pipe.



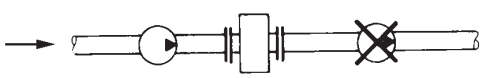
Downpipe over 5 m (16 ft) length
Install air valve ⊗ downstream of flowmeter.



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

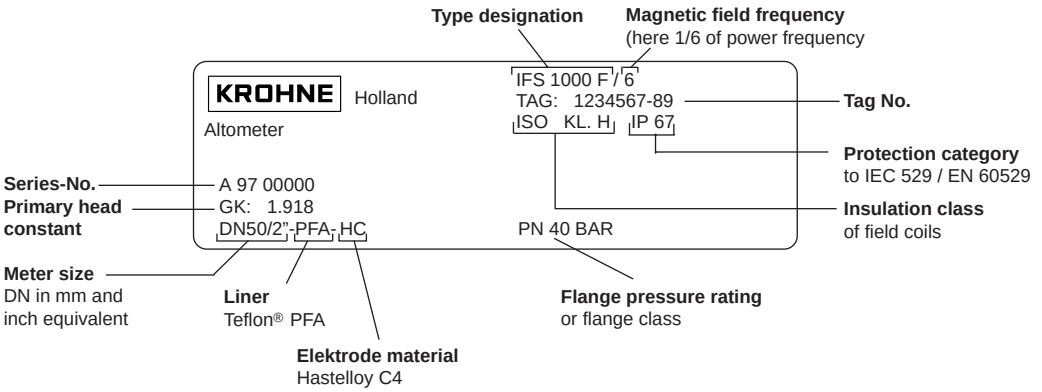


Pumps
Never install flowmeter on pump suction side.



3 Instrument nameplate

IFS 1000 F
separate primary head



Teflon® is a registered trademark of Du Pont

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

4 Flowmeter versions

IFS 1000 F **Separate primary head (F)** , electrically connected to the signal converter by signal and field current cables.

IFM 1010 K **Compact flowmeter (K),** IFC 010 K signal converter mounted direct on the primary head.

IFM 1080 K **Compact flowmeter (K),** IFC 090 K signal converter mounted direct on the primary head.

5 Installation in the pipeline

- **Installation material**, refer to table on page 3.

- **Pipe flanges and operating pressure,**
  refer to table on page 3.

- **Pipe flange spacing** (fitting dimension)

Nominal size to . . .		**Space between pipe flanges**			
DIN 2501 and JIS	ANSI B 16.5	Installation **with** grounding rings **1)**		Installation **without** grounding rings **2)**	
DN 10, 15	$^3/_8$", $^1/_2$"	2 x s + 68 mm	(2 x s + 2.68")	–	–
DN 25	1	2 x s + 60 mm	(2 x s + 2.38")	54 mm	(2.13")
DN 40	1 $^1/_2$"	2 x s + 84 mm	(2 x s + 3.31")	78 mm	(3.07")
DN 50	2	2 x s + 106 mm	(2 x s + 4.17")	100 mm	(3.94")
DN 80	3	2 x s + 156 mm	(2 x s + 6.14")	150 mm	(5.91")
DN 100	4	2 x s + 206 mm	(2 x s + 8.11")	200 mm	(7.87")
DN 150	6	2 x s + 206 mm	(2 x s + 8.11")	200 mm	(7.87")

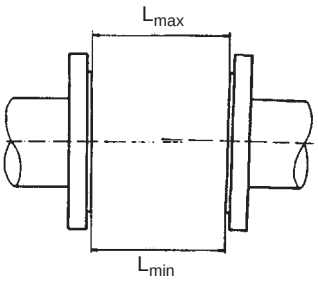
1) Dimensions including grounding rings

2) No gasket required between measuring tube and pipe flanges, seal provided by PFA liner on the flanges

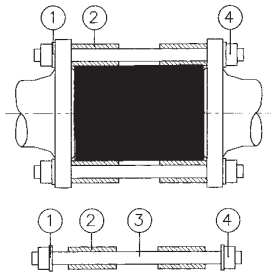
s Thickness of gasket D2 between grounding rings and pipe flanges, not included with flowmeter, to be provided by customer. Use Teflon-type gaskets, deformable under pressure, to DIN 2690/ANSI B 16.21, 8 - 16 N/mm^2/1160 - 2320 psi.

- **High-temperature pipelines**
  Where process temperatures exceed 100 °C/212 °F, provide for facilities to compensate for longitudinal expansion on heat-up of the pipeline.
  For **short** pipelines use resilient gaskets and
  for **long** pipelines install flexible pipe elements (e.g. elbows).

