



OPTISONIC 7300 Quick Start

Ultrasonic gas flowmeter

1 Safety instructions	3
2 Installation	4
2.1 Scope of delivery	4
2.2 Device description	5
2.3 Storage	5
2.4 Transport	6
2.5 Installation requirements signal converter	6
2.6 Installation requirements sensor	6
2.6.1 Inlet and outlet	7
2.6.2 Mounting position	7
2.6.3 Flange deviation	8
2.6.4 T-section	8
2.6.5 Vibration	8
2.6.6 Control valve	9
2.6.7 Insulation	9
2.7 Mounting the field housing, remote version	10
2.7.1 Pipe mounting	10
3 Electrical connections	11
3.1 Safety instructions	11
3.2 Signal cable (remote versions only)	11
3.3 Power supply	13
3.4 Laying electrical cables correctly	14
4 Technical data	15
4.1 Dimensions and weights	15
4.1.1 Gas flow sensor, carbon steel	16
4.1.2 Converter housing	19
4.1.3 Mounting plate, field housing	20
5 Notes	21

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!**

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

**INFORMATION!**

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

**INFORMATION!**

The device will arrive in two cartons. One carton contains the converter and one carton contains the sensor.

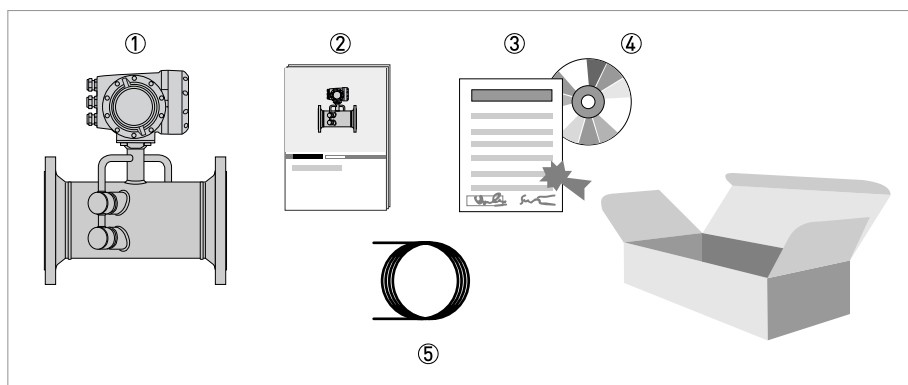


Figure 2-1: Scope of delivery

- ① Ordered flowmeter
- ② Product documentation
- ③ Factory calibration report
- ④ CD-ROM with product documentation in available languages
- ⑤ Signal cable (remote versions only)

**INFORMATION!**

Assembly materials and tools are not part of the delivery. Use the assembly materials and tools in compliance with the applicable occupational health and safety directives.

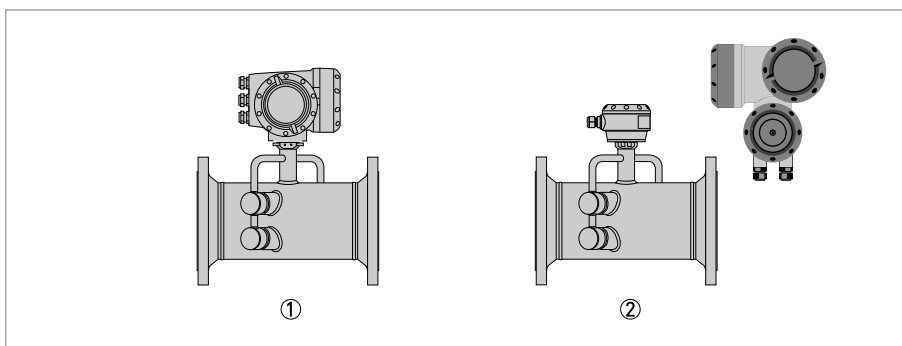
2.2 Device description

The ultrasonic flowmeters are designed exclusively for the continuous measurement of actual volume flow, mass flow, molar mass, flow speed, velocity of sound, gain, SNR and diagnosis value.

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

The following version is available:

- Compact version (the signal converter is mounted directly on the measuring sensor)
- Remote version (electrical connection to the measuring sensor via signal cable)



- ① Compact version
② Remote version

2.3 Storage

- Store the device in a dry, dust-free location.
- Avoid continuous direct sunlight.
- Store the device in its original packaging.
- Storage temperature: -50...+70°C / -58...+158°F

2.4 Transport

Signal converter

- Do not lift the signal converter by the cable glands.

