

## ALTOFLUX IFS 4000/4005

... result of more than 40 years' experience with electromagnetic flowmeters



- Liner made of KROHNE Teflon®-PFA or other fluorines
- Dimensionally stable, even in caustic, acid and hot conditions
- Vacuum-resistant, also at elevated temperatures
- For use in hazardous locations

Variable area flowmeters

Vortex flowmeters

Flow controllers

**Electromagnetic flowmeters**

Ultrasonic flowmeters

Mass flowmeters

Level measuring instruments

Communications engineering

Engineering systems & solutions



## ALTOFLUX IFS 4000 / 4005

The result of more than 40 years' experience with electromagnetic flowmeters

### ALTOFLUX IFS 4000 / 4005

flowmeters measure the volumetric flowrate of electrically conductive liquids, acids, alkaline solutions, pastes and slurries, also with very high solids content.

#### Fields of application

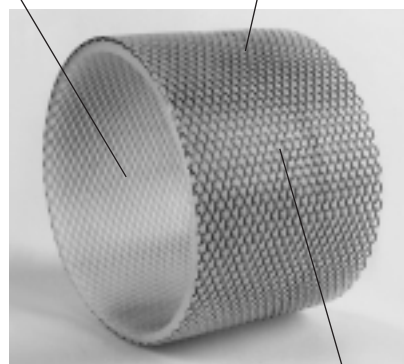
- water and wastewater
- chemical and pharmaceutical
- paper and woodpulp production
- mining, ore extraction and dressing
- measurement of water / sand mixes
- ... with solids contents of up to 50%
- Teflon®-PFA and -PTFE liners ensure extremely high abrasion resistance
- chemically resistant to alkaline solutions and acids:
- no restriction with Teflon®-PFA or -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.



DN 25-150 and 1"-6" with KROHNE Teflon®-PFA liner

Dimensionally stable through stainless steel mesh reinforcement, also at elevated temperatures

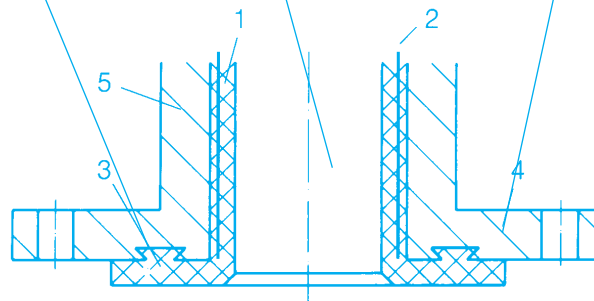


No additional electrode gaskets required

With dovetail groove for easy installation

Meter sizes up to DN 3000 and 120"

Fully welded housing, absolutely tight, rugged, resistant to corrosion



Can be operated together with all KROHNE signal converters of integral or remote design

Fitting length also in conformity with ISO 13 359

For use in hazardous locations

**Grounding rings**

For process flow measurement reasons the product must be grounded. Such as 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 Teflon®-PTFE liner.

On primary heads with Teflon®-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 3 mm/0.10" thick  
 30 mm/1.25" long for DN 10-300 and 3/8"-12"  
 100 mm/3.95" long for ≥ DN 350 and ≥ 14"

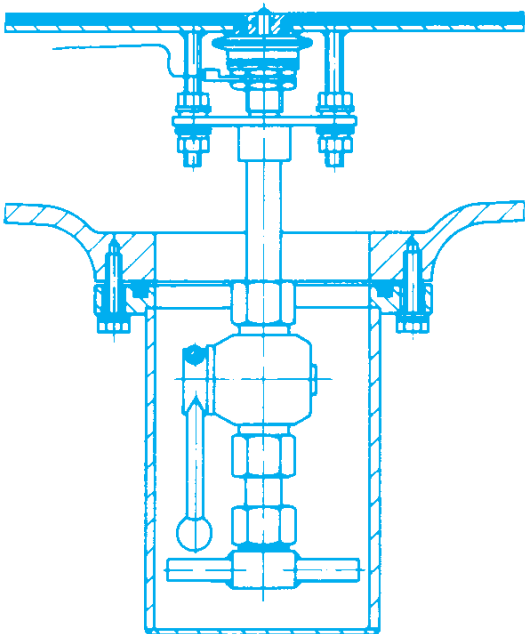
Where abrasive liquids are concerned, grounding rings No. 3 with cylindrical neck should be used for the inlet side of the primary head to prevent damage to the inlet edge.