- **Position of flanges**
  Install flowmeter in line with the pipe axis. Pipe flange faces must be parallel to each other,
  max. permissible deviation:
  $L_{max} - L_{min} \leq 0{,}5$ mm
  ≤ 0.02"



- **Arrangement of centering sleeves**
  1 washer
  2 centering sleeve
  3 stud bolt
  4 hex. nut



6 Torques

Nominal size measuring tube and pipe flanges	**Pressure rating or flange class** of pipe flanges	**Max. allowable operating pressure**		**Max. torques** stud bolts	
		bar	psig	Nm	ft x lbf
. . . DIN 2501 (BS 4504)					
DN 10-25 **1)**	PN 16/PN 40	≤ 16	≤ 230	16	11.6
DN 40	PN 16/PN 40	≤ 16	≤ 230	25	18.1
DN 50	PN 16/PN 40	≤ 16	≤ 230	45	32.5
DN 80	PN 16/PN 40	≤ 16	≤ 230	25	18.1
DN 100	PN 16/PN 40	≤ 16	≤ 230	33	23.9
DN 150	PN 16/PN 40	≤ 16	≤ 230	82	59.3
. . . ANSI B 16.5					
3/8"-1/2" **1)**	150/300 lb	≤ 16	≤ 230	16	11.6
1"	150/300 lb	≤ 16	≤ 230	15	10.8
1 1/2"	150/300 lb	≤ 16	≤ 230	25	18.1
2"	150/300 lb	≤ 16	≤ 230	45	32.5
3"	150 lb 300 lb	≤ 16	≤ 230	56 28	40.5 20.5
4"	150/300 lb	≤ 16	≤ 230	36	26.0
6"	150 lb 300 lb	≤ 16	≤ 230	100 66	72.3 47.7
. . . JIS					
DN 10-15 **1)**	10 K 20 K	≤ 7 ≤ 14	≤ 100 ≤ 200	16 16	11.6 11.6
DN 25	10 K 20 K	≤ 7 ≤ 14	≤ 100 ≤ 200	16 19	11.6 13.7
DN 40	10 K 20 K	≤ 7 ≤ 14	≤ 100 ≤ 200	20 17	14.5 12.3
DN 50	10 K 20 K	≤ 7 ≤ 14	≤ 100 ≤ 200	35 24	25.3 17.4
DN 80	10 K 20 K	≤ 7 ≤ 14	≤ 100 ≤ 200	20 30	14.5 21.7
DN 100	10 K 20 K	≤ 7 ≤ 14	≤ 100 ≤ 200	26 89	18.8 28.9
DN 150	10 K 20 K	≤ 7 ≤ 14	≤ 100 ≤ 200	65 89	47.0 64.3

1) For **meter sizes DN 10 and 3/8",** use pipe flanges DN 15 or 1/2".

7. Grounding

- **Warning**: 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.

Separate primary head IFS 1000 F with terminal box

- A **functional ground FE** must always be connected.
- **Signal converters with a field power supply of > 125 mA / > 60 V** for the primary heads should not be operated with the IFS 1000 F.

Compact systems

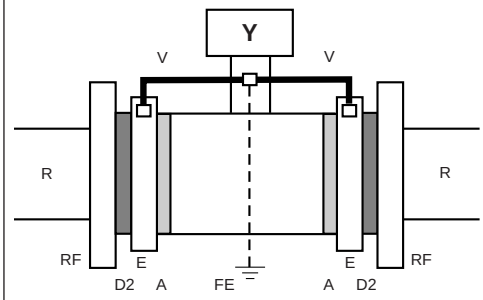
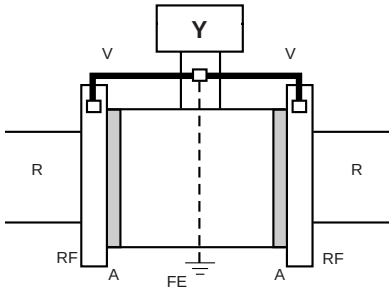
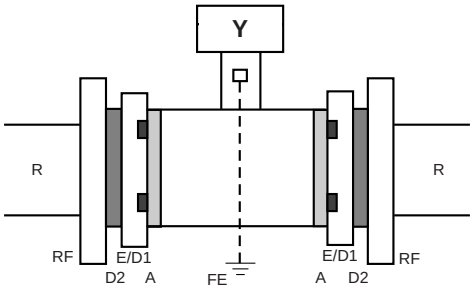
Supply power > 50 V AC

- 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, with or without internal coating, and plastic pipelines grounding with grounding rings	**Metal pipelines, not internally coated** grounding without grounding rings
DN 25 - 150 / 1” - 6”		
DN 10 - 15 / 3/8” - 1/2”		