Measuring sensor

- Do not lift the measuring sensor by the connection box.
- Use hoisting belts only.
- To transport flange devices, use lifting straps. Wrap these around both process connections.

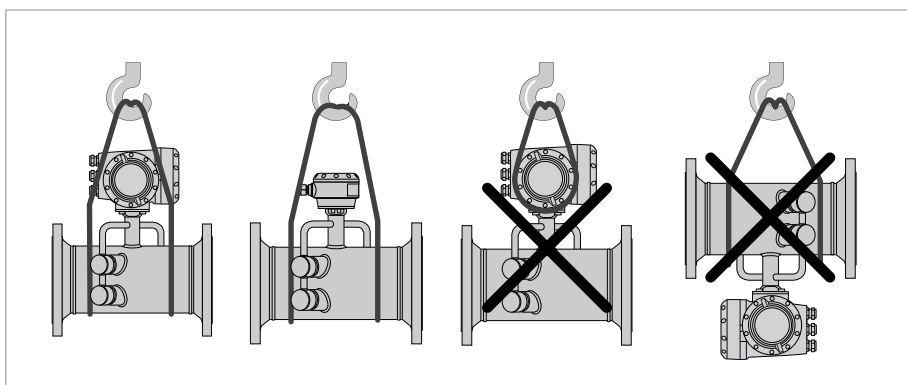


Figure 2-2: Transport

2.5 Installation requirements signal converter

- Allow 10...20 cm / 3.9...7.9" of space at the sides and rear of the signal converter to permit free air circulation.
- Protect signal converter against direct solar radiation, install a sunshield if necessary.
- Signal converters installed in switchgear cabinets require adequate cooling, e.g. by fan or heat exchanger.
- Do not expose the signal converter to intense vibration.

2.6 Installation requirements sensor

To secure the optimum functioning of the flowmeter, please note the following observations.

The OPTISONIC 7300 is designed for the measurement dry gasflow. Excess of liquids may disturb the acoustic signals and should thus be avoided.

The following guidelines should be observed in case occasional small amounts of liquids are to be expected:

- Install the flowsensor in a horizontal position in a slightly descending line.
- Orientate the flowsensor such that the path of the acoustic signal is in the horizontal plane.

For exchanging the transducers, please keep a free space of 1 m / 39" around the transducer.

2.6.1 Inlet and outlet

1 path flowmeter

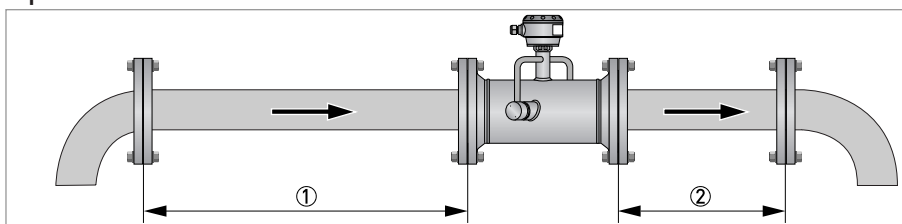


Figure 2-3: Recommended inlet and outlet for $\leq \text{DN}80/3''$

① $\geq 20 \text{ DN}$

② $\geq 3 \text{ DN}$

2 path flowmeter

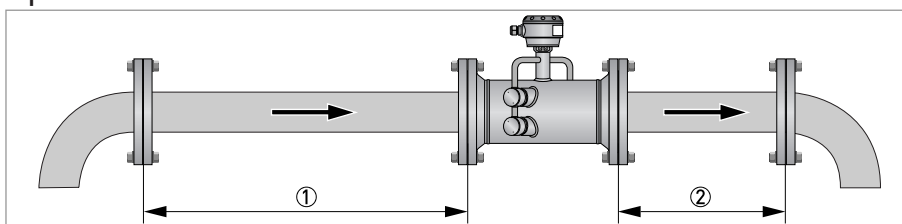


Figure 2-4: Recommended inlet and outlet for $\geq \text{DN}100/4''$

① $\geq 10 \text{ DN}$

② $\geq 3 \text{ DN}$

2.6.2 Mounting position

- Horizontally with the acoustic path in horizontal plane
- Vertically

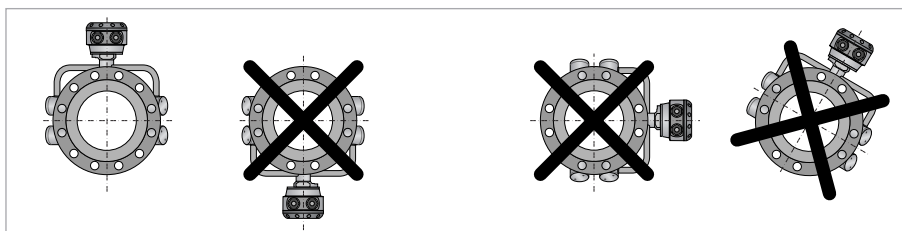


Figure 2-5: Mounting position

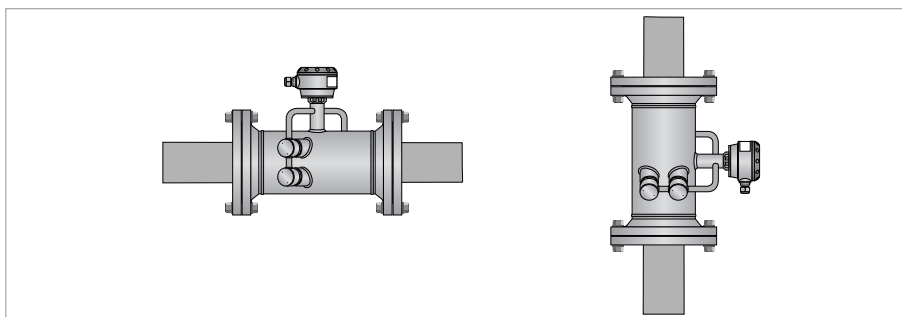


Figure 2-6: Horizontal and vertical mounting

2.6.3 Flange deviation

**CAUTION!**

Max. permissible deviation of pipe flange faces:

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

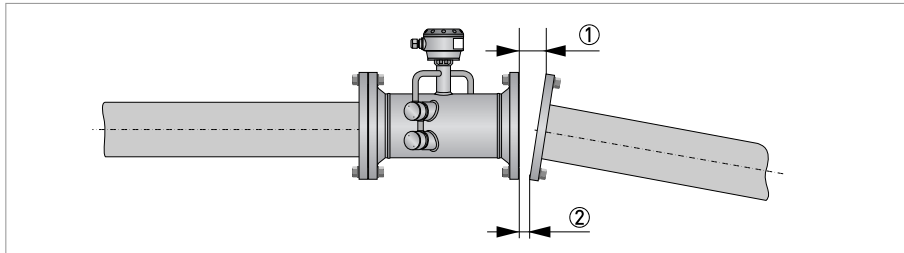


Figure 2-7: Flange deviation

- ① L_{max}
② L_{min}

2.6.4 T-section

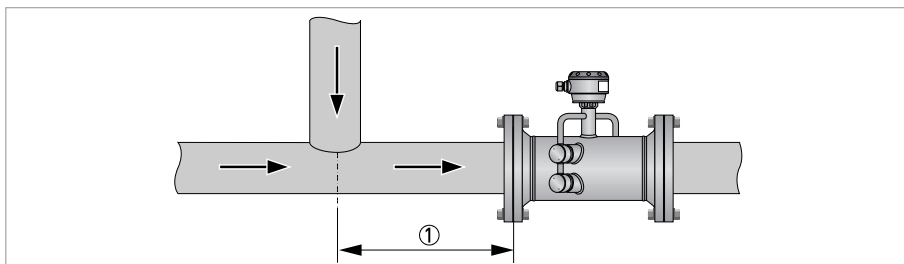


Figure 2-8: Distance behind a T-section

- ① $\geq 10 \text{ DN}$

2.6.5 Vibration

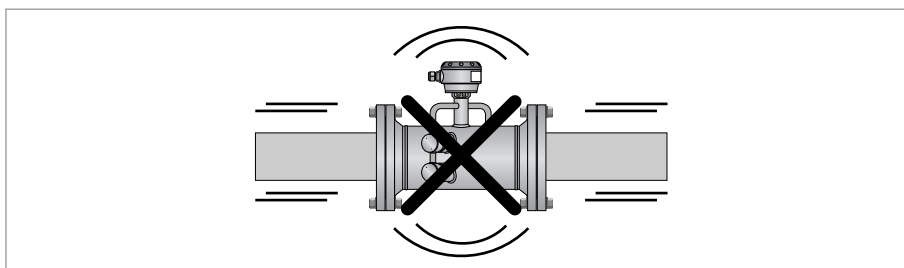


Figure 2-9: Avoid vibrations

2.6.6 Control valve

To avoid distorted flow profiles and interference caused by valve noise in the sensor, control valves or pressure reducers should not be installed in the same pipeline as the flowmeter. In case this is required, please contact the manufacturer.

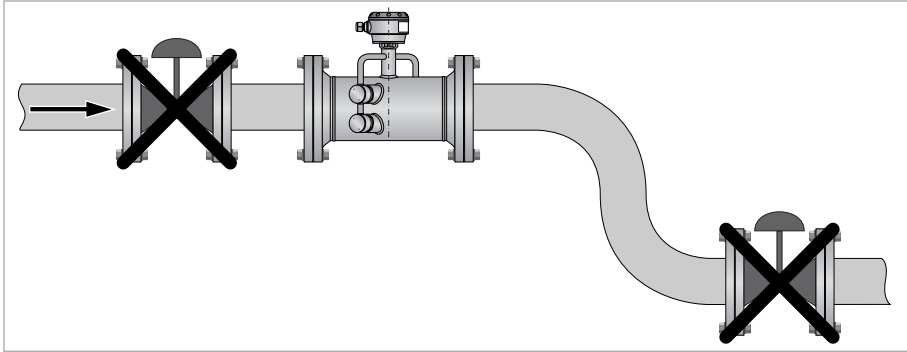


Figure 2-10: Control valve

2.6.7 Insulation

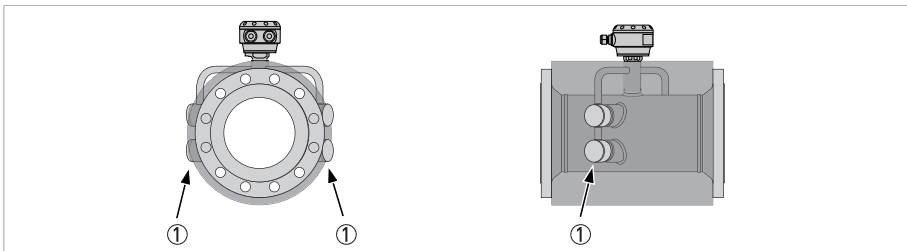


Figure 2-11: Leave vent holes free

① Vent holes



WARNING!
Always leave vent holes free!

2.7 Mounting the field housing, remote version

**INFORMATION!**

Assembly materials and tools are not part of the delivery. Use the assembly materials and tools in compliance with the applicable occupational health and safety directives.

2.7.1 Pipe mounting

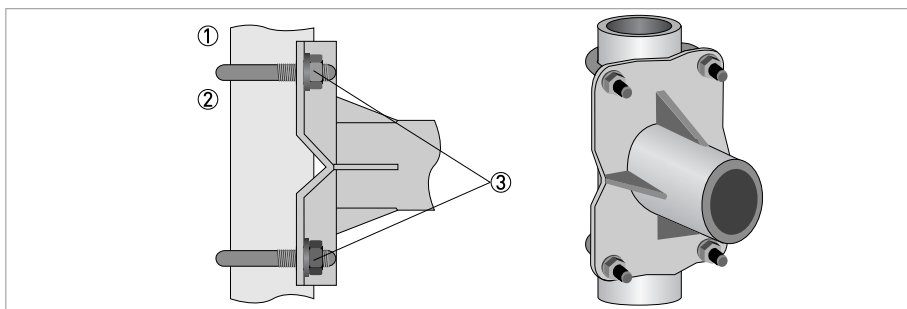


Figure 2-12: Pipe mounting of the field housing



- ① Fix the signal converter to the pipe.
- ② Fasten the signal converter using standard U-bolts and washers.
- ③ Tighten the nuts.

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 Signal cable (remote versions only)

The flow sensor is connected to the signal converter via the signal cable(s). A flow sensor with one acoustic path, 1 cable is required. A flow sensor with two acoustic paths, 2 cables are required.

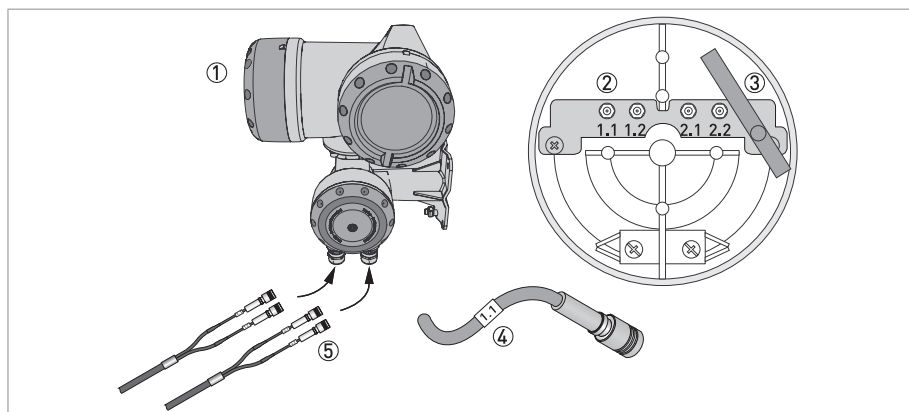


Figure 3-1: Construction field version

- ① GFC 300 F converter
- ② Open connection box
- ③ Tool for releasing connectors
- ④ Marking on cable
- ⑤ Insert cable(s) into connection box



CAUTION!

To ensure smooth functioning, always use the signal cable(s) included in the delivery.

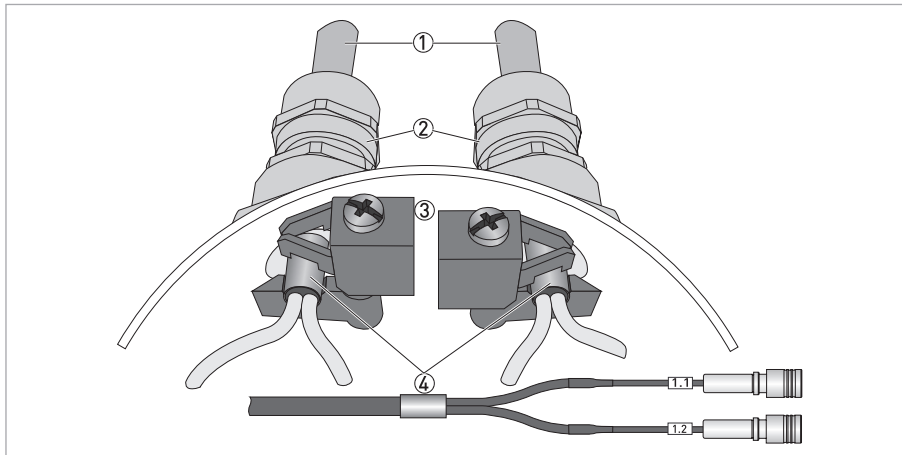


Figure 3-2: Clamp the cables on the shielding bush

- ① Cables
- ② Cable glands
- ③ Grounding clamps
- ④ Cable with metal shielding bush

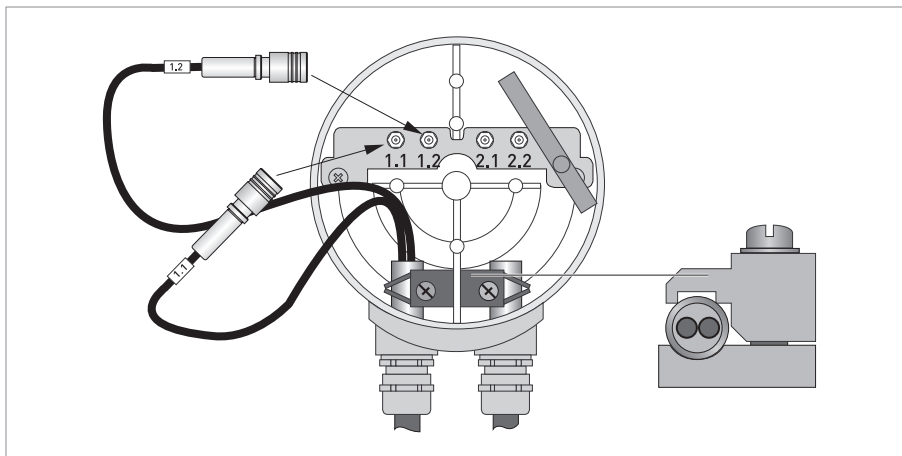


Figure 3-3: Connect the cables on the signal converter



INFORMATION!

Connect the cable on connector with similar numeral marking

3.3 Power supply


WARNING!

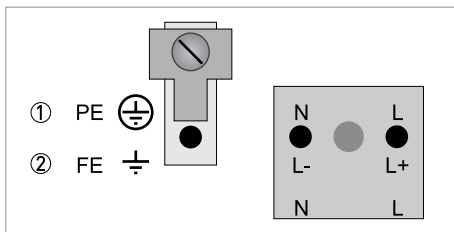
When this device is intended for permanent connection to the mains.

It is required (for example for service) to mount an external switch or circuit breaker near the device for disconnection from the mains. It shall be easily reachable by the operator and marked as the disconnecting the device for this equipment.

The switch or circuit breaker and wiring has to be suitable for the application and shall also be in accordance with the local (safety) requirements of the (building) installation (e.g. IEC 60947-1 / -3)


INFORMATION!

The power terminals in the terminal compartments are equipped with additional hinged lids to prevent accidental contact.



① 100...230 VAC (-15% / +10%), 22 VA

② 24 VAC/DC (AC: -15% / +10%; DC: -25% / +30%), 22 VA or 12 W


DANGER!

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

100...230 VAC

- Connect the protective ground conductor PE of the mains power supply to the separate terminal in the terminal compartment of the signal converter.
- Connect the live conductor to the L terminal and the neutral conductor to the N terminal.

24 VAC/DC

- Connect a functional ground FE to the separate U-clamp terminal in the terminal compartment of the signal converter.
- When connecting to functional extra-low voltages, provide a facility for protective separation (PELV) (VDE 0100 / VDE 0106 and/or IEC 364 / IEC 536 or relevant national regulations).

3.4 Laying electrical cables correctly

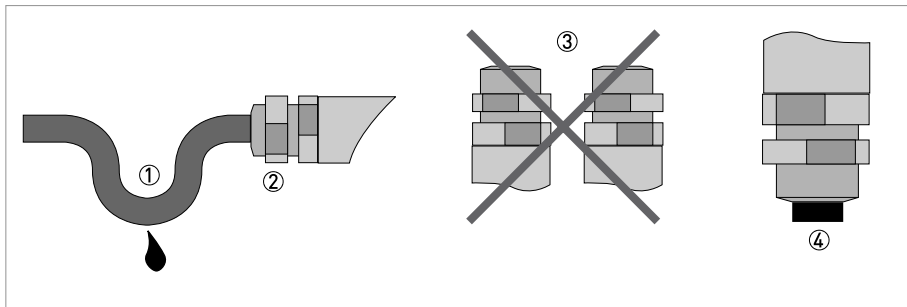


Figure 3-4: Protect housing from dust and water



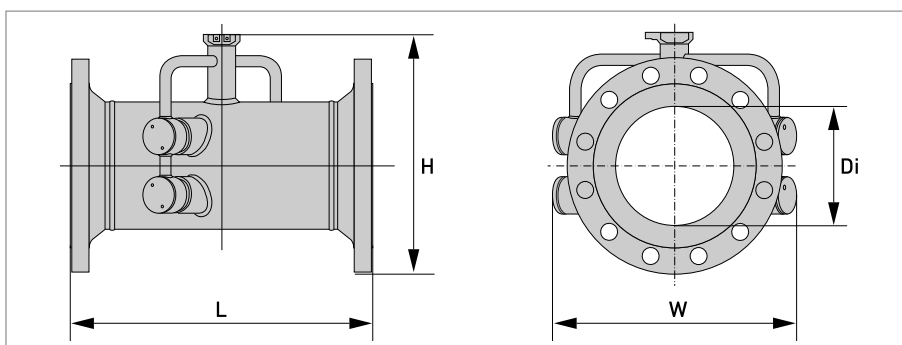
- ① Lay the cable in a loop just before the housing.
- ② Tighten the screw connection of the cable entry securely.
- ③ Never mount the housing with the cable entries facing upwards.
- ④ Seal cable entries that are not needed with a plug.

4.1 Dimensions and weights

Remote version		$a = 77 \text{ mm} / 3.1''$ $b = 139 \text{ mm} / 5.5''$ ① $c = 106 \text{ mm} / 4.2''$ Total height = $H + a$
Compact version		$a = 155 \text{ mm} / 6.1''$ $b = 230 \text{ mm} / 9.1''$ ① $c = 260 \text{ mm} / 10.2''$ Total height = $H + a$

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

4.1.1 Gas flow sensor, carbon steel



EN 1092-1

Nominal size		Dimensions [mm]				Approx weight [kg]
DN	PN [Bar]	L	H	W	Di ①	
200	PN 10	460	368	429	207	46
250	PN 10	530	423	474	261	66
300	PN 10	580	473	517	310	81
350	PN 10	610	519	542	341	109
400	PN 10	640	575	583	392	141
450	PN 10	620	625	623	442	170
500	PN 10	670	678	670	493	202
600	PN 10	790	784	780	593	278

① Di = inner diameter at flange face. Inner tube diameter may be smaller.

Nominal size		Dimensions [mm]				Approx weight [kg]
DN	PN [Bar]	L	H	W	Di ①	
100	PN 16	490	254	337	107	24
125	PN 16	520	283	359	133	32
150	PN 16	540	315	387	159	35

① Di = inner diameter at flange face. Inner tube diameter may be smaller.

Nominal size		Dimensions [mm]				Approx weight [kg]
DN	PN [Bar]	L	H	W	Di ①	
50	PN 40	320	196	300	54.5	11
65	PN 40	350	216	313	70.3	14
80	PN 40	480	230	324	82.5	19

① Di = inner diameter at flange face. Inner tube diameter may be smaller.

ASME 150 lb

Nominal size	Dimensions								Approx weight	
	L		H		W		Di ^①			
	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[lb]	[kg]
2"	14.2	360	7.5	190	11.8	300	2.1	53	22	10
2½"	15.0	380	8.3	210	12.2	310	2.5	63	33	15
3"	20.5	520	8.9	226	12.8	324	3.1	78	44	20
4"	21.7	550	10.1	258	13.3	337	4.0	102	64	29
5"	23.2	590	11.2	285	14.1	364	5.1	128	84	38
6"	24.4	620	12.2	312	15.2	387	6.1	154	90	41
8"	21.2	540	14.5	369	16.9	429	8.1	206	130	59
10"	24.0	610	16.9	428	18.7	474	10.3	260	185	84
12"	26.4	670	19.4	492	20.4	512	12.2	311	266	121
14"	28.7	730	21.0	534	21.3	540	13.4	340	352	160
16"	30.3	770	23.3	591	23.5	597	15.4	391	462	210
18"	30.7	780	25.0	635	25.0	635	17.5	441	570	259
20"	32.7	830	27.3	693	27.5	699	19.3	489	607	304
24"	35.8	910	31.5	801	32.0	813	23.3	591	904	411

① Di = inner diameter at flange face. Inner tube diameter may be smaller.

ASME 300 lb

Nominal size	Dimensions [inches]								Approx weight	
	L		H		W		Di ①			
	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[lb]	[kg]
2"	15.0	380	7.7	196	11.8	300	2.1	53	27	12
2½"	15.4	390	8.5	217	12.2	310	2.5	63	38	17
3"	21.3	540	9.3	235	12.8	324	3.1	78	53	24
4"	22.4	570	10.7	271	13.3	337	4.0	102	86	39
5"	24.0	610	11.7	298	14.1	364	5.1	128	115	52
6"	25.2	640	13.0	331	15.0	387	6.1	154	146	66
8"	22.0	560	15.3	388	16.6	429	8.0	203	207	94
10"	25.2	640	17.6	448	18.3	474	10.0	255	309	140
12"	28.0	710	20.1	511	20.5	521	11.9	303	452	205
14"	29.9	760	22.0	559	23.0	584	13.1	333	609	276
16"	31.9	810	24.3	616	25.5	648	15.0	381	785	356
18"	33.1	840	26.5	673	28.0	711	16.9	428	926	420
20"	36.6	930	28.8	731	30.5	775	18.8	478	1237	561
24"	38.2	970	33.5	851	36.0	914	22.6	575	1715	778

① Di = inner diameter at flange face. Inner tube diameter may be smaller.

ASME 600 lb

Nominal size	Dimensions [inches]								Approx weight	
	L		H		W		Di ①			
	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[lb]	[kg]
2"	15.7	400	7.7	196	11.5	300	1.9	49	33	15
2½"	16.1	410	8.5	217	12.0	310	2.3	59	44	20
3"	22.0	560	9.3	235	12.5	324	2.9	74	66	30
4"	24.4	620	11.1	281	13.1	337	3.8	97	119	54
5"	26.0	660	12.7	323	14.1	359	4.8	122	183	83
6"	27.2	690	13.8	350	15.0	374	5.8	146	223	101
8"	24.4	620	16.1	408	16.5	421	7.6	194	333	151
10"	27.2	690	18.3	479	20.0	508	9.6	243	531	241
12"	28.3	720	20.9	530	22.0	559	11.4	289	655	297
14"	29.9	760	22.4	568	23.7	603	12.5	317	798	362
16"	32.7	830	25.0	635	27.0	686	14.3	364	1105	501
18"	34.6	880	27.1	689	29.3	743	16.1	409	1389	630
20"	35.4	900	29.5	750	32.0	813	17.9	456	1695	769
24"	38.2	970	34.0	864	37.0	640	21.6	548	2438	1106