**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**

**IFS 4000 F-EEx primary heads** are approved in conformity with European Standard, PTB No. Ex-90.C.2003 X.

**IFS 4000 F-EEx primary heads** DN 10-300 and 3/8"-12":  
 EEx eq ib IIC T3-T6

DN 350-3000 and 14"-120": EEx e ib IIC T3-T6

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, EEx d or de [ib] IIC T6.

**IFC 110 F-Ex** (field housing) **signal converters** for use outside hazardous areas, EEx d or de [ib] IIC T6.

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

The **IFM 4080 K-EEx** integral flowmeters are approved in conformity with European Standard, PTB No. Ex-95.D.2009. DN 10-300 and 3/8"-12":  
 EEx dqe or dq ib IIC T6

DN 350-1600 and 14"-64": EEx de ib IIC T6

**FM Approvals**

The **IFS 4000 F primary heads** are FM approved:

Div 1: EXP-IS / I / 1 / BCD  
 DIP-IS / II, III / 1 / EFG  
 J.I. No. 5Y8A1.AX

Div 2: NI / I / 2 / ABCD  
 S / II / 2 / FG  
 S / III / 2  
 J.I. No. 4X7A4.AX

The FM approvals for **IFC 110** and **IFC 090** signal converters are pending.

The **IFM 4080 K** integral flowmeters are FM approved:

Div 2: NI / I / 2 / ABCD  
 S / II / 2 / FG  
 S / III / 2  
 J.I. No. 4X7A4.AX

Background	
Water Wastewater	
Abrasive, corrosive and hot products	
Non-contact measurement $K < 0.05 \mu\text{S}/\text{cm}$	
Food, Beverage, Pharmaceutical	
High Pressure and special connections	
Integral and Remote	Signal converter
Remote	Remote
Calibration / Measuring Principle	Calibration / Measuring Principle
Sizing / installation guides	Sizing / installation guides
Ordering guide	Ordering guide

**Technical data****Meter sizes**

Integral systems	DN 10 - 1600 and $\frac{3}{8}$ " - 64"
IFS 4000 F (remote)	DN 10 - 3000 and $\frac{3}{8}$ " - 120"
IFS 4005 F (remote)	DN 50 - 3000 and 2" - 120"

**Pipe flanges**

to DIN 2501 (= BS 4504)	DN 10 - 50 and DN 80 / PN 40 DN 65 and DN 100 - 150 / PN 16 DN 200 - 1000 / PN 10 DN 1100 - 2000 / PN 6 DN 2200 - 3000 / PN 2.5
to ANSI B 16.5 to AWWA	$\frac{3}{8}$ " - 24" / Class 150 lb / RF 14" - 120" / Class B or D / FF

**Electrical conductivity**

≥ 5 μS/cm,  
≥ 20 μS/cm for demineralized cold water

**Temperatures**

	Ambient temperature	Process temperature
Integral systems	- 25 to + 60 °C - 13 to + 140 °F	- 25 to ≤ + 60 °C - 13 to ≤ + 140 °F
	- 25 to + 140 °C - 13 to + 104 °F	- 25 to ≤ + 140 °C* (Ex max. 150 °C) - 13 to ≤ + 284 °F* (Ex max. 302 °F)
IFS 4000 F (remote)	- 25 to + 60 °C - 13 to + 140 °F	- 25 to ≤ + 180 °C* - 13 to ≤ + 356 °F*
IFS 4005 F (remote) DN 50/2"	- 25 to + 60 °C - 13 to + 140 °F	- 60 to ≤ + 100 °C* - 76 to ≤ + 212 °F*
≥ DN 65 / ≥ 2½"	- 25 to + 60 °C - 13 to + 140 °F	- 60 to ≤ + 120 °C* - 76 to ≤ + 248 °F*

\* dependent on liner, flange standard, etc.

