



## OPTIFLUX 7300 Quick Start

Electromagnetic flowmeter with non wetted electrodes and ceramic liner

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## Warnings and symbols used



### **DANGER!**

*This information refers to the immediate danger when working with electricity.*



### **DANGER!**

*These warnings must be observed without fail. Even partial disregard of this warning can lead to serious health problems and even death. There is also the risk of seriously damaging the device or parts of the operator's plant.*



### **WARNING!**

*Disregarding this safety warning, even if only in part, poses the risk of serious health problems. There is also the risk of damaging the device or parts of the operator's plant.*



### **CAUTION!**

*Disregarding these instructions can result in damage to the device or to parts of the operator's plant.*



### **INFORMATION!**

*These instructions contain important information for the handling of the device.*



## HANDLING

- This symbol designates all instructions for actions to be carried out by the operator in the specified sequence.

### ➔ **RESULT**

This symbol refers to all important consequences of the previous actions.

## Safety instructions for the operator



### **CAUTION!**

*Installation, assembly, start-up and maintenance may only be performed by appropriately trained personnel. The regional occupational health and safety directives must always be observed.*



### **LEGAL NOTICE!**

*The responsibility as to the suitability and intended use of this device rests solely with the user. The supplier assumes no responsibility in the event of improper use by the customer. Improper installation and operation may lead to loss of warranty. In addition, the "Terms and Conditions of Sale" apply which form the basis of the purchase contract.*



### **INFORMATION!**

- *Further information can be found on the supplied CD-ROM in the manual, on the data sheet, in special manuals, certificates and on the manufacturer's website.*
- *If you need to return the device to the manufacturer or supplier, please fill out the form contained on the CD-ROM and send it with the device. Unfortunately, the manufacturer cannot repair or inspect the device without the completed form.*

## 2.1 Scope of delivery



### INFORMATION!

Inspect the cartons carefully for damage or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.



### INFORMATION!

Check the packing list to check if you received completely all that you ordered.

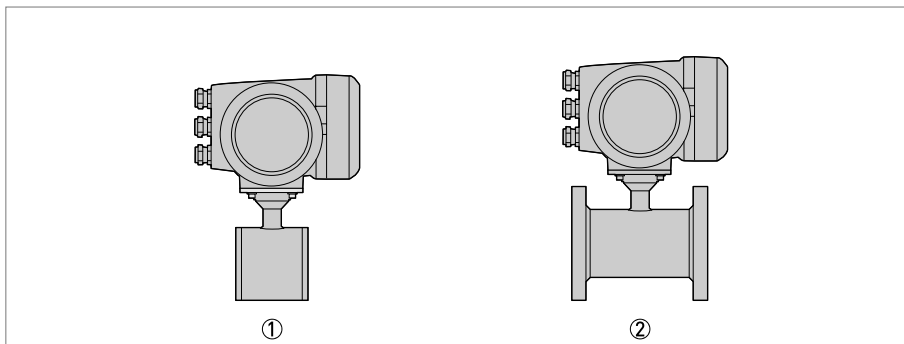


Figure 2-1: Available versions

- ① Sandwich version
- ② Flanged version

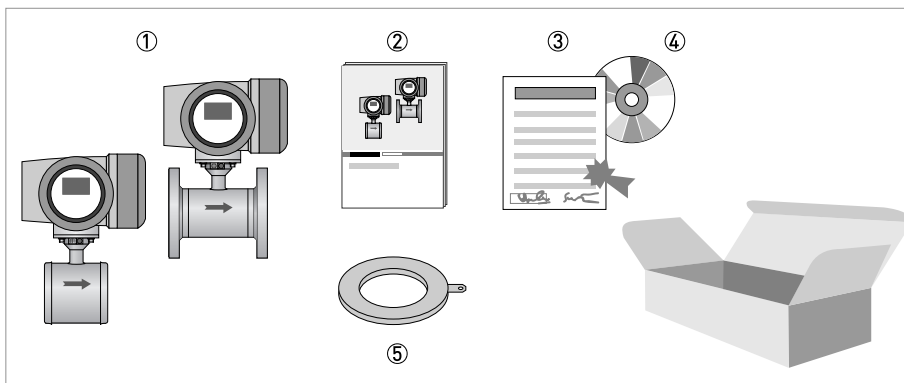


Figure 2-2: Scope of delivery

- ① Ordered flowmeter (sandwich or flanged version)
- ② Product documentation
- ③ Factory calibration report
- ④ CD-ROM with product documentation
- ⑤ Grounding rings (optionally)

## 2.2 Nameplates



### **INFORMATION!**

Look at the device nameplate to ensure that the device is delivered according to your order.  
Check for the correct supply voltage printed on the nameplate.

## 2.3 Storage

- Store the device in a dry and dust-free location.
- Avoid lasting direct exposure to the sun.
- Store the device in its original packing.

## 2.4 Transport

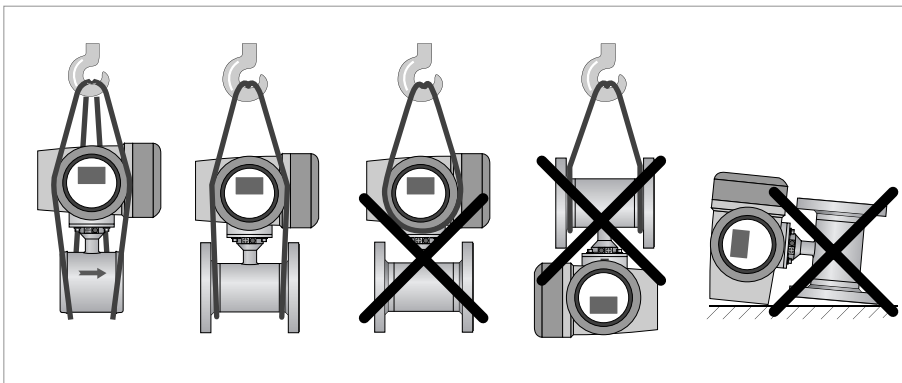


Figure 2-3: Transport

## 2.5 Installation conditions

### 2.5.1 Inlet and outlet

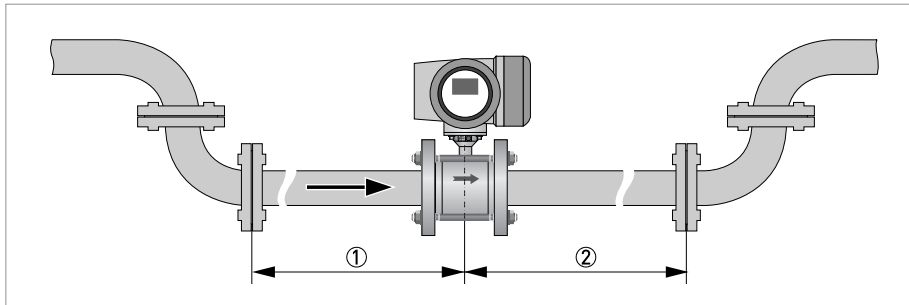


Figure 2-4: Recommended inlet and outlet sections

- ①  $\geq 5$  DN
- ②  $\geq 2$  DN

### 2.5.2 Mounting position

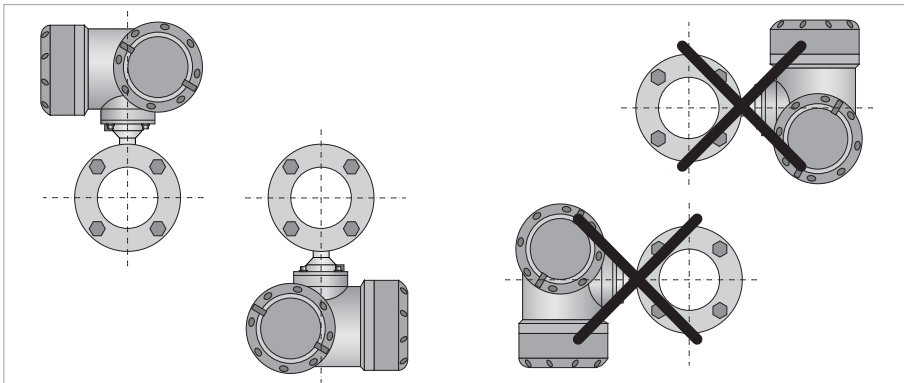


Figure 2-5: Mounting position

### 2.5.3 Flange deviation



**CAUTION!**

Max. permissible deviation of pipe flange faces:

$$L_{max} - L_{min} \leq 0.5 \text{ mm} / 0.02''$$

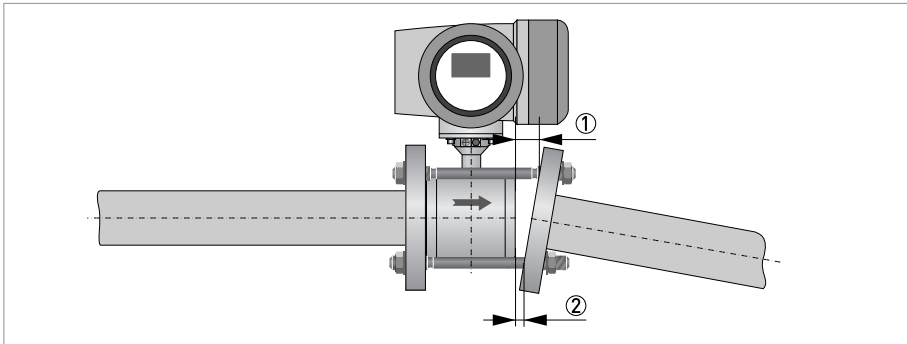


Figure 2-6: Flange deviation

- ①  $L_{max}$
- ②  $L_{min}$

### 2.5.4 T-section

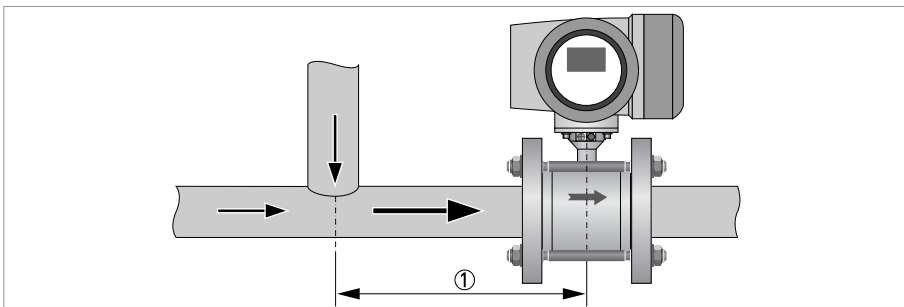


Figure 2-7: Distance after T-sections

- ①  $\geq 10 \text{ DN}$

### 2.5.5 Vibration

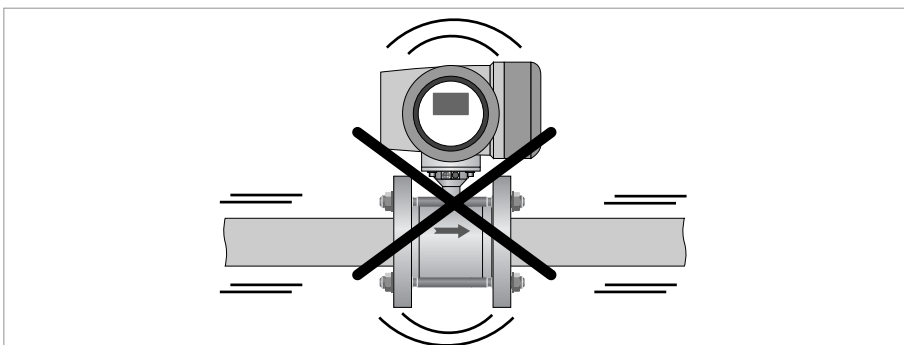


Figure 2-8: Avoid vibrations

2.5.6 Magnetic field

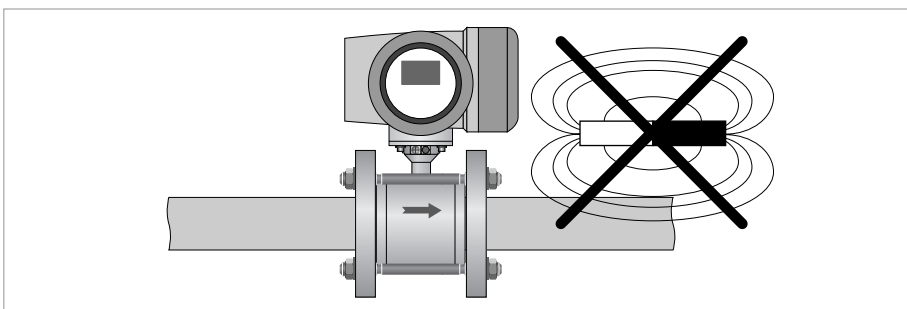


Figure 2-9: Avoid magnetic fields

2.5.7 Bends

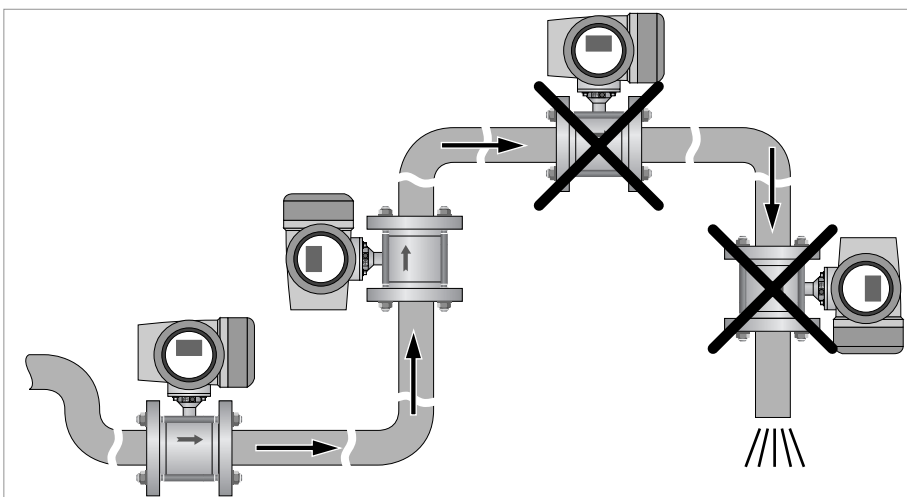


Figure 2-10: Installation in bending pipes

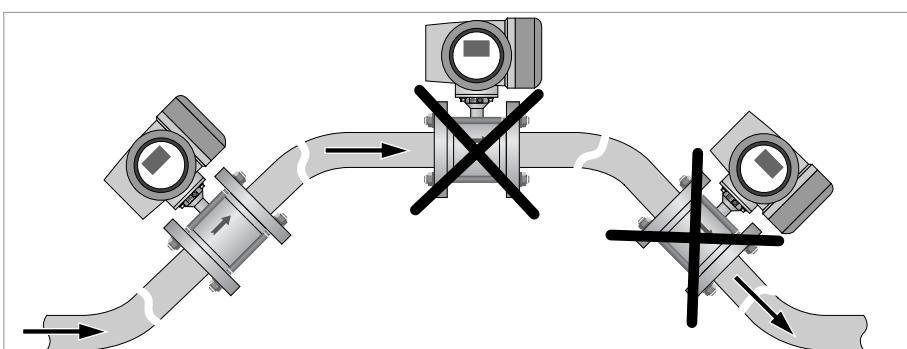


Figure 2-11: Installation in bending pipes



### 2.5.8 Open discharge

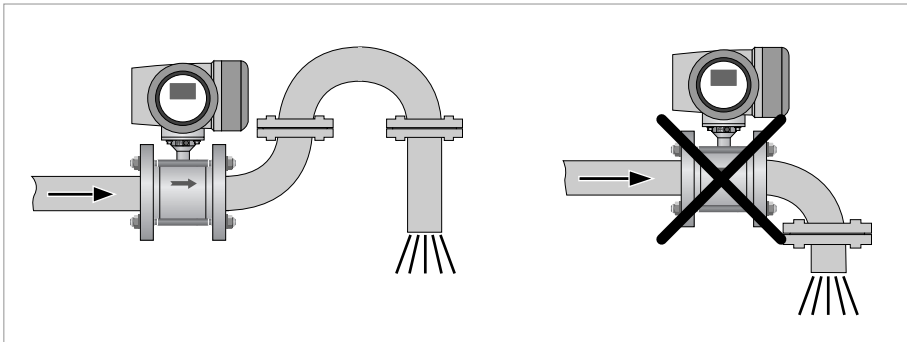


Figure 2-12: Installation before an open discharge

### 2.5.9 Control valve

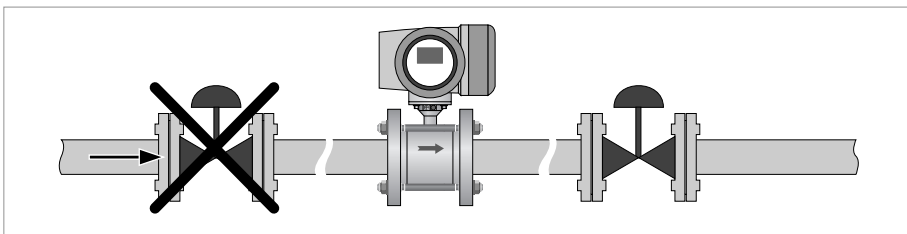


Figure 2-13: Installation before control valve

### 2.5.10 Air venting

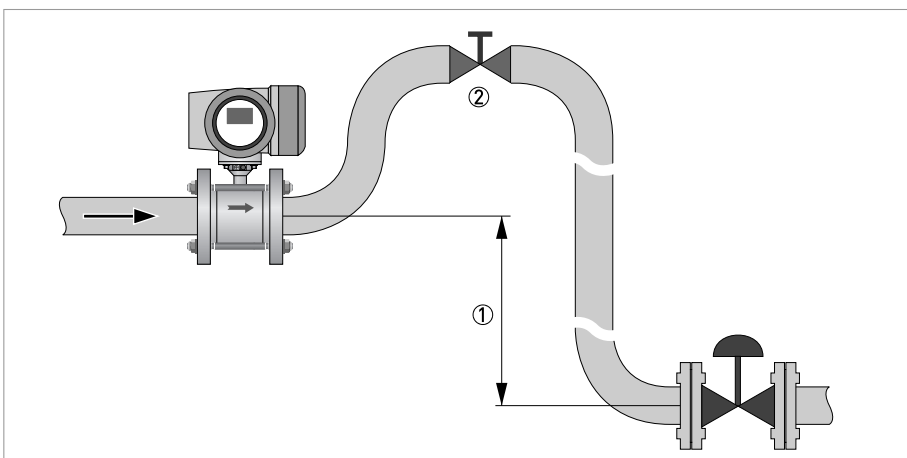


Figure 2-14: Air venting

- ①  $\geq 5$  m
- ② Air ventilation point

2.5.11 Pump

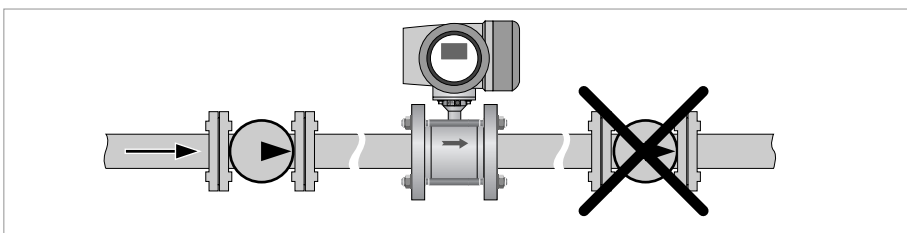


Figure 2-15: Installation after pump

2.5.12 Temperatures

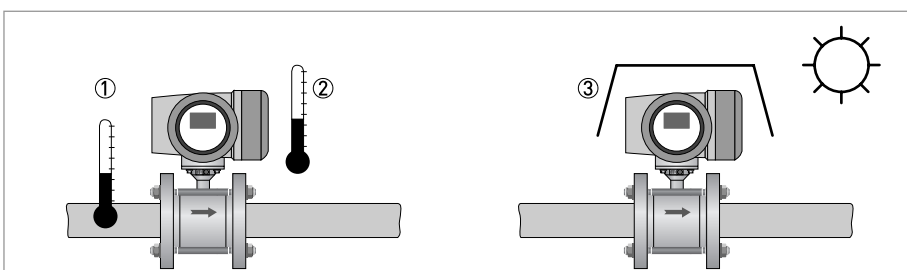


Figure 2-16: Temperatures

- ① Process temperature
- ② Ambient temperature
- ③ Sunshade



**CAUTION!**  
Protect the device from direct sunlight.

Temperature range	Process [°C]		Ambient [°C]		Process [°F]		Ambient [°F]	
	min.	max.	min.	max.	min.	max.	min.	max.
Compact + IFC 300	-40	100	-40	65	-40	212	-40	149

## 2.6 Mounting

### 2.6.1 Torques and pressures sandwich versions



**WARNING!**

- Use stainless steel A2 / 6.9 class bolts.
- Make sure the connecting flanges are of type raised face (RF).

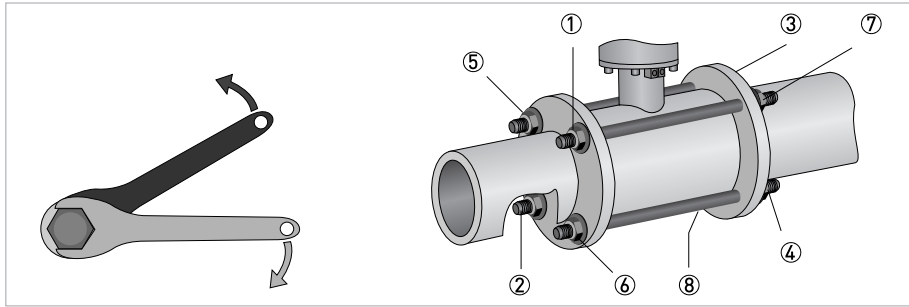


Figure 2-17: Tighten the bolts in fixed order, see picture.

**Max. torque:**

- Step 1: approx. 50% of max. torque
- Step 2: approx. 80% of max. torque
- Step 3: 100% of max. torque given in tables

**EN 1092-1**

Nominal size DN [mm]	Pressure rating	Max. allowable operating pressure [bar]
25...80	PN 40	40
100	PN 16	16
100	PN 25	25

**ASME B 16.5**

Nominal size [inch]	Pressure rating	Max. allowable operating pressure [psig]
1...4"	150 lb	230
1...3"	300 lb	580

## EN 1092-1

Nominal size DN [mm]	Pipe flanges	Max. allowable torque with gaskets made of	
		Gylon® [Nm]	Chemotherm® [Nm]
25	PN 40	22	32
40	PN 40	47	66
50	PN 40	58	82
80	PN 40	48	69
100	PN 16	75	106
100	PN 25	94	133

## ASME B 16.5

Nominal size DN [mm]	Pipe flanges	Max. allowable torque with gaskets made of	
		Gylon® [ftlb]	Chemotherm® [ftlb]
1"	150 lb	18	24
1 1/2"	150 lb	28	40
2"	150 lb	43	61
3"	150 lb	72	102
4"	150 lb	55	80

