



Magnetic-inductive Flow meter

EPS with UMF2B

Installation and operation manual



This operating manual contains important information for the operation Please read the instructions carefully and store them in a safe place

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1 Introduction



It is essential that you read these operating instructions, prior to installation and commissioning of the device. The operating instructions must be read completely and fully understood.

If you do not have a copy of the latter instructions or any part is missing, please request one from Heinrichs Messtechnik GmbH or download the instructions from our website.

Custom designs and special applications are not be addressed in this manual. All devices are thoroughly tested and checked for order compliance and functionality

prior to shipping. If however you have any queries or problems concerning your purchased product, please contact our head office in Cologne.

Heinrichs Messtechnik GmbH accepts no liability for any loss or damage of any kind arising from improper operation of any product, improper handling or use of any replacement part, or from external electrical or mechanical effects, overvoltage or lightning. Any such improper operation, use or handling shall automatically invalidate the warranty for the product concerned.

1.1 Hazard warnings

The purpose of the hazard warnings listed below is to ensure the safety of the device operators and maintenance personnel, and that the flowmeter and any devices connected to it are not damaged.

The safety advisories and hazard warnings in this document are defined in the four categorised terms below, and are aimed to prevent putting operators and maintenance personnel at risk, or to avoid material damage. The used terms have, with respect to this document and the products described within, the following meanings:

Danger

means that failure to take the prescribed precautions **will result** in death, severe bodily injury, or substantial material damage.

Warning

means that failure to take the prescribed precautions **could result** in death, severe bodily injury, or substantial material damage.

Caution

means that failure to take the prescribed precautions **could result** in incorrect operation, malfunction or damage to the device.

Note

means that the accompanying text contains important information about the product, handling of the product or is about a section of the documentation that is of particular importance.

1.2 Installation, commissioning and maintenance



The devices described in this manual are to be installed and serviced only by qualified technical personnel such as a qualified Heinrichs Messtechnik electronics engineer or service technician.

Warning

To avoid danger of electric shock, service personnel should abide to the safety regulations pertaining to the use of electrical and automated technical devices and with the applicable laws and regulations in their own country before connecting this device to any periphery device or power supply.

Observe the technical data on the type plate and the safety instructions in the separate operating instructions of the associated converter!

Identification 2

2.1 Supplier/manufacturer

Heinrichs Messtechnik GmbH Robert-Perthel-Str. 9 · D-50739 Köln Telephone: +49 221 49708 - 0, Fax: +49 221 49708 - 178 Internet: http://www.heinrichs.eu, Email: mailto:info@heinrichs.eu

2.2 Product type

Magnetic-inductive flowmeter based on Faraday's law of induction

2.3 Application

Bidirectional measurement of liquids with a minimum conductivity of 5µS / cm

2.4 **Product name**

EPS

2.5 **Issue date**

11/20/2020

2.6 Version no.

File: EPS_BA_20.02_en.docx

2.7 **Designation/rating plate**

	Type:	EPS-P335B-1HH1	0				
\frown	Ser. No.:	327361					
	TAG No.:						
Heinrichs	MF-Date:	01 /2018					
\smile	CONNECTION:	DN100 PN16 For					
KOBOLD Group	WETTED PARTS:	PTFE / Hastelloy	1				
D-50739 Köln	Tm:	-20°C to 150°C					
Robert-Perthel-Str. 9	Tamb: -20°C to 60°C						
www.heinrichs.eu	PS:	16 bar PT:	24 bar				
www.nenincris.eu	Qmin = 14,42n	n³/h Qmax = 28	8 m³/h				
<i>C C c c c c c c c c c c</i>	Sensor Constant C:	75,1959 (m³/h)/m	V				
C E 0036	Excitation frequ	.: 6,25 Hz					
	Protect:	IP 67	See Manual				
	PED	Cat. II	$\wedge \rightarrow \square$				
	Cable fittings:	M20x1,5					

The rating plate states the following information:

Logo	Manufacturer's logo
Address	Manufacturer's address (Internet address)
CE	CE Marking in accordance with the applied EC Directives
Туре	Type designation
Code	Code of the model
Ser. No.	Serial number (for tracking reasons)
Tag No.	Operator's measuring point number (if stated in the order)
T amb	Ambient temperature range
Τm	Medium temperature range
С	Sensor constant
DN	Flange designation
PN	Pressure stage of flange
PS	Max. permissible process pressure
PED	Information about the Pressure Equipment Directive 2014/68/EU.
	- For devices with a process connection =< DN 25:
	 There is no CE Marking in accordance with Section. 4 para. 3 of the PED.
	Under PED (Pressure Equipment Directive) the reason for exception in accordance with Section 4 para. 3
	of the PDE is stated. The device is rated as SEP (Sound Engineering Practice).
	- For devices with a process connection > DN 25:
	 CE Marking with the number of the indicated notified body that certified the device manufacture.
	 Category (I, II, III or IV) in accordance with the PED; fluid group 1 comprises "dangerous fluids".
Materials	Material of wetted parts such as pipe lining, material of electrodes and seal
MF-Date	Year of manufacture
Degrees of	Degrees of protection in accordance with DIN EN 60529:2014
protection	

Area of application 3

The electromagnetic flowmeter EPS is used to measure or monitor the volume flow of fluids with and without solids concentration, slurries, pastes and other electrically conductive media while minimizing pressure drops. The conductivity of the medium must be at least 5 µS/cm. Pressure, temperature, density and viscosity do not affect the volume measurements. Small quantities of solid particles and small gas pockets are also measured as part of the volume flow. A larger number of solid particles or gas pockets will result in failures.

4 Safety warnings

Installation, mounting, commissioning and operating personnel 4.1



Installation, mounting, commissioning and maintenance of safety relevant, are to be performed by a technician trained to work with this kind of devices, or by a Heinrichs Messtechnik service technician.

It is a necessity that the gualified personal have read and understood this operating manual and follow its instructions.

The principle rules and regulations in the country of the operator must be observed.



The technical data on the rating plates as well as the safety warnings in the separate operating manual of the associated transmitter are to be observed!

4.2 Intended use



The electromagnetic flowmeter is to be used solely for measuring the volume flow of liquids, suspensions and pastes with a conductivity of $\geq 5 \ \mu\text{S/cm}$ ($\geq 20 \ \mu\text{S/cm}$ demineralized cold water). The responsibility for the use and installation of the flowmeter lies solely by the operator. Heinrichs Messtechnik will accept no liability for any damage resulting from its improper or unintended use. Damage caused by improper use will lead to loss of warranty.



Before using corrosive or abrasive fluids, the operator must test the resistance of all wetted materials. We will be happy to assist you in testing the corrosion resistance of wetted parts (for special fluids including cleaning fluids). However, sole responsibility for ensuring that the device is used in accordance with the manufacturer's recommendations rests with the

system operator. Minor changes of temperature, concentration or the degree of contamination in the process may cause changes in corrosion resistance. Therefore the manufacturer accepts no responsibility for any damage with respect to corrosion resistance of wetted materials in a certain application.

4.3 Packaging / storage / transport

Be careful not to damage the device whilst removing it from its packaging. The device should be stored in a clean dry room until installation so as to prevent impurities from entering the device. Make certain that the ambient temperature in the room in which the device is stored lies within the prescribed range. Upon receipt of the product, check the contents of the packaging and the product accessories against the information on the delivery slip and order form so as to ensure that all ordered components have been delivered.

If, after the unpacking of the device, it is to sent elsewhere to be installed, the original packaging and transport protection inserts should be used.

Transit damage identified before or after the unpacking of the goods is to be reported immediately. Delayed notification of the damage cannot be honoured. Besides a fault description, the type of device in question and its serial number will be required.

4.4 Warranty

Your flowmeter was manufactured in accordance with the highest quality standards and was thoroughly tested prior to shipment. However, in the event any problem arises with your device, we will be happy to resolve the problem for you as quickly as possible under the terms of the warranty which can be found in the terms and conditions of delivery. Your warranty will only be honoured if the device was installed and operated in accordance with the instructions for your device. Any mounting, commissioning and/or maintenance work is to be carried out by qualified and authorized technicians only.

4.5 Return of the device for repairs or servicing

Note: According to German waste disposal legislation, it is the owner's or customer's responsibility to dispose of hazardous waste. Thus, before any devices is sent back to Heinrichs Messtechnik for servicing or repairs the following measures must be carried out:

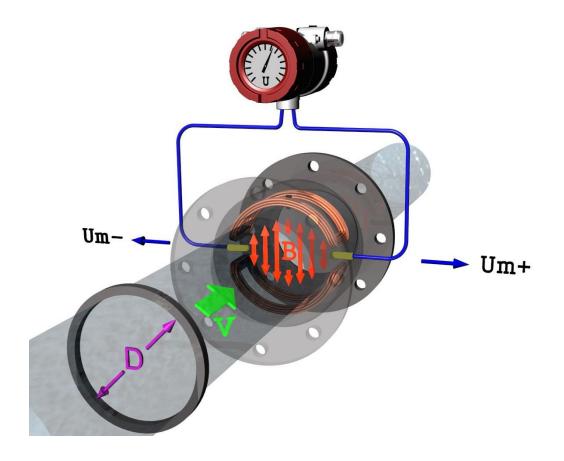
- When returning the unit for an inspection, please enclose as detailed a description as possible of the fault and the specific application, as well as the chemical-physical properties of the measurement medium.
- Remove all residue of measurement medium which may be present. Paying special attention to the gasket grooves and crevices. This is especially important if the medium is detrimental to health and safety, for example: corrosive, poisonous, carcinogenic or radioactive etc.
- Costs, which result from insufficient cleaning, (disposal and/or personal injuries) will be invoiced to the customer.

A decontamination certificate, to be found in section Mode of Operational and system design

5 Operation and system structure

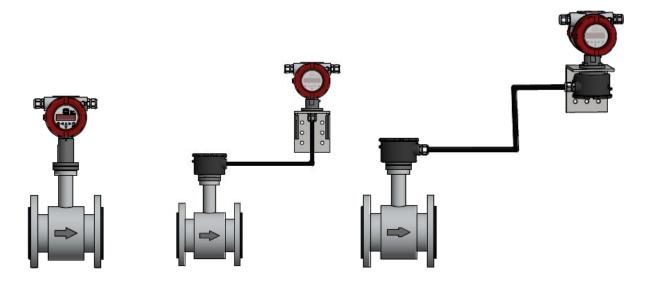
5.1 Mode of operation

According to the faraday principle of electrodynamic induction, a conductive fluid flowing through a tube with an insulating lining and a flow velocity **V**, produces a voltage **Um** on the two electrodes to be found at right angles to the direction of flow and the magnetic field **B** generated by the field coils. The strength of this voltage **Um** is proportional to the mean flow velocity and therefore the volume flow rate.



5.2 System configuration

The electromagnetic flowmeter EPS consists of a sensor, which picks up an induced measuring signal from the medium flowing through the pipe, and a transmitter which transforms this signal into standardized output signals (4-20 mA or pulses). The sensor is installed in the pipe while the transmitter is mounted directly on the sensor (integral mount) or separately at an external location (remote mount), depending on the device version.



compact-Version

remote-Version

5.2.1 Integrally mounted transmitter

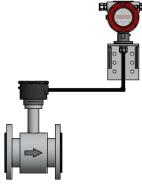
This type of configuration ensures easy and trouble-free installation.



5.2.2 Remote mounted transmitter

This type of configuration is recommended for confined spaces or if the temperature of the measured fluid is high. The connection between the sensor and the transmitter is established with a cable with separately shielded circuits for field coils and electrodes.

Transmitter version with a pigtail cable (maximal cable length 10 m)

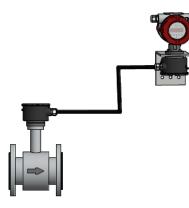


The maximum cable length between the transmitter and sensor may not exceed 10 m.

The sensor is equipped with a terminal box, whereas the transmitter has a direct cable entry.

Before the system can be commissioned, the cable from the transmitter must be connected to the sensors terminal box.

Transmitter version with a terminal box



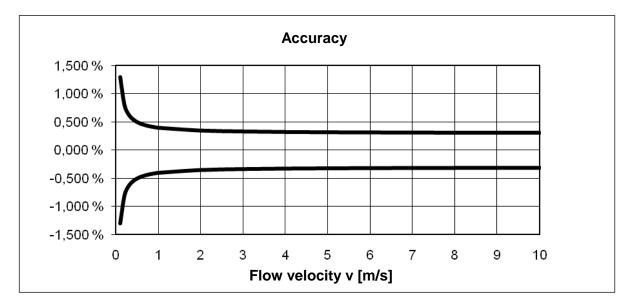
For cable lengths of 10 m or longer, it is mandatory that the cable is wired on both sides in a separately mounted terminal box.

6 Performance characteristics

6.1 Measuring accuracy

6.1.1 Measured error

+/- [0.3 % of actual value + 0.0001 * (Q at 10 m/s)]



6.1.2 Repeatability

+/- [0.15 % of actual value + 0.00005 * (Q at 10 m/s)]

6.1.3 Reference conditions

In accordance with DIN EN 29104

- Fluid temperature 22 °C ± 4 K
- Ambient temperature 22 °C ± 2 K
- Inlet section $\ge 10 \text{ x DN}$ and outlet section $\ge 5 \text{ x DN}$
- Sensor and transmitter are earthed

6.2 Fluid conductivity

 \geq 5 µS/cm (\geq 20 µS/cm for demineralized water)

6.3 Influence of ambient temperature

See Operating Instructions of the corresponding transmitter

6.4 Influence of fluid temperature

None

6.5 Materials

6.5.1 Wetted parts

Parts	Standard	Others				
Lining	EPDM	Ceramics, PFA, soft rubber,				
		Hard rubber, PTFE				
Measuring and grounding	Hastelloy C276/C22	St.st. 1.4571,				
electrodes		Tantalum, Platinum, Titanium				
Grounding disk	St.st. 1.4571	Hastelloy C4, Tantalum				
Tri-Clamp® connection	St.st. 1.4404 (316L)	(on request)				
Hygienic Conn. DIN 11851	St.st. 1.4404 (316L)	(on request)				

6.5.2 Non-wetted parts

Parts	Standard	Others
Flow tube	Stainless steel 1.4571	
Housing DN 10 – 300	Varnished steel	Stainless steel [1.4404/316L] (standard with connections DIN11851, Tri-Clamp® [®] and Wafer DN 2;3;6;10)
Flange	Varnished steel	
threaded adapter	Stainless steel 1.4404	
Terminal box for remote mount transmitter	Aluminum pressure casting, varnished	

6.5.3 External power supply / electrical connections

See rating plate and/or the operating manual of the transmitter.

7 Installation/conditions for use

7.1 Receipt of goods and transport

7.1.1 Receipt of goods

- Check the packaging and contents for damage.
- Inspect the supplied goods to ensure complete delivery and compare the consignment with your order specifications.

7.1.2 Transport

Please observe the following tips when unpacking your device, or transporting it to its measuring point:

- If possible the devices should be forwarded in the packaging in which they were delivered.
- Do not remove any protection disks or caps from the process connections. This is particularly important in the case of sensors with a PTFE flow tube lining. The protection caps should only be removed immediately before installation of the device in the pipe.
- Never lift the devices by the mounted transmitter housing or terminal box for transport. When transporting heavy devices, use slings. Place these around both process connections. Do not use chains as these can damage the surface coating and the housing.
- When transporting devices without lugs, and when looping the slings around the flow tube, the center of gravity of the entire device can be higher than both attachment points of the slings. When transporting the device ensure that it does not rotate or slip accidentally. This could cause injury.
- Sensors with a nominal sizes of more than DN 150 should not be lifted by the sheet metal of the shell with a forklift truck. This could dent the sheet metal of the shell and damage the internal solenoid coils. There is also the risk that the device could roll off the forks.
- If the sensor is provided with PTFE (Teflon) lining, then, upon delivery, the sensor is mounted with two wooden discs, to hold the lining in position during transport and storage. These wooden discs should remain on the sensor until installed. Without the discs, the liner creeps back to its original shape and installation is more difficult to do. The sensor should be left for at most a few hours without the discs. Remove the discs immediately before installation.

7.2 Installation requirements

The installation location in the pipe must be selected so that the sensor is always fully filled with the fluid and cannot run empty. This can best be guaranteed if it is installed in an ascending pipe or drain.

The measuring principle is generally independent of the flow profile of the fluid provided no standing vortices reach into the area of measurement, such as from elbows or half-open sliding valves upstream from the sensor. In these cases measures must be taken to normalize the flow profile. Practical experience has shown that in most cases a straight **inlet section of** \geq 5 x DN and an **outlet section of** \geq 2 x DN of the nominal sizes of the sensor is sufficient. The occurrence of strong electromagnetic fields in the vicinity of the installed sensor must be avoided.

For the Implementation of forward and backward flow measurements, both sides of the sensor must be provided with a straight pipe section with the nominal sizes of the sensor and a length of 5 DN of the nominal sizes of the sensor. It is advisable to install actuators, such as regulating or shut-off devices, downstream from the sensor. The forward flow direction is marked on the sensor with an arrow. When mounting sensors, always observe the specified screw torques.

After the installation of the sensor and the electrical connections between the sensor and the transmitter have been made, the system can be taken into operation. To prevent measuring errors caused by gas pockets in the fluid and damage to the lining of the sensor caused by negative pressure, the following points must be observed:

7.2.1 Bypass pipes

To allow for a problem-free dismount, emptying and cleaning of the sensor, a bypass pipe may be installed. The bypass with a blind flange permits the fluid pipe to be cleaned without having to dismount the flowmeter. This is recommended for highly soiled fluids.

7.2.2 Sensor tube lining

If the flow tube is lined with PTFE, the flowmeter must be installed with special care. The tube lining is bordered at the flanges (seal). This must not be damaged or removed as it prevents the fluid from penetrating between the flange and flow tube destroying the electrode insulation.

7.3 Installation

Screws, bolts, nuts and seals are not supplied by Heinrichs Messtechnik GmbH and must therefore be provided by the operator. The sensor is to be installed between the pipes. Please observe the required torques stated Section "Torques for screws and bolts". The installation of additional grounding rings is described in Section "Earthing – potential equalisation". Use for the flanges only gaskets in accordance with DIN EN 1514-1. Mounted gaskets must not reach into the pipe cross-section.

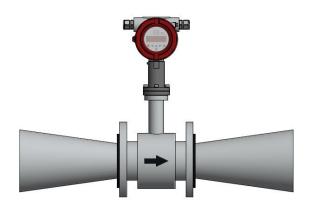


Caution!

Do not use conductive sealing compounds such as graphite. This could result in a conductive layer building up on the inside of the flow tube, short-circuiting the measuring signal.

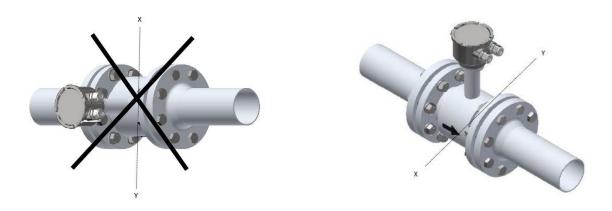
7.3.1 Installation in pipelines with larger nominal sizes

The flowmeter can also be installed in pipes with larger nominal sizes by using pipe tapers (e.g. flange transition pieces in accordance with DIN EN 545). However, the resulting pressure loss must be taken into consideration. To avoid flow interruptions in the flow tube, a reducing angle of $\leq 8^{\circ}$ for the tapers should be exceeded.



7.3.2 Horizontal or vertical Installation

The installed position of the flowmeter is arbitrary, however the intended x-y electrode axis should run approximately horizontal. A vertical Electrode axis should be avoided, since gas pockets or solid particles carried along in the fluid could affect the accuracy of the device.



7.3.3 Installation examples

To avoid measuring errors evoked by gas pockets or lining damage caused by negative pressure, the following points must be observed:

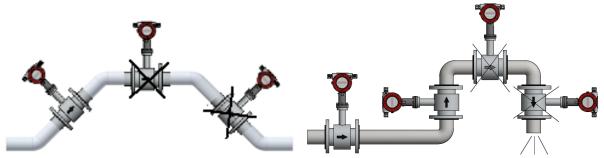
Vibrations

To eliminate the effects of vibrations and prevent premature damage to the transmitter, the sensor shall be supported in the near vicinity of the flanges.



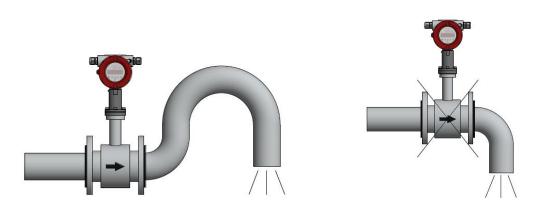
Horizontal pipeline routing

Install preferably in slightly ascending pipes.



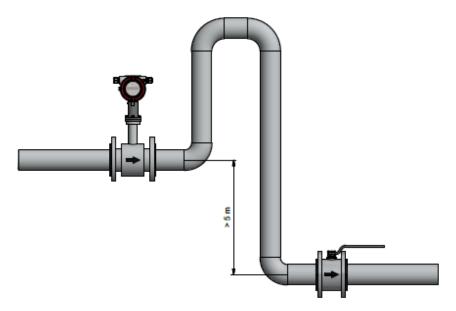
Open inlet or outlet

Where possible, the device should be installed in a syphon. The empty pipe detection circuit of the transmitter is an additional safety feature for recognizing empty or partially filled pipes. **Caution!** There is the danger of accumulation of solids in the siphon. The installation of a cleaning aperture in the pipe is therefore advisable.



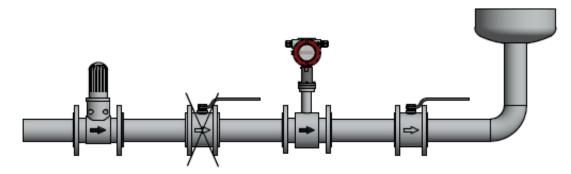
Down pipes

Where down pipes are to be found in the pipe system, a syphon or a ventilation valve should be placed after the sensor. By these means, negative pressure can be avoided in the pipeline, which may otherwise damage the sensor lining. This measure will also prevent a breakdown of the flow reducing the risk of air inclusions in the measurement medium.



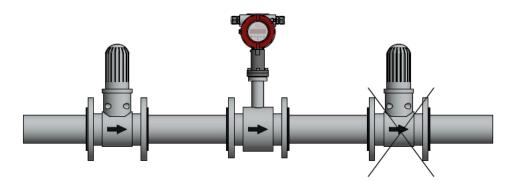
Long pipelines

In long pipelines there is always a danger of pressure surges. Therefore regulating and shut-off devices should be placed behind the sensor. However, when installed in vertical piping, especially when using sensors with PTFE-lining and high operating temperatures, the regulating and shut-off devices should be placed in front of the sensor (danger of vacuum).



Installation of pumps

To avoid negative pressure and eventual damage to the tube lining, never install flowmeters on the suction side of pumps.





If necessary, arrange for pulsation dampeners when using piston, diaphragm or hose pumps.

Consider the space requirements beforehand with respect to a potential deinstallation of the device.

7.3.4 Earthing – potential equalisation

The sound grounding concept of the flowmeter is a necessity for both safety reasons as well as to ensure a faultless operation. In accordance with VDE 0100 Part 410 and VDE 0100 Part 540 the grounding connections must be at protective conductor potential. For metrological reasons, this potential must be identical to the potential of the fluid. The grounding cable should not transmit any interference voltage. For this reason do not simultaneously ground other electrical devices with this cable.

The measuring signal tapped at the electrodes amounts to only a few millivolts. Correct grounding of the electromagnetic flowmeter is therefore an important prerequisite for exact measurement. The transmitter requires a reference potential to evaluate the measured voltage on the electrodes. In the simplest case the non-insulated metal pipe and/or the connecting flange may be used as a reference potential.

Where pipes are lined with electrically insulating materials or pipes are made of plastic, the reference potential can be obtained from a grounding ring or grounding electrode. These establish the necessary conductive connection to the fluid and are made of a chemical-resistant material. The material used should be identical to that of the measuring electrodes

7.3.4.1 Earthing with earthing electrodes

The device can be optionally equipped with grounding electrodes. With plastic pipes this version is the easiest grounding method. As the surface of the grounding electrode is relatively small, the use of grounding rings on both sides of the sensor is preferable in systems in which high equalizing currents along the pipeline can be expected to occur.

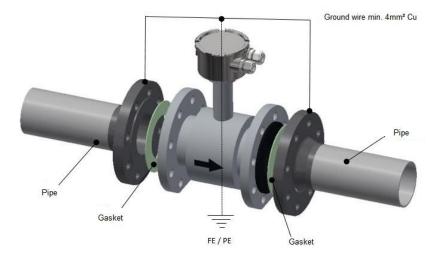
7.3.4.2 Earthing with earthing rings

The outside diameter of the grounding ring should be at least equal to the diameter of the flange or be dimensioned in such a way that the grounding ring is positioned inside the flange bolts and is centered by these. The terminal lugs routed to the outside must be connected to the FE terminal in the junction box of the sensor. During installation ensure that the inner diameter of the seals do not protrude over the grounding disk!

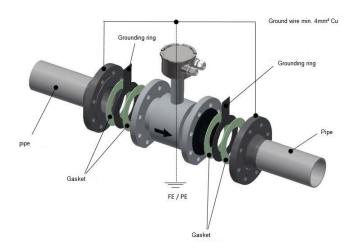
The grounding cables are not included in the scope of your delivery and must be provided by the plant operator. The grounding rings can be ordered as accessories.

7.3.4.3 Examples of earthing the EPS

7.3.4.3.1 Metal piping electrically conductive



7.3.4.3.2 Plastic piping, or internally coated metal piping



7.3.4.3.3 Cathodic piping protection

Special care must be taken with cathodic protection pipelines.

For compact installation:

The transmitter must be powered by an isolation transformer.

The connection "PE" must never be connected.

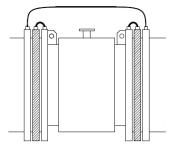
With separate installation:

The shield must be connected to the sensor end via a 1.5 μF capacitor.

The shield must never be connected to both ends.

For isolated installation:

If the above connections are unacceptable, isolate the sensor from the piping.

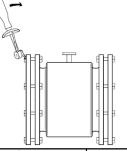


7.3.5 Torques for screws and bolts

Due to the fact that the flow pipe lining is made of plastic or vulcanized materials such as hard rubber. Or PTFE, electromagnetic flowmeters must be installed in pipe system with special care since these materials are malleable under pressure. If the flange screws are overtightened, the sealing surface will deform. If the seals are to function properly, the correct torque is highly important.

Tighten the screws crosswise so that the process connections are tight. When tightening the screws for the first time approx. 50 percent of the required torque should be reached, for the second time the torque should be 80 percent. The required torque should reach 100 percent when the screws are tightened for the third time. For higher torques it is advisable to use protectors.

The maximum permissible torques can be obtained from the following table



						N	BR						Ebon	it/We	eichgu	ımmi	i	PTFE							DN2+DN3 Zirkonium;				
mm	inch	PN	110	PN	116	Pľ	N40	Clas	s 150	AW	/WA	PN	110	PN	116	PI	N40	P	PN6		110	PN	N16 PN25 PN40			140	DN6-100	Keramik	
		Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs	Nm	f/lbs
2	-	-	-	-	-	I	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	I	1	I	I	-	-	13	10
3	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-	1	I	1	1	-	-	13	10
6	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	I	1	1	-	1	-	13	10
10	-	-	-	-	-	I	-	-	-	1	-	-	-	-	-	I	I	-	-	-	-	I	I	I	-	1	-	13	10
15	1⁄2"	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	I	1	1	-	10	7	16	12
25	1"	-	-	-	-	10	7	7	5	1	-	-	-	-	-	16	12	-	-	-	-	I	I	I	-	16	12	30	22
40	1½"	-	-	-	-	16	12	9	7	-	-	-	-	-	-	34	25	-	1	-	-	I	1	1	-	34	25	54	40
50	2"	-	-	25	18	1	-	25	18	-	-	-	-	-	-	46	34	-	•	-	-	1	1	1	-	46	34	90	66
65	2½"	-	-	25	18	I	-	25	18	-	-	-	-	25	18	1	I	10	7	-	-	25	18	I	-	34	25	90	66
80	3"	-	-	25	18	1	-	34	25	-	-	-	-	25	18	-	1	25	18	-	-	25	18	1	-	42	31	90	66
100	4"	-	-	25	18	1	-	26	19	-	-	-	-	25	18	-	1	25	18	-	-	25	18	1	-	72	53	115	84
125	5"	-	-	29	21	-	-	42	31	-	-	-	-	32	24	-	-	25	18	-	-	32	24	-	-	114	84	-	-
150	6"	-	-	50	37	1	-	57	42	-	-	-	-	50	37	-	1	25	18	-	-	50	37	1	-	144	106	-	-
200	8"	50	37	50	37	-	-	88	65	-	-	50	37	52	38	-	-	25	18	50	37	52	38	105	77	185	137	-	-
250	10"	50	37	82	61	-	-	99	73	-	-	50	37	88	65	-	-	25	18	50	37	88	65	160	118	300	221	-	-
300	12"	57	42	111	82	-	-	132	97	-	-	62	46	117	86	-	-	50	37	62	46	117	86	170	125	320	236	-	-
350	14"	60	44	120	89	-	-	225	166	-	-	60	44	120	89	-	-	50	37	60	44	120	89	240	177	450	332	-	-
400	16"	88	65	170	125	-	-	210	155	-	-	88	65	170	125	-	-	50	37	88	65	170	125	330	244	650	480	-	-
450	18"	92	68	170	125	-	-	220	162	-	-	92	68	170	125	-	-	56	41	92	68	170	125	320	236	570	421	-	-
500	20"	103	76	230	170	-	-	200	148	-	-	103	76	230	170	-	-	53	39	103	76	230	170	390	288	740	546	-	-
600	24"	161	119	350	258	-	-	280	207	-	-	161	119	350	258	-	-	81	60	161	119	350	258	560	413	1220	900	-	-
700	28"	200	148	304	224	-	-	-	-	200	-	200	148	304	224	-	-	-	-	-	-	-	-	-	-	-	-	-	-
750	30"	-	-	-	-	-	-	-	-	240	177	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
800	32"	274	-	386	285	-	-	-	-	260		274	202	386	285	-	-	-	-	-	-	-	-	-	-	-	-	-	-
900	36"	288	213	408	301	-	-	-	-	240	177	288	213	408	301	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1000	40"	382	282	546	403	-	-	-	-	280		382	282	546	403	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	42"	-	-	-	-	-	-	-	-	280	207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1100	44"	-	-	-	-	-	-	-	-	290	214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1200	48"	395	292	731	539	-	-	-	-	310	229	395	292	731	539	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Torque - calculation:

- 1) All bolts are new and the material selection complies with EN 1515-1 Table 2
- 2) Sealing material of maximum 75 Shore A hardness will be used between the flow meter and the associated flanges
- 3) All bolts are galvanized and greased accordingly
- 4) The values are calculated for use with carbon steel flanges
- 5) Flow meter and associated flanges are properly aligned

7.3.6 Remote mount transmitter

A separately installed transmitter and sensor is necessary if:

- the installation area is difficult to access,
- space is restricted,
- the fluid and ambient temperatures are high,
- there is strong vibration.

Caution!



The cable between transmitter and sensor must be shielded. The outer cable shield must be electrically connected at both ends with special EMC cable glands (e.g. type Hummel HSK-M-EMV).



For the remote mount version, the minimum permissible conductivity of the fluid is determined by the distance between the sensor and the transmitter. To ensure accuracy, a maximum cable length of 200 m should not be exceeded.

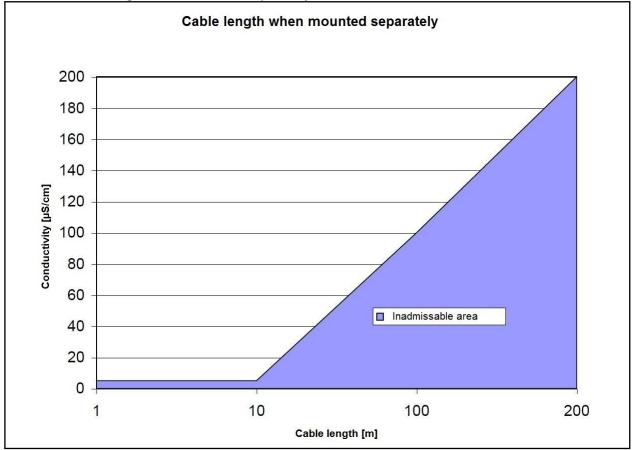


The electrode cable must be fixed during installation. If the conductivity of the fluid is low, cable movements may change the capacity considerably and thus disturb the measuring signals. Do not lay the cables close to electrical machines or switching elements.



Do not connect or disconnect the field coil cable before the primary power of the flowmeter has been disconnected.

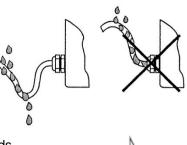
Maximum cable length when installed separately



7.4 Wiring

Please observe the following wiring hints. (Inappropriate wiring will invalidate any warranty claims)

- Cable glands are not included in the standard scope of delivery
- Customer used cable glands must adhere to the applied Ex-provisions, and be suitable for the specified screw-threads
- The cable glands must be appropriate for the diameter of the used cable
- Make sure that the cable is routed to the cable gland in the form of a loop (Water trap") see picture on the right.
- The cable glands should not be positioned with the opening pointing vertically upwards.
- The used blind plugs may not be removed or replaced with cable glands, when the corresponding bushing is not in use with electrical cables.
- The sealing or tightening of the cable glands must be performed in accordance with the manufactures guidelines. Too tight or too loosely tightened cable glands could lead to water or other liquids penetrating into the enclosure.





Installation work or maintenance and repair work on the sensor, transmitter or the terminal box may only be carried out in a non-explosive atmosphere! Before any dismantling can take place, it must be ensured that the device is no longer energised

For the use of remote mounted transmitters:



Only sensors and transmitters with the same serial number may be interconnected. The connection of units with different serial numbers can lead to incorrect measurements.



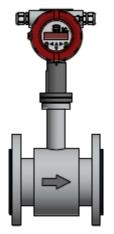
Ensure that the stripped and twisted inner cable shield ends in the terminal box are kept as short as possible up to the terminals themselves If necessary these must be covered with an insulating sleeve to prevent short circuits.

The outer cable shield must be connected to the EMC cable gland connectors at both ends of the cable.

Important tightening torques for cable glands

•	KLE (cable glands) to the enclosure	12 Nm
•	Cap nut to the KLE (cable glands)	8 Nm

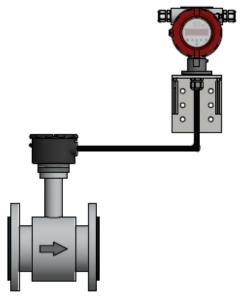
7.4.1 Mounted transmitter



On the integral mounted transmitter the connections to the sensor are internally wired. The terminal assignment is described in the operating manual of the UMF2 transmitter.

7.4.2 Transmitter mounted separately with a pigtail cable

Transmitter with pigtail cable (maximum cable length 10 m)



In this version the UMF2 transmitter, the sensor cable is conducted out of the transmitter as a pigtail. The cable is permanently fixed to the transmitter, and is regarded as part of the internal wiring of the transmitter. The cable length is defined during the order process.

For connecting to the transmitter the sensor is equipped with a terminal box. It contains certified terminals and other elements of the WAGO series.

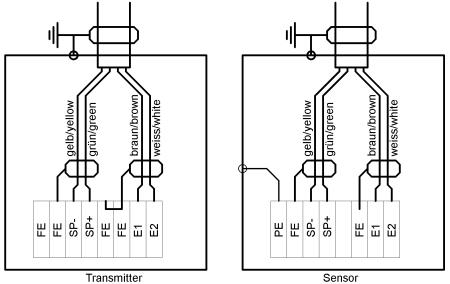
The Sensor cable is a double chamber cable with separated circuits for the exciter coils and electrode circuits.



Caution!

The pigtail is an integral part of the approval, and may neither be replaced, repaired nor may it be removed from the transmitter UMF2. A repair or replacement may only be carried out by the manufacturer. The securing Cap nut of the pigtail cable gland may not be removed or loosened.

7.4.3 Connection plan



Applying the outer cable shield to the EMC cable gland

For an optimal disturbance rejection, the outer cable shield of the sensor cable must be electrically connected to the special metal cable gland.



Schematic representation

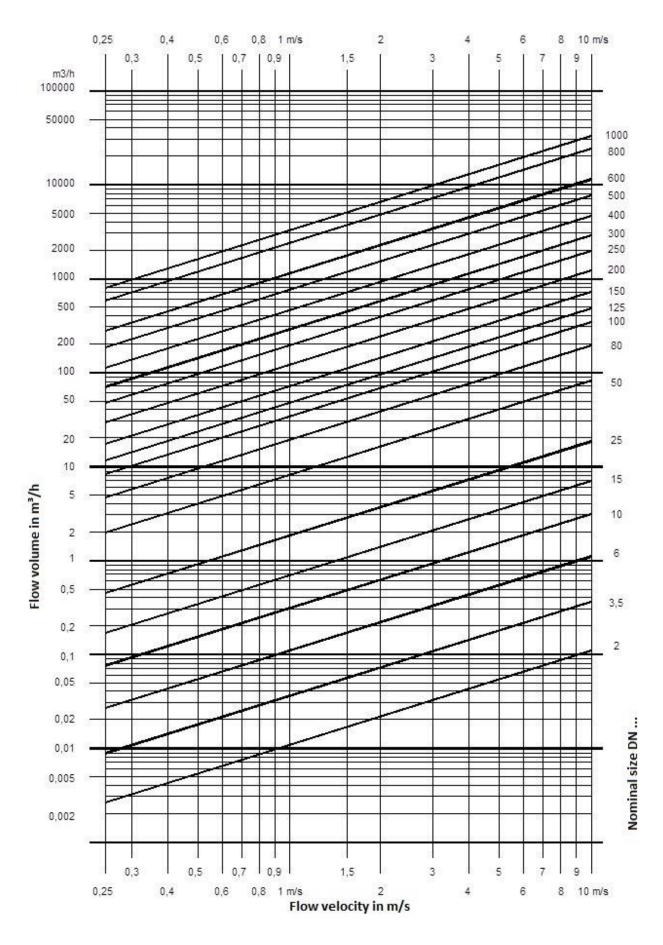
7.5 Nominal size and ranges

Volume flow depends on the flow velocity and the nominal size of the flowmeter. The following flow rate nomogram shows the flow range which can be measured by a device with a specific nominal size as well as which nominal size is suitable for a specific flow rate. The electromagnetic flowmeter has been designed in such a way that it operates within the range of the flow velocities occurring in practical applications. The flow velocities have an upper range value of between 0.5 m/s and 10 m/s.

The nominal size DN of the sensor must be selected, if possible, in such a way that the flow velocity does not drop below the upper range value of 0.5 m/s. In case of fluids with solid particles, the flow velocity should range between 3 m/s and 5 m/s in order to prevent sedimentation depositing in the sensor.

The flow nomogram shows the volume flow in m³/h and the flow velocity in m/s in relation to the nominal size DN of the sensor. The y-axis shows the flow values in m³/h. The nominal size DN of the sensor has been selected as a parameter for the plotted straight lines. The upper range measuring value m³/h is taken as a basis for determining the sought nominal size DN. This value is given on the y-axis. The value for the flow velocity in m/s is shown on the x-axis. The straight line of the nominal size DN is found at the intersection of the two variables.

7.5.1 Flow - Diagram



7.5.2 Flow specific values

Di	Di		liter pe	r second	m ³ per hour				
	DN	ASME	Qmin	Qmax	Qmin	Qmax			
2	10	1⁄2"	0,002	0,031	0,006	0,113			
3	10	1⁄2"	0,004	0,071	0,013	0,254			
6	10	1⁄2"	0,014	0,283	0,051	1,02			
10	10	1⁄2"	0,039	0,785	0,141	2,83			
15	15	1⁄2"	0,088	1,767	0,318	6,36			
25	25	1"	0,245	4,909	0,884	17,67			
40	40	1½"	0,628	12,57	2,262	45,24			
50	50	2"	0,982	19,63	3,534	70,69			
65	65	2 ½"	1,659	33,18	5,973	119,5			
80	80	3"	2,513	50,27	9,048	181,0			
100	100	4"	3,927	78,54	14,14	282,7			
125	125	5"	6,136	122,7	22,09	441,8			
150	150	6"	8,836	176,7	31,81	636,2			
200	200	8"	15,71	314,2	56,55	1131			
250	250	10"	24,54	490,9	88,36	1767			
300	300	12"	35,34	706,9	127,2	2545			
350	350	14"	48,11	962,1	173,2	3464			
400	400	16"	62,83	1257	226,2	4524			
450	450	18"	79,52	1590	286,3	5726			
500	500	20"	98,17	1963	353,4	7069			
600	600	24"	141,4	2827	508,9	10179			
700	700	28"	192,4	3848	692,7	13854			
800	800	32"	251,3	5027	904,8	18096			
900	900	36"	318,1	6362	1145	22902			
1000	1000	40"	392,7	7854	1414	28274			
1200	1200	44"	565,5	11310	2036	40715			
1400	1400	48"	769,7	15394	2771	55418			
1600	1600	-	1005	20106	3619	72382			
1800	1800	-	1272	25447	4580	91609			
2000	2000	-	1571	31416	5655	113097			

7.6 Ambient conditions

7.6.1 Ambient temperature limits

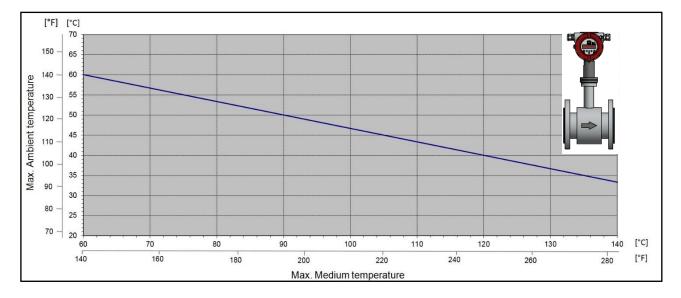
Medium temperature > 60 °C



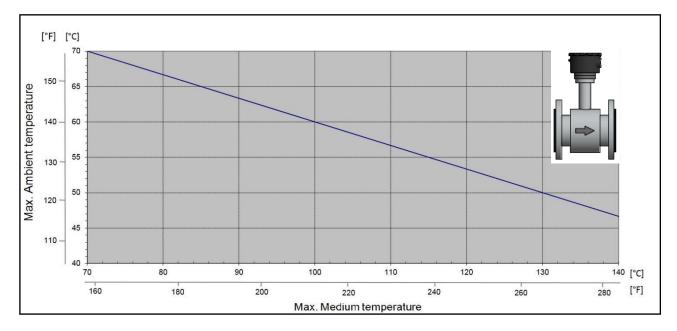
When thermally insulating the sensor, it is important to avoid including the transmitter or the terminal box into the insulation.

Since the sensors are an element of the pipeline, when installed these are normally thermally isolated to save energy and prevent accidental physical contact. Due to the process temperature heat is introduced through the support for securing the transmitter or the terminal box. For this reason the thermal insulation of the sensor should not extend over more than the half of this support. It is essential to prevent inclusion of the installed transmitter or the terminal box in the thermal insulation. The maximum permissible fluid temperature range is stated on the rating plate of the respective version.

Maximum ambient temperature in dependence of the medium temperature 7.6.1.1 for the mounted transmitter version.



7.6.1.2 Maximum ambient temperature for the sensor in dependence of the medium temperature for the remote mounted transmitters.



7.6.1.3 Remote mounted transmitter

By remote mounted transmitters, the permissible ambient temperature for the sensor shall not exceed -20 °C to + 60 °C.

7.6.2 Storage temperature range

The storage temperature range shall not exceed -40 °C to 80°C.

7.6.3 Climate category

In accordance with DIN EN 60654-1; Non weather-protected **Class D1** locations with direct exposure to an open-air climates.

7.6.4 Ingress protection

The sensor meets the requirements of the protection class **IP 67**. The following must be observed to ensure compliance with protection class IP67 when the device has been installed or serviced:

- The housing seals must be clean and undamaged when placed in the sealing groove. If necessary the seals must be cleaned or replaced.
- Tighten the cover of the terminal box also tightening the safety bug screw to secure the lid or tighten the screw cap of the transmitter (integral mount version).
- The cables used for connection must comply with the specified outer diameter for the cable glands used.
- Tighten the cable glands firmly, taking the specified torque into account
- Loop the cable in front of the cable gland. Any moisture running along the cable can then drip off and not penetrate the device. Always install the device so that the opening of the cable gland does not face upwards.
- Any unused cable glands must be closed with a plug which is suitable for the respective protection class.

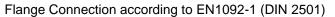
The sensors are also available in an **IP 68** version. The maximum permissible immersion depth in water is **5 m**. In this case the transmitter is installed separately from the sensor. The cable at the sensor is connected by the manufacturer and the terminal box is resin filled (standard, non EX!). For the connection cable a special cable suitable for IP68 applications is used.

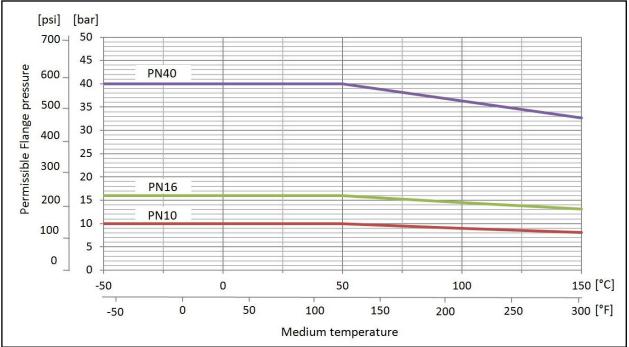
7.6.5 Shock and vibration resistance

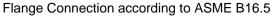
The flowmeter should be protected from extreme shocks and vibrations, which could cause damage. Maximum permissible shock/vibration: 15 m/s^2 (10 to150 Hz

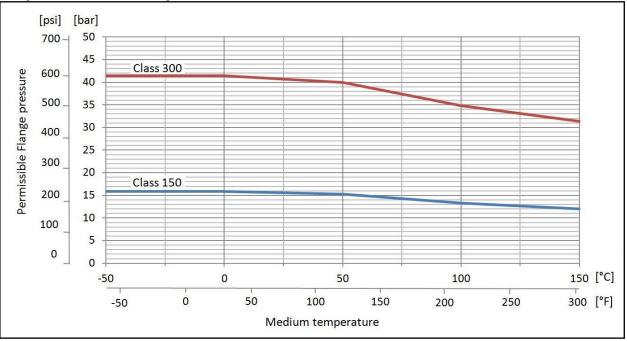
7.7 Process pressure

The maximal permissible process pressure is stated on the rating plate, and is dependent on the medium temperature. The maximal process pressure for the appropriate flange can be obtained from the following table.









7.8 Medium temperature and assignment of the temperature class

The maximum allowable medium temperature of the sensor depends on the used version as well as from the pipe lining used in the sensor. The device-specific temperature is designated on the rating plate. The Industrial Safety Act stipulates that equipment with very cold or hot components must be provided with protective guards to prevent accidental physical contact of employees with the respective parts. For this reason, as well as from an energy aspect, in practical applications where temperatures of 60 °C and higher prevail, all pipes and installed measuring instruments are normally thermally insulated.

Thermal insulation of the sensor

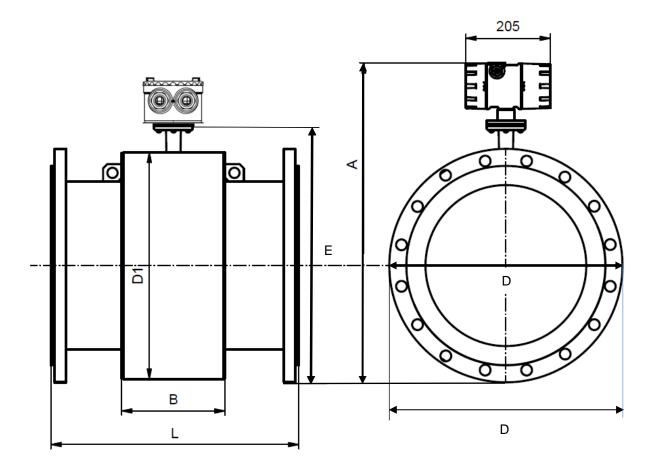
The sensor can also be provided with a thermal insulation. However, the insulation should only reach maximal half way up the connecting tube, on which the terminal box or the transmitter is mounted.

In the following table the temperature ranges with respect to the used lining.

Lining	Medium temperature range
EPDM	-10 to +70 °C (14 to 158 °F)
PTFE	-20 to +150 °C (-4 to +302 °F)
Ceramics (EPDM gasket)	-20 to +150 C (-4 to +302 °F)
Ceramics (PTFE gasket)	-20 to +130 C (-4 to +266 °F)
Hard rubber (Ebonit)	0° to +95 °C (32 to +203 °F)
Soft rubber	0 to +70 ° C (32 to 158 °F)

8 Dimensions and weight

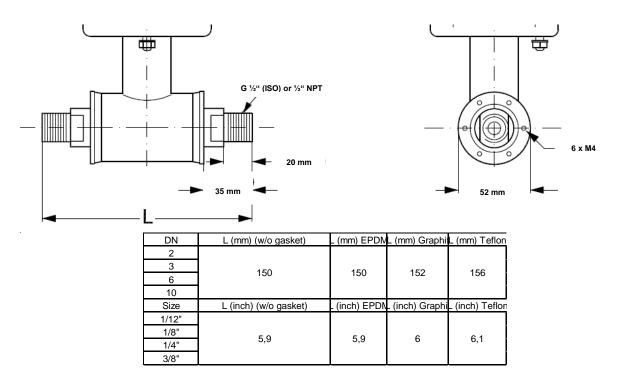
8.1 Dimensional drawing EPS – DN 10 to DN 1200, flange design



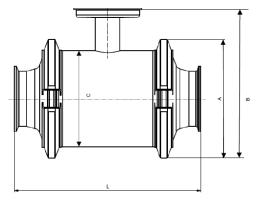
	D in mm				nm		E	in mm				A in	mm	-			L	_	
(standard - pressure	pressure DN A		AS	ME	EN1092-1	D1 in mm	EN 1092-1	AS	ME	with t	ransmitt	er	with ju	unction box		B in mm	mm	Inch	weight / Mass
level)					EIG1002 1		21110021			EN 1092-1	AS	ME	EN 1092-1	AS				mon	[kg]
			150lbs	300lbs				150lbs	300lbs	EN 1002 1	150lbs	300lbs	EN 1002 1	150lbs	300lbs				[19]
	15	1/2"	88,9	95,2	90	104	159	159	159	312	312,0	312,0	225,5	225,5	225,5	59	200	7,9	4
PN 40	25	1"	108	124	115	104	164,5	161	169	317,5	314,0	322,0	231	227,5	235,5	59	200	7,9	5
111440	40	1½"	127	155,4	150	124	192	180,5	194,7	345	333,5	347,7	258,5	247,0	261,2	82	200	7,9	8
	50	2"	152,4	165,1	165	139	207	200,7	207,1	360	353,7	360,1	273,5	267,2	273,6	72	200	7,9	9
	65	21⁄2"	177,8	190,5	185	_154	224,5	220,9	227,3	377,5	373,9	380,3	291	287,4	293,8	72	200	7,9	11
	80	3"	190,5	209,6	200	174	242	237,3	246,8	395	390,3	399,8	308,5	303,8	313,3	72	200	7,9	12
PN 16	100	4"	228,6	254	220	214	272	276,3	289	425	429,3	442,0	338,5	342,8	355,5	85	250	9,8	16
PN10*	125	5"	254	279,4	250	239	299,5	301,5	314,2	452,5	454,5	467,2	366	368,0	380,7	85	250	9,8	19
	150	6"	279,4	317,5	285	282	338,5	335,7	354,8	491,5	488,7	507,8	405	402,2	421,3	85	300	12	27
	200	8"	342,9	381	340	338	394	395,5	414,5	547	548,5	567,5	460,5	462,0	481,0	137	350	14	40
	250	10"	406,4	444,5	395	393	449	454,7	473,8	602	607,7	626,8	515,5	521,2	540,3	157	450	18	60
	300	12"	482,6	520,7	445	444	499,5	518,3	537,4	652,5	671,3	690,4	566	584,8	603,9	157	500	20	80
	350	14"	533,4	584,2	505	451	533	547,2	572,6	686	700,2	725,6	599,5	613,7	639,1	270	550	22	110
	400	16"	596,9	647,7	565	502	588,5	604,5	629,9	741,5	757,5	782,9	655	671,0	696,4	270	600	24	125
	450	18"	635	711,2	615	563	644	654	692,1	797	807,0	845,1	710,5	720,5	758,6	310	600	24	175
PN 10	500	20"	698	774,7	670	614	697	711	749,4	850	864,0	902,4	763,5	777,5	815,9	350	600	24	200
PN 16*	600	24"	812,8	914,4	780	715	802,5	818,9	869,7	955,5	71,9	1022,7	869	885,4	936,2	320	600	24	287
	700	-	-		880	816	903	-	-	1056	-	-	969,5	-	-	450	700	28	330
	800	-	-		1015	927	1026	-	-	1179	-	-	1092,5	-	-	560	800	32	450
	900	-			1115	1032	1128,5	-	-	1281,5	-	-	1195	•	-	630	900	35	530
	1000	-	-		1230	1136	1238	-	-	1391	-	-	1304,5	-	-	670	1000	39	660
	1200	-	-		1455	1348	1456,5	-	-	1609,5	-	-	1523	-	-	792	1200	47	1180

Weights are proximate (for PN16) without transmitter. For transmitter additional weight of 2.4 kg (* higher pressure on request)

8.2 Dimension DN 2; 3; 6; 10 incl. G ¹/₂" (ISO) or ¹/₂" NPT connection



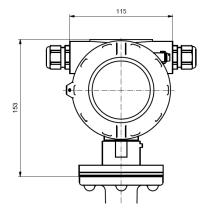
8.3 Dimension in DIN 11851, Tri-Clover®

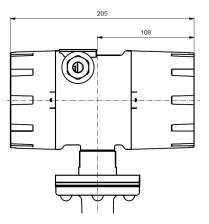


Size				S	tandard
DN	A (mm)	B (mm)	C (mm)	11851	Tri-Clover®
				L (mm)	L (mm)
10	99	159,2	64	146	146
15	99	159,2	64	146	146
25	113	180	77,5	161	161
40	126	207	91	176	176
50	154	240,7	119	186	186
65	165	261,1	130	223	223
80	200	297	155	258	258
100	225	336,5	183	288	288
Ansi	A (inch)	B (inch)	C (inch)	L (inch)	L (inch)
3/8"	3,9	6,26	2,52	5,75	5,75
1/2"	3,9	6,26	2,52	5,75	5,75
1"	4,45	7,09	3,05	6,34	6,34
1 ½"	4,96	8,15	3,58	6,93	6,93
2"	6,06	9,47	4,68	7,32	7,32
2 ½	6,5	10,28	5,12	8,78	8,78
3	7,87	11,69	6,1	10,16	10,16
4	8,86	13,25	7,2	11,34	11,34

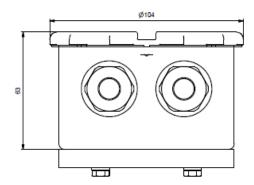
8.4 Transmitter UMF2(B)

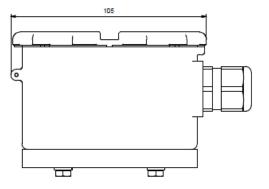
8.4.1 Compact design



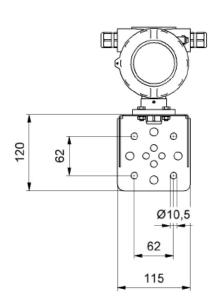


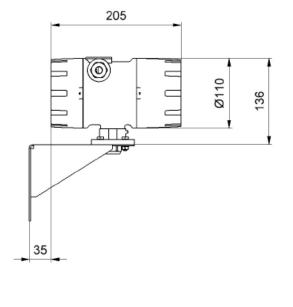
8.4.2 Junction box of the sensor at remote design



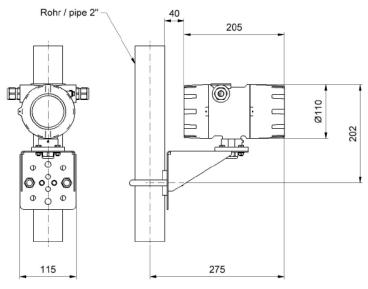


8.4.3 Wall mounting

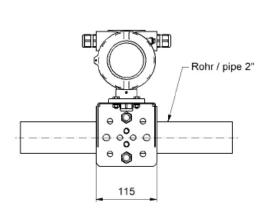


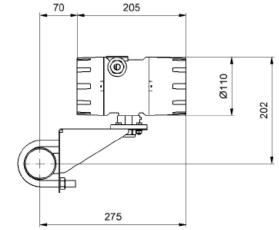


8.4.4 Pipe mounting vertically

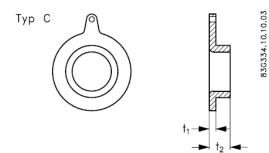


8.4.5 Pipe mounting horizontally

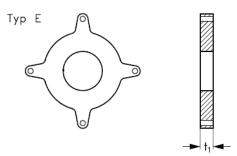




8.5 Dimension grounding rings



DN	t ₁ [mm]	t ₂ [mm]	Weight kg
25-250	1,2	15	0,03-0,4
300-600	1,6	20	0,6-2,6
700-1200	2,0	25	3-5
1400-2000	3,0	40	9-16



DN [mm]	t ₁ [kg]	Weight kg
15	6	0,07
25-150	6	0,3-1,4
200-350	8	1,7-4,1
400-600	10	6,5-13,0

Grounding ring type C is only for sensors with Neoprene, EPDM, LinatexR and Ebonite linings. Grounding ring type E is only for sensors with PTFE lining.

9 Maintenance

The device requires no maintenance under normal operation. By measuring media, which tend to deposit and soiling of the electrodes and the measuring tube, a cleaning may be necessary.

10 Auxiliary power / electrical connection

See type plate or operating instructions of the associated converter.

11 CE typing

The measuring system complies with the legal requirements of the EMC Directive, the Low Voltage Directive and the Pressure Equipment Directive. We as the manufacturer confirm the conformity with the guidelines by affixing the CE mark.

12 Standards and guidelines, certificates and approvals

Low voltage directive 2014/35/EU (LVD)

EN 61010-1:2011 Safety requirements for electrical measuring, control and laboratory devices.

Directive 2014/30/EU (EMC)

EN 61000-6-2:2011 EN 61000-6-3:2011 EN 55011:2018 Immunity for Industrial environments Emission residential environments Group 1, class B (emitted interference)

Directive 2014/68/EU (PED) AD-2000 Guidelines

EN60529:2010

Degrees of protection provided by enclosures (IP Code)

13 Declaration of Decontamination for the cleaning of the device

Company:	Town/City:
	-
Department:	Name:
TelNo.:	
The enclosed flowmeter	
Model: EPS	
Was operated using the following fluid:	

Since the used fluid is potentially hazardous to water / toxic / corrosive / combustible*,

we have:

- checked all cavities in the device to ensure that they are free of fluid residues *
- washed and neutralized all cavities in the device*
- * Delete if not applicable.

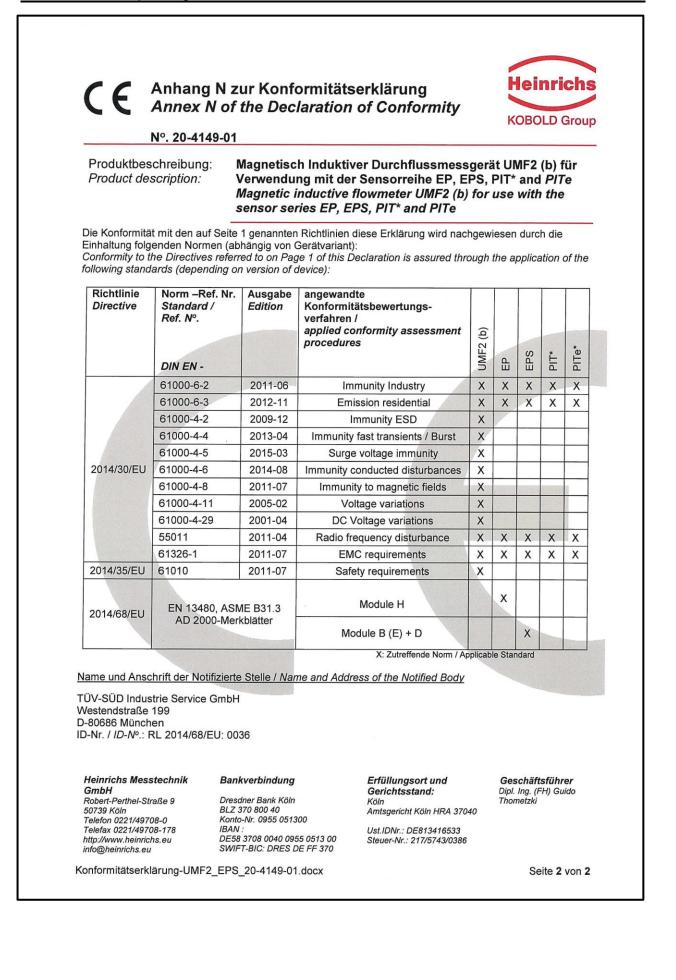
We hereby confirm that no health or environmental hazard will arise from any fluid residues on or in the device enclosed for return.

Date: Signature:

Company stamp

14 Declaration of Conformity

Declaratio	tätserklärung on of Conformity	KOBOLD Grou
<u> </u>	01	
Hersteller: <i>Manufacturer</i> :	Heinrichs Messtechnik GmbH Robert-Perthel-Strasse 9 50739 Köln	
Produktbeschreibung: Product description:	Magnetisch Induktiver Durchflussmessge Verwendung mit der Sensorreihe EP, EPS Magnetic inductive flowmeter UMF2 (b) fo sensor series EP, EPS, PIT* and PITe	S, PIT* and PITe
	er Verantwortung, dass das oben genannte Messsysten einschließlich allen bis heute veröffentlichten Änderunge	
We declare herewith, in sole re	esponsibility, that the product described above is conford cluding all published changes and amendments as of too	
2014/30/EU (EMC)	EU-Richtlinie über die Elektromagnetische Verträglic EU-Directive relating to electromagnetic compatibility	
2014/35/EU (LVD)	EU-Richtlinie über die Bereitstellung elektrischer Bet Verwendung innerhalb bestimmter Spannungsgrenze EU-Directive relating to the making available on the r equipment designed for use within certain voltage lin	en auf dem Markt market of electrical
2014/68/EU (PED)	EU-Richtlinie zur Harmonisierung der Rechtsvorschri Mitgliedstaaten über die Bereitstellung von Druckger EU-Directive on the harmonisation of the laws of the relating to the making available on the market of pres	äten auf dem Markt <i>Member States</i>
Anhang N ist ein integraler Bestandtei Annex N is an integral part of this decl		
Köln, den 01.04.2020 Michael Manderfeld (Druckgerätebeauftragter / PED Representative)	Suido Thometzki (Geschäftsführung / Managing	Director)
Michael Manderfeld (Druckgerätebeauftragter /	(Geschäftsführung / Managing Kontakt: Tel: +49 <i>Contact:</i> Email: info@	Director) (221) 49708-0 <u>Dheinrichs.eu</u> .heinrichs.eu



15 Modelcode

Model code	Description			
Sensor EPS-	Material Lining	Electrodes	Process-Temperature	
E	EPDM Hard Rubber (Ebonit)	Standard 2x Measuring- + 2x Groundelectrodes Standard 2x Measuring- + 2x Groundelectrodes	-10+70°C 0°C95°C	
W	Soft Rubber	Standard 2x Measuring- + 2x Groundelectrodes	0°C70°C	
P	PTFE Ceramics	Standard 2x Measuring Electrodes Standard 2x Measuring Electrodes	-20°C+150°C -20°C+150°C	
-	Process connection	Material	Max. measuring range	Installation
DIN		Lining / Electrodes / Sealing	(Water 20°C, 1 mPas)	length
connections				
002E	DN 2 G1/2"(316L) / incl. Gasket/EPDM	Ceramics / Platinum / EPDM	156 l/h	150 mm
003E	DN 3 G1/2"(316L) / incl. Gasket/EPDM	Ceramics / Platinum / EPDM	254 l/h	150 mm
006E	DN 6 G1/2"(316L) / incl. Gasket/EPDM	Ceramics / Platinum / EPDM	1017 l/h	150 mm
010E	DN10 G1/2"(316L) / incl. Gasket/EPDM	Ceramics / Platinum / EPDM	2827 l/h	150 mm
H02E	DN 2 G1/2"(Hastelloy) / incl. Gasket/PTFE	Keramik / Platin / PTFE	156 l/h	156 mm
H03E	DN 3 G1/2"(Hastelloy) / incl. Gasket/PTFE	Keramik / Platin / PTFE	254 l/h	156 mm
H06E	DN 6 G1/2"(Hastelloy) / incl. Gasket/PTFE	Keramik / Platin / PTFE	1017 l/h	156 mm
H10E	DN10 G1/2"(Hastelloy) / incl. Gasket/PTFE	Keramik / Platin / PTFE	2827 l/h	156 mm
DIN flanges				
305B	DN15 PN40 Form B1 DIN EN 1092-1		6,3 m³/h	200 mm
309B	DN25 PN40 Form B1 DIN EN 1092-1		17,6 m³/h	200 mm
317B	DN40 PN40 Form B1 DIN EN 1092-1		45 m³/h	200 mm
320B	DN50 PN16 Form B1 DIN EN 1092-1	only EPDM	70 m³/h	200 mm
321B	DN50 PN40 Form B1 DIN EN 1092-1		70 m³/h	200 mm
325B	DN65 PN16 Form B1 DIN EN 1092-1		119 m³/h	200 mm
326B	DN65 PN40 Form B1 DIN EN 1092-1		119 m³/h	200 mm
330B	DN80 PN16 Form B1 DIN EN 1092-1		180 m³/h	200 mm
331B	DN80 PN40 Form B1 DIN EN 1092-1		180 m³/h	272 mm
335B	DN100 PN16 Form B1 DIN EN 1092-1		282 m³/h	250 mm
336B	DN100 PN40 Form B1 DIN EN 1092-1		282 m³/h	250 mm
340B	DN125 PN16 Form B1 DIN EN 1092-1		441 m³/h	250 mm
341B	DN125 PN40 Form B1 DIN EN 1092-1		441 m³/h	250 mm
345B	DN150 PN16 Form B1 DIN EN 1092-1		636 m³/h	300 mm
346B	DN150 PN40 Form B1 DIN EN 1092-1		636 m³/h	300 mm
349B	DN200 PN10 Form B1 DIN EN 1092-1		1130 m³/h	350 mm
350B	DN200 PN16 Form B1 DIN EN 1092-1		1130 m³/h	350 mm
351B	DN200 PN40 Form B1 DIN EN 1092-1		1130 m³/h	350 mm
355B	DN250 PN10 Form B1 DIN EN 1092-1		1767 m ³ /h	450 mm
356B	DN250 PN16 Form B1 DIN EN 1092-1		1767 m ³ /h	450 mm
358B	DN250 PN40 Form B1 DIN EN 1092-1		1767 m³/h	450 mm
362B	DN300 PN10 Form B1 DIN EN 1092-1		2544 m³/h	500 mm
363B	DN300 PN16 Form B1 DIN EN 1092-1		2544 m³/h	500 mm
365B	DN300 PN40 Form B1 DIN EN 1092-1		2544 m³/h	550 mm
369B	DN350 PN10 Form B1 DIN EN 1092-1		3463 m³/h	550 mm
370B	DN350 PN16 Form B1 DIN EN 1092-1		3463 m³/h	550 mm
375B	DN400 PN10 Form B1 DIN EN 1092-1		4523 m³/h	600 mm
376B	DN400 PN16 Form B1 DIN EN 1092-1		4523 m³/h	600 mm
3B1B	DN450 PN10 Form B1 DIN EN 1092-1		5725 m³/h	600 mm
3B2B	DN450 PN16 Form B1 DIN EN 1092-1		5725 m³/h	600 mm
380B	DN500 PN10 Form B1 DIN EN 1092-1		7068 m³/h	600 mm
381B	DN500 PN16 Form B1 DIN EN 1092-1		7068 m³/h	600 mm
384B	DN600 PN10 Form B1 DIN EN 1092-1		10178 m ³ /h	600 mm
385B	DN600 PN16 Form B1 DIN EN 1092-1		10178 m ³ /h	600 mm
38AB	DN700 PN10 Form B1 DIN EN 1092-1		13854 m³/h	700 mm
389B	DN800 PN6 Form B1 DIN EN 1092-1		18095 m³/h	800 mm
390B	DN800 PN10 Form B1 DIN EN 1092-1		18095 m³/h	800 mm
391B	DN900 PN6 Form B1 DIN EN 1092-1		22902 m ³ /h	900 mm
392B	DN900 PN10 Form B1 DIN EN 1092-1		22902 m ³ /h	900 mm
393B	DN1000 PN6 Form B1 DIN EN 1092-1		27274 m ³ /h	1000 mm
394B	DN1000 PN10 Form B1 DIN EN 1092-1		27274 m ³ /h	1000 mm
395B	DN1200 PN6 Form B1 DIN EN 1092-1		40715 m ³ /h	1200 mm
396B ANSI	DN1200 PN10 Form B1 DIN EN 1092-1		40715 m³/h	1200 mm
connections		1 (D) ((CD))	450.0	150
002A	DN 2 - 1/2"NPT(316L) / incl. Gasket/EPDM	Keramik / Platin / EPDM	156 l/h	150 mm
003A	DN 3 - 1/2"NPT(316L) / incl. Gasket/EPDM	Keramik / Platin / EPDM	254 l/h	150 mm
006A	DN 6 - 1/2"NPT(316L) / incl. Gasket/EPDM	Keramik / Platin / EPDM	1017 l/h	150 mm
010A	DN10 - 1/2"NPT(316L) / incl. Gasket/EPDM	Keramik / Platin / EPDM	2827 l/h	150 mm
H02A	DN 2 - 1/2"NPT(Hastelloy) / incl. Gasket/PTFE	Keramik / Platin / PTFE	156 l/h 254 l/h	156 mm
H03A	DN 3 - 1/2"NPT(Hastelloy) / incl. Gasket/PTFE	Keramik / Platin / PTFE	1017 l/h	156 mm
H06A	DN 6 - 1/2"NPT(Hastelloy) / incl. Gasket/PTFE	Keramik / Platin / PTFE		156 mm
H10A ANSI flanges	DN10 - 1/2"NPT(Hastelloy) / incl. Gasket/PTFE	Keramik / Platin / PTFE	2827 l/h	156 mm
	1/ "Close 150 DE ASME B16 5 2002		6.2 m3/h	200 mm
201R 221R	½ "Class 150 RF ASME B16.5-2003 ½ "Class 300 RF ASME B16.5-2003		6,3 m³/h 6 m³/h	200 mm 200 mm
203R	1" Class 150 RF ASME B16.5-2003		17,6 m³/h	200 mm
223R	1" Class 300 RF ASME B16.5-2003		17,6 m³/h	200 mm
205R	11/2" Class 150 RF ASME B16.5-2003		45 m³/h	200 mm
225R	1½" Class 300 RF ASME B16.5-2003		45 m³/h	200 mm
206R	2" Class 150 RF ASME B16.5-2003		70 m³/h	200 mm
226R	2" Class 300 RF ASME B16.5-2003		70 m³/h	200 mm
207R	2½" Class 150 RF ASME B16.5-2003		119 m³/h	200 mm
227R	2½" Class 300 RF ASME B16.5-2003		119 m³/h	272 mm
208R	3" Class 150 RF ASME B16.5-2003		180 m³/h	272 mm
228R	3" Class 300 RF ASME B16.5-2003		180 m³/h	272 mm
210R	4" Class 150 RF ASME B16.5-2003		282 m³/h	250 mm
230R	4" Class 300 RF ASME B16.5-2003		282 m³/h	310 mm
211R 231R	5" Class 150 RF ASME B16.5-2003 5" Class 300 RF ASME B16.5-2003		441 m ³ /h	250 mm 335 mm
212R	6" Class 150 RF ASME B16.5-2003		636 m³/h	300 mm
232R	6" Class 300 RF ASME B16.5-2003		636 m³/h	300 mm
213R	8" Class 150 RF ASME B16.5-2003		1130 m³/h	350 mm
233R	8" Class 300 RF ASME B16.5-2003		1130 m ³ /h	350 mm
214R	10" Class 150 RF ASME B16.5-2003		1767 m ³ /h	450 mm
234R	10" Class 300 RF ASME B16.5-2003		1767 m ³ /h	450 mm
215R	12" Class 150 RF ASME B16.5-2003		2544 m³/h	500 mm
235R	12" Class 300 RF ASME B16.5-2003		2544 m³/h	500 mm
216R	14" Class 150 RF ASME B16.5-2003		3463 m ³ /h	550 mm
236R	14" Class 300 RF ASME B16.5-2003		3463 m ³ /h	550 mm
217R	16" Class 150 RF ASME B16.5-2003		4523 m³/h	600 mm
237R	16" Class 300 RF ASME B16.5-2003		4523 m³/h	600 mm
218R	18" Class 150 RF ASME B16.5-2003		5725 m³/h	600 mm
238R	18" Class 300 RF ASME B16.5-2003		5725 m ³ /h	640 mm
219R	20" Class 150 RF ASME B16.5-2003		7068 m ³ /h	600 mm
239R	20" Class 300 RF ASME B16.5-2003		7068 m³/h	730 mm
220R	24" Class 150 RF ASME B16.5-2003		10178 m ³ /h	600 mm
240R	24" Class 300 RF ASME B16.5-2003		10178 m ³ /h	860 mm
2A1R	28" Class 150 RF ASME B16.5-2004		13854 m³/h	800 mm
2A2R	30" Class 150 RF ASME B16.5-2005		15904 m³/h	900 mm
2A3R	32" Class 150 RF ASME B16.5-2006		18095 m³/h	900 mm
2A4R	36" Class 150 RF ASME B16.5-2007		22902 m³/h	1100 mm
2A5R	40" Class 150 RF ASME B16.5-2008		28274 m³/h	1100 mm
2A5R	40" Class 150 RF ASME B16.5-2008		28274 m³/h	1100 r
2A6R	48" Class 150 RF ASME B16.5-2010		40715 m³/h	1400 r

