Instruction **MI 021-538 en**

FEBRUARY 2020

Model 8500A Magnetic Flowmeter wafer version

Quick Start

Schneider Electric

CONTENTS

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.

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.

NOTICE!
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.

NOTICE!
Further information can be found on the website.

2.1 Scope of delivery

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

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

NOTICE!
The remote version will arrive in two cartons. One carton contains the signal transmitter and one carton contains the flow tube.

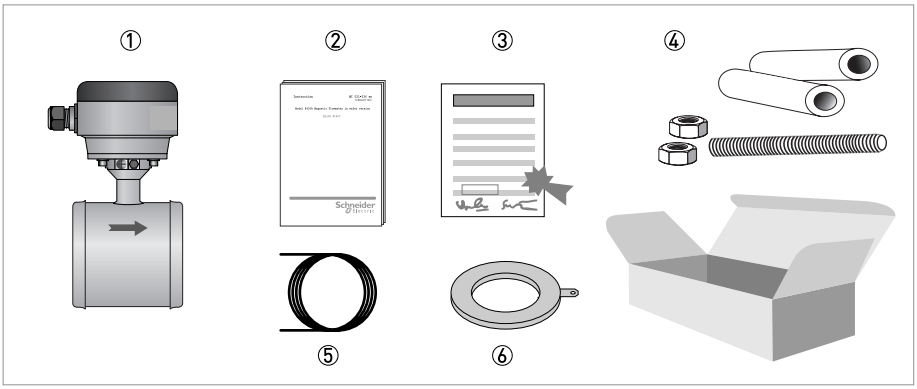


Figure 2-1: Scope of delivery

① Ordered flowmeter
② Product documentation
③ Factory calibration report
④ Mounting material (rubber sleeves). Optional; studs and bolts.
⑤ Signal cable (remote versions only)
⑥ Grounding rings (optional)

NOTICE!
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.

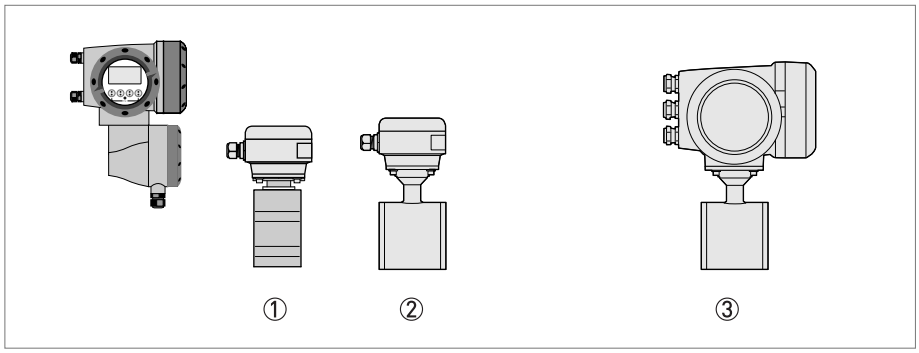
2.2 Device description

Electromagnetic flowmeters are designed exclusively to measure the flow and conductivity of electrically conductive, liquid media.

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 versions are available:

- Compact version (the signal transmitter is mounted directly on the flow tube)
- Remote version (a flow tube with connection box and a separate signal transmitter)



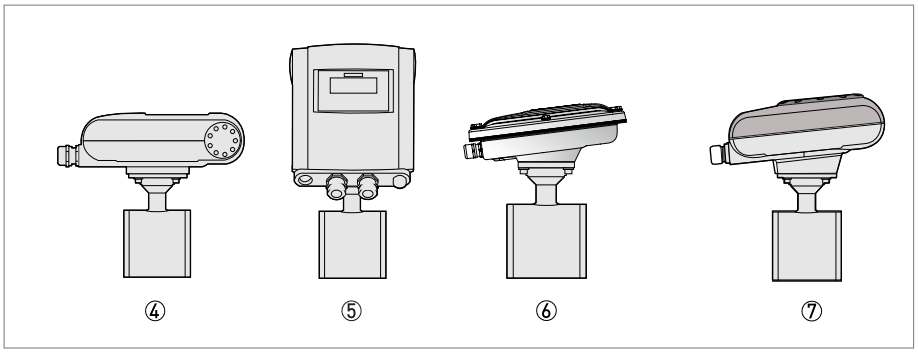


Figure 2-2: Device versions

① Remote version (DN10...40 - 3/8...1 ½")
② Remote version (DN50...150 - 2...6")
③ Compact version with signal transmitter IMT33A
④ Compact version with signal transmitter IMT31A (0°)
⑤ Compact version with signal transmitter IMT31A (45°)
⑥ Compact version with stainless steel signal transmitter IMT31A (10°)
⑦ Compact version with signal transmitter IMT30A (10°)

2.3 Nameplates (examples)

NOTICE!
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.

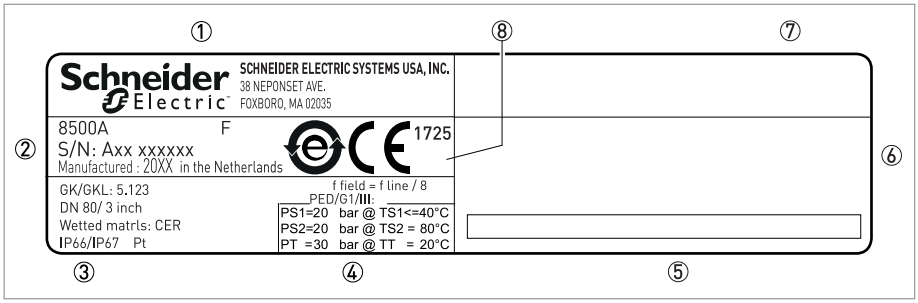


Figure 2-3: Example of the nameplate on the tube

① Name and logo of the manufacturer
② Type designation of the flowmeter, serial number and manufacturing date
③ Calibration data
④ PED data
⑤ Tag no.
⑥ Additional information
⑦ Additional marking
⑧ Chinese recycling symbol and CE sign with number(s) of notified body / bodies

2.4 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

2.5 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 the device, use lifting straps.

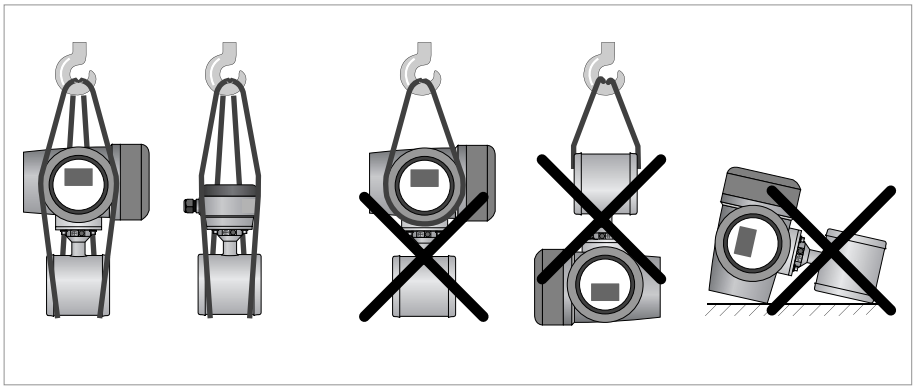


Figure 2-4: Transport

2.6 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

2.7 General requirements

NOTICE!

The following precautions must be taken to ensure reliable installation.

- *Make sure that there is adequate space to the sides.*
- *Protect the transmitter from direct sunlight and install a sun shade if necessary.*
- *Transmitters installed in control cabinets require adequate cooling, e.g. by fan or heat exchanger.*
- *Do not expose the transmitter to intense vibration. The flowmeters are tested for a vibration level in accordance with IEC 60068-2-64.*
- *Avoid magnetic field! Keep at least 5 DN distance between electromagnetic flow tubes.*

2.7.1 Vibration

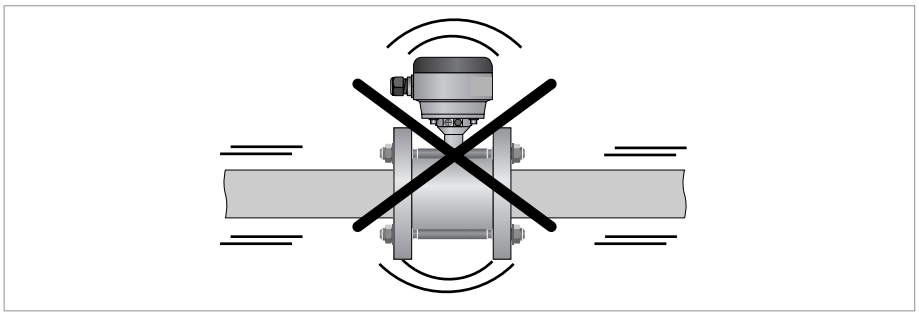


Figure 2-5: Avoid vibrations

2.7.2 Magnetic field

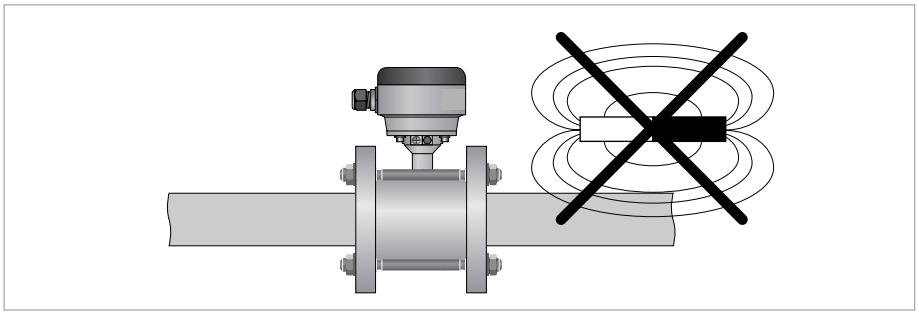


Figure 2-6: Avoid magnetic fields

2.8 Installation conditions

2.8.1 Inlet and outlet

Use straight inlet and outlet pipe sections to prevent flow distortion or swirl, caused by bends and T-sections.