A	Teflon® PFA liner. For DN 25 - 150 and 1” - 6” meter sizes, additional gaskets between measuring tube and grounding rings or pipe flanges are not required.
D2	Gaskets between grounding rings and pipe flanges, not included in supply, to be provided by customer. Use Teflon-type flat gaskets to DIN 2690/ANSI B 16.21, deformable under pressure, 8 - 16 N/mm^2/1160 - 2320 psi.
E / D1	Grounding rings, screwed to housing, with inserted gaskets D1, special O-rings.
FE	Functional ground, conductor ≥ 4 mm^2 Cu/AWG 10.
R	Pipeline
RF	Pipe flanges
V	Interconnecting wires, bolted to housing.
Y	Terminal box or signal converter.

8 Replacement of the separate primary head IFS 1000 F

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.

9 Spare parts and order numbers

O-ring gasket D1 for the grounding rings

DN 10, 15	3/8”, 1/2”	**Order No.**	53002602

Grounding rings E

DN 25	1”	**Order No.**	231157-01
DN 40	1 1/2”		230505-11
DN 50	2”		231157-03
DN 80	3”		231157-04
DN 100	4”		231157-05
DN 150	6”		231157-06

10. Technical data

Meter sizes	DN 10 - 150 and $^3/_8$" - 6"	
Pipe flanges		
to DIN 2501 (=BS 4504)	DN 10 - 150 / PN 16 or PN 40	
to ANSI B 16.5	$^3/_8$" - 6" / Class 150 and 300 lb / RF	
to JIS	DN 10 - 150 / 10 K and 20 K	
Electrical conductivity	≥ 5 µS/cm, ≥ 20 µS/cm for demineralized cold water	
Temperatures	Ambient temperature	Process temperature
Compact systems	-25 to +**50** °C/-13 to +**122** °F	-25 to + 60 °C/-13 to +140 °F
	-25 to +**40** °C/-13 to +**104** °F	-25 to +120 °C/-13 to +248 °F
IFS 1000 F (separate)	-25 to +**60** °C/-13 to +**140** °F	-25 to +120°C/-13 to +248 °F
In storage	-25 to +**60** °C/-13 to +**140** °F	–
Operating pressure		
with pipe flanges to		
... DIN 2501 (=BS 4504)	≤ 16 bar/≤ 230 psig	
... ANSI B 16.5	≤ 16 bar/≤ 230 psig	
... JIS 10 K	≤ 10 bar/≤ 150 psig	
20 K	≤ 16 bar/≤ 230 psig	
Vacuum load	0 mbar abs./0 psia, fully vacuum resistant	
Insulation class of field coils	E	
Electrode design	pin electrodes	
Protection category (EN 60 529/IEC 529)	IP 67/NEMA 6	
Humidity rating (DIN 50 016, DIN / IEC 68)	R, relative humidity < 90% annual mean	
Grounding rings	Standard for DN 10 - 15 and $^3/_8$" - $^1/_2$" optional for DN 25 - 150 and 1" - 6"	
Materials		
Measuring section	virgin Teflon®-PFA	
Electrodes	Hastelloy C4	
Housing		
DN 10 - 40 / $^3/_8$" - 1 $^1/_2$"	malleable cast iron GTW S 38	
DN 50 - 150 / 2" - 6"	steel St 37.2, paint finish	
Grounding rings	stainless steel 1.4571/SS 316 Ti-AISI (optionally for DN 25 - 150 and 1" - 6")	
Centering material	rubber sleeves	
Stud bolts (option)	steel, electrogalvanized or stainless steel 1.4301/SS 304 - AISI	
Gaskets between grounding rings and pipe flanges	not included with flowmeter, use Teflon-type gaskets to DIN 2690/ANSI B 16.21, deformable under pressure, 8-16 N/mm²/1160 - 2320 psi	

Teflon® is a registered trademark of Du Pont

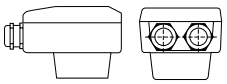
11 Dimensions and weights

PLEASE NOTE

The **total dimension for the height** is obtained from **dimension b** (see table) **plus the height** of the terminal box or the signal converter, see drawings.

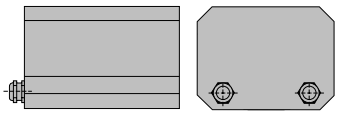
The **total weight** is made up of the weight of the signal converter (see table) **plus** the weight of the terminal box or signal converter, see below.