Nominal size DN [mm]	Pipe flanges	Max. allowable torque with gaskets made of	
		Gylon® [ftlb]	Chemotherm® [ftlb]
1"	300 lb	15	21
1 1/2"	300 lb	32	45
2"	300 lb	45	64
3"	300 lb	43	61
4"	300 lb	63	90

## 2.6.2 Torques and pressures flanged versions

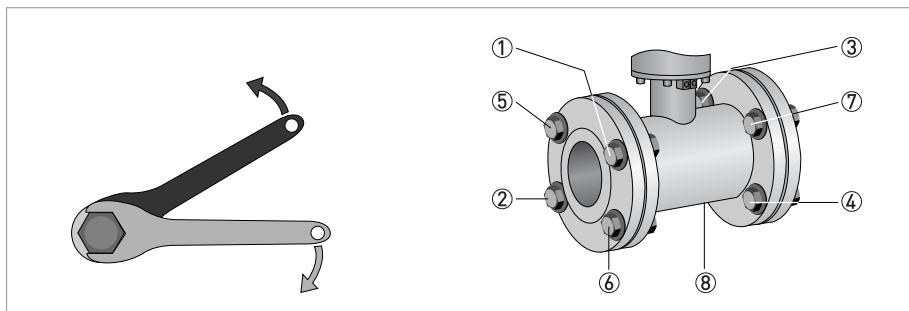


### **WARNING!**

Use stainless steel A2 / 6.9 class bolts.

**Tighten the bolts in fixed order, see picture:**

- Step 1: by hand
- Step 2: approx. 25% of max. torque
- Step 3: approx. 50% of max. torque
- Step 4: approx. 80% of max. torque
- Step 5: 100% of max. torque given in table



### **INFORMATION!**

Diameters DN80 and DN100 have 8 holes per flange, please continue in the same way to tighten the other bolts.



### **CAUTION!**

With the instrument, 4 PTFE sealing rings are included (2 to be used with installation, 2 as spare).

No other gaskets are required.

### EN 1092-1

Nominal size DN [mm]	Pressure rating	Bolts	Max. torque [Nm]
25	PN 40	4 × M 12	73.5
40	PN 40	4 × M 16	178
50	PN 40	4 × M 16	178
80	PN 40	8 × M 16	178
100	PN 16	8 × M 16	178

## ASME B 16.5

Nominal size [inch]	Flange class [lb]	Bolts	Max. torque [ftlb]
1	150	4 × 1/2"	40
1 1/2	150	4 × 1/2"	40
2	150	4 × 5/8"	96.84
3	150	4 × 5/8"	96.84
4	150	8 × 5/8"	96.84

Nominal size [inch]	Flange class [lb]	Bolts	Max. torque [ftlb]
1	300	4 × 3/4"	188.8
1 1/2	300	4 × 3/4"	188.8
2	300	8 × 5/8"	96.84
3	300	8 × 3/4"	188.8

### 3.1 Safety instructions



**DANGER!**

All work on the electrical connections may only be carried out with the power disconnected. Take note of the voltage data on the nameplate!



**DANGER!**

Observe the national regulations for electrical installations!



**DANGER!**

For devices used in hazardous areas, additional safety notes apply; please refer to the Ex documentation.



**WARNING!**

Observe without fail the local occupational health and safety regulations. Any work done on the electrical components of the measuring device may only be carried out by properly trained specialists.



**INFORMATION!**

Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct supply voltage printed on the nameplate.

### 3.2 Grounding



**DANGER!**

The device must be grounded in accordance with regulations in order to protect personnel against electric shocks.

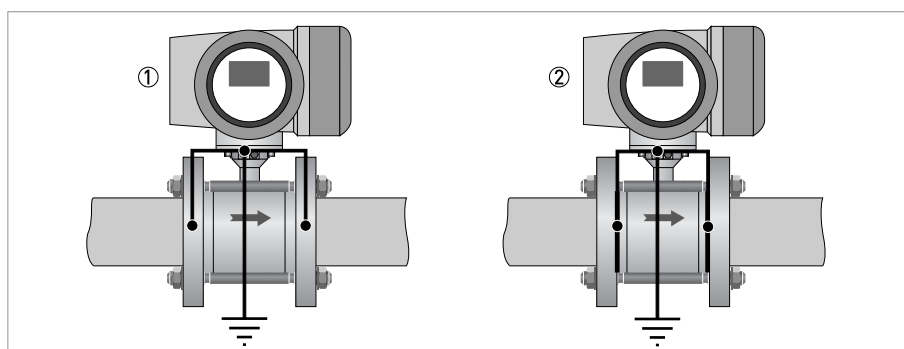


Figure 3-1: Grounding

- ① Metal pipelines, not internally coated. Grounding without grounding rings.
- ② Metal pipelines with internal coating and non-conductive pipelines. Grounding with grounding rings.



Figure 3-2: Grounding ring number 1

**Grounding ring number 1 (for type VN19):**

- 3 mm / 0.1" thick (tantalum: 0.5 mm / 0.1")

### 3.3 Connection diagrams



**INFORMATION!**

*For the connection diagrams please refer to the documentation of the applicable converter.*



## 4.1 Measuring principle

An electrically conductive fluid flows inside an electrically insulated pipe through a magnetic field. This magnetic field is generated by a current, flowing through a pair of field coils. Inside of the fluid, a voltage  $U$  is generated:

$$U = v * k * B * D$$

in which:

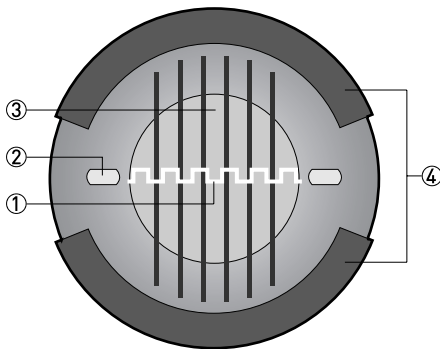
$v$  = mean flow velocity

$k$  = factor correcting for geometry

$B$  = magnetic field strength

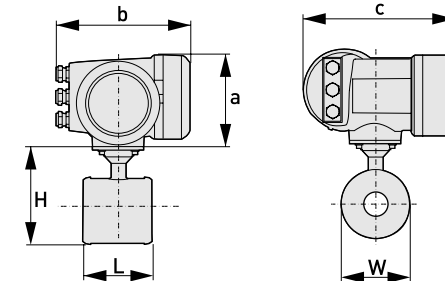
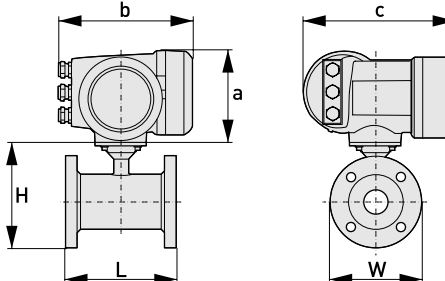
$D$  = inner diameter of flow meter

The signal voltage  $U$  is picked off by electrodes and is proportional to the mean flow velocity  $v$  and thus the flow rate  $q$ . A signal converter is used to amplify the signal voltage, filter it and convert it into signals for totalising, recording and output processing.



- ① Induced voltage (proportional to flow velocity)
- ② Electrodes (capacitive)
- ③ Magnetic field
- ④ Field coils

## 4.2 Dimensions and weights

Sandwich version		<p>a = 155 mm / 6.1"</p> <p>b = 230 mm / 9.1" ①</p> <p>c = 260 mm / 10.2"</p> <p>Total height = H + a</p>
Flanged version		<p>a = 155 mm / 6.1"</p> <p>b = 230 mm / 9.1" ①</p> <p>c = 260 mm / 10.2"</p> <p>Total height = H + a</p>

① The value may vary depending on the used cable glands.

**INFORMATION!**

- All data given in the following tables are based on standard versions of the sensor only.
- Especially for smaller nominal sizes of the sensor, the converter can be bigger than the sensor.
- Note that for other pressure ratings than mentioned, the dimensions may be different.
- For full information on converter dimensions see relevant documentation.