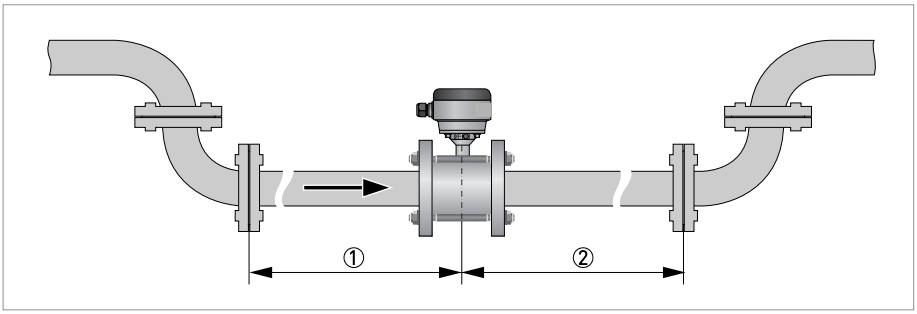


Figure 2-7: Recommended inlet and outlet section

① Refer to chapter "Bends in 2 or 3 dimensions"
② ≥ 2 DN

2.8.2 Bends in 2 or 3 dimensions

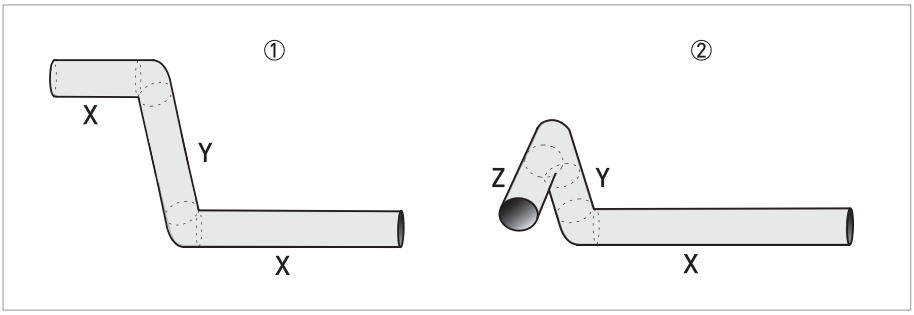


Figure 2-8: 2 and/or 3 dimensional bends upstream of the flowmeter

① 2 dimensions = X/Y
② 3 dimensions = X/Y/Z
Inlet length: using bends in 2 dimensions: ≥ 5 DN; when having bends in 3 dimensions: ≥ 10 DN

NOTICE!
*2 dimensional bends occur in a vertical **or** horizontal plane (X/Y) only, while 3 dimensional bends occur in both vertical **and** horizontal plane (X/Y/Z).*

2.8.3 T-section

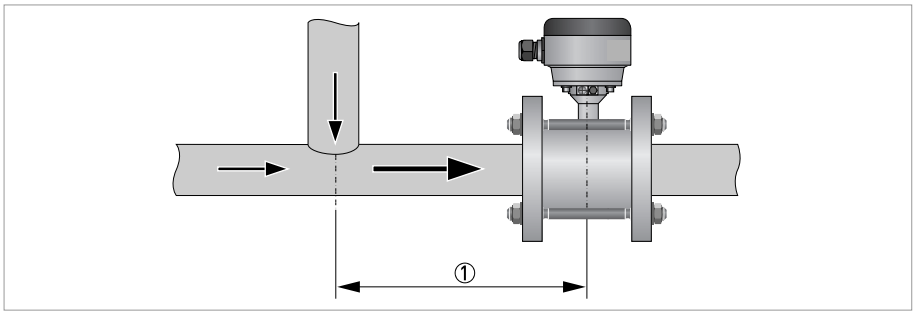


Figure 2-9: Distance behind a T-section

① ≥ 10 DN

2.8.4 Bends

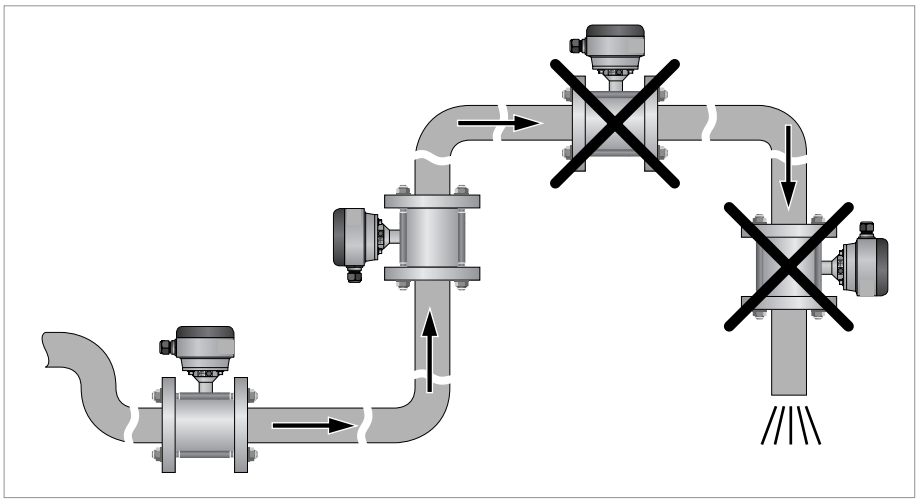


Figure 2-10: Installation in bending pipes (90°)

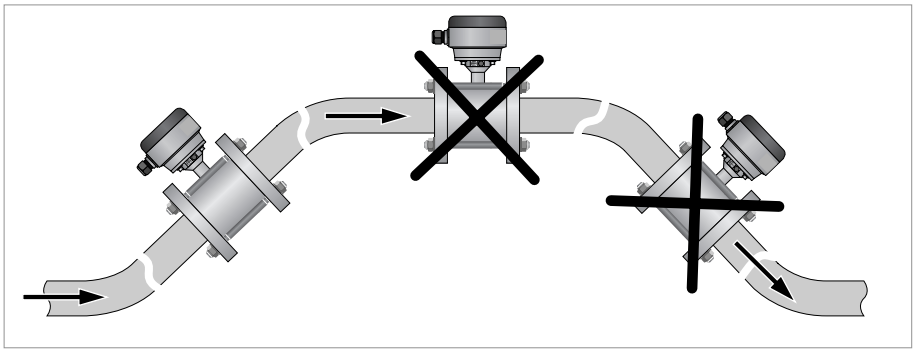


Figure 2-11: Installation in bending pipes (45°)

⚠	***CAUTION!*** *Avoid draining or partial filling of the flow tube*

2.9 Open discharge

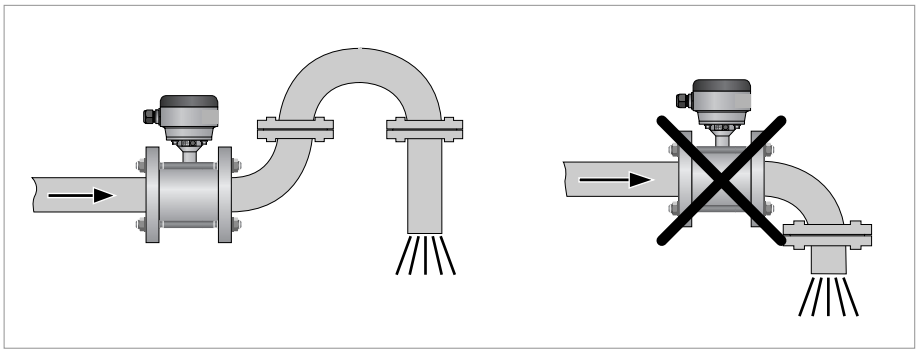


Figure 2-12: Installation in front of an open discharge

2.10 Control valve

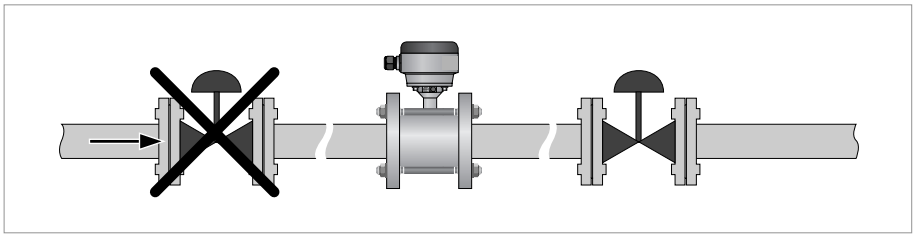


Figure 2-13: Installation in front of a control valve

2.11 Pump

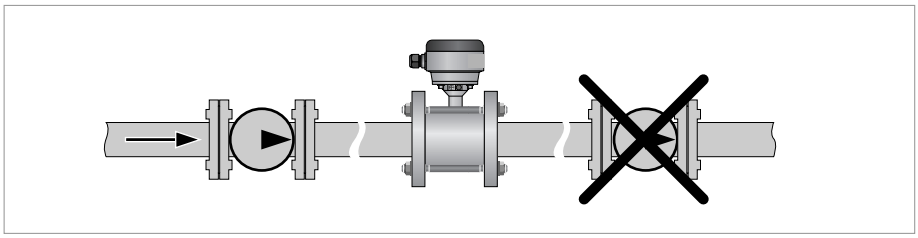


Figure 2-14: Installation behind a pump

2.12 Air venting and vacuum forces

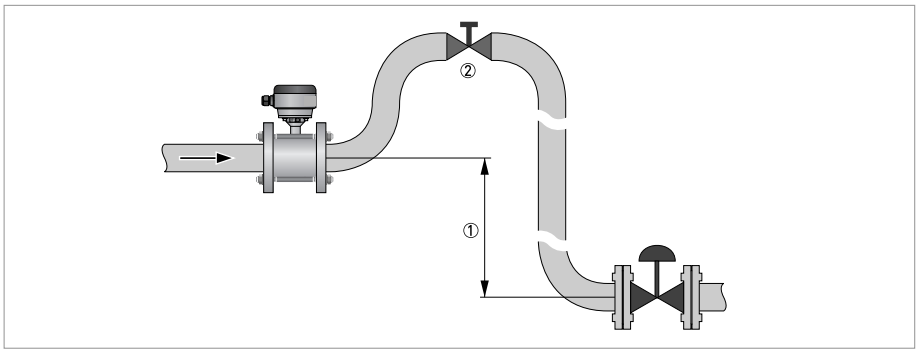


Figure 2-15: Air venting

① ≥ 5 m / 17 ft
② Air ventilation point

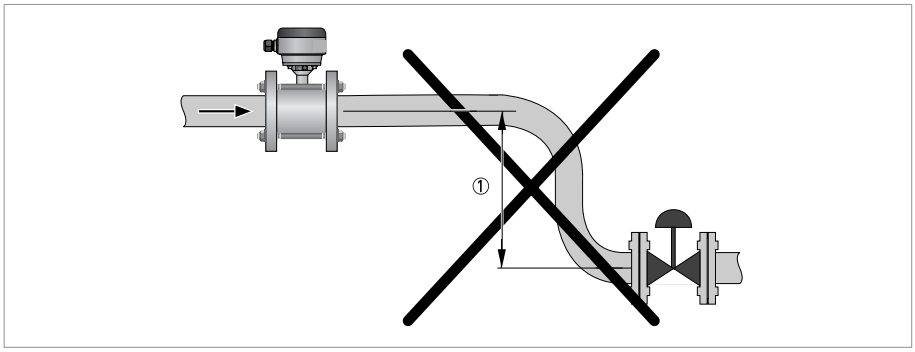


Figure 2-16: Vacuum

① ≥ 5 m / 17 ft

2.13 Flange deviation

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

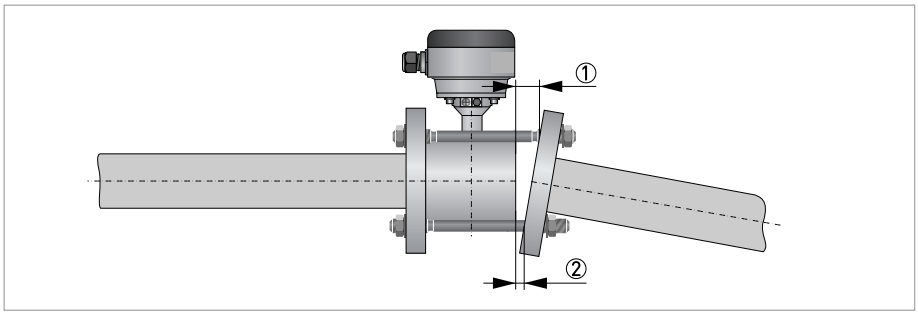


Figure 2-17: Flange deviation

① L_{max}
② L_{min}

2.14 Mounting position

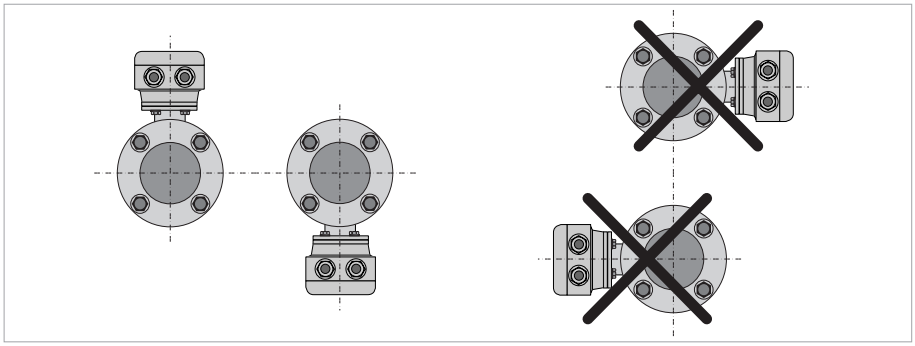


Figure 2-18: Mounting position

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

2.15 Mounting

2.15.1 Torques and pressure

WARNING!
- *Please use stainless steel A2 / 6.9 class bolts.*
- *Make sure the connecting flanges are of type raised face (RF).*

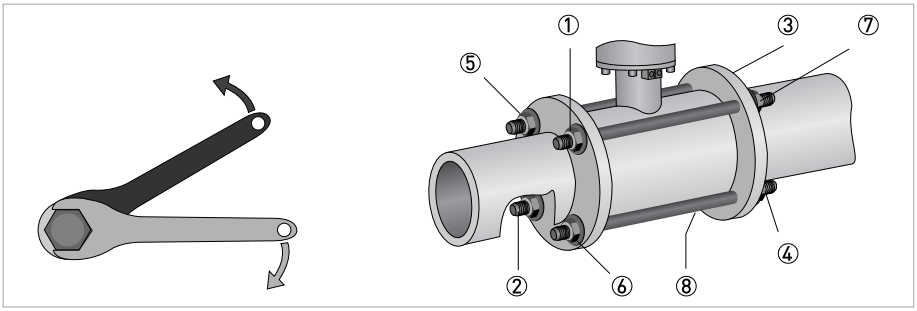


Figure 2-19: Tighten the bolts in fixed order, see picture.

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]
2.5...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]
1/10...4"	150 lb	230
1/10...3"	300 lb	580

CAUTION!
- *Pressures at 20° C / 68° F.*
- *For higher temperatures, the pressure and temperature ratings are as per ASME B16.5.*

NOTICE!
The specified torque values are dependent on variables (temperature, bolt material, gasket material, lubricants, etc.) which are not within the control of the manufacturer. Therefore the values should be regarded as indicative only.

EN 1092-1

Nominal size DN [mm]	Counter flanges & bolts		Max. allowable torque					
			Gasket: Filled PTFE / PTFE / PF29		Gasket: Graphite		O-ring	
	Rating	Size	Nm	ft-lb	Nm	ft-lb	Nm	ft-lb
2.5...10	PN 40	M12 x 141	-	-	-	-	32	24
15	PN 40	M12 x 141	-	-	-	-	36	27
25	PN 40	M12 x 141	22	16	32	24	-	-
40	PN 40	M16 x 176	47	35	66	49	-	-
50	PN 40	M16 x 203	58	43	82	60	-	-
80	PN 40	M16 x 261	48	35	69	51	-	-
100	PN 16	M16 x 303	75	55	106	78	-	-
100	PN 25	M20 x 176	94	69	133	98	-	-

ASME B 16.5

Nominal size [inch]	Counter flanges & bolts		Max. allowable torque					
			Gasket: Filled PTFE / PTFE / PF29		Gasket: Graphite		O-ring	
	Rating	Size	Nm	ft-lb	Nm	ft-lb	Nm	ft-lb
1/10...3/8"	150 lb	1/2"UNC x 142	-	-	-	-	35	26
1/2"	150 lb	1/2"UNC x 142	-	-	-	-	35	26
1"	150 lb	1/2"UNC x 142	24	18	33	24	-	-
1 1/2"	150 lb	1/2"UNC x 174	38	28	54	40	-	-
2"	150 lb	5/8"UNC x 215	58	43	83	61	-	-
3"	150 lb	5/8"UNC x 268	98	72	138	102	-	-
4"	150 lb	5/8"UNC x 318	75	55	108	80	-	-

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.

NOTICE!
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.

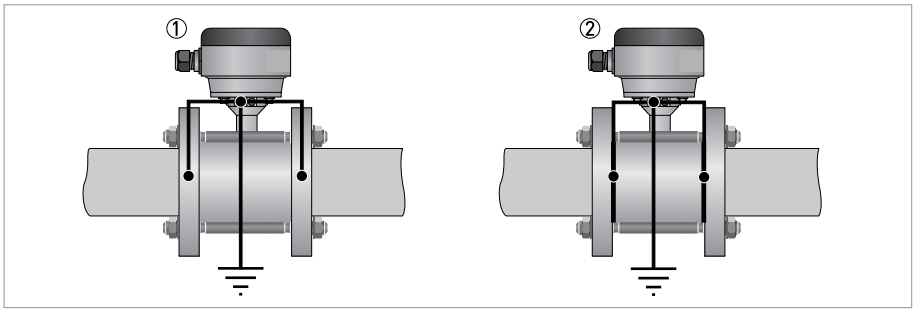


Figure 3-1: Grounding

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

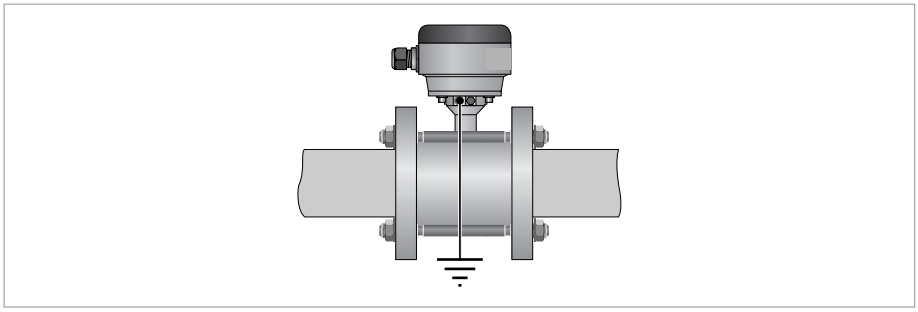


Figure 3-2: Build-in grounding rings for DN10-15 / 3/8 -½ "

NOTICE!
For diameter DN10 / 3/8" and DN15 / ½", grounding rings are integrated as standard in the tube construction.

Grounding rings

Figure 3-3: Grounding ring number 1

Grounding ring number 1 (optional for DN25...150 / 1...6"): Thickness: 3 mm / 0.1"

3.3 Virtual reference for IMT33A (4, N and H version)

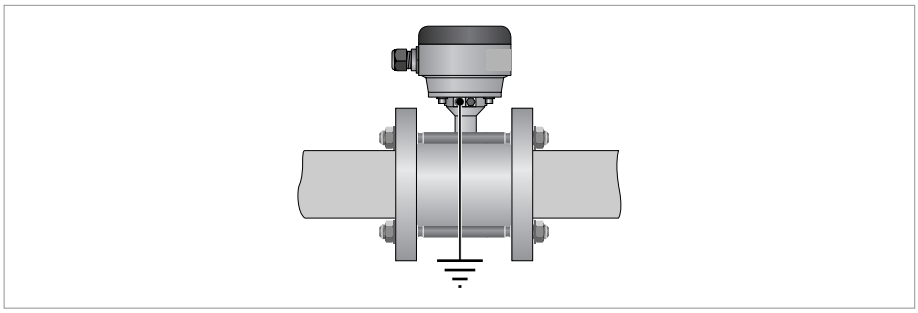


Figure 3-4: Virtual reference

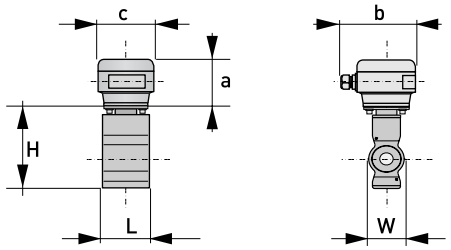
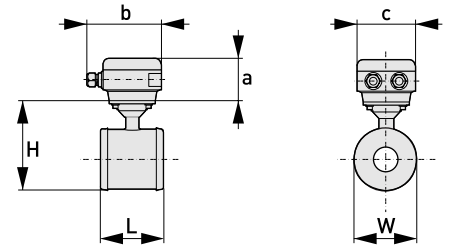
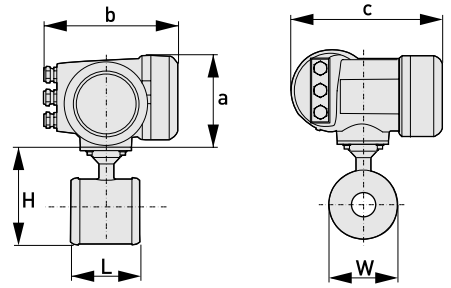
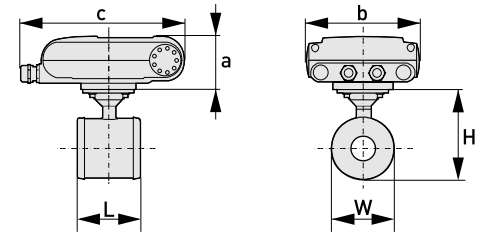
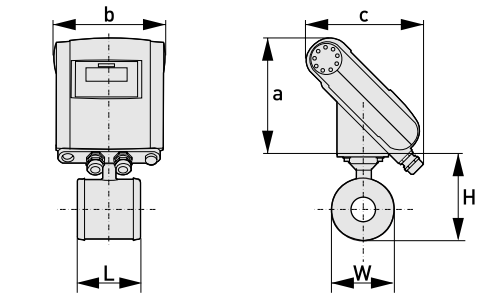
Minimum requirements:

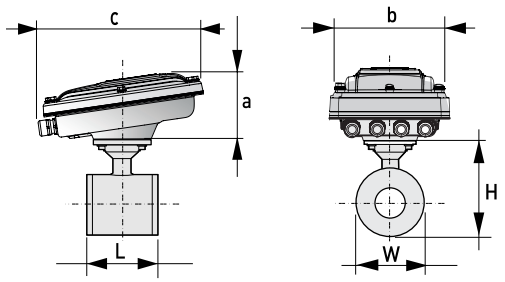
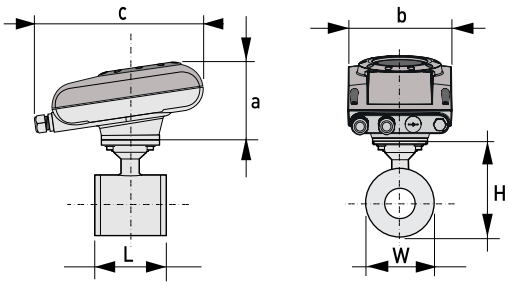
- Size: ≥ DN10 / 3/8"
- Electrical conductivity: ≥ 200 µS/cm
- Signal cable: max. 50 m / 164 ft, type DS

3.4 Connection diagrams

NOTICE!
For the connection diagrams, please refer to the documentation of the applicable converter.

4.1 Dimensions and weights

Remote version: DN2.5...15 / 1/10...1/2"		a = 88 mm / 3.5" b = 139 mm / 5.5" ① c = 106 mm / 4.2" Total height = H + a
Remote version: DN25...100 / 1...4"		a = 88 mm / 3.5" b = 139 mm / 5.5" ① c = 106 mm / 4.2" Total height = H + a
Compact version with IMT33A		a = 155 mm / 6.1" b = 230 mm / 9.1" ① c = 260 mm / 10.2" Total height = H + a
Compact version with IMT31A (0°)		a = 82 mm / 3.2" b = 161 mm / 6.3" c = 257 mm / 10.1" ① Total height = H + a
Compact version with IMT31A (45°)		a = 186 mm / 7.3" b = 161 mm / 6.3" c = 184 mm / 2.7" ① Total height = H + a

Compact stainless steel version with IMT31A (10°)		a = 100 mm / 4" b = 187 mm / 7.36" ① c = 270 mm / 10.63" Total height = H + a
Compact version with IMT30A (10°)		a = 100mm / 4" b = 157 mm / 6.18" ① c = 260 mm / 10.24" Total height = H + a

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

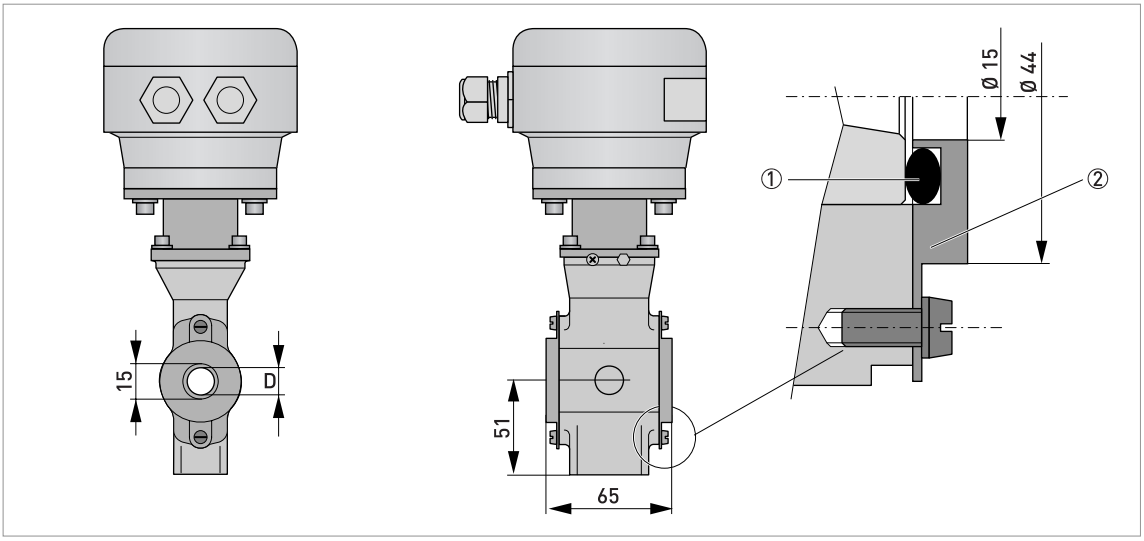


Figure 4-1: Construction details DN2.5...15 / 1/10...1/2"

① O-ring
② Grounding ring

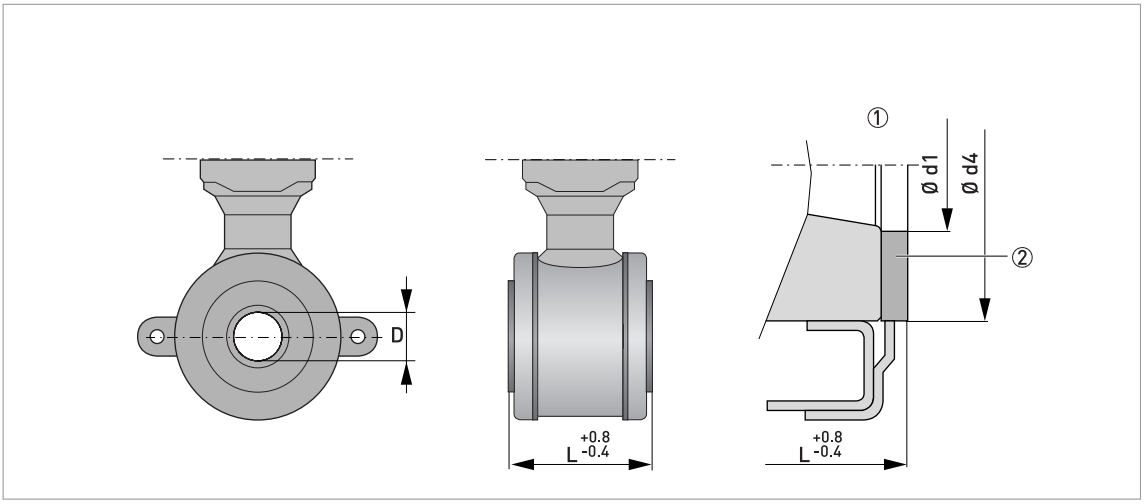


Figure 4-2: Construction details DN25...100 / 1...4"

① Situation without grounding rings
② Gasket

NOTICE!

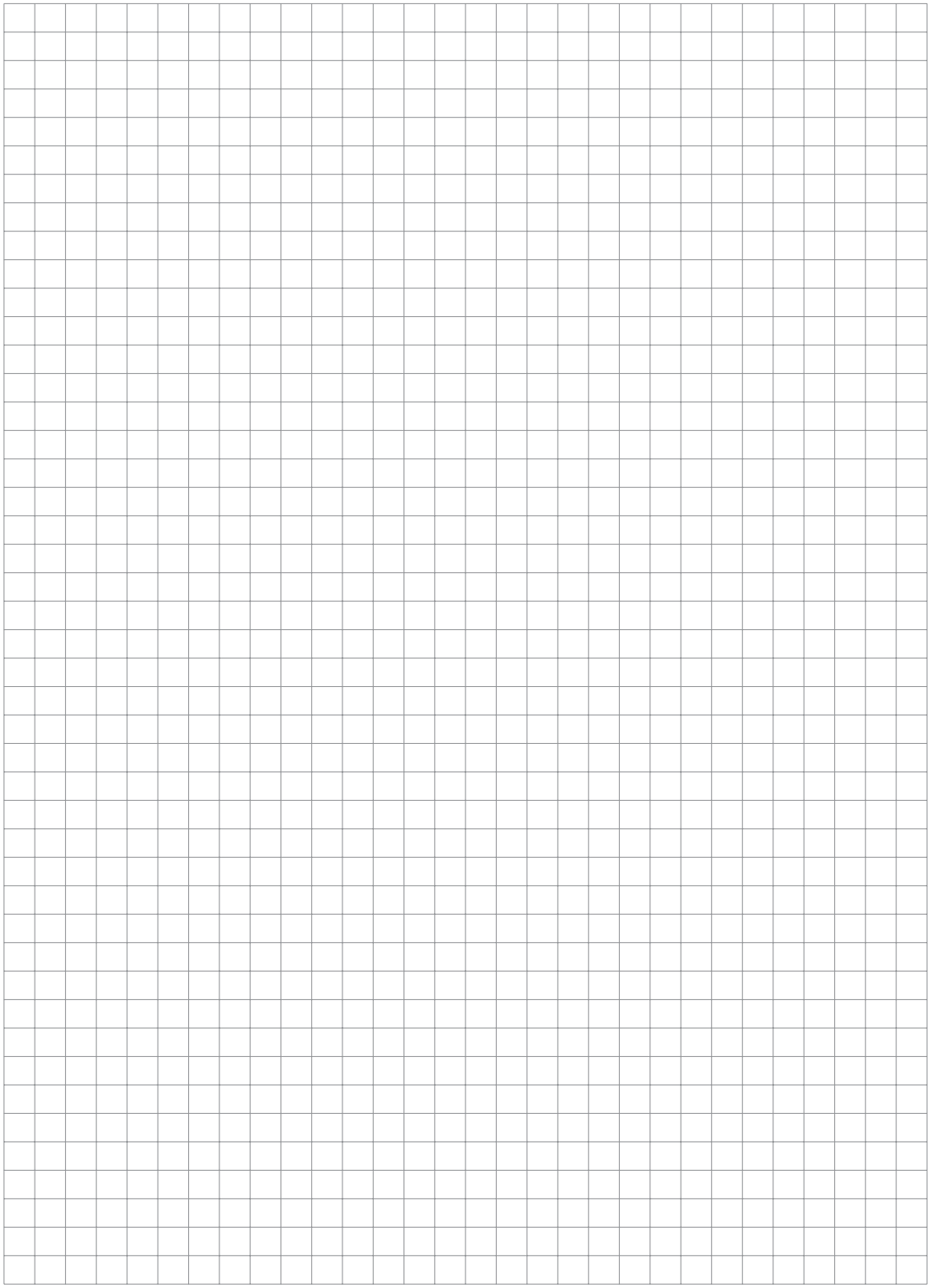
- *All data given in the following tables are based on standard versions of the flow tube only.*
- *Especially for smaller nominal sizes of the flow tube, the signal transmitter can be bigger than the tube.*
- *Note that for other pressure ratings than mentioned, the dimensions may be different.*
- *For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

Nominal size	Dimensions [mm]						Approx. weight [kg]
DN	L	H	W	D	Ød1	Ød4	
2.5	65 ①	123	44		-	-	1.6
4	65 ①	123	44		-	-	1.6
6	65 ①	123	44		-	-	1.6
10	65 ①	123	44		-	-	1.6
15	65 ①	123	44		-	-	1.6
25	58 ②	116	68	20	26	46	1.6
40	83 ②	131	83	30	39	62	2.4
50	103 ②	149	101	40	51	74	2.9
80	153 ②	181	133	60	80	106	6.4
100	203 ②	206	158	80	101	133	8.8

① Total fitting length of flowmeter with integrated rings: dimension L + 2 x gasket thickness.
② Total fitting length of flowmeter without rings: dimension L only.

Nominal size	Dimensions [inches]						Approx. weight [lb]
ASME	L	H	W	D	Ød1	Ød4	
1/10"	2.56 ①	4.84	1.73		-	-	3.53
1/6"	2.56 ①	4.84	1.73		-	-	3.53
¼"	2.56 ①	4.84	1.73		-	-	3.53
3/8"	2.56 ①	4.84	1.73		-	-	3.53
½"	2.56 ①	4.84	1.73		-	-	3.53
1"	2.28 ②	4.57	2.68	0.79	1.02	1.81	3.53
1½"	3.27 ②	5.16	3.27	1.18	1.54	2.44	5.29
2"	4.06 ②	5.87	3.98	1.57	2.01	2.91	6.39
3"	6.02 ②	7.13	5.24	2.36	3.15	4.17	14.11
4"	7.99 ②	8.11	6.22	3.15	3.98	5.24	19.40

① Total fitting length of flowmeter with integrated rings: dimension L + 2 x gasket thickness.
② Total fitting length of flowmeter without rings: dimension L only.



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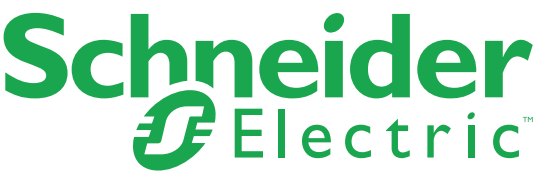

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