Terminal box



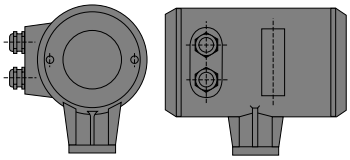
Weight approx.
0.5 kg (1.1 lb)

IFC 010 K signal converter



Weight approx.
1.6 kg (3.6 lb)

IFC 090 K signal converter



Weight approx.
2.3 kg (5.1 lb)

Meter size		**Dimensions** in mm (in)										**Approx. weight 1)**	
DN mm	(in)	a		b **1)**		c		d		e		in kg	(lb)
DN 10	$^3/_8$	68	(2.68)	137	(5.39)	52	(2.05)	67	(2.64)	47	(1.85)	1.7	(3.7)
DN 15	$^1/_2$	68	(2.68)	137	(5.39)	52	(2.05)	67	(2.64)	47	(1.85)	1.7	(3.7)
DN 25	1	54	(2.13)	147	(5.79)	52	(2.05)	62	(2.44)	66	(2.60)	1.7	(3.7)
DN 40	$1^1/_2$	78	(3.07)	162	(6.38)	76	(2.99)	70	(2.76)	82	(3.23)	2.6	(5.7)
DN 50	2	100	(3.94)	151	(5.94)	98	(3.86)	50	(2.58)	101	(3.98)	4.2	(9.3)
DN 80	3	150	(5.91)	180	(7.09)	146	(5.75)	65	(3.15)	130	(5.12)	5.7	(12.6)
DN 100	4	200	(7.87)	207	(8.15)	196	(7.72)	78	(3.66)	156	(6.14)	10.5	(23.1)
DN 150	6	200	(7.87)	271	(10.67)	196	(7.72)	110	(4.90)	219	(8.62)	15.0	(33.1)

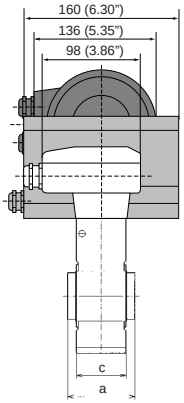
Necessary distance between flanges

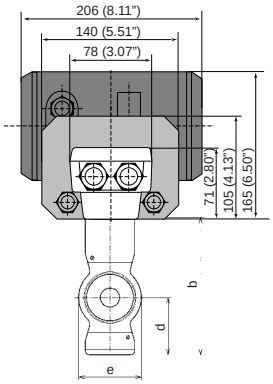
DN 10 - 15 / $^3/_8$" - $^1/_2$"	(flowmeter supplied with grounding rings)	Dimension a + 2 x gasket thickness **(2)**
DN 25 - 150 / 1" - 6"	without grounding rings:	Dimension a only (no gaskets required)
	with grounding rings:	Dimension a + 2 x gasket thickness **(2)**
		+ 2 x 3 mm or 2 x 0.12" (thickness of grounding rings)

1) Overall height "b" and approx. weight **without** mounted terminal box or signal converter

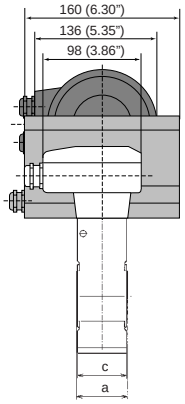
2) Teflon-type gaskets to DIN 2690/ANSI B 16.21, deformable under pressure 8 - 16 N/mm²/1160 - 2320 psi, to be provided by customer.

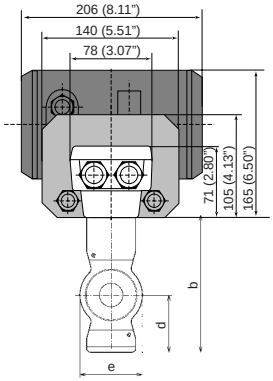
DN 10 - 15 / 3/8" - 1/2"
Dimension "a" with fitted grounding rings (standard)



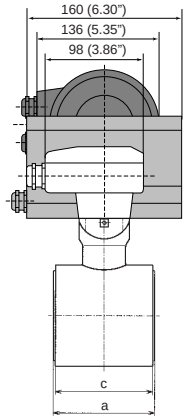


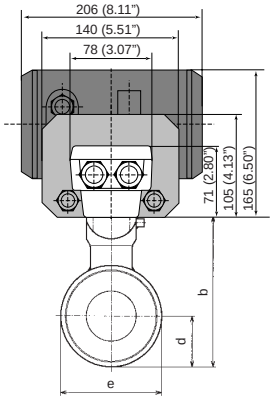
DN 25 - 40 / 1" - 1 1/2"





DN 50 - 150 / 2" - 6"





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 such dangerous 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: