OPTIFLUX 6000 Handbook

Electromagnetic flow sensor
for hygienic and sanitary applications

The documentation is only complete when used in combination with the relevant documentation for the signal converter.

KROHNE

IMPRINT

1.1 Intended Use

CAUTION!
Responsibility for the use of the measuring devices with regard to suitability, intended use and corrosion resistance of the used materials against the measured fluid lies solely with the operator.

INFORMATION!
The manufacturer is not liable for any damage resulting from improper use or use for other than the intended purpose.

1.2 Certification

CE marking

The manufacturer certifies successful testing of the product by applying the CE marking.

This device fulfils the statutory requirements of the relevant EU directives.

For full information of the EU directives and standards and the approved certifications, please refer to the CE declaration or the website of the manufacturer.

1.3 Safety instructions from the manufacturer

1.3.1 Copyright and data protection

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1.3.2 Disclaimer

The manufacturer will not be liable for any damage of any kind by using its product, including, but not limited to direct, indirect or incidental and consequential damages.

This disclaimer does not apply in case the manufacturer has acted on purpose or with gross negligence. In the event any applicable law does not allow such limitations on implied warranties or the exclusion of limitation of certain damages, you may, if such law applies to you, not be subject to some or all of the above disclaimer, exclusions or limitations.

Any product purchased from the manufacturer is warranted in accordance with the relevant product documentation and our Terms and Conditions of Sale.

The manufacturer reserves the right to alter the content of its documents, including this disclaimer in any way, at any time, for any reason, without prior notification, and will not be liable in any way for possible consequences of such changes.

1.3.3 Product liability and warranty

The operator shall bear responsibility for the suitability of the device for the specific purpose. The manufacturer accepts no liability for the consequences of misuse by the operator. Improper installation or operation of the devices (systems) will cause the warranty to be void. The respective "Standard Terms and Conditions" which form the basis for the sales contract shall also apply.

1.3.4 Information concerning the documentation

To prevent any injury to the user or damage to the device it is essential that you read the information in this document and observe applicable national standards, safety requirements and accident prevention regulations.

If this document is not in your native language and if you have any problems understanding the text, we advise you to contact your local office for assistance. The manufacturer can not accept responsibility for any damage or injury caused by misunderstanding of the information in this document.

This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device. Special considerations and precautions are also described in the document, which appear in the form of icons as shown below.

1.3.5 Warnings and symbols used

Safety warnings are indicated by the following symbols.

DANGER!
This warning refers to the immediate danger when working with electricity.

DANGER!
This warning refers to the immediate danger of burns caused by heat or hot surfaces.

DANGER!
This warning refers to the immediate danger when using this device in a hazardous atmosphere.

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.

LEGAL NOTICE!
This note contains information on statutory directives and standards.

- 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.

1.4 Safety instructions for the operator

WARNING!
In general, devices from the manufacturer may only be installed, commissioned, operated and maintained by properly trained and authorized personnel.
This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device.

2.1 Scope of delivery

INFORMATION!
Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.

INFORMATION!
Do a check of the packing list to make sure that you have all the elements given in the order.

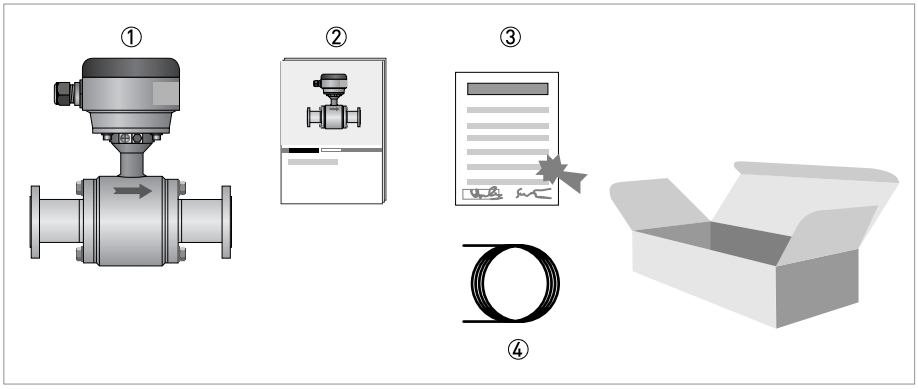


Figure 2-1: Scope of delivery

① Ordered flowmeter
② Product documentation
③ Factory calibration report
④ Signal cable (remote version only)

2.2 Device description

Your measuring device is supplied ready for operation. The factory settings for the operating data have been made in accordance with your order specifications.

INFORMATION!
Product specific information and extensive product specification is available using PICK, the Product Information Center KROHNE web-tool.
PICK can be found via the service menu button on the KROHNE.com website.

PICK up your information

The following versions are available:

- Compact version (the signal converter is installed directly on the measuring sensor)
- Remote version (electrical connection to the signal converter via field current and signal cable)

INFORMATION!
This flow sensor can be used as a remote version or as a compact version. All versions are covered by this document, although you will see the remote version in most pictures.

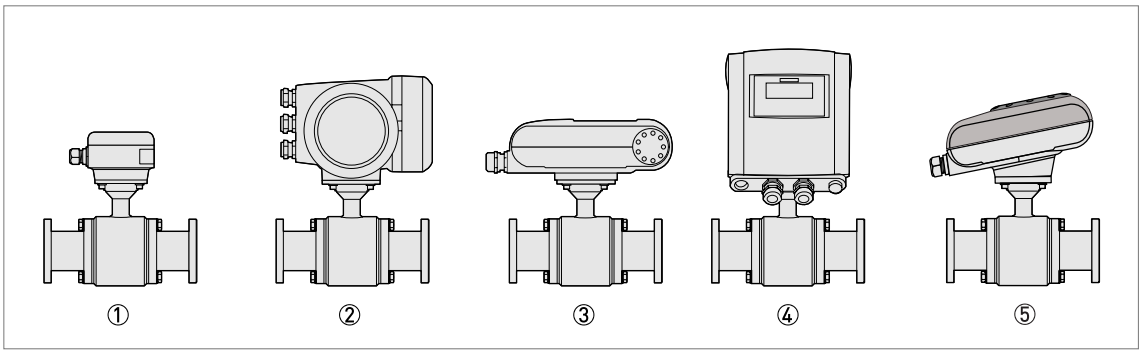
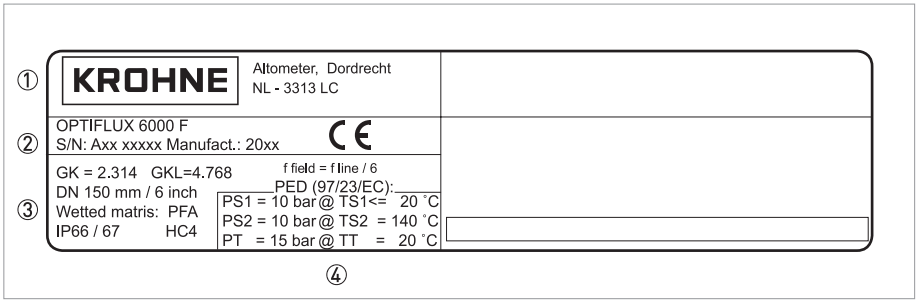


Figure 2-2: Available versions

① Remote version
② Compact version with IFC 300 signal converter
③ Compact version with IFC 100 (0°) signal converter
④ Compact version with IFC 100 (45°) signal converter
⑤ Compact version with IFC 050 (10°) signal converter

2.3 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.



① Name and address of the manufacturer
② Type designation of the flowmeter and CE sign with number(s) of notified body / bodies
③ Calibration data
④ PED data

3.1 General notes on installation

INFORMATION!
Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.

INFORMATION!
Do a check of the packing list to make sure that you have all the elements given in the order.

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 Storage

- Store the device in a dry and dust-free location.
- Avoid lasting direct exposure to the sun.
- Store the device in its original packaging.
- Storage temperature: -50...+70°C / -58...+158°F

3.3 Transport

Signal converter

- No special requirements.

Compact version

- Do not lift the device by the signal converter housing.
- Do not use lifting chains.
- To transport flange devices, use lifting straps. Wrap these around both process connections.