**Max. allowable operating data**

Process temperature, operating pressure  
and vacuum load for the liner, refer to Page 8  
"Limits"

**Insulation class of field coils**Integral systems

DN 10 - 300 / $\frac{3}{8}$ " - 6"	H / ≤ 140 °C / ≤ 284 °F process temperature
DN 350 - 1600 / 14" - 64"	E / ≤ 120 °C / ≤ 248 °F process temperature, (option H / ≤ 140 °C / ≤ 284 °F)

IFS 4000 F (remote)

DN 10 - 300 / $\frac{3}{8}$ " - 6"	H / ≤ 180 °C / ≤ 356 °F process temperature
DN 350 - 3000 / 14" - 120"	E / ≤ 120 °C / ≤ 248 °F process temperature, (option H / ≤ 180 °C / ≤ 356 °F)

**Power supply for field coils**

IFS 4000 F (seperate) and all integral units	max. 60V from signal converter
IFS 4005 F (seperate)	max. 250V from SC150 F signal converter

**Electrode design**

DN 10 - 3000 / $\frac{3}{8}$ " - 120"	flat elliptical electrodes, solidly fitted, surface-polished
Option DN 350 - 3000 / 14" - 120"	field-replaceable electrodes WE

**Protection category (EN 60 529 / IEC 529)**

Standard	IP 67, equivalent to NEMA 6 (with field replaceable electrodes WE: IP65, equivalent to NEMA 4/4X)
Option	IP 68, equivalent to NEMA 6

**Grounding rings**

available as an option

**Materials**

Measuring tube stainless steel 1.4301 (or higher materials number), equivalent to SS 304

Liner

Standard	DN 10 - 20 / 3/8" - 3/4" DN 25 - 150 / 1" - 6" DN200 - 600 / 8" - 24" DN 700 - 2000 / 4" - 80"	Teflon®-PTFE Teflon®-PFA (reinforced with stainless steel mesh) Tefzel (gaskets of electrodes: KALREZ, option Viton) FEP
Option	DN200 - 600 / 8" - 24" DN200 - 1200 / 8" - 48" DN200 - 1800 / 8" - 72" DN200 - 3000 / 8" - 120" ≥ DN200 / ≥ 8"	Teflon®-PTFE soft rubber Irrathane Neoprene others on request

Electrodes

Standard	Hastelloy C4
Option	stainless steel 1.4571 or SS 316 Ti, Hastelloy B2, titanium, tantalum, platinum, platinum-iridium, others on request
Field replaceable WE	stainless steel 1.4571 or SS 316 Ti

Connecting flanges\*

DIN: DN 10 - 50, DN 80 (3/8" - 2", 3") DN 65, ≥ DN 100 (≥ 4")	steel 1.0402 (C 22) or AISI C 1020 steel 1.0501 (RST 37.2) or AISI C 1035 steel ASTM A 105 N
ANSI	

Housing\*

DN 10 - 40 / 3/8"-1 1/2" ≥ DN 50 / ≥ 2"	GTW-S 30 (malleable cast iron) sheet steel
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Terminal box\*

IFS 4000 F (remote)	die-cast aluminium
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Grounding rings (option)

stainless steel 1.4571 or SS 316 Ti

\* with polyurethane coating

Background
Water Wastewater
Abrasive, corrosive and hot products
Non-contact measurement K > 0,05 µS/cm
Food, Beverage, Pharmaceutical
High Pressure and special connections
Integral and Remote
Signal converter
Remote
Calibration / Measuring Principle
Sizing / installation guides
Ordering guide

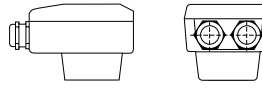
**Dimensions and weights**

**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.

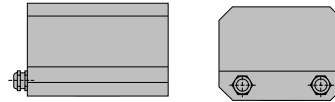
The **total weight** is made up of the weight of the signal converter (see table) **plus** the weight of the terminal box or signal converter, see below.

**Terminal box**



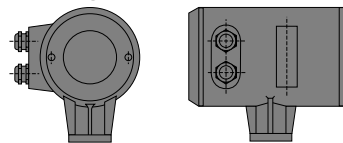
Weight approx. 0.5 kg (1.1 lb)

**IFC 010 K and IFC 020 K signal converter**



Weight approx. 1.6 kg (3.6 lb)

**IFC 090 K signal converter**



Weight approx. 2.3 kg (5.1 lb)

Flange connections to ...				Dimensions in mm (inches)
<b>DIN 2501</b> (= BS 4504)	DN 10- 300	PN40, 16, 10		see table
	DN350-1000	PN 10		see table
	DN350-1000	PN25		see table, dimension "a <sub>standard</sub> " + 200 mm information supplied on request
	≥ DN1200	PN 6, 2.5		information supplied on request
<b>ANSI B 16.5</b>	3/8"-24"	150 lb / RF		see table
		≥ 300 lb / RF		dimensions supplied on request
<b>AWWA</b>	≥ 14"	Class B, D / FF		dimensions supplied on request

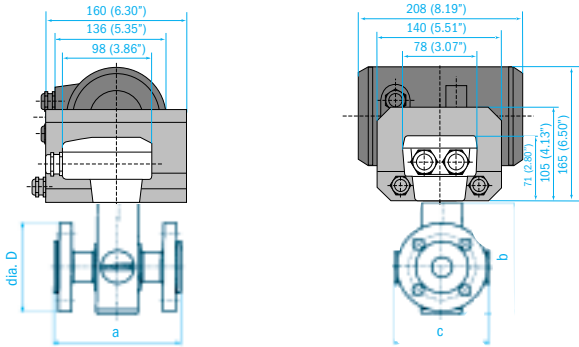
- Dimension "a" without flange gaskets: not included with flowmeter, to be provided by customer.
- rathane liner ≥ DN 350 / ≥ 14"; thickness > 12 mm: nominal size of flanges greater than nominal size of measuring tube, see table
- Meter size 3/8": flange connection 1/2"

Nominal size		Dimensions in mm (inches)										Approx. weight in kg (lb)	
DIN	ANSI	a (fitting length)			bmax		c		dia. D		with DIN flanges	with ANSI flanges	
DN	PN (psig)	inches	Standard	ISO 13 359	ANSI			DIN, ISO	ANSI				
10	40 (580)	3/8	150 (5.91)	-	150 (5.91)	165 (6.50)	121 (4.76)	90 (3.54)	88.9 (3.50)	5 (11.0)	6 (13.2)		
15	40 (580)	1/2	150 (5.91)	200 (7.87)	150 (5.91)	165 (6.50)	121 (4.76)	95 (3.74)	88.9 (3.50)	5 (11.0)	6 (13.2)		
20	40 (580)	3/4	150 (5.91)	200 (7.87)	150 (5.91)	165 (6.50)	121 (4.76)	105 (4.13)	98.6 (3.88)	7 (15.4)	8 (17.6)		
25	40 (580)	1	150 (5.91)	200 (7.87)	150 (5.91)	165 (6.50)	121 (4.76)	115 (4.53)	108 (4.25)	7 (15.4)	8 (17.6)		
32	40 (580)	-	150 (5.91)	200 (7.87)	-	180 (7.09)	139 (5.47)	140 (5.51)	-	8 (17.6)	-		
40	40 (580)	1 1/2	150 (5.91)	200 (7.87)	150 (5.91)	180 (7.09)	139 (5.47)	150 (5.91)	127 (5.00)	8 (17.6)	9 (19.8)		
50	40 (580)	2	200 (7.87)	200 (7.87)	200 (7.87)	218 (8.58)	160 (6.30)	165 (6.50)	152 (6.00)	8 (17.6)	8 (17.6)		
65	16 (232)	-	200 (7.87)	200 (7.87)	-	228 (8.98)	173 (6.81)	185 (7.28)	-	10 (22)	-		
80	40 (580)	3	200 (7.87)	200 (7.87)	200 (7.87)	235 (9.25)	173 (6.81)	200 (7.87)	191 (7.50)	12 (27)	13 (29)		
100	16 (232)	4	250 (9.84)	250 (9.84)	250 (9.84)	286 (11.26)	233 (9.17)	220 (8.66)	228 (8.98)	15 (33)	18 (40)*		
125	16 (232)	-	250 (9.84)	250 (9.84)	-	297 (11.69)	233 (9.17)	250 (9.84)	-	19 (42)	-		
150	16 (232)	6	300 (11.81)	300 (11.81)	300 (11.81)	327 (12.87)	257 (10.12)	285 (11.22)	279 (10.98)	22 (49)	26 (58)*		
200	10 (145)	8	350 (13.78)	350 (13.78)	350 (13.78)	385 (15.16)	291 (11.46)	340 (13.39)	343 (13.50)	34 (75)	42 (95)*		
250	10 (145)	10	400 (15.75)	450 (17.72)	400 (15.75)	437 (17.20)	331 (13.03)	395 (15.55)	406 (16.00)	48 (107)	64 (140)*		
300	10 (145)	12	500 (19.69)	500 (19.69)	500 (19.69)	500 (19.69)	381 (15.00)	445 (17.52)	533 (21.00)	58 (128)	94 (210)*		
350	10 (145)	14	500 (19.69)	550 (21.65)	700 (27.56)	548 (21.57)	428 (16.85)	505 (19.88)	597 (23.50)	78 (172)	129 (285)*		
400	10 (145)	16	600 (23.62)	600 (23.62)	800 (31.50)	606 (23.86)	483 (19.02)	565 (22.24)	635 (25.00)	98 (217)	165 (365)*		
500	10 (145)	20	600 (23.62)	-	800 (31.50)	651 (25.63)	533 (20.98)	670 (26.38)	699 (27.50)	128 (283)	223 (492)*		
600	10 (145)	24	600 (23.62)	-	800 (31.50)	820 (32.28)	585 (23.03)	780 (30.71)	813 (32.00)	164 (362)	306 (675)*		
700	10 (145)	28	700 (27.56)	-	flanges	937 (36.89)	694 (27.32)	895 (35.24)	flanges	245 (540)	flanges		
800	10 (145)	32	800 (31.50)	-	to AWWA:	1058 (41.65)	922 (36.30)	1015 (39.96)	to AWWA:	328 (724)	to AWWA:		
900	10 (145)	36	900 (35.43)	-	dimensions	1164 (45.83)	1026 (40.39)	1115 (43.90)	dimensions	425 (1000)	weight		
1000	10 (145)	40	1000 (39.37)	-	on request	1278 (50.31)	1132 (44.57)	1230 (48.43)	on request	507 (1118)	on request		