## Sandwich version

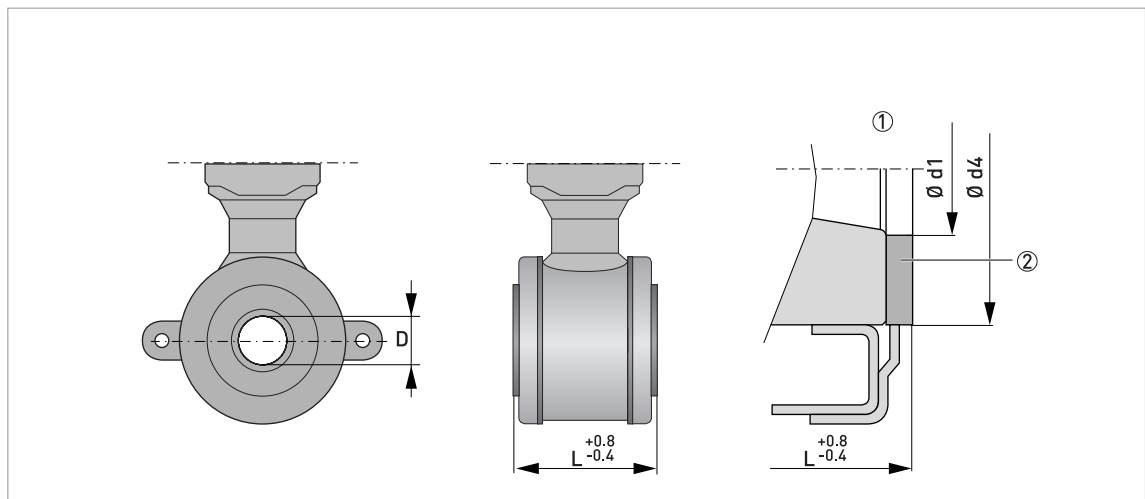


Figure 4-1: Construction details DN25...100

- ① Situation without grounding rings  
 ② Gasket

Nominal size	Dimensions [mm]						Approx. weight [kg]
	DN	L	H	W	D	Ød1	
25	58 ①	116	68	20	26	46	1.6
40	83 ①	131	83	30	39	62	2.4
50	103 ①	149	101	40	51	74	2.9
80	153 ①	181	133	60	80	106	6.4
100	203 ①	206	158	80	101	133	8.8

① Total fitting length of flowmeter without rings: dimension L only.

**INFORMATION!**

The table below is valid for 150 and 300 lb.

Nominal size	Dimensions [inches]						Approx. weight [lb]
	ASME	L	H	W	D	Ød1	
1"	2.28 ①	4.57	2.68	0.79	1.02	1.81	3.53
1½"	3.27 ①	5.16	3.27	1.18	1.54	2.44	5.29
2"	4.06 ①	5.87	3.98	1.57	2.01	2.91	6.39
3"	6.02 ①	7.13	5.24	2.36	3.15	4.17	14.11
4"	7.99 ①	8.11	6.22	3.15	3.98	5.24	19.40

① Total fitting length of flowmeter without rings: dimension L only.

Flanged version

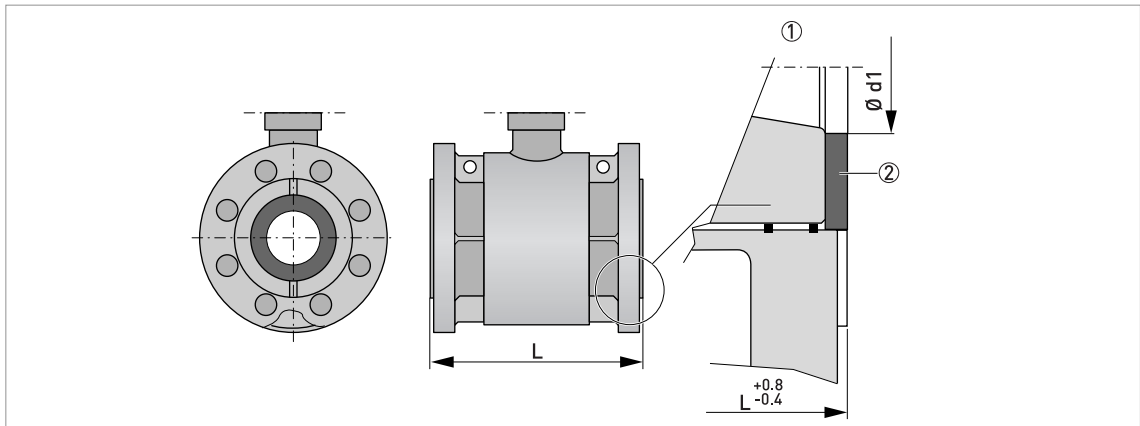


Figure 4-2: Construction details DN25...100

- ① Detail ceramics / flange / gaskets
- ② PTFE sealing ring

EN 1092-1

Nominal size	Dimensions [mm]					Approx. weight [kg]
	DN	L	H	W	D	
25	150	143	115	20	26	4
40	150	168	150	30	39	6
50	200	184	165	40	51	9
80	200	217	200	60	80	15
100	250	242	220	80	101	21

**ASME B 16.5 150 lb**

Nominal size	Dimensions [inches]					Approx. weight [lb]
	inch	L	H	W	D	
1"	5.91	5.47	4.25	0.79	1.02	8.8
1½"	5.91	6.18	5	1.18	1.54	13.2
2"	7.87	6.89	6	1.57	2.01	19.8
3"	7.87	8.39	7.5	2.36	3.15	33.1
4"	9.84	9.65	9	3.15	3.98	46.3

**ASME B 16.5 300 lb**

Nominal size	Dimensions [inches]					Approx. weight [lb]
	inch	L	H	W	D	
1"	5.91	5.91	4.92	0.79	1.02	8.8
2"	7.87	7.20	6.50	1.57	2.01	22.9
3"	7.87	8.86	8.27	2.36	3.15	40.6







### KROHNE product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature meters
- Pressure meters
- Analysis products
- Measuring systems for the oil and gas industry
- Measuring systems for sea-going tankers

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**KROHNE**