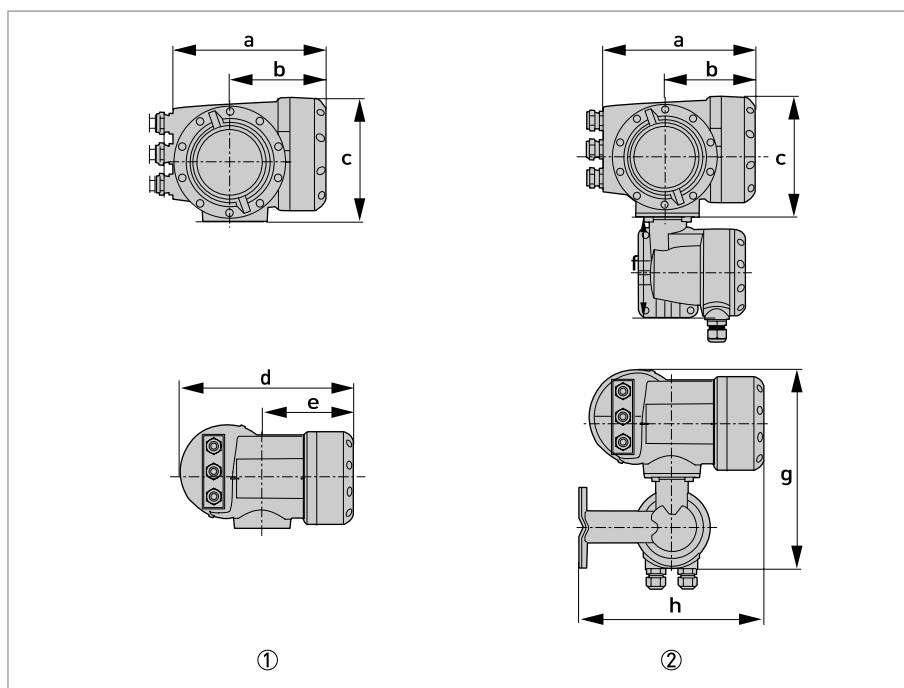
① Di = inner diameter at flange face. Inner tube diameter may be smaller.

ASME 900 lb

Nominal size	Dimensions [inches]								Approx weight	
	L		H		W		Di ^①			
	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[lb]	[kg]
2"	17.7	450	8.7	222	11.5	300	1.7	43	64	29
2½"	18.1	460	9.6	244	12.0	310	2.3	59	86	39
3"	23.6	600	9.9	251	12.5	324	2.6	67	119	54
4"	26.8	640	11.4	290	13.0	337	3.4	87	157	71
5"	26.8	680	12.6	333	13.7	359	4.6	116	240	109
6"	28.7	730	14.3	363	15.0	381	5.5	140	335	152
8"	26.8	680	17.0	433	18.5	470	7.2	183	545	247
10"	29.9	760	19.6	498	21.5	546	9.1	230	838	380
12"	31.9	810	21.9	556	24.0	610	10.7	273	1168	530
14"	33.9	860	23.1	588	25.2	641	11.8	300	1382	627

① Di = inner diameter at flange face. Inner tube diameter may be smaller.

4.1.2 Converter housing



① Compact housing [C]

② Field housing [F]

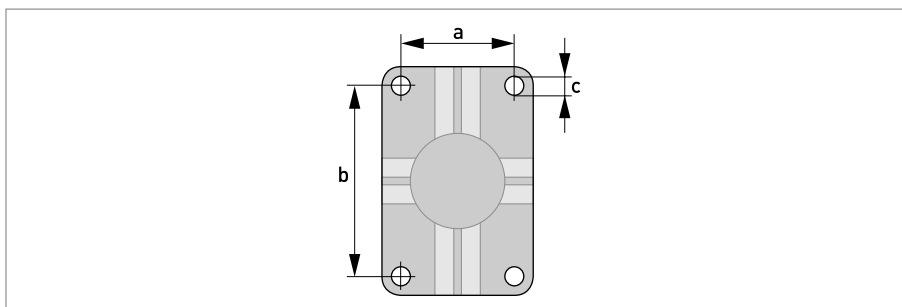
Dimensions and weights in mm and kg

Version	Dimensions [mm]							Weight [kg]
	a	b	c	d	e	g	h	
C	202	120	155	260	137	-	-	4.2
F	202	120	155	-	-	295.8	277	5.7

Dimensions and weights in inches and lb

Version	Dimensions [inches]							Weight [lb]
	a	b	c	d	e	g	h	
C	7.75	4.75	6.10	10.20	5.40	-	-	9.30
F	7.75	4.75	6.10	-	-	11.60	10.90	12.60

4.1.3 Mounting plate, field housing



Dimensions in mm and inches

	[mm]	[inches]
a	60	2.4
b	100	3.9
c	Ø 9	Ø 0.4









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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