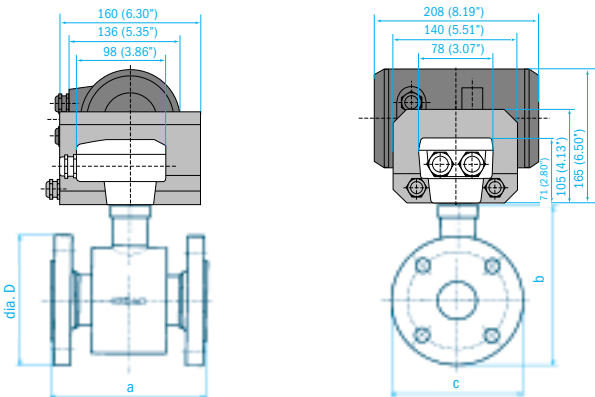
\* max. pressure rating acc. DIN flanges, see column "PN (psig)"

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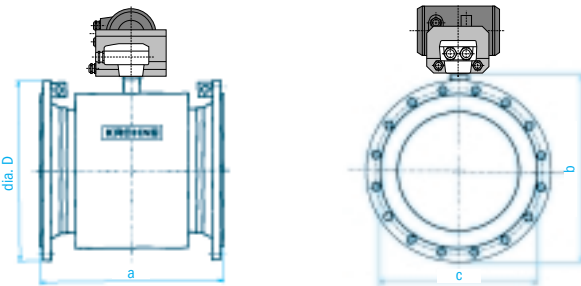
## DN 10 - 40 / 3/8" - 1 1/2"



## DN 50 - 300 / 2" - 12"



## DN 350 - 1000 / 14" - 24"



### Tolerance details for fitting length dimensions "a"

#### Standard

≤ DN 300 / ≤ 12" : ±0.5%,  
min. ± 1mm / ± 0.04"  
≥ DN 350 / ≥ 14" : ±0.5%

#### to ISO DIS 13 359

≤ DN 200 / ≤ 8" : +0/-3  
≥ DN 250 / ≥ 10" : +0/-5

### Flange size for Itrathane liners, thickness > 12 mm / > 0.50"

#### Nominal diameter of measuring tube

#### Flange size

DN in mm		in inches	
DN 350	DN 400	14	16
DN 400, 500	DN 500	14, 16	20
DN 500, 550	DN 600	20, 22	24
DN 600, 650	DN 700	24, 26	28
DN 700, 750	DN 800	28, 30	32
DN 800, 850	DN 900	32, 34	36
DN 900, 950	DN 1000	36, 38	40
DN 1000	DN 1200	40	48