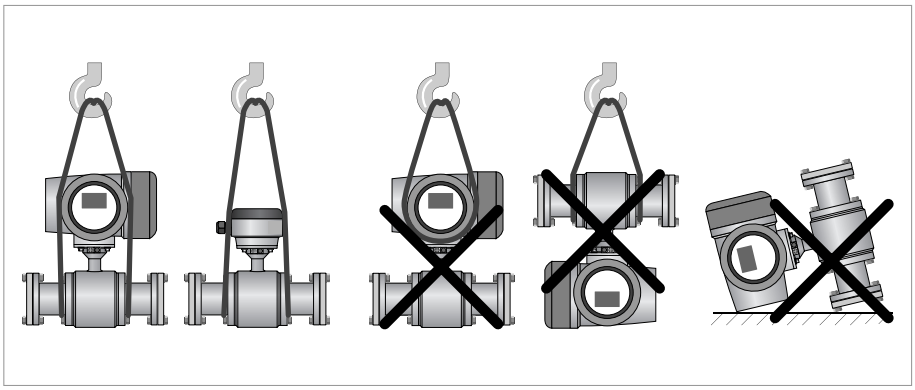


Figure 3-1: Transport

3.4 Pre-installation requirements

Make sure that you have all necessary tools available:

- Allen key (4 mm)
- Small screwdriver
- Wrench for cable glands
- Wrench for wall mounting bracket (remote version only)
- Torque wrench for installing flowmeter in pipeline

3.5 General requirements

INFORMATION!
The following precautions must be taken to ensure reliable installation.

- *Make sure that there is adequate space to the sides.*
- *Protect the signal converter from direct sunlight and install a sun shade if necessary.*
- *Signal converters installed in control cabinets require adequate cooling, e.g. by fan or heat exchanger.*
- *Do not expose the signal converter to intense vibration. The flowmeters are tested for a vibration level in accordance with IEC 68-2-64.*

3.5.1 Vibration

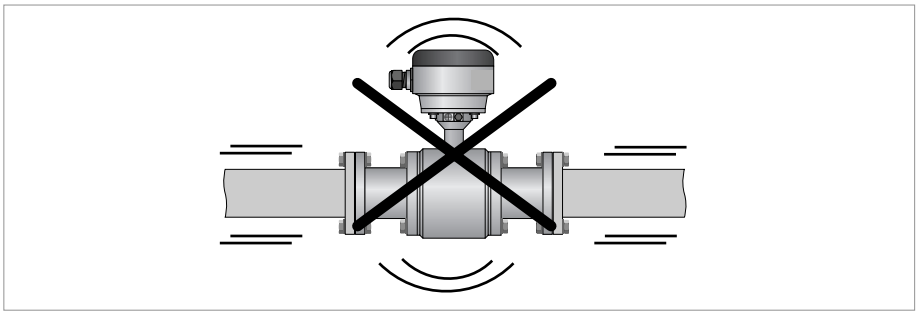


Figure 3-2: Avoid vibrations

3.5.2 Magnetic field

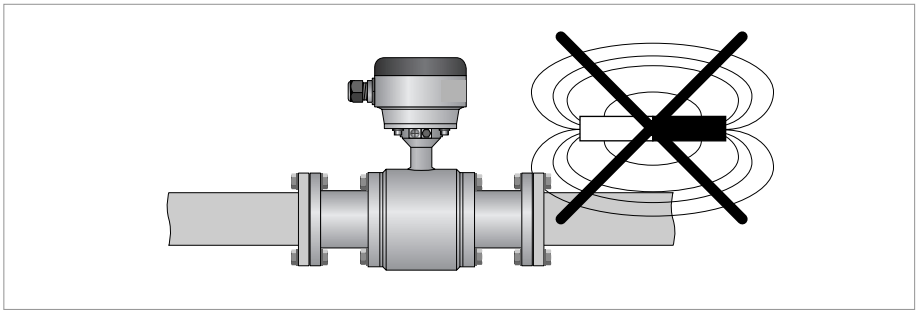


Figure 3-3: Avoid magnetic fields

3.6 Installation conditions

3.6.1 Inlet and outlet

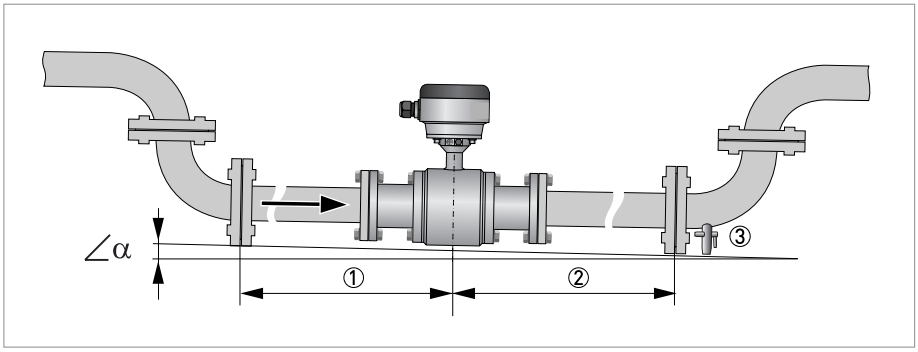


Figure 3-4: Recommended inlet and outlet

① Refer to chapter "Bends in 2 or 3 dimensions"
② ≥ 2 DN
③ Drain valve (to empty pipeline)
∠α ; >2°

3.6.2 Bends in 2 or 3 dimensions

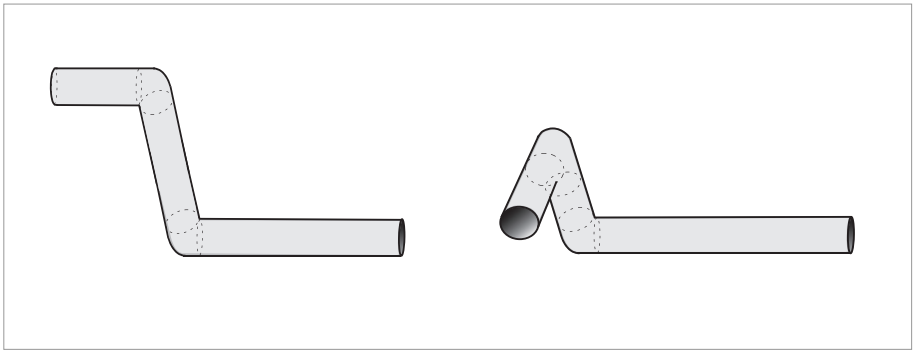


Figure 3-5: Inlet when using 2 and/or 3 dimensional bends in front of the flowmeter

Inlet length: using bends in 2 dimensions: ≥ 5 DN; when having bends in 3 dimensions: ≥ 10 DN

3.6.3 T-section

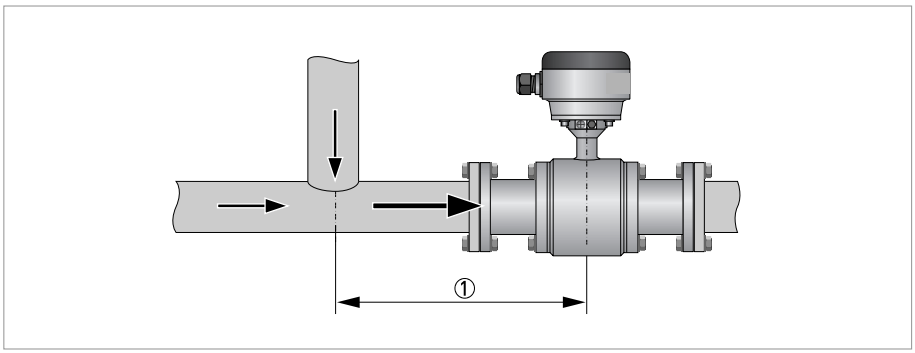


Figure 3-6: Distance behind a T-section

① ≥ 10 DN

3.6.4 Bends

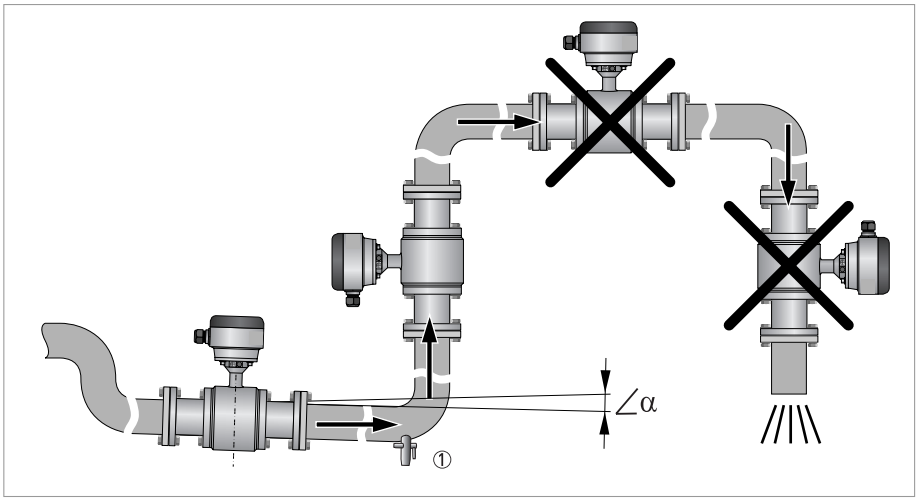


Figure 3-7: Installation in bending pipes

∠α ; >2°

① Drain valve (to empty pipeline)

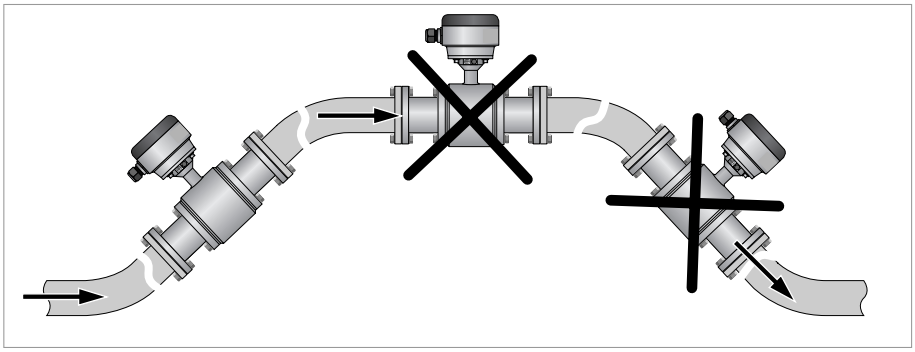


Figure 3-8: Installation in bending pipes

3.6.5 Open discharge

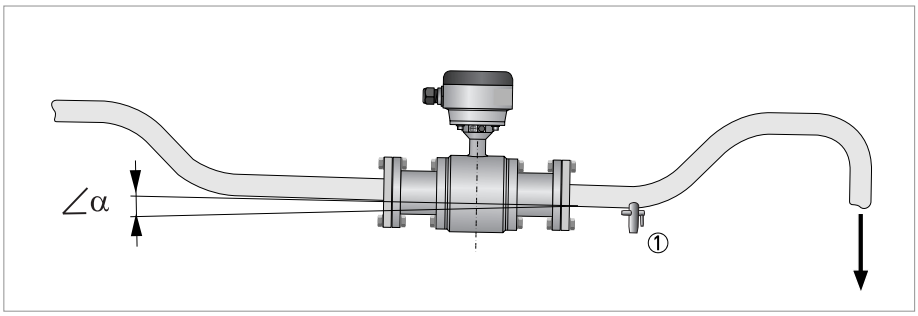


Figure 3-9: Installation in front of an open discharge

∠α ; >2°
① Drain valve (to empty pipeline)

3.6.6 Control valve

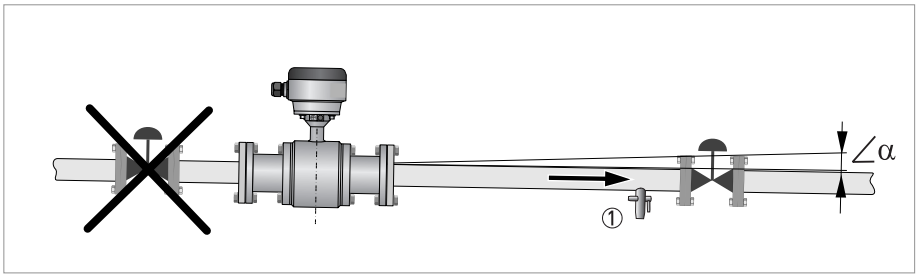


Figure 3-10: Installation in front of a control valve

∠α ; >2°
① Drain valve (to empty pipeline)

3.6.7 Pump

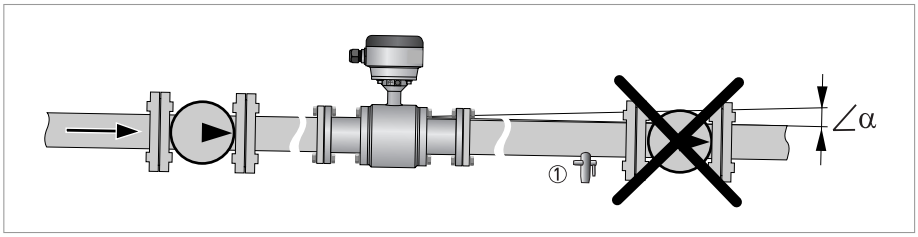


Figure 3-11: Installation behind a pump

3.6.8 Air venting and vacuum forces

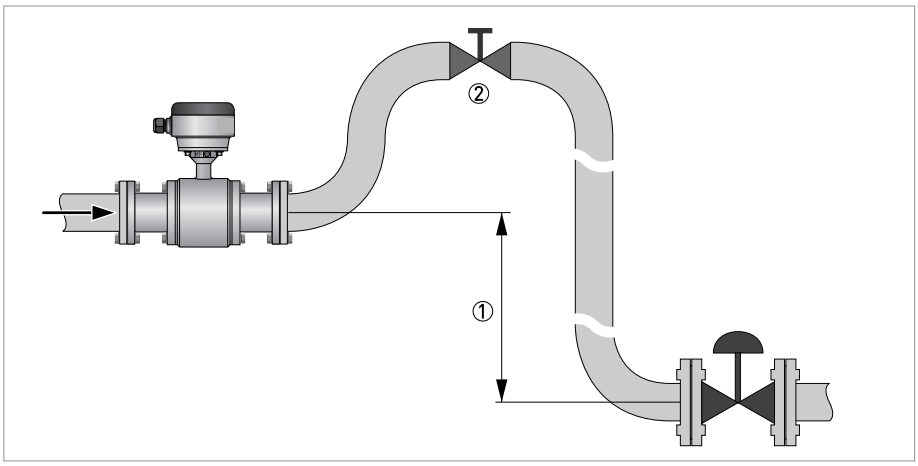


Figure 3-12: Air venting

① ≥ 5 m
② Air ventilation point

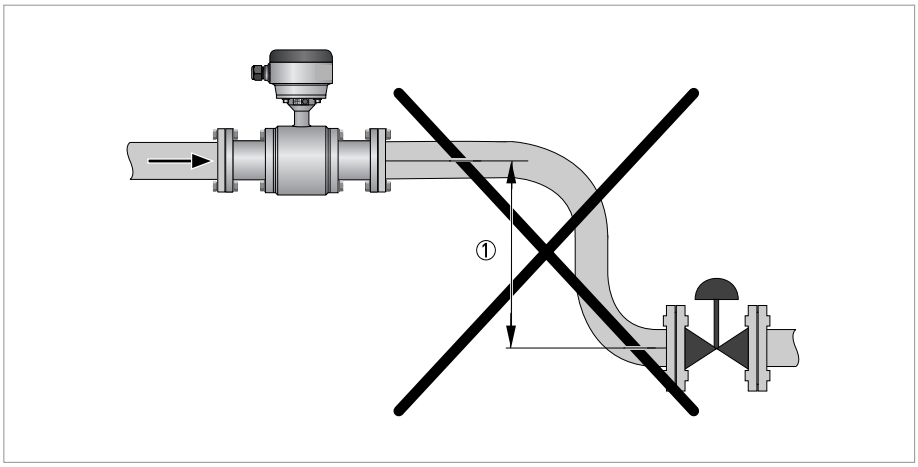


Figure 3-13: Vacuum

① ≥ 5 m

3.6.9 Mounting requirements for self-draining

INFORMATION!
Applicable for 3A marked installations: install flow sensor in vertical pipelines or in pipelines with a minimum slope as indicated!

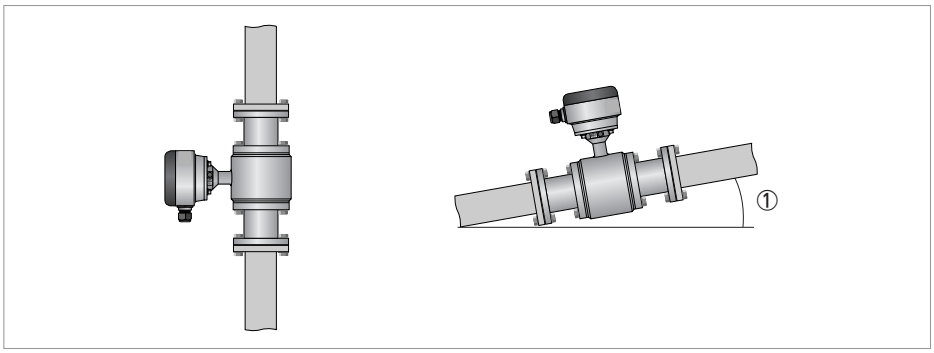


Figure 3-14: Installation note for 3A marked installations

① Minimum slope

Minimum slope

Nominal diameter	DIN 11850	ISO 2037	DIN 11864 2A	ISO 2852	DIN 32676	Tri Clamp
2.5...6	10°	10°	-	-	-	-
10	3°	3°	-	-	-	-
15	10°	10°	-	①	-	-
25	10°	3°	10°	3°	10°	3°
40...50	5°	3°	5°	3°	5°	3°
65...80	10°	3°	10°	3°	10°	3°
100	5°	3°	5°	3°	5°	3°
125...150	10°	3°	10°	3°	①	①

① on request

3.6.10 Flange deviation

CAUTION!
Max. permissible deviation of pipe flange faces:
$L_{max} - L_{min} \leq 0.5$ *mm / 0.02"*

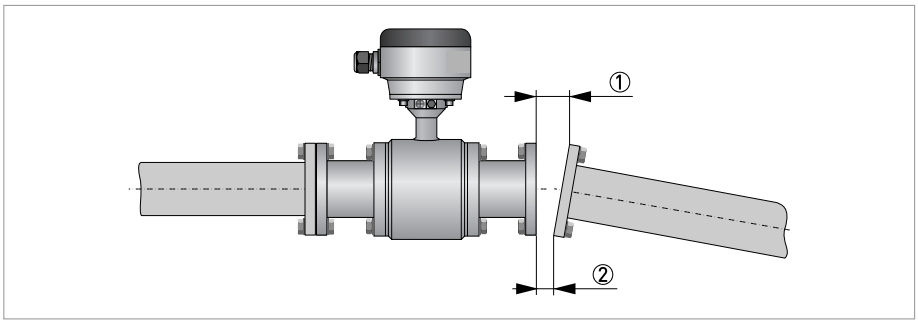


Figure 3-15: Flange deviation

① L_{max}
② L_{min}

3.6.11 Mounting position

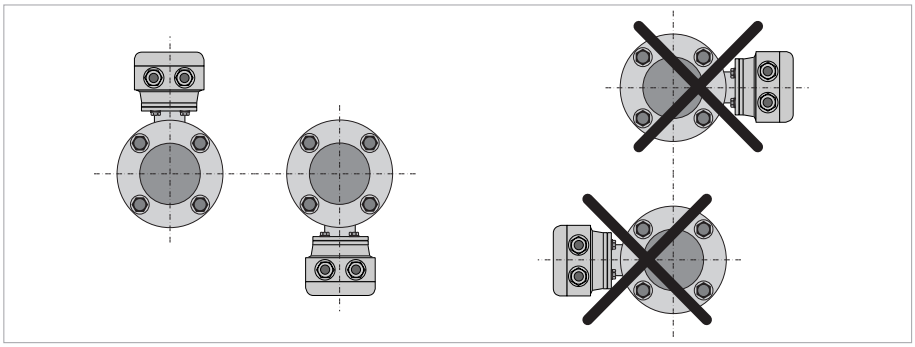


Figure 3-16: Mounting position

- Install flow sensor in line with the pipe axis.
- Pipe flange faces must be parallel to each other.

3.7 Mounting

3.7.1 Torques and pressures

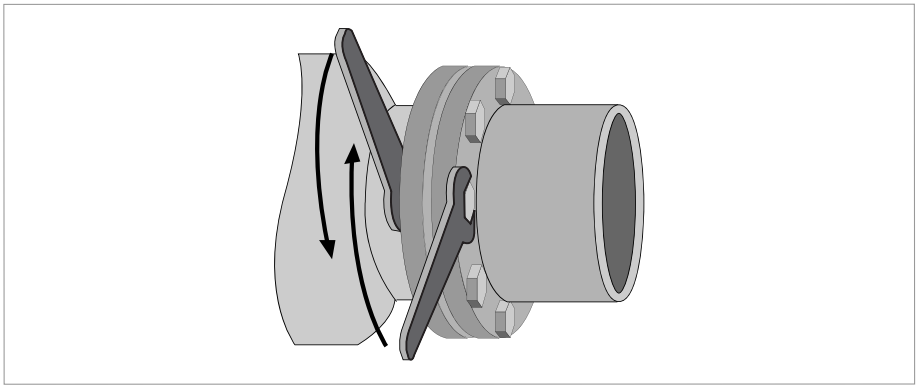


Figure 3-17: Tightening of bolts

CAUTION!
The max. allowable torque depends on the gasket material, see datasheet for detailed information.
Bolts to be used from material SS, class 70-A2.

Tightening of bolts

- Always tighten the bolts uniformly and in diagonally opposite sequence.
- Do not exceed the maximum torque value.
- Step 1: Apply approx. 50% of max. torque given in table.
- Step 2: Apply approx. 80% of max. torque given in table.
- Step 3: Apply 100% of max. torque given in table.

Maximum torque for 11864-2A flange version

Nominal diameter [mm]	Pressure rating	Bolts	Max. torque [Nm]
25	PN 40	4x M6	7
40	PN 40	4x M8	16
50	PN 25	4x M8	16
80	PN 25	6x M8	16
100	PN 25	6x M8	16
125	PN 10	6x M10	32
150	PN 10	6x M10	32

Type of connection	Size of connection		Max. operating pressure	
	mm	inch	bar	psig
Aseptic weld on for pipes to DIN 11850	DN10...40	-	40	580
	DN50...80	-	25	360
	DN100	-	16	230
	DN125...150	-	10	145
Aseptic weld on for pipes to ISO 2037	12...38	-	40	580
	51...76.1	-	25	360
	101.6	-	16	230
	114.3...139.7	-	10	145
Dairy screw to DIN 11851 ①	DN10...40	-	40	580
	DN50...80	-	25	360
	DN100	-	16	230
	DN125...150	-	10	145
Screwed to SMS 1145 ①	2.5...100	-	6	90
Flanges to DIN 11864-2A	DN25...40	-	40	580
	DN50...80	-	25	360
	DN100	-	16	230
	DN125...150	-	10	145
Clamp joint to ISO 2852	12...51	-	16	230
	63.5...76.1	-	10	145
	100	-	8	115
	114.3...139.7	-	5	72
Clamp joint to DIN 32676	DN25...50	-	16	230
	DN65...150	-	10	145
Clamp joint to Tri Clamp	-	1/2...3	20.5	295
	-	4	13.8	200
	-	5...6	②	②
Vacuum load	all versions and sizes		0 mbar abs.	0 psia

① Without 3A mark
② on request

3.7.2 Installation of weld-on versions

For mounting sensors with weld-on connections, please follow the procedure as follows:

- Mount the sensor completely in the pipeline and spot the weld-on connections to the pipe. This is necessary to align the mounting bores of the flange.
- Remove the sensor body and the gaskets from the adapters by loosen the screws.
- Weld the adapters completely to the pipe.
- When the pipe is cold again, reinstall the gasket and mount the sensor.

3.7.3 Temperatures

CAUTION!
Protect the device from direct sunlight.

Ambient temperature

	°C		°F	
	min.	max.	min.	max.
Separate flow sensor Compact version with; IFC 050 , IFC100 & IFC 300	-40	65	-40	149

Maximum process temperature

Type of connection	Separate flow sensor		Compact + IFC 050 & IFC100		Compact + IFC 300	
	°C	°F	°C	°F	°C	°F
Aseptic weld on for pipes to DIN 11850	140	284	120 ①	248 ②	140	284
Aseptic weld on for pipes to ISO 2037	140	284	120 ①	248 ②	140	284
Dairy screw to DIN 11851 ③	140	284	120 ①	248 ②	140	284
Screwed to SMS 1145 ③	140	284	120 ①	248 ②	140	284
Flanges to DIN 11864-2A	140	284	120 ①	248 ②	140	284
Clamp joint to ISO 2852	120	248	120	248	120	248
Clamp joint to DIN 32676	140	284	120 ①	248 ②	140	284
Clamp joint to Tri Clamp	120	248	120	248	120	248

① 140°C if ambient temperature ≤ 40°C
② 284°F if ambient temperature ≤ 104°F
③ Without 3A mark

4.1 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.

4.2 Grounding

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

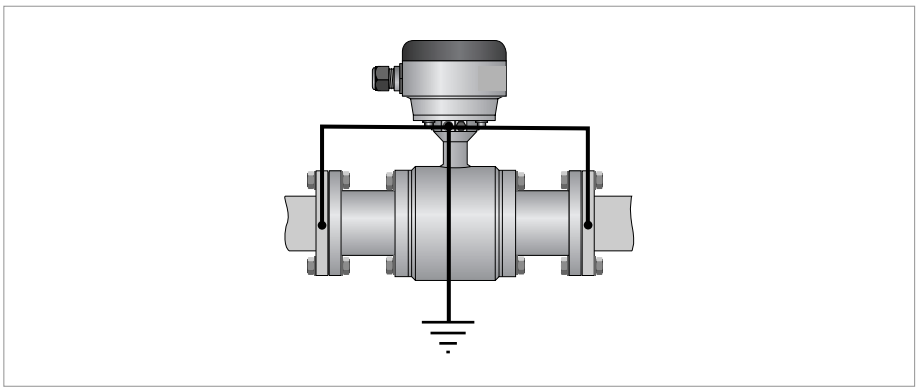


Figure 4-1: Grounding

4.3 Virtual reference for IFC 300 (C, W and F version)

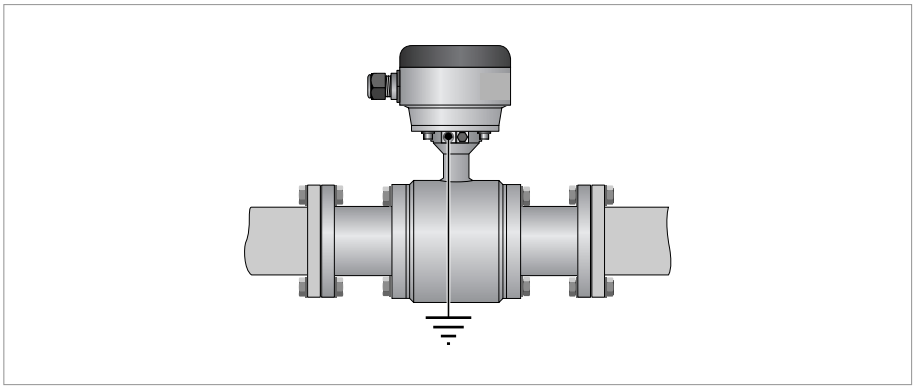


Figure 4-2: Virtual reference

Minimum requirements:

- Size: ≥ DN10
- Electrical conductivity: ≥ 200 µS/cm
- Electrode cable: max. 50 m / 164 ft, type DS

4.4 Connection diagrams

INFORMATION!
For the connection diagrams please refer to the documentation of the applicable signal converter.

5.1 Cleaning

CAUTION!
In principle, no special maintenance is needed. However, make sure that the used cleaning product doesn't affect the outer surface and the gaskets.

5.2 Spare parts availability

The manufacturer adheres to the basic principle that functionally adequate spare parts for each device or each important accessory part will be kept available for a period of 3 years after delivery of the last production run for the device.

This regulation only applies to spare parts which are subject to wear and tear under normal operating conditions.

5.3 Availability of services

The manufacturer offers a range of services to support the customer after expiration of the warranty. These include repair, maintenance, technical support and training.

INFORMATION!
For more precise information, please contact your local sales office.

5.4 Returning the device to the manufacturer

5.4.1 General information

This device has been carefully manufactured and tested. If installed and operated in accordance with these operating instructions, it will rarely present any problems.

CAUTION!
Should you nevertheless need to return a device for inspection or repair, please pay strict attention to the following points:

- *Due to statutory regulations on environmental protection and safeguarding the health and safety of the personnel, the manufacturer may only handle, test and repair returned devices that have been in contact with products without risk to personnel and environment.*
- *This means that the manufacturer can only service this device if it is accompanied by the following certificate (see next section) confirming that the device is safe to handle.*

CAUTION!
If the device has been operated with toxic, caustic, flammable or water-endangering products, you are kindly requested:

- *to check and ensure, if necessary by rinsing or neutralising, that all cavities are free from such dangerous substances,*
- *to enclose a certificate with the device confirming that is safe to handle and stating the product used.*

5.4.2 Form (for copying) to accompany a returned device

CAUTION!
To avoid any risk for our service personnel, this form has to be accessible from outside of the packaging with the returned device.

Company:		Address:
Department:		Name:
Tel. no.:		Fax no. and/or Email address:
Manufacturer's order no. or serial no.:		
The device has been operated with the following medium:		
This medium is:		radioactive
		water-hazardous
		toxic
		caustic
		flammable
		We checked that all cavities in the device are free from such substances.
		We have flushed out and neutralized all cavities in the device.
We hereby confirm that there is no risk to persons or the environment through any residual media contained in the device when it is returned.		
Date:		Signature:
Stamp:		

5.5 Disposal

CAUTION!
Disposal must be carried out in accordance with legislation applicable in your country.

Separate collection of WEEE (Waste Electrical and Electronic Equipment) in the European Union:

According to the directive 2012/19/EU, the monitoring and control instruments marked with the WEEE symbol and reaching their end-of-life **must not be disposed of with other waste**.
The user must dispose of the WEEE to a designated collection point for the recycling of WEEE or send them back to our local organisation or authorised representative.

6.1 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 flowmeter

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 totalizing, recording and output processing.

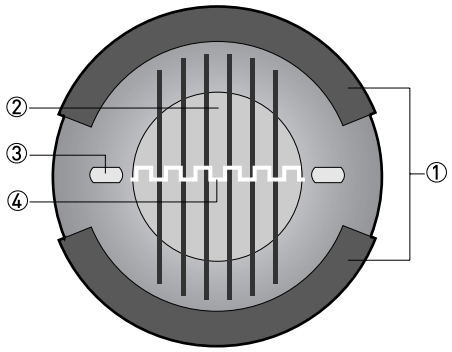


Figure 6-1: Measuring principle

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

6.2 Technical data

INFORMATION!

- *The following data is provided for general applications. If you require data that is more relevant to your specific application, please contact us or your local sales office.*
- *Additional information (certificates, special tools, software,...) and complete product documentation can be downloaded free of charge from the website (Downloadcenter).*

Measuring system

Measuring principle	Faraday's law of induction
Application range	Electrically conductive fluids
Measured value	
Primary measured value	Flow velocity
Secondary measured value	Volume flow

Design

Features	Hygienic design
	Stainless steel housing
	Food & beverage and pharmaceutical process connections
Modular construction	The measurement system consists of a flow sensor and a signal converter. It is available as compact and as separate version.
Compact version	With IFC 050 signal converter: OPTIFLUX 6050 C
	With IFC 100 signal converter: OPTIFLUX 6100 C
	With IFC 300 signal converter: OPTIFLUX 6300 C
Remote version	In wall (W) mount version with IFC 050 signal converter: OPTIFLUX 6050 W
	In wall (W) mount version with IFC 100signal converter: OPTIFLUX 6100 W
	In field (F), wall (W) or rack (R) mount version with IFC 300 signal converter: OPTIFLUX 6300 F, W or R
Nominal diameter	DN2.5...150 / 1/10"...6"
Measuring range	-12...+12 m/s / -40...+40 ft/s

Measuring accuracy

Reference conditions	Flow conditions similar to EN 29104
	Medium: Water
	Temperature: +10...+30°C / +50...+86°F
	Operating pressure: 1 bar / 14.5 psig
	Inlet section: ≥ 5 DN
	Electrical conductivity: ≥ 300 µS/cm
	Wet calibrated on EN 17025 accredited calibration rig by direct volume comparison.
Accuracy curves	Related to volume flow (MV = Measured Value)
	These values are related to the pulse / frequency output.
	The additional typical measuring deviation for the current output is ±10 µA.
	For detailed information refer to *Measuring accuracy* on page 46.
Repeatability	±0.1% of MV, minimum 1 mm/s
Long term stability	±0.1% of MV

Special calibration	On request

Operating conditions

Temperature	
Process temperature	Separate flow sensor: -40...+140°C / -40...+284°F
	Compact with IFC 300 converter: -40...+140°C / -40...+284°F
	Compact with IFC 050 - IFC 100 converter: -40...+120°C / -40...+248°F
	For detailed information refer to *Temperatures* on page 22.
	For Ex versions different temperatures are valid. Please check the relevant Ex documentation for details.
Ambient temperature	-40...+65°C / -40...+149°F
Storage temperature	-50...+70°C / -58...+158°F
Pressure	
Ambient pressure	Atmospheric
Nominal flange pressure	For detailed information refer to *Dimensions and weights* on page 32.
Vacuum load	0 mbar / 0 psi
Chemical properties	
Physical condition	Electrical Conductive liquids
Electrical conductivity	Standard: ≥ 1 µS/cm
	Water: ≥ 20 µS/cm
Permissible gas content (volume)	IFC 050: ≤ 3%
	IFC 100: ≤ 3%
	IFC 300: ≤ 5%
Permissible solid content (volume)	IFC 050: ≤ 10%
	IFC 100: ≤ 10%
	IFC 300: ≤ 70%

Installation conditions

Installation	Assure that the flow sensor is always fully filled.
	For detailed information refer to *Installation* on page 12.
Flow direction	Forward and reverse
	Arrow on flow sensor indicates positive flow direction.
Inlet run	≥ 5 DN
Outlet run	≥ 2 DN
Dimensions and weights	For detailed information refer to *Dimensions and weights* on page 32.

Materials

Sensor housing	DN2.5...15: Stainless steel Duplex (1.4462)
	DN25...150: Stainless steel AISI 304 (1.4301)
Measuring tube	Stainless steel AISI 304 (1.4301)
Adapters	Stainless steel AISI 316 L (1.4404)
	Other materials on request.
Liner	PFA
Connection box (F-version only)	**Standard:**
	Aluminum, Polyurethane coated
	Option:
	Stainless steel AISI (1.4408)
Electrodes	**Standard:**
	Hastelloy® C
	Option:
	Hastelloy® B2, platinum, stainless steel, tantalum, titanium
Gaskets	**Standard:**
	EPDM
	FDA recommends EPDM gaskets only if medium ≤ 8% fat.
	Option:
	Silicone (non-Ex only)

Process connections

DIN 11850 row 2 / 11866 row A	DN2.5...150
DIN 11851	DN2.5...150
DIN 11864-2A flange with notch	DN25...150
DIN 32676	DN25...150
ISO 2037	DN2.5...150
ISO 2852	DN2.5...150
SMS 1145	DN2.5...100
Tri Clamp	1/10"...6"
Note: sensor diameters < DN10 have DN10 connections, which means the sensor diameter is smaller.	

Electrical connections

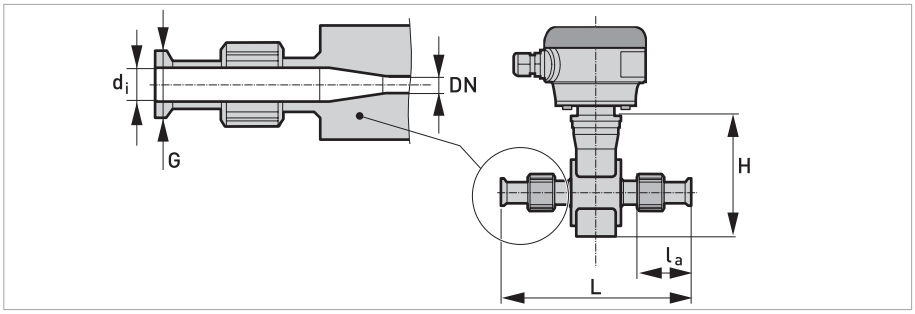
Signal cable	
Type A (DS)	Standard cable, double shielded. Max. length: 600 m / 1950 ft (dep. on electrical conductivity and measuring sensor). See documentation of the converter for more information.
Type B (BTS)	Optional cable, triple shielded. Max. length: 600 m / 1950 ft (dep. on electrical conductivity and measuring sensor). See documentation of the converter for more information.

Approvals and certificates

CE	
This device fulfills the statutory requirements of the EU directives. The manufacturer certifies successful testing of the product by applying the CE mark.	
	For full information of the EU directives and standards and the approved certifications, please refer to the CE declaration or the website of the manufacturer.
Hazardous areas	
ATEX	Please check the relevant Ex documentation for details.
	Compact version with IFC 300 C converter:
	II 2 G, II D, II 2 (1) G
	Remote (F) version:
	II 2 G, II 2 D
FM	**In combination with IFC 300 C or F converter:**
	Class I, Div. 2, Groups A, B, C and D
	Class II, Div. 2, Groups F and G
	Class III, Div. 2, Groups F and G
	Only available for DN2.5...15
CSA	**In combination with IFC 300 C or F converter:**
	Class I, Div. 2, Groups A, B, C and D
	Class II, Div. 2, Groups F and G
	Class III, Div. 2, Groups F and G
	Only available for DN2.5...15
Other approvals and standards	
Protection category acc. to IEC 529/ EN 60529	**Standard**
	IP 66/67 (NEMA 4/4X/6)
	Option (F version only)
	IP 68 field (NEMA 6P)
	IP 68 factory (NEMA 6P)
	IP 68 is only available for separate design and with a stainless steel connection box.
Hygienic	3A approved
	EHEDG
Shock test	IEC 68-2-27
	30 g for 18 ms
Vibration test	IEC 68-2-64
	f = 20 - 2000 Hz, rms = 4.5 g, t = 30 min.

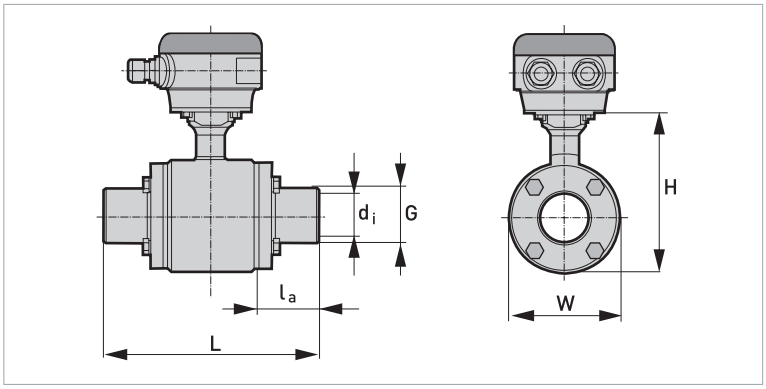
6.3 Dimensions and weights

DIN 11850 (row 2 or DIN 11866 row A)



DN2.5...10 screwed adapter with DN10 process connections / DN15 screwed adapter

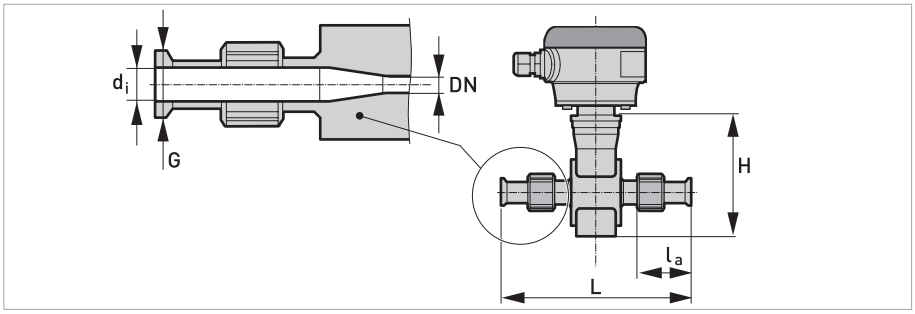
Nominal size		Dimensions [mm]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
2.5...10	40	10	13	32	180	120	44	1.5
15	40	16	19	32	180	120	44	1.5



DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
25	40	26	29	20.6	132.6	128	89	3
40	40	38	41	61.3	220	153	114	5.3
50	25	50	53	61.3	220	153	114	6.8
65	25	66	70	41.8	220	180	141	10.9
80	25	81	85	66.8	280	191	152	11.2
100	16	100	104	59.3	280	242	203	18.4
125	10	125	129	66.3	319	258	219	29.5
150	10	150	154	64.3	325	293	254	44.3

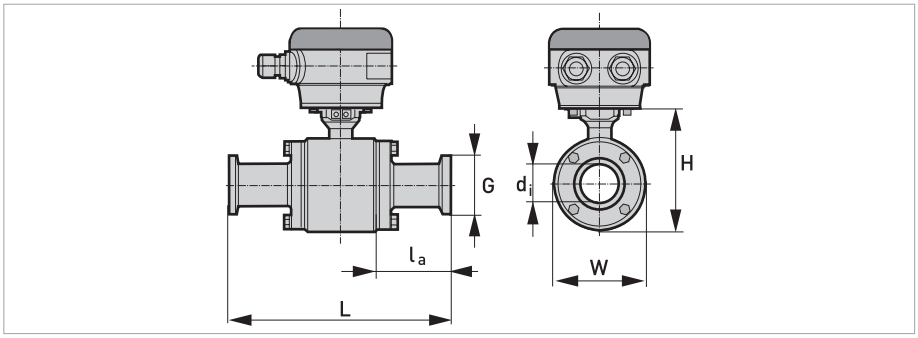
DIN 11851



DN2.5...10 screwed adapter with DN10 process connections / DN15 screwed adapter

Nominal size		Dimensions [mm]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
2.5...10	40	10	Rd 28 x 1/8"	53.1	214	142	44	1.5
15	40	16	Rd 34 x 1/8"	53.1	214	142	44	1.5

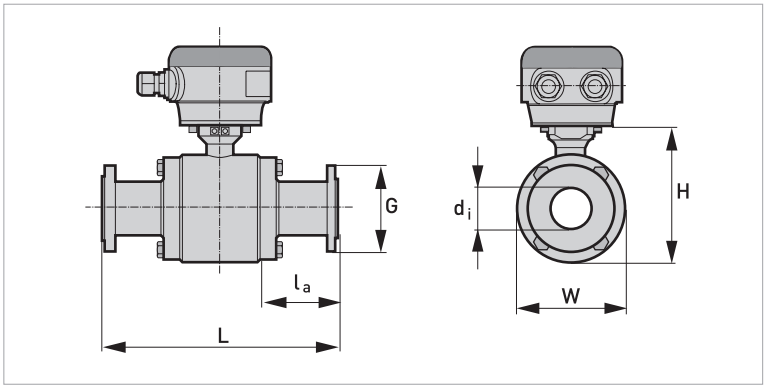
DIN 11851



DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
25	40	26	Rd 52 x 1/6"	49.3	190	128	89	3.2
40	40	38	Rd 65 x 1/6"	91.3	280	153	114	5.5
50	25	50	Rd 78 x 1/6"	93.3	284	153	114	5.3
65	25	66	Rd 95 x 1/6"	77.8	292	180	141	10
80	25	81	Rd 110 x 1/4"	107.8	362	191	152	12.5
100	16	100	Rd 130 x 1/4"	109.3	380	242	203	21.8
125	10	On request						
150	10							

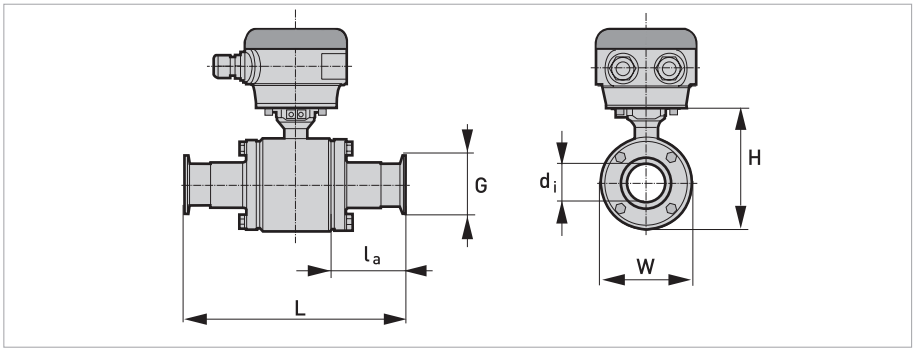
DIN 11864-2A



DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
25	40	26	70	45.8	183	128	89	4.4
40	25	38	82	83.3	264	153	114	7.5
50	25	50	94	83.3	264	153	114	9
65	25	66	113	63.8	264	180	141	14.5
80	25	81	133	122.8	392	191	152	18.6
100	16	100	159	115.3	392	242	203	28.2
125	10	125	183	121	429	259	219	35
150	10	150	213	127	450	294	254	52

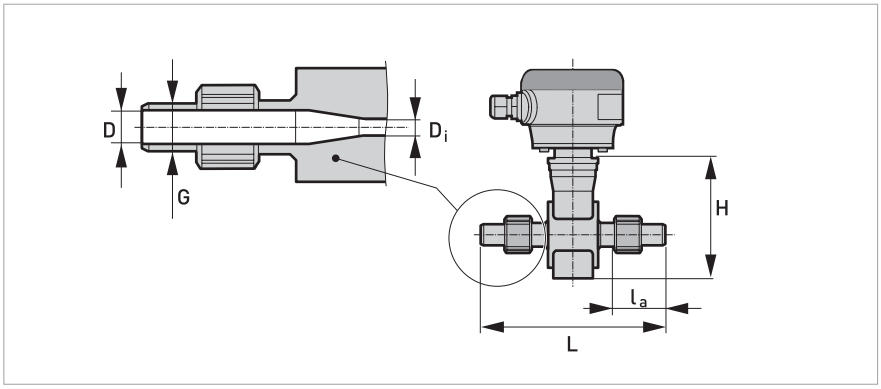
DIN 32676



DN25...150 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
25	16	26	50.5	41.8	175	128	89	3.2
40	16	38	50.5	80.8	259	153	114	5.5
50	16	50	64	80.8	259	153	114	5.3
65	16	66	91	67.8	272	180	141	10
80	16	81	106	92.8	332	191	152	12.5
100	16	100	119	85.3	332	242	203	21.8
125	16	125	155	90	366	259	219	30
150	16	150	213	127	450	294	254	45

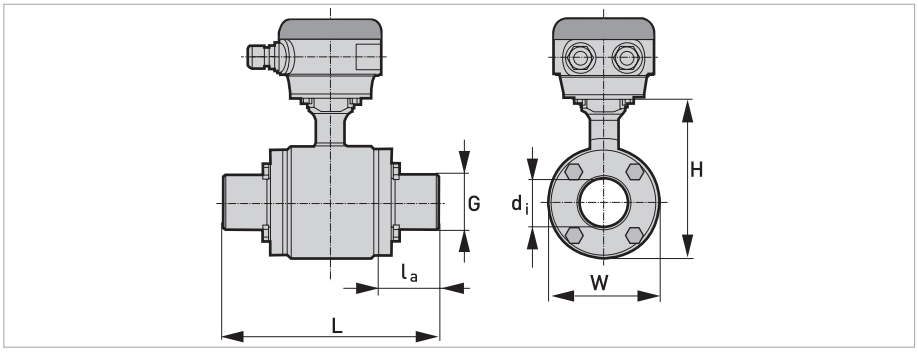
ISO 2037



DN2.5...10 screwed adapter with DN10 process connections / DN17.2 screwed adapter

Nominal size		Dimensions [mm]						Approx. weights
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
2.5...12	40	10	15	32	180	142	44	1.5
17.2	40	16	21	32	180	142	44	1.5

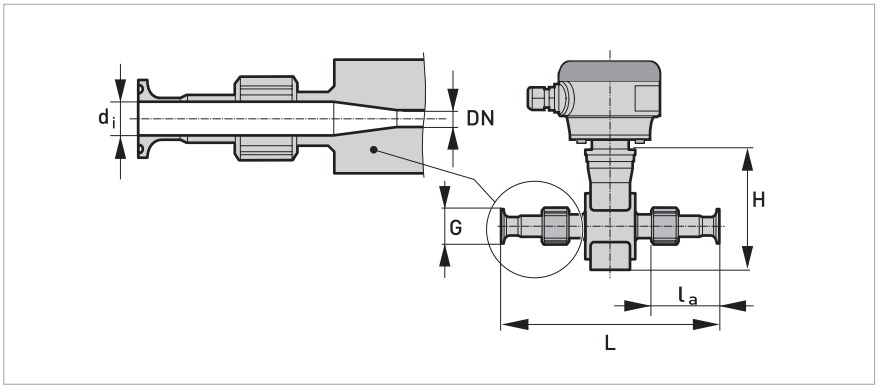
ISO 2037



DN25...150 bolted adapter

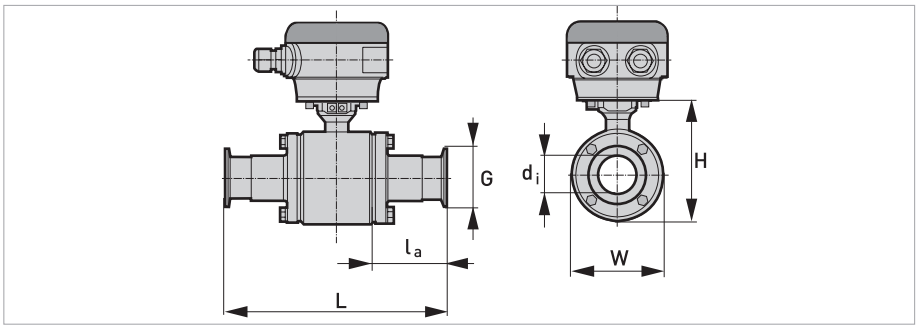
Nominal size		Dimensions [mm]						Approx. weights
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
25	40	22.6	31	20.6	132.6	128	89	3
38	40	38	43	61.3	220	153	114	5.3
51	25	49	55	61.3	220	153	114	5
63.5	25	60.3	71	41.8	220	180	141	9
76.1	25	72.9	86	66.8	280	191	152	10.8
101.6	16	97.6	105	59.3	280	242	203	18.4
114.3	10	110.3	130	66.3	319	258	219	29.5
139.7	10	135.7	156	64.3	325	293	254	44.3

ISO 2852



DN2.5...10 screwed adapter with DN10 process connections / DN17.2 screwed adapter

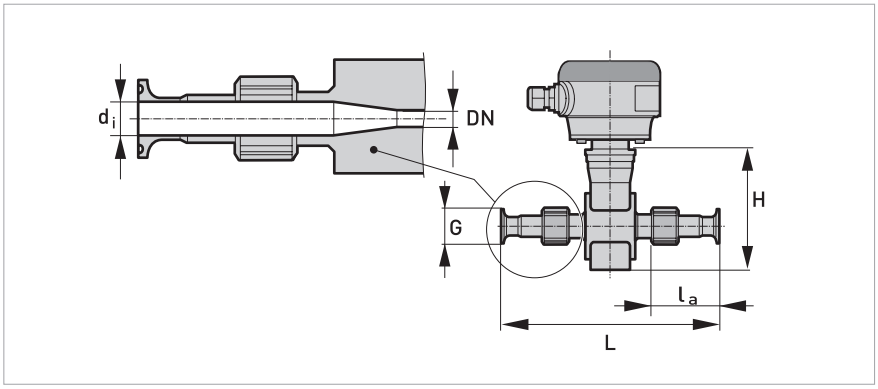
Nominal size			Dimensions [mm]						Approx. weight
			Adapter			Flowmeter			
DN	[Inch]	PN	d_i	G	l_a	L	H	W	[kg]
2.5...10	1/10"...3/8"	16	10	34	51.6	219	142	44	1.8
17.2	1/2"	16	16	34	51.6	219	142	44	1.8



DN25...150 bolted adapter

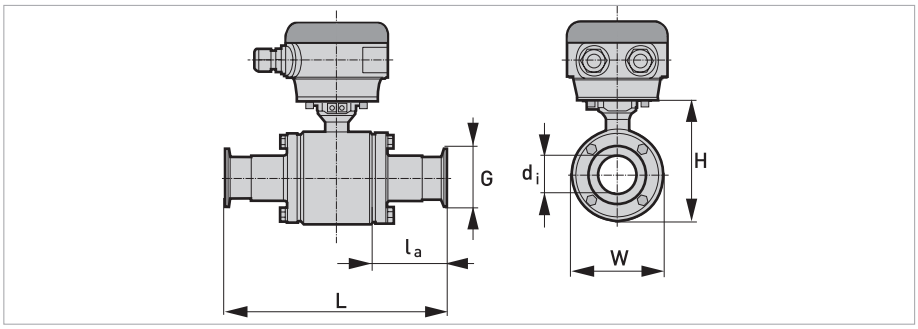
Nominal size			Dimensions [mm]						Approx. weight
			Adapter			Flowmeter			
DN	[Inch]	PN	d_i	G	l_a	L	H	W	[kg]
25	1"	16	22.6	50,5	41.8	175	128	89	3.3
38	1.5"	16	35.6	50,5	87.8	273	153	114	5.4
50	2"	16	48.6	64	87.8	273	153	114	5.2
63.5	2.5"	10	60.3	77.5	68.3	273	180	141	9.5
76.1	3"	10	72.9	91	93.3	333	191	152	11.2
101.6	4"	8	97.6	119	85.8	333	242	203	19.1
114.3	5"	5	110.3	211	90	366	259	219	30
139.7	6"	5	135.7	246	90	376	294	254	45

Tri Clamp



DN1/10...1/2" screwed adapter

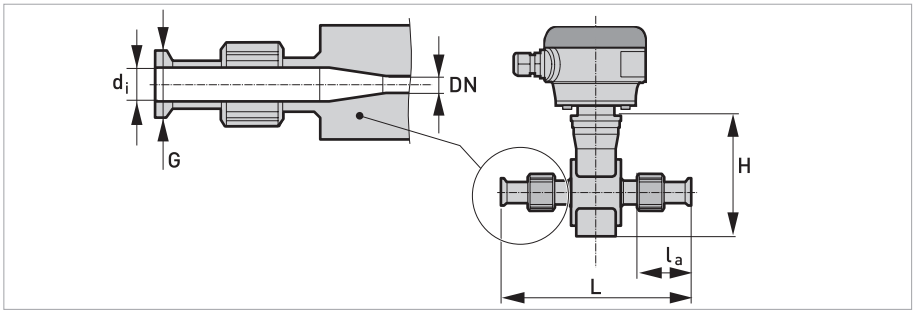
Nominal size		Dimensions [inch]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
1/10"...3/8"	20	0.37	0.98	1.97	8.5	5.59	1.73	1.5
1/2"	20	0.62	0.98	1.97	8.5	5.59	1.73	1.5



DN1...6" bolted adapter

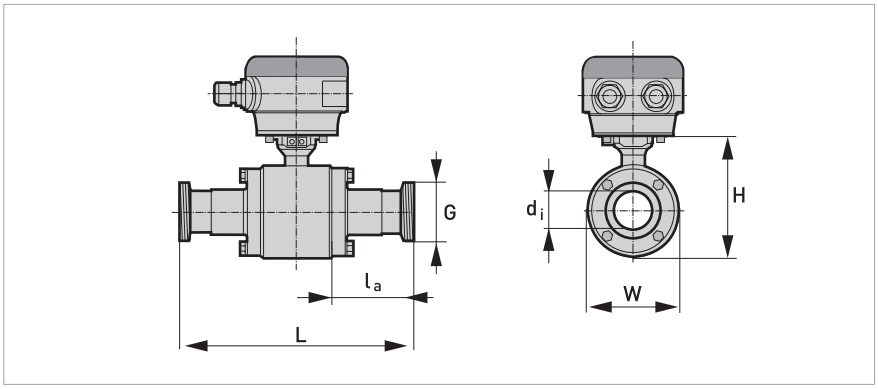
Nominal size		Dimensions [inch]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
1"	20	0.85	1.98	1.02	5.64	5.04	3.5	3.2
1½"	20	1.35	1.98	3.46	10.75	6.02	4.49	5.5
2"	20	1.85	2.52	3.46	10.75	6.02	4.49	5.3
2½"	20	2.35	3.05	2.69	11.5	7.09	5.55	10
3"	20	2.85	3.54	3.68	14.25	7.52	5.98	12.5
4"	12	3.83	4.68	3.38	14.96	9.53	7.99	21.8
5"	'-	4.78	5.69	3.54	14.43	10.20	8.62	30
6"	'-	5.78	6.57	3.62	14.98	11.57	10.00	45

SMS 1145 Adapter



DN2.5...10 screwed adapter with DN10 process connections / DN15 screwed adapter

Nominal size		Dimensions [mm]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
2.5	39	10	Rd 40-6	53	226	128	44	2
4	39	10	Rd 40-6	53	226	128	44	2
6	39	10	Rd 40-6	53	226	128	44	2
10	6	10	Rd 40-6	53	226	128	44	2
15	6	10	Rd 40-6	53	226	128	44	2



DN25...100 bolted adapter

Nominal size		Dimensions [mm]						Approx. weight
		Adapter			Flowmeter			
DN	PN	d_i	G	l_a	L	H	W	[kg]
25	6	22.6	Rd 40-6	28.1	147.6	128	89	3.2
38	6	35.5	Rd 60-6	54	262	153	114	5.7
51	6	48.6	Rd 70-6	84.3	266	153	114	5.4
63.5	6	60.3	Rd 85-6	69.8	276	180	141	9.9
76	6	72.9	Rd 98-6	99.8	346	191	152	12.1
100	6	97.6	Rd 132-6	44	336	242	203	21.9

6.4 Measuring accuracy

Reference conditions

- Medium: water
- Temperature: 20°C / 68°F
- Pressure: 1 bar / 14.5 psi
- Inlet section: ≥ 5 DN
- Electrical conductivity ≥ 300 µS/cm

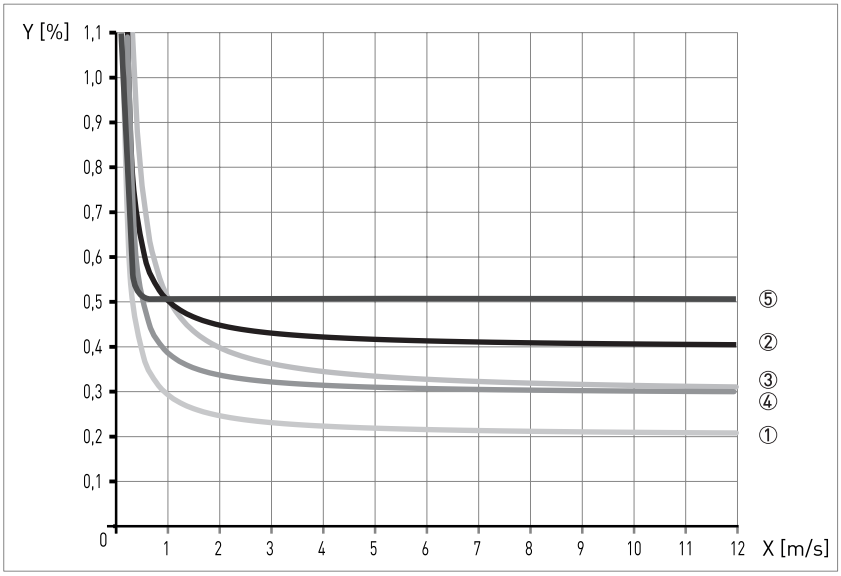


Figure 6-2: Flow velocity vs. accuracy
X [m/s] : flow velocity
Y [%]: deviation from the actual measured value (mv)

Compact with IFC 300	Accuracy	Curve
DN2.5...6 / 1/10...1/4"	0.3% of MV + 2 mm/s	③
DN10...150 / 3/8...6"	0.2% of MV + 1 mm/s	①

Compact with IFC 100	Accuracy	Curve
DN2.5...6 / 1/10...1/4"	0.4% of MV + 1 mm/s	②
DN10...150 / 3/8...6"	0.3% of MV + 1 mm/s	④
DN10...150 / 3/8...6" * extended calibration	0.2% of MV + 1 mm/s	①

Compact with IFC 050	Accuracy	Curve
DN10...150 / 3/8...6"	0.5% of mv above 0.5 m/s below 0.5 m/s, deviation ± 2.5 mm/s	⑤

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Head Office KROHNE Messtechnik GmbH
Ludwig-Krohne-Str. 5
47058 Duisburg (Germany)
Tel.: +49 203 301 0
Fax: +49 203 301 10389
info@krohne.com

The current list of all KROHNE contacts and addresses can be found at:
www.krohne.com

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