

BATCHFLUX 5500 C Handbook

Electromagnetic flowmeter for volumetric filling machines

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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.

The electromagnetic flowmeter is designed exclusively for measuring the volumetric flow rate of electrically conductive, liquid process products.

Minimum electrical conductivity:

- > 5 µS/cm (except for water)
- > 10 µS/cm

1.2 Certification

Product marking

CE

Figure 1-1: Example of marking logo

The manufacturer certifies successful testing of the product by applying the conformity mark on the device.

This device fulfils the statutory requirements of the relevant directives.

For more information on the directives, standards and the approved certifications, please refer to the declaration of conformity supplied with the device or downloadable from the manufacturer's website.

INFORMATION!
The BATCHFLUX 5500 is restricted for use in industrial machinery applications as defined in the Electrical Standard for Industrial Machinery, NFPA 79.

1.3 Safety instructions from the manufacturer

1.3.1 Copyright and data protection

The contents of this document have been created with great care. Nevertheless, we provide no guarantee that the contents are correct, complete or up-to-date.

The contents and works in this document are subject to copyright. Contributions from third parties are identified as such. Reproduction, processing, dissemination and any type of use beyond what is permitted under copyright requires written authorisation from the respective author and/or the manufacturer.

The manufacturer tries always to observe the copyrights of others, and to draw on works created in-house or works in the public domain.

The collection of personal data (such as names, street addresses or e-mail addresses) in the manufacturer's documents is always on a voluntary basis whenever possible. Whenever feasible, it is always possible to make use of the offerings and services without providing any personal data.

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We hereby expressly prohibit the use of the contact data published as part of our duty to publish an imprint for the purpose of sending us any advertising or informational materials that we have not expressly requested.

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 cannot 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.

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.

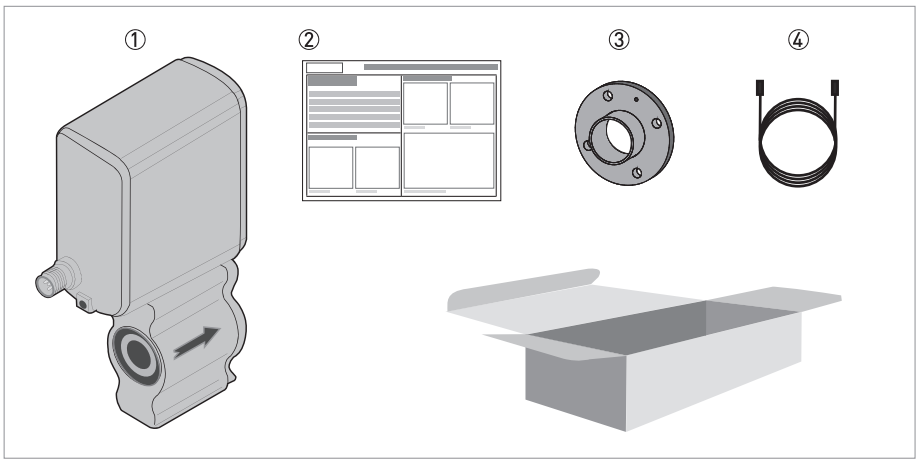


Figure 2-1: Scope of delivery

① Flowmeter in ordered size
② Product documentation (on request)
③ Counter flange (on request)
④ Cable (on request)

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

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 compact versions are available:

- Version 1: converter directly mounted on cast sensor housing in size DN2.5...6
- Version 2: converter and sensor in solid cast BNG construction for DN10 and DN15
- Version 3: converter mounted on conventional sensor construction (DN25 and DN40)

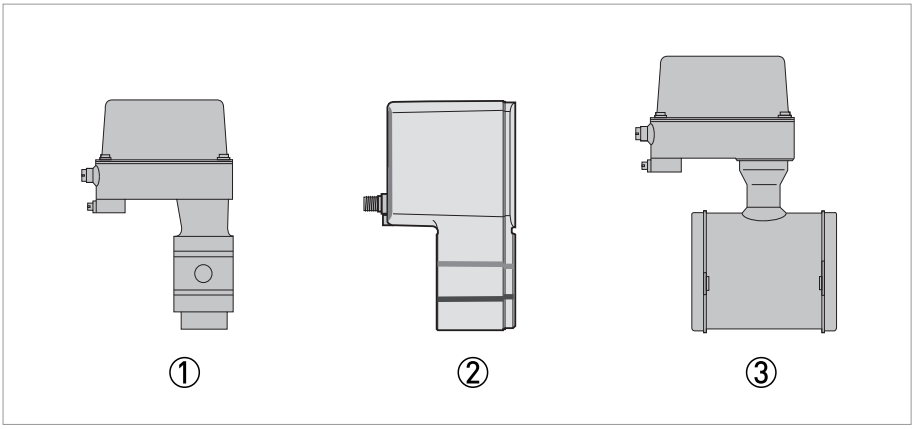


Figure 2-2: Device version

① DN2.5 - 4 - 6 / 1/10 - 1/6 - 1/4 inch
② DN10 - DN15 / 3/8 - 1/2 inch
③ DN25 - DN40 / 1 - 1 1/2 inch

2.3 Nameplate (example)

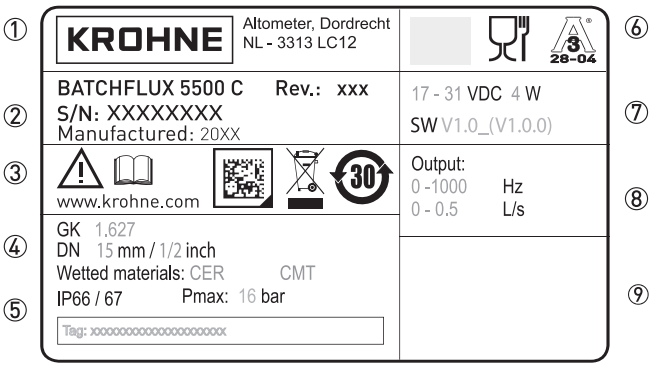


Figure 2-3: Example of nameplate

① Name and address of the manufacturer
② Type designation of the flow meter, serial number and manufacturing date
③ Manufacturer website, safety instructions, data matrix, disposal and China RoHs marking
④ Calibration and device data, size and wetted materials
⑤ Tag number, protection category and maximum pressure
⑥ Conformity marking (eg. CE logo and other certifications)
⑦ Electrical values and software revision number
⑧ Output data
⑨ Additional info

Auto ID according to DIN specifications

The auto ID code (data matrix) guides you directly to the PICK server (Product Information Center KROHNE).
Scan the auto ID code on the device nameplate to download all product specific information.

- Handbooks, Quick Starts and Supplementary instructions
- Calibration certificates
- Factory settings as .bin file
- Parameter data sheets
- Digital nameplates

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 Pre-installation requirements

Make sure that you have all necessary tools available:

- Small wrench (M5) for connection to ground
- Torque wrench for installing flowmeter in pipeline.

Always tighten the bolts uniformly and in diagonally opposite sequence!
Accessories necessary for the correct installation are available on request at the manufacturer.

Make sure that these accessories are available before starting installation:

- O-rings / L-ring gasket
- Special pipe flanges
- Stud bolts with lock washer, plain washer and nut

INFORMATION!
To facilitate servicing and/or exchanging of the device, please note that:
- *It must be possible to shut off the flow through the pipeline (control valve upstream in pipeline).*
- *Drain the pipeline before removing the device (provide drain valve).*

3.4 General requirements

INFORMATION!
The following precautions must be taken to ensure a 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.*
- *Support the pipeline on both side of the flowmeter.*
- *Do not expose the signal converter to intense vibrations and mechanical shocks. The measuring devices are tested for a vibration/shock level as described in the chapter "Technical data".*

3.4.1 Vibration

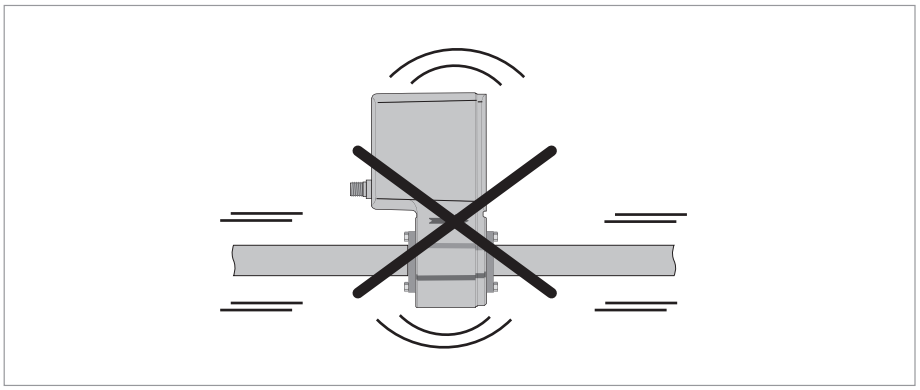


Figure 3-1: Avoid vibrations

3.4.2 Magnetic field

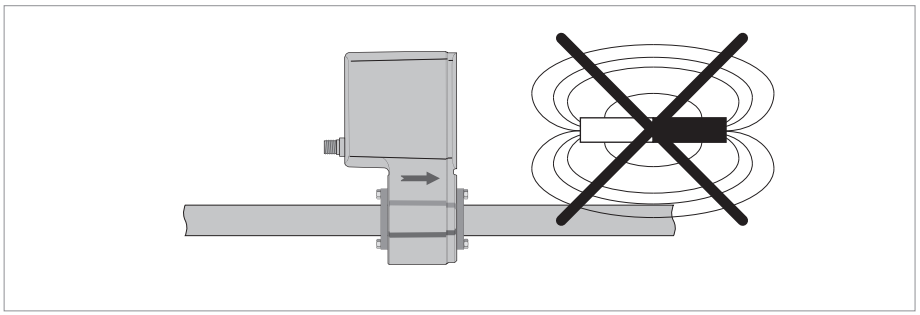


Figure 3-2: Avoid strong magnetic fields

3.5 Installation conditions

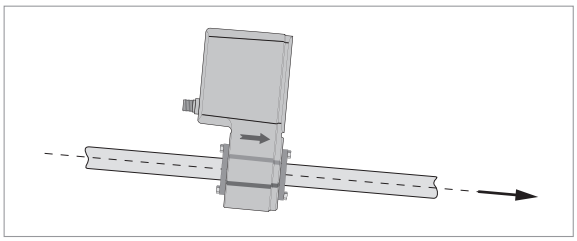


Figure 3-3: Horizontal pipe run

CAUTION!
Install in a slightly descending pipe section, to prevent air from collecting and to avoid faulty measurements (meter can drain).

INFORMATION!
Support the pipeline on both side of the flowmeter. Make sure the M12 connector is on the flow inlet side.

3.5.1 Inlet and outlet

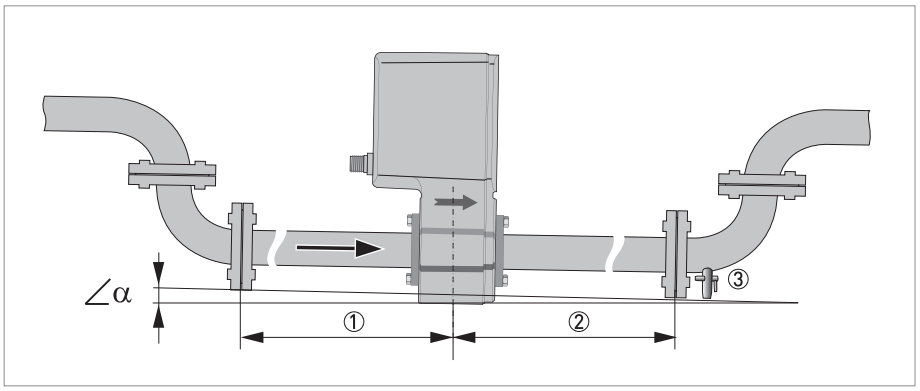


Figure 3-4: Inlet and outlet section

① Refer to chapter "Bends in 2 or 3 dimensions"
② ≥ 2 DN
③ Drain valve (to empty pipeline)

∠ α > 2°

3.5.2 Bends in 2 or 3 dimensions

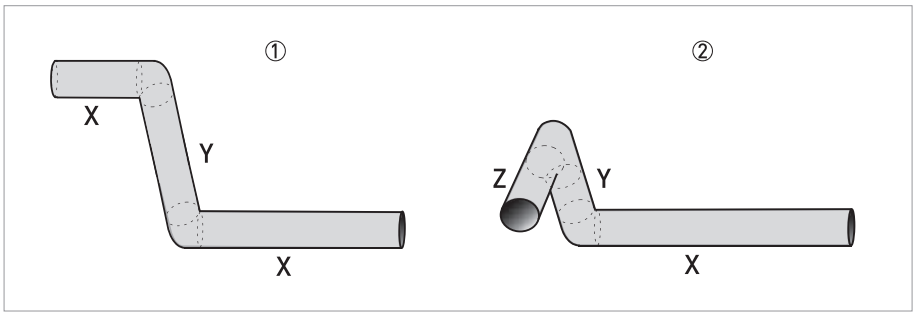


Figure 3-5: 2 and/or 3 dimensional bends upstream of the flowmeter

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

INFORMATION!
*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).*

3.5.3 Open feed or discharge

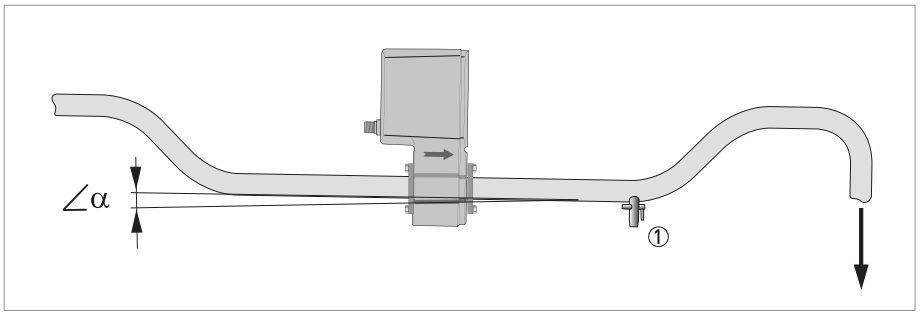


Figure 3-6: Installation in front of an open discharge

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

3.5.4 Pump

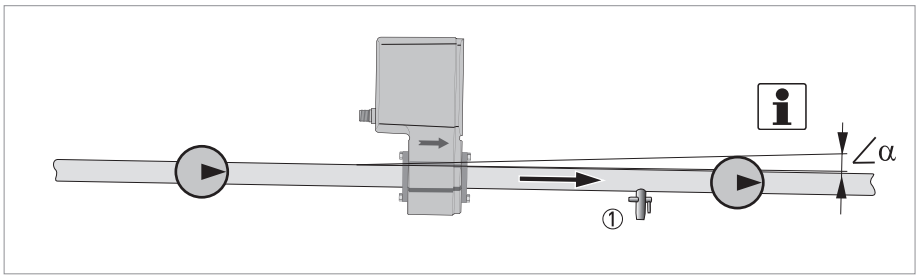


Figure 3-7: Installation behind a pump

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

INFORMATION!
Recommended position to install a flowmeter is downstream a pump (on a position where the flow disturbances of the pump are resolved).
An electromagnetic flowmeter can be installed in the suction line of a pump if there is no cavitation in the pipeline system.

3.5.5 Control valve

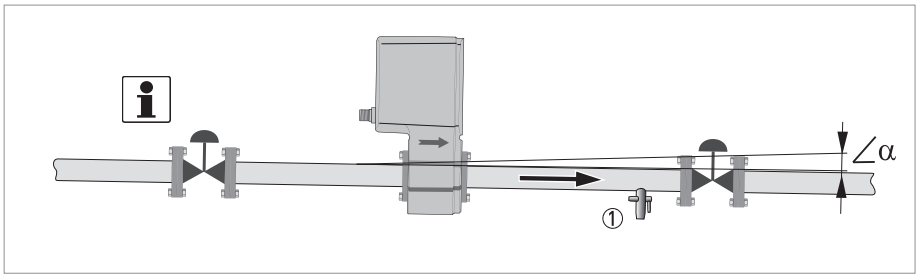


Figure 3-8: Installation in front of a control valve

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

INFORMATION!
Recommended position to install a flowmeter is upstream a control valve.
An electromagnetic flowmeter can be installed downstream of the control valve if there is no cavitation in the pipeline system (e.g. flow profile disturbances are resolved).

3.5.6 Mounting position

The BATCHFLUX 5500 C flowmeter can be installed in every position.

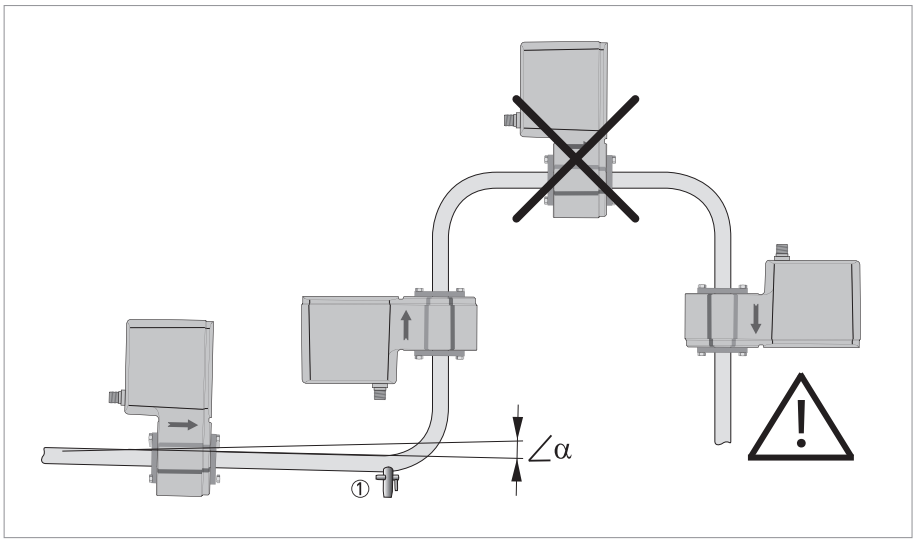


Figure 3-9: Installation in bending pipes

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

CAUTION!
For correct measurements, avoid draining or partial filling of the flow sensor during operation.

INFORMATION!
Vertical down position only in conjunction with a control valve.

INFORMATION!
Prevent installation near hot product tanks. If possible, try to insulate the flowmeter from radiant heat sources.

3.5.7 Installation position

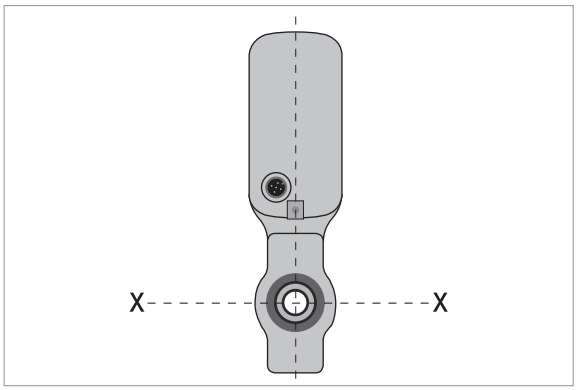


Figure 3-10: Horizontal installation

CAUTION!
Mount the flow sensor in such a way that the electrode axis (X--------X) is approximately in a horizontal pipe run.

3.5.8 Flange deviation

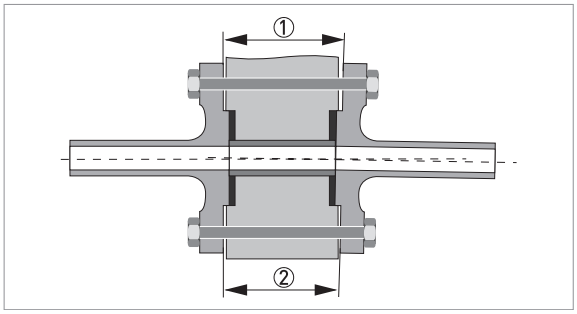


Figure 3-11: Mounting position and flange deviation

① L_{max}
② L_{min}

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

3.5.9 Temperatures

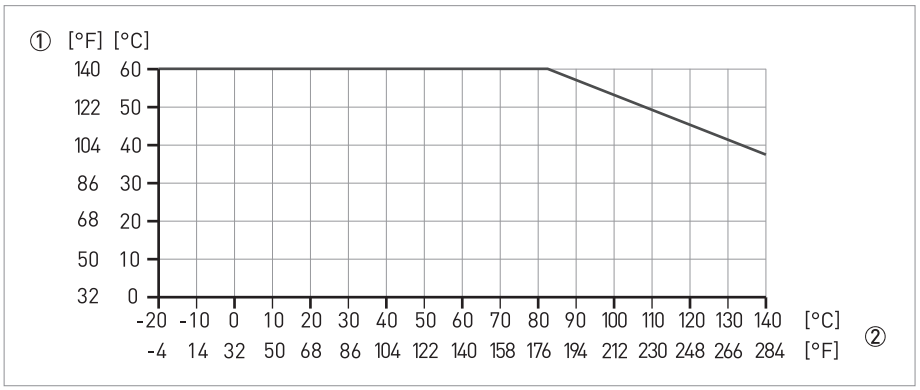


Figure 3-12: Process temperature vs ambient temperature

① Ambient temperature
② Process temperature

INFORMATION!
For more information on temperatures, refer to Technical data on page 29

3.5.10 Hot filling

CAUTION!
On high temperature pipes and where temperatures exceed 100°C / 212°F, provide facilities to compensate for longitudinal expansion of pipeline (due to heat-up). Use flexible pipe elements (e.g. elbows).

INFORMATION!
The electronics temperature can be monitored with the CAN bus version. Please ensure that the electronics temperature stays below 85°C / 185°F at all times.

Installation position

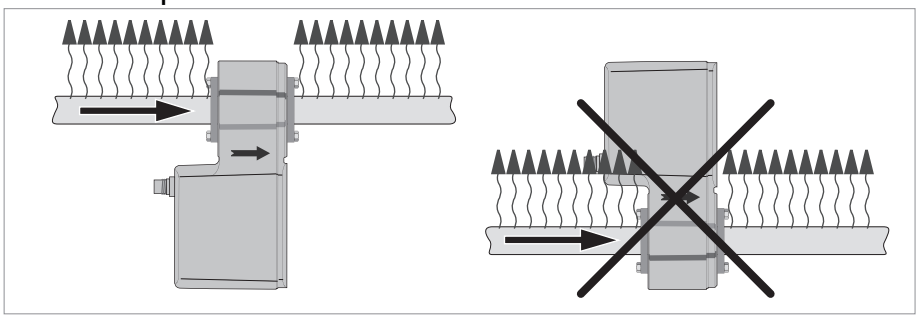


Figure 3-13: In case of hot fluids

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!

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

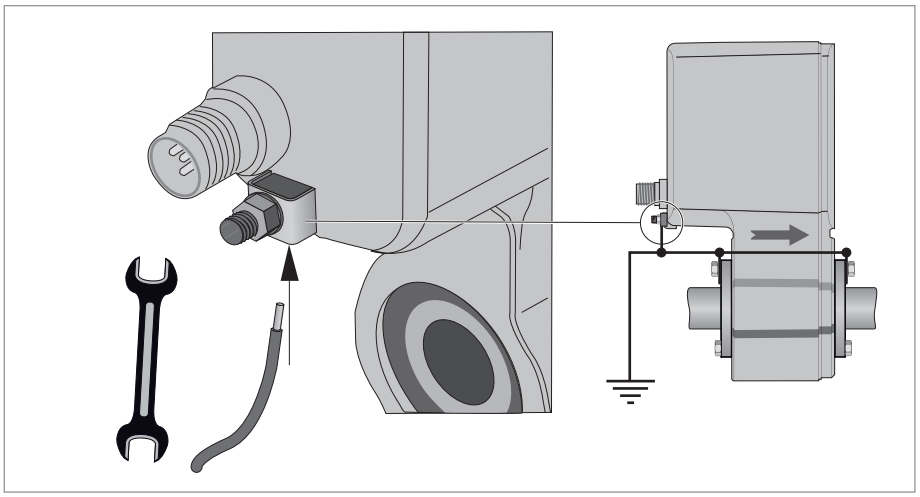


Figure 4-1: Grounding

CAUTION!
A grounding wire must be connected to the screw terminal for functional earth (FE), to ensure correct device operation.

CAUTION!
The grounding wire should not transmit any interference voltage. Therefore do not ground any other electrical device at the same conductor.

CAUTION!
Do not remove the secured (glued) adjusting screw. Removing the screw will affect the gas tightness and durability of the device.

CAUTION!
When connecting to functional extra-low voltages (24VDC), ensure that you use protective separation (PELV) according to IEC 60364/IEC 61140 or VDE 0100/VDE 0106.

4.3 Electrical connection

4.3.1 Cable connector M12 - 5 pin

All the operating data are preset at the factory. For changing the parameters and diagnostic purposes BATCHMon plus operation software can be used.

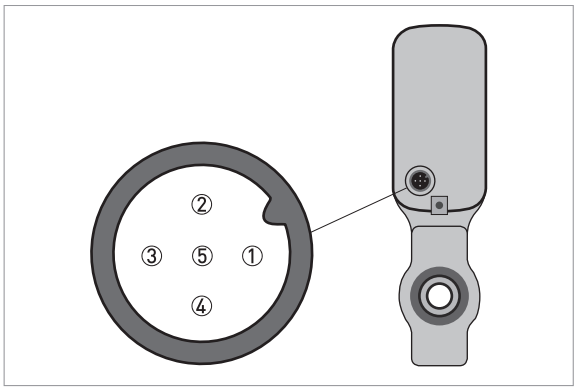


Figure 4-2: Cable connector description

① +24 VDC
② Frequency +
③ Frequency -
④ Ground
⑤ To be connected for servicing only

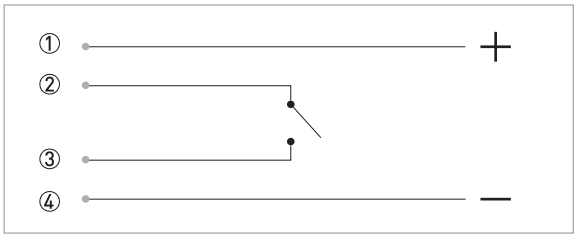


Figure 4-3: Connection diagram

Note: the switch circuit have a resistance of approximately 76 Ohm.

4.3.2 Cable connector M12 - 8 pin duo contour (with CAN bus output)

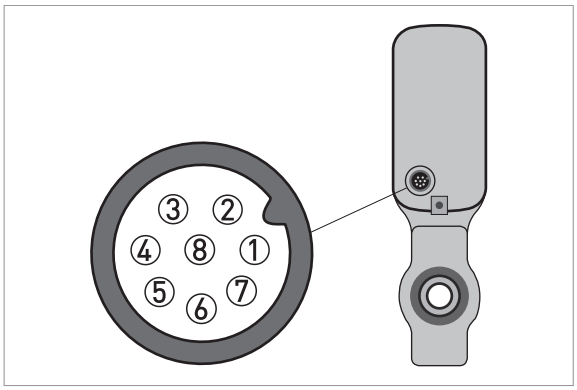


Figure 4-4: Cable connector description

① Ground power supply and service interface
② To be connected for servicing only
③ CAN high
④ Ground CAN I/O
⑤ CAN low
⑥ CAN low
⑦ CAN high
⑧ + 24 VDC

4.3.3 Cable connector M12 - 8 pin (with status output)

The 8 pin electric connection has a status output. This status output is configurable to customer specifications and offers either the flow direction (of the medium) or an error signal.

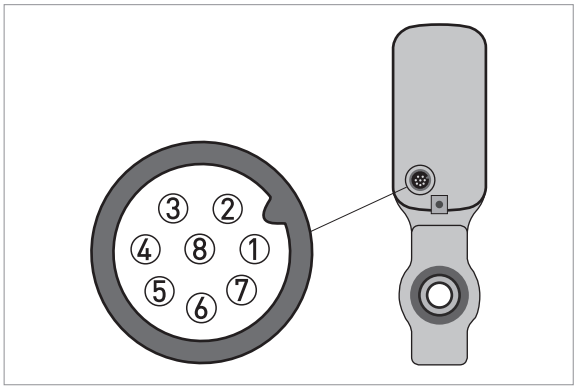


Figure 4-5: Cable connector description

① + 24 VDC
② Not Connected
③ To be connected for servicing only
④ Ground
⑤ Frequency +
⑥ Frequency / status common
⑦ Status output
⑧ Not Connected

Options on status output ⑦ : Off / Error / Flow direction

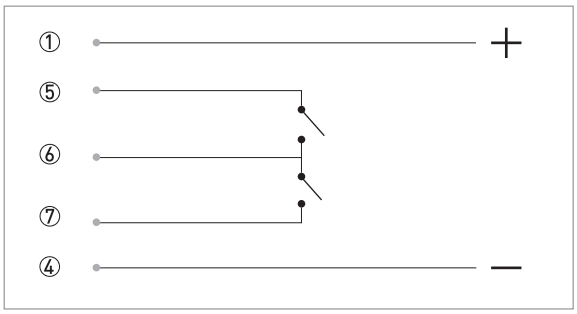


Figure 4-6: Connection diagram

Note: the switch circuits have a resistance of approximately 76 Ohms

Mode

- Status output On / Off
- Flow direction

- Default value: Flow Direction
- Forward flow: status output: open
- Reversed flow: status output: closed

- Error software / application failure

Error signaling for following events: software failure or application failure (detection of empty pipe only). No error: status output open

4.3.4 Plug types to connect the flowmeter

Use one of the following attachment plug types to connect the flowmeter to a third party system:

- Moulded plug, straight or angle-entry form.
- Integrally extruded plug with cable in various lengths.
- Moulded plug, straight form, especially suitable for high-interference environments.
- Suitable cables can be obtained from the manufacturer.
- Make sure the cable and connector has the necessary IP rating and chemical compatibility for your application.

Possible other vendors of these plugs are:

- Binder
- Hirschmann
- Lumberg
- Amphenol
- Coninvers

INFORMATION!
For UL systems/applications, approved field wiring and connectors must be used. The temperature rating of the cable must be suitable for the application and shall be at least 70 °C.

5.1 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.

5.2 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.

5.3 Returning the device to the manufacturer

5.3.1 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.



WARNING!
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.*



WARNING!
If the device has been operated with toxic, caustic, radioactive, 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 it is safe to handle and stating the product used.*

5.3.2 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:
Telephone number: Fax number:		Email address:
Manufacturer order number or serial number:		
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 caused by any residual media contained in this device when it is returned.		
Date:		Signature:
Stamp:		

5.4 Disposal

Disposal must be carried out in accordance with legislation applicable in your country.
This instrument is specially designed for installation as part of another equipment [LSFI -Large-Scale Fixed Installation] and not in the scope of WEEE directive.

The instrument contains Printed Circuit Boards that needs to be separated during recycling.

It is the End-User's responsibility to dispose of these electronic parts in accordance with legislation applicable in the country.

Separate collection of WEEE (Waste Electrical and Electronic Equipment):



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.



INFORMATION!
This device cannot be opened and disassembled, only the external cable can be disconnected and recycled. Contact the local support office if you need related recycling information regarding the materials used.

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.

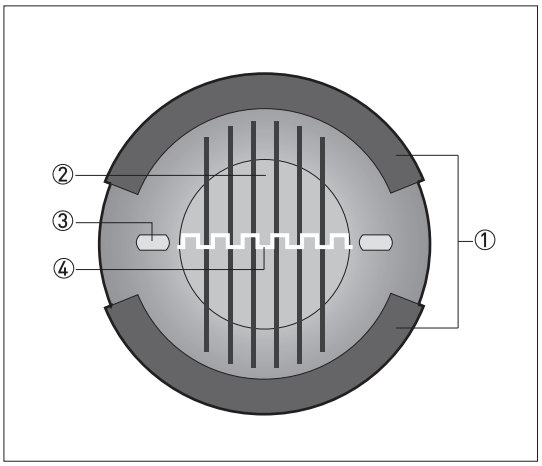


Figure 6-1: Measuring principle

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 (Download Center).*

Measuring system

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

Design

Features	Standard wet calibration
Modular construction	The measurement system consists of a flow sensor and a signal converter. It is only available as compact version.
Compact version	BATCHFLUX 5500 C
Nominal diameter	DN2.5...40 / 0.1...1½", CAN bus version DN15 / ½" only
Measurement range	-12...+12 m/s / -39...+39 ft/s
User interface	
Operating data	Factory set to customer specification.
Human Machine Interface (HMI)	Option: BATCHMon Plus software
Cable connections	Standard 1x M12, 5- pin connector IEC 61076-2-101:2024
	Standard 1x M12, 8- pin connector IEC 61076-2-101:2024
	With CAN bus output 1x M12, 8- pin duo contour connector IEC 61076-2-010:2021

Measuring accuracy

Reference conditions	Medium: water	
	Inlet / outlet section: 10 DN / 5 DN	
	Valve closing time variation: < 1 ms	
	Flow velocity: 1 m/s, flow conditions similar to EN 29104	
	Operating pressure: 1 bar / 14.5 psi	
Error limits at reference conditions for tap water, 400 µS/cm, 20°C / 68°F:		
Maximum measuring error	**DN2.5...6:**	
	v ≤ 1 m/s: ± 0.4% of measured value + 1 mm/s	
	v > 1 m/s: ± 0.5% of measured value	
	DN10...15:	
	± 0.2% of measured value + 1 mm/s	
	DN15 CAN bus:	
	v ≤ 3.4 m/s: ± 0.15% of measured value + 1 mm/s (Optimization switched "on", see supplementary instruction CAN open)	
	DN25...40:	
	v ≤ 1 m/s: ± 0.2% of measured value + 1 mm/s	
	v > 1 m/s: ± 0.3% of measured value	
Repeatability	**DN2.5...6 / DN25...40:**	**Standard deviation:**
	Filling time 1.5...3 s:	≤ 0.4%
	Filling time 3...5 s:	≤ 0.2%
	Filling time > 5 s:	≤ 0.1%
	DN10...15:	**Standard deviation:**
	Filling time 1.5...3 s:	≤ 0.15%
	Filling time 3...5 s:	≤ 0.10%
	Filling time > 5 s:	≤ 0.07%
Error limits at reference conditions for hot water, 400 µS/cm, 80°C / 176°F:		
Maximum measuring error	**DN10...15:**	
	± 0.2% of measured value + 1 mm/s	
Repeatability	**DN10...15:**	**Standard deviation:**
	Filling time 1.5...3 s:	≤ 0.3%
	Filling time 3...5 s:	≤ 0.2%
	Filling time > 5 s:	≤ 0.1%

Operating conditions

Temperature	
Process temperature	Dependent on ambient temperature. For detailed information, refer to *Temperatures* on page 19.
Cleaning temperature	SIP: Maximum 1 hour at 150°C / +302°F
	CIP: Maximum 1 hour at 140°C / +284°F
Shock	≤ 3 K/s
Ambient temperature	-40...+60°C / -40...+140°F
Storage temperature	-50...+70°C / -58...+158°F
Pressure	
Ambient	Atmospheric
Process pressure	up to 16 bar / 232 psi for DN10...15
	up to 40 bar / 580 psi for DN2.5...6 / DN25...40
	Option: DN25 up to 200 bar / 2900 psi
Vacuum load	0 mbara / 0 psig
Humidity (ambient)	Suitable for wet location (RH=100%)
Chemical properties	
Physical condition	Liquids
Electrical conductivity	≥ 5 µS/cm (≥ 10 µS/cm for demineralised water)
Maximum flow velocity	-12...+12 m/s / -39...+39 ft/s

Installation conditions

Installation	For detailed information, refer to *Installation* on page 12.
Inlet run	≥ 5 DN
Outlet run	≥ 2 DN
Dimensions and weights	For detailed information, refer to *Dimensions and weights* on page 34.

Materials

Sensor- and converter housing	Stainless steel 1.4404 / 1.4408
Measuring tube	DN2.5...25 Zirconium oxide, DN40 Aluminium oxide
Measuring electrodes	DN2.5..25 Cermet (fused in place ceramic platinum)
	DN40: Platinum

Process connections

Connection	Sandwich design
	Optional: Pressure relief groove at flange facing of the sensor
	Construction drawings of recommended counter flanges are available on the manufacturer website, under services.

Electrical connections

Power supply	24 VDC ± 25% Limited Energy Circuit Cl.9.4/UL61010-1, Class 2 per NEC, LPS/UL60950-1 or equivalent
Power consumption	≤ 3 W (≤ 4 W CAN bus version)
Switch on current	≤ 5 A (< 100 µs) at 24 VDC
Voltage loss	Possible for a maximum of 20 ms according to NAMUR NE21.
BATCHMON	For parameter setting and diagnostic purposes, communication via PC with a single device (optional)
Status output	Configurable: error, flow direction (factory set), on/off
Frequency output	
Type	Frequency (passive) / galvanically isolated from power supply
Function	All operating data preset at factory.
Interval	Counter gate time ≥ 1000 / ($P_{100\%}$ [Hz])
Frequency output	≤ 10 kHz
Pulse width at full scale value	≤ 10 Hz: 50, 100, 200 or 500 ms
	> 10 Hz: automatic, pulse width = 1 / (2 x $f_{100\%}$) or symmetrical, 1:1
Passive operation	Connection of electronic or electromechanical counters.
	External voltage: ≥ 5 ≤ 30 VDC / ≤ 24 VAC
	Load: I_{max} ≤ 20 mA
Low flow cut-off	Threshold: 0...20%
	Hysteresis: 0...20%
	Hysteresis ≤ threshold
	Depending on customers specifications.
CAN bus version	
Interface	1 Mbit/s Highspeed CAN (ISO 11898-2)
Isolation	Galvanically isolated from power supply (500 V).
Protocol	CAN open (DIN EN 50325-4:2003-07: industrial communications subsystem based on ISO 11898), CiA-301 V4.2 compliant.
Baudrate	125, 250, 500, 1000 kBit/s
Cable length	Maximum 15 m (unshielded)

Approvals and certifications

CE	
This device fulfills the statutory requirements of the relevant directives. The manufacturer certifies successful testing of the conformity mark on the device.	
	For more information on the directives, standards and the approved certifications, please refer to the declaration of conformity supplied with the device or downloadable from the manufacturer website.
Other approvals and standards	
Protection category acc. to IEC 60529	DN2.5...6 / DN25...40: IP66/67
	DN10...15: IP69 (evaluated by accredited laboratory (AKUVIB))
UL	Certified Safety US_CA E547320
Shock test	IEC 60068-2-2: 30g, half sine, time 18ms.
Vibration test	IEC 60068-2-64: f1 = 20 - 2000Hz. rms a = 4,5g, t = 30 min.
Hygienic	DN2.5...40: 3A
	FDA approved materials
	EN1935/2004 / EC 2023/2006
	GB4806-4

6.3 Dimensions and weights

DN2.5...6

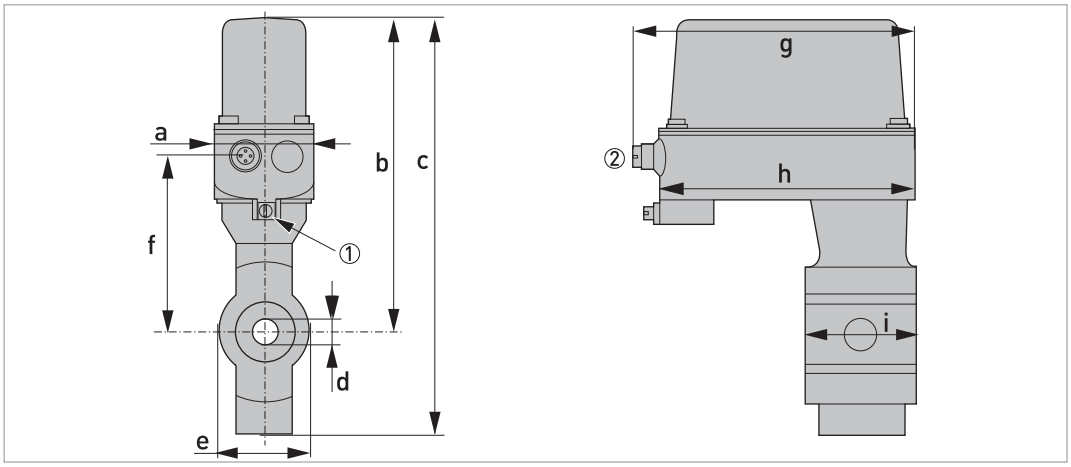


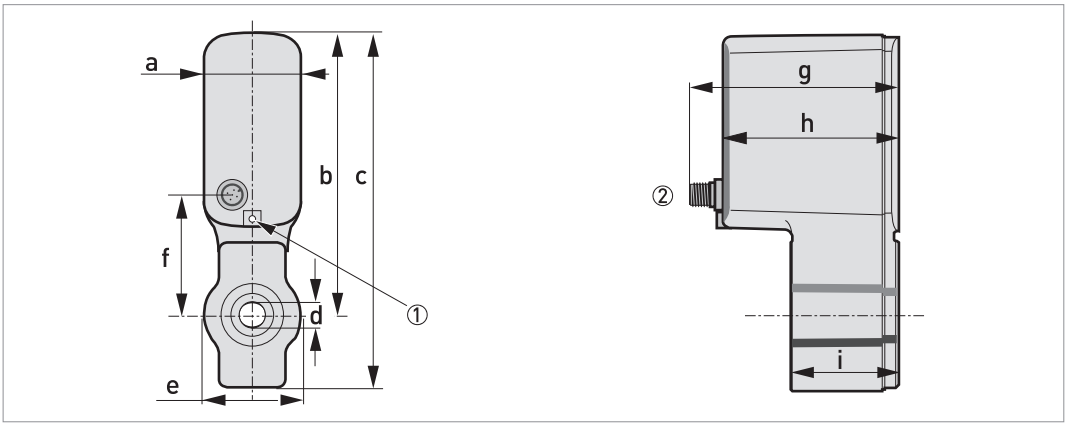
Figure 6-2: Dimensions

① (Grounding)
② M12: 5 - 8 pins connector

Nominal size	Dimensions [mm]									Weight [kg]
	a	b	c	d	e	f	g	h	i	
DN2.5	50	156	206	6 → 2.5	44	88	141	128	54	1.5
DN4	50	156	206	7 → 3.2	44	88	141	128	54	1.6
DN6	50	156	206	9 → 4.8	44	88	141	128	54	1.6
Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle										

Nominal size	Dimensions [inches]									Weight [lb]
	a	b	c	d	e	f	g	h	i	
1/10"	1.97	6.14	8.11	0.24 → 0.10	1.73	3.46	5.55	5.0	2.13	3.4
1/6"	1.97	6.14	8.11	0.28 → 0.13	1.73	3.46	5.55	5.0	2.13	3.6
1/4"	1.97	6.14	8.11	0.35 → 0.19	1.73	3.46	5.55	5.0	2.13	3.6
Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle										

DN10...15



① (Grounding)
② M12: 5 - 8 pins connector

Nominal size	Dimensions [mm]									Weight [kg]
	a	b	c	d	e	f	g	h	i	
DN10	50	140	179	10.5 → 8	45.4	60	106.5	88	54	1.4
DN15	50	140	179	14 → 12	45.4	60	106.5	88	54	1.4
Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle										

Nominal size	Dimensions [inches]									Weight [lb]
	a	b	c	d	e	f	g	h	i	
3/8"	1.97	5.51	7.05	0.41 → 0.31	1.79	2.36	4.19	3.46	2.13	3.1
1/2"	1.97	5.51	7.05	0.55 → 0.47	1.79	2.36	4.19	3.46	2.13	3.1
Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle										

DN25...40

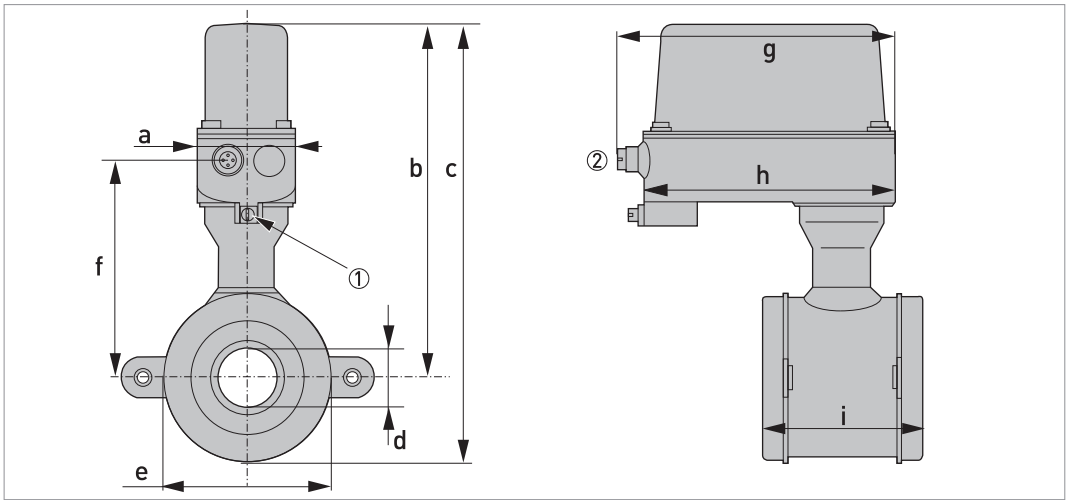


Figure 6-3: Dimensions

① (Grounding)
② M12: 5 - 8 pins connector

Nominal size	Dimensions [mm]									Weight [kg]
	a	b	c	d	e	f	g	h	i	
DN25	50	170	204	26 → 20	68	102	141	128	58	1.6
DN40	50	177	219	39 → 30	84	117	141	128	83	2.3
Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle										

Nominal size	Dimensions [inches]									Weight [lb]
	a	b	c	d	e	f	g	h	i	
1"	1.97	6.69	8.03	1.02 → 0.79	2.68	4.02	5.55	5.04	2.28	3.6
1 1/2"	1.97	6.97	8.62	1.54 → 1.18	3.30	4.61	5.55	5.04	3.27	5.1
Note on dimension d: As the diameter reduces to the middle, the diameter is specified for the inlet and for the middle										

6.4 Measurement accuracy

Every electromagnetic flowmeter is calibrated by direct volume comparison. The wet calibration validates the performance of the flowmeter under reference conditions against accuracy limits.

The accuracy limits of electromagnetic flowmeters are typically the result of the combined effect of linearity, zero point stability and calibration uncertainty.

Reference conditions

- Medium: water
- Temperature: +5...+35°C / +41...+95°F
- Operating pressure: 0.1...5 barg / 1.5...72.5 psig
- Inlet section: ≥ 5 DN
- Outlet section: ≥ 2 DN

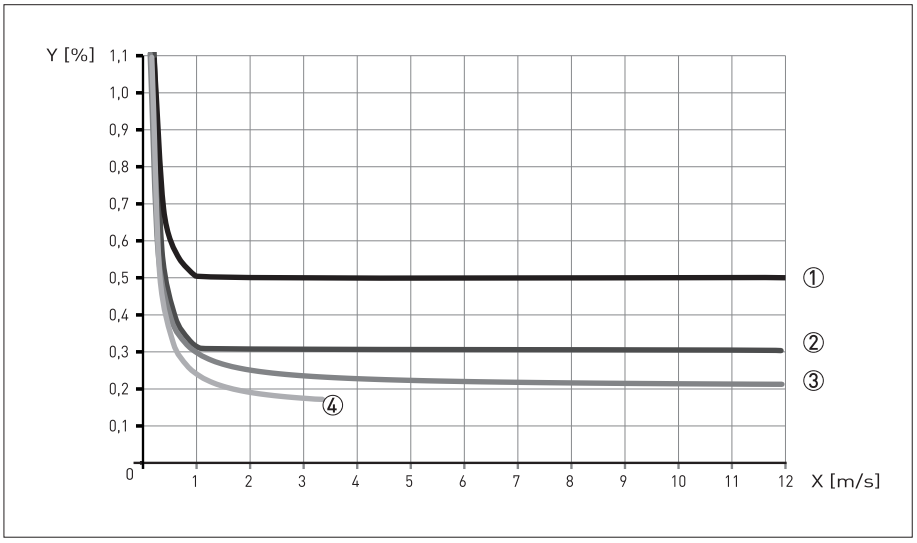


Figure 6-4: Measuring accuracy
X [m/s]: Flow velocity; Y [%]: Maximum measuring error

Accuracy

Size	Velocity	Accuracy	Curve
DN2.5...6 / 1/10...1/4"	v ≤ 1 m/s	0.4% of measured value + 1 mm/s	①
	v > 1 m/s	0.5% of measured value	
DN10...15 / 3/8...1/2"		0.2% of measured value + 1 mm/s	③
DN25...40 / 1...1½"	v ≤ 1 m/s	0.2% of measured value + 1 mm/s	②
	v > 1 m/s	0.3% of measured value	
DN15 / 1/2" CAN bus version	v ≤ 3.4 m/s	0.15% of measured value + 1 mm/s	④ Note *
	v > 3.4 m/s	0.2% of measured value + 1 mm/s	③

Note *: with optimized accuracy switched on

6.5 Measurement range

For the frequency and status output version, consult the tables below for default factory settings..

Flow characteristics values in SI units

Nominal diameter [mm]	Full scale value [l/s]	Pulse value [ml]	Low flow cut off [ml/s]
2.5	0.017	0.01667	0.250
4	0.042	0.04167	0.625
6	0.083	0.08333	1.250
10	0.500	0.50000	22.500
15	0.500	0.50000	22.500
25	2.222	2.22222	33.333
40	5.556	5.55556	83.333

Flow characteristics values in US units

Nominal diameter [inch]	Full scale value [gal/s]	Pulse value [oz fl]	Low flow cut off [oz fl/s]
1/10	0.0044	0.00056	0.0085
1/6	0.0110	0.00141	0.0211
1/4	0.0220	0.00282	0.0423
3/8	0.1321	0.01691	0.7608
1/2	0.1321	0.01691	0.7608
1	0.5871	0.07514	1.1271
1 1/2	1.4676	0.18786	2.8178

INFORMATION!
Other pulse settings and measuring ranges on request.

6.6 Counter Flanges

The BATCHFLUX 5500 must be mounted between counter flanges (as shown in the following drawing), to ensure that the device complies to hygiene regulations and to avoid damaging the ceramic flow tube. Counter flanges conforming to DIN11850 r2 / DIN 11866 Reihe A / EN 10357 series A can be obtained via the manufacturer.

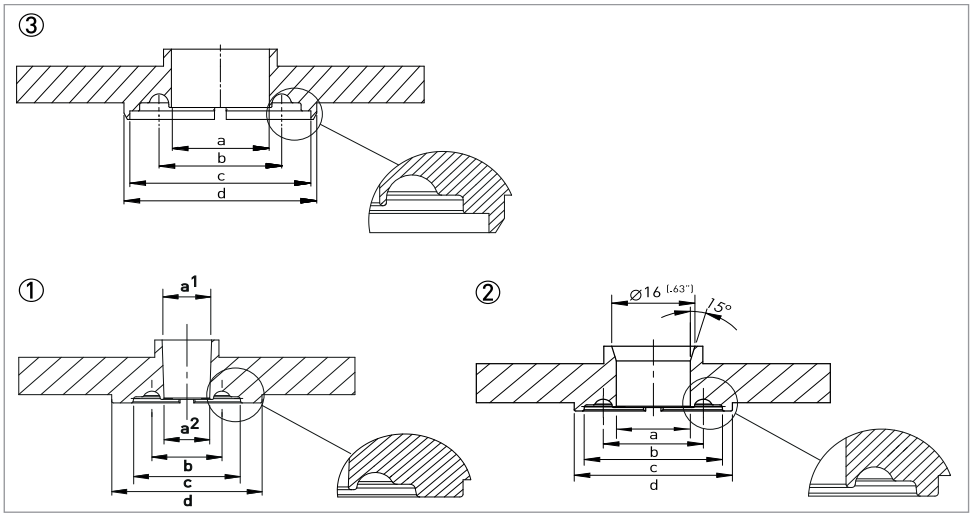


Figure 6-5: Counter flanges

Sizes of flanges

	DN	a [mm]	b [mm]	c [mm]	d [mm]	O-ring [mm]
Flange ①	2,5...10	* see table below	* see table below	* see table below	Ø 30.4	* see table below
Flange ②	15	Ø 14.2	Ø 19.2	Ø 26.6	Ø 30.4	15.47 x 3.53
Flange ③	25	Ø 25	Ø 31.3	Ø 41.2	Ø 49.2	26 x 5

Size DN	a^1[mm]	a^2 [mm]	b [mm]	c [mm]	O-ring [mm]
2,5	Ø 10	Ø 6.2	Ø 11.1	Ø 18.4	Ø 7.52 x 3.53
4	Ø 10	Ø 7.2	Ø 12.1	Ø 19.4	Ø 9.12 x 3.53
6	Ø 10	Ø 9.2	Ø 14.2	Ø 21.5	Ø 10.69 x 3.53
10	Ø 10	Ø 10.7	Ø 15.7	Ø 23	Ø 12.29 x 3.53

Note: flanges must be fully welded and surface roughness, grinded and polished (roughness 0,8). See for more information the 3A CCE 2007-2 Coordination Bulletin.

INFORMATION!
The O-rings require periodic inspection and replacement. As the interval depends on process-specific variables, the length of the interval cannot be specified.

INFORMATION!
For 3A applications, O-rings must conform to the requirements of the 3A sanitary standard for Flow meters. The used O-rings must also withstand the processing, sterilization and chemical conditions for the intended use (for more information, contact the manufacturer).

Reference to specific dimensions and drawing numbers

Size DN	Pcd [mm]	D [mm]	W [mm]	Drawing number
2,5	Ø 56	Ø 68	14.5	4000587801
4	Ø 56	Ø 68	14.5	4000587807
6	Ø 56	Ø 68	14.5	4000587810
10	Ø 56	Ø 68	14.5	4000587815
15	Ø 56	Ø 68	14.9	4000587818
25	Ø 84	Ø 104	16.5	4000587824
40	#	#	#	#

Dimensions for DN40: on request

INFORMATION!
Detailed construction drawings of the above sketches are available from the manufacturer website (see table for drawing numbers).

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www.krohne.com

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