Dimensions ≥ DN 1200 / ≥ 28" on request

Background	Water Wastewater	Abrasive, corrosive and hot products	Non-contact measurement K ≥ 0.05 µs/cm	Food, Beverage, Pharmaceutical	High Pressure and special connections	Signal converter Integral and Remote	Remote	Calibration / Measuring Principle	Sizing / installation guides	Ordering guide
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**Limits**

**PLEASE NOTE!**

- The limits specified in the table for process temperature and operating pressure make allowance for the tube liner and the flange standard. Refer also to footnotes 1) to 4).
- Refer to certificates of conformity for max. allowable operating data for hazardous-duty versions, provided only with hazardous-duty equipment.

● **Abbreviations used:**

- DIN** = DIN 2501 (= BS 4504)
- ANSI** = ANSI B 16.5
- AWWA** = AWWA
- API** = API 6 BX

**Limits for Teflon®-PFA, Teflon®-PTFE and Tefzel**

Liner	Flange	Nominal diameter	Pressure rating/ Class	Max. operating pressure in bar (psig) at a process 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)		
PFA	DIN	DN25-50, DN80	PN40	40.0 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)
		DN65, DN 100-150	PN16	16 (232)	16 (232)	16 (232)	16 (232)	16 (232)	16 (232)	16 (232)	16 (232)	16 (232)	16 (232)
PFA	ANSI B16.5	1", 1½", 2", 3", 4", 6", 150 lb	150 lb 300 lb	19.6 (284)	19.0 (275)	18.7 (271)	18.1 (262)	17.7 (256)	17.0 (246)	16.2 (235)	14.7 (213)		
				on request									
PTFE	DIN	DN10-20	PN40	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	40 (580)	
		DN200-500	PN10	10 (145)	10 (145)	10 (145)	10 (145)	10 (145)	10 (145)	10 (145)	10 (145)	10 (150)	
PTFE	ANSI B16.5	¾"-3/4", 1¼", 2½", 5"	150 lb 300 lb	19.6 (284)	19.0 (275)	18.7 (271)	18.1 (262)	17.7 (256)	17.0 (246)	16.2 (235)	14.7 (213)		
				on request									
Tefzel	ANSI B16.5	8"	150 lb	19.6 (284)	19.0 (275)	18.7 (271)	18.0 (261)	17.7 (256)	16.9 (246)	16.2 (235)	14.7 (213)		
			300 lb	32.1 (465)	32.1 (465)	31.7 (459)	30.4 (440)	29.7 (430)	28.5 (413)	26.7 (387)	25.5 (369)		
Tefzel		10"	150 lb	19.6 (284)	19.0 (275)	18.7 (271)	18.0 (261)	17.7 (256)	16.9 (246)	16.2 (235)	14.7 (213)		
			300 lb	23.6 (342)	23.4 (339)	22.9 (332)	22.0 (319)	21.6 (313)	20.7 (300)	20.0 (290)	18.6 (269)		
			150-300 lb	19.6 (284)	19.0 (275)	18.7 (271)	18.0 (261)	17.7 (256)	16.9 (246)	16.2 (235)	14.7 (213)		
			14"	150-300 lb	17.8 (258)	17.6 (255)	17.3 (250)	16.6 (240)	16.3 (236)	15.6 (226)	15.6 (219)	14.0 (203)	
			16"	150-300 lb	15.6 (226)	15.4 (223)	15.1 (219)	14.5 (210)	14.2 (205)	13.7 (198)	13.2 (191)	12.2 (177)	
			18"	150-300 lb	13.8 (200)	13.7 (198)	13.4 (194)	12.9 (187)	12.6 (182)	12.1 (175)	11.7 (169)	10.8 (156)	
			20"	150-300 lb	12.4 (179)	12.3 (178)	12.0 (174)	11.6 (168)	11.3 (163)	10.9 (158)	10.5 (152)	9.7 (140)	
			22"	150-300 lb	11.2 (162)	11.2 (162)	10.9 (158)	10.5 (152)	10.3 (149)	10.0 (145)	9.5 (137)	8.8 (127)	
			24"	150-300 lb	14.2 (205)	14.1 (204)	13.8 (200)	13.3 (192)	13.0 (188)	12.5 (181)	12.0 (174)	11.2 (162)	
			Tefzel		DN 200-600	PN10 4)	10 (145)	10 (145)	10 (145)	10 (145)	10 (145)	10 (145)	-

1) with insulation class E of the field coils, the maximum process temperature allowable is 120°C (250°F).  
 2) Max. process temperature 140°C (285°F) for the integral flowmeters.  
 3) Ambient temperature max. 40°C (105°F).  
 4) Max. process temperature 120°C (248°F) for the flowmeters with Tefzel liner.  
 5) Higher pressure rating on request. KROHNE is able to supply electromagnetic flowmeters up to 1500 bar (20000psig) and more.

**Limits for FEP, soft rubber, Irathane and Neoprene**

Flange	Standard	Meter size/ Nom. dia.	Pressure/ rating/Class	Max. operating pressure in bar (psig) at a process temperature of ....						FEP	
				Soft rubber ≤ 40°C (≤ 105°F)	Neoprene ≤ 60°C (≤ 140°F)	Irathane ≤ 70°C (≤ 158°F)	FEP ≤ 100°C (≤ 210°F)				
DIN		DN200-1000	PN10	10 (150)	10 (150)	10 (150)	10 (150)				
			PN16-1500	16-64 (150-920) 5)	16-100 (150-1450) 5)	16-1500 (150-20000) 5)					
ANSI		≥ DN1100	PN2.5-6	2.5-6 (37-90) 5)	2.5-6 (37-90) 5)	2.5-6 (37-90) 5)	2.5-6 (37-90) 5)				
			8"-40"	150 lb	≤ 19.6 (≤ 284) 6)	≤ 19.0 (≤ 275) 6)	≤ 18.7 (≤ 271) 6)				
AWWA		≥ 14"	300 lb	≤ 50.8 (≤ 737) 6)	≤ 49.2 (≤ 714) 6)	≤ 48.4 (≤ 702) 6)		on request			
			600 lb	≤ 64.0 (≤ 920)	≤ 100.0 (≤ 1450)	≤ 100.0 (≤ 1450)					
API		≥ 8"	B	6 (90)	6 (90)	6 (90)					
			D	10 (150)	10 (150)	10 (150)					
			20000 psig	-	-	≤ 1500 (≤ 20000)					

5) dependent on flange pressure rating  
 6) dependent on process temperature

**Vacuum load**

Liner	Meter size / Nom. dia.	Max. operating pressure in mbar abs. (psia) at a process temperature of ....										
		DN	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)	
PFA	DN 25- 150	1"- 6"	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)		
PTFE	DN 10- 20	¾"- ¾"	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	500 (7.3)	750 (9.7)	1000 (15.0)		
	DN200- 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)		
Tefzel	DN350- 600	14"- 24"	800 (11.2)	1000 (15.0)	1000 (15.0)	1000 (15.0)	1000 (15.0)	1000 (15.0)	1000 (15.0)	1000 (15.0)		
	DN200- 600	8"- 12"	100 (1.5)	100 (1.5)	100 (1.5)	100 (1.5)	100 (1.5)	100 (1.5)	-	-		
Soft rubber	DN200- 300	8"- 12"	500 (7.3)	-	-	-	-	-	-	-		
	DN350-1200	14"- 48"	600 (8.7)	-	-	-	-	-	-	-		
Irathane	DN200-1800	8"- 72"	500 (7.3)	-	-	-	-	-	-	-		
Neoprene	DN200- 300	8"- 12"	400 (5.6)	400 (5.6)	-	-	-	-	-	-		
	DN350-3000	14"-120"	600 (8.7)	600 (8.7)	-	-	-	-	-	-		
FEP	DN200-2000	8"- 80"	on request									

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