	1" JIS K10		17,6 m³/h	200 mm
418R 1	1" JIS K10 1" JIS K20		17,6 m³/n 17,6 m³/h	200 mm 200 mm
	1½" JIS K10 1½" JIS K20		45 m³/h 45 m³/h	200 mm 240 mm
	2" JIS K20 2" JIS K10		45 m3/h 70 m3/h	
	2 JIS K10 2" JIS K20		70 m³/h	200 mm 240 mm
			119 m³/h	240 mm 200 mm
	2½" JIS K10 2½" JIS K20		119 m³/h	
			180 m³/h	272 mm
	3" JIS K10			200 mm
	3" JIS K20		180 m³/h	272 mm
	4" JIS K10		282 m³/h	250 mm
	4" JIS K20		282 m³/h	310 mm
	5" JIS K10		441 m³/h	250 mm
	5" JIS K20		441 m³/h	335 mm
	6" JIS K10		636 m³/h	300 mm
	6" JIS K20		636 m³/h	300 mm
	8" JIS K10		1130 m³/h	350 mm
	8" JIS K20		1130 m³/h	350 mm
466R 1	10" JIS K10		1767 m³/h	450 mm
468R 1	10" JIS K20		1767 m³/h	450 mm
471R 1	12" JIS K10		2544 m³/h	500 mm
473R 1	12" JIS K20		2544 m³/h	500 mm
	14" JIS K10		3463 m³/h	550 mm
	14" JIS K20		3463 m³/h	550 mm
	16" JIS K10		4523 m³/h	600 mm
	16" JIS K20		4523 m³/h	600 mm
	18" JIS K10		5725 m³/h	600 mm
	18" JIS K20		5725 m³/h	640 mm
	20" JIS K10	İ	7068 m³/h	600 mm
	20" JIS K20		7068 m³/h	680 mm
	24" JIS K10		10178 m ³ /h	600 mm
	24" JIS K20		10178 m ³ /h	800 mm
				000
ood design				
7000 [DN15 Tri-Clamp-Connection	Ceramics / Platinum	6,3 m³/h	144 mm
	DN25 Tri-Clamp-Connection	Ceramics / Platinum	17,6 m ³ /h	159 mm
	DN40 Tri-Clamp-Connection	Ceramics / Platinum	45 m ³ /h	174 mm
	DN50 Tri-Clamp-Connection	Ceramics / Platinum	70 m ³ /h	184 mm
	DN65 Tri-Clamp-Connection	Ceramics / Platinum	119 m ³ /h	221 mm
	DN80 Tri-Clamp-Connection	Ceramics / Platinum	180 m³/h	256 mm
	DN100 Tri-Clamp-Connection	Ceramics / Platinum	282 m³/h	286 mm
7000	Bittee m-biamp-benneetion	Ceramics / Flaundin	202 111 /11	200 11111
6610	DN 15 Sanitary connection DIN11851	Ceramics / Platinum		144 mm
	DN 25 Sanitary connection DIN11851	Ceramics / Platinum	17,6 m ³ /h	159 mm
				174 mm
	DN 40 Sanitary connection DIN11851	Ceramics / Platinum	45 m³/h	
	DN 50 Sanitary connection DIN11851	Ceramics / Platinum	70 m³/h	184 mm
	DN100 Sanitary connection DIN11851	Ceramics / Platinum	282 m³/h	286 mm
	Special on request			1.01
	special on request		xx	хх
	Material Process connection			
0 1	w/o			
	Flange steel painted			
1 F				
1 F 2 F	Flange st.st. 1.4301 (DN210 in 1.4404)			
1 F 2 F x s	Flange st.st. 1.4301 (DN210 in 1.4404) special on request			
1 F 2 F x s	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes			
1 F 2 F x s S s	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI)	(Standard for hard rubber, soft rubber)		
1 F 2 F X S S S H F	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy	(Standard for hard rubber, soft rubber) (Standard for PTFE / EPDM - lining)	special for hard rubber, soft rubber	
1 F 2 F x s S s H F	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum	(Standard for PTFE / EPDM - lining)	special for soft rubber, EPDM	
1 F 2 F X S S S H H T 7 N F	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy		special for soft rubber, EPDM special for soft rubber, EPDM	
1 F 2 F X S S S H H T 7 N F	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum	(Standard for PTFE / EPDM - lining)	special for soft rubber, EPDM	
1 F 2 F X S N F N F M	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium	(Standard for PTFE / EPDM - lining)	special for soft rubber, EPDM special for soft rubber, EPDM	
1 F 2 F X S S S H F T N F M 7 X S	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request	(Standard for PTFE / EPDM - lining)	special for soft rubber, EPDM special for soft rubber, EPDM	
1 2 X S H	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12"	special for soft rubber, EPDM special for soft rubber, EPDM	
1 F 2 F X S S S H F M T X S 0 V	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o	(Standard for PTFE / EPDM - lining)	special for soft rubber, EPDM special for soft rubber, EPDM	
1 F 2 F X S S S H F M T X S 0 V	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12"	special for soft rubber, EPDM special for soft rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining)	special for soft rubber, EPDM special for soft rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI)	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM	
1 r 2 r 3 s 4 r 1 r 5 s 5 s 5 s 7 r 7 r 7 r 7 r 7 r 7 r 7 r 7 r 7 r 7 r	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) EPDM; PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, EPDM special for soft rubber, EPDM special for soft rubber, EPDM	
1 [2 [2 [3 2 2 2 2 2 2 2 2 2	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) EPDM; PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for hard rubber, soft rubber special for soft rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) EPDM; PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, EPDM special for soft rubber, EPDM special for soft rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) EPDM; PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, EPDM special for soft rubber, EPDM special for soft rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) (Standard for hard rubber, soft rubber) EPDM; PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, EPDM special for soft rubber, EPDM special for soft rubber, EPDM	
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1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request Transmitter mounting Integrated transmitter	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) EPDMt PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request Tantalum Platinum Titanium Special on request Transmitter mounting Integrated transmitter Remote Transmitter	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) (EPDM; PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, Soft rubber special for soft rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request Transmitter mounting Integrated transmitter	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) EPDMt PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM	
1 F 2 F 3 S S H H H T T N F M T X S H H N F M T N F M T X S H H 1 F 2 F 3 F 1 F 3 F 1 F 1 F 1 F 1 F 1 F 1 F 1 F 1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request Transmitter mounting Integrated transmitter Remote Transmitter Remote Transmitter	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) (EPDM; PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, Soft rubber special for soft rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM	nsmitter
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request Transmitter mounting Integrated transmitter Remote Transmitter Remote Transmitter	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) (EPDM; PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, Soft rubber special for soft rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM	nsmitter
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request Transmitter mounting Integrated transmitter Remote Transmitter Remote Transmitter Remote Transmitter	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) (EPDM; PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, Soft rubber special for soft rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request Transmitter mounting Integrated transmitter Remote Transmitter Remote Transmitter Remote Transmitter Certificates w/o Certificate of compliance with order 2.1	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) (EPDM; PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN600/24" (not available for ceramic lining)	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, Soft rubber special for soft rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM	
1	Flange st.st. 1.4301 (DN210 in 1.4404) special on request Material electrodes st.st. 1.4571 (316 -TI) Hastelloy Tantalum Platinum / Iridium Titanium Special on request Earthing electrode w/o st.st. 1.4571 (316 TI) Hastelloy Tantalum Platinum Titanium Special on request Transmitter mounting Integrated transmitter Remote Transmitter Remote Transmitter Remote Transmitter	(Standard for PTFE / EPDM - lining) (Standard for ceramic lining)/ PTFE max. DN300/12" (Standard for PTFE / ceramic - lining) (Standard for hard rubber, soft rubber) EPDM; PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN800/24" (not available for ceramic lining) PTFE max. DN300/12" (not available for ceramic lining) PTFE max. DN800/24" (n	special for soft rubber, EPDM special for soft rubber, EPDM special for hard rubber rubber, EPDM special for hard rubber, soft rubber special for soft rubber, Soft rubber special for soft rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM special for hard rubber, EPDM	

	Mounting	Connection to sensor	Thread - electrical connection	
	IP 67			
А	Integrated transmitter IP 67 standard			1/2" NPT (f)
В	Integrated transmitter IP 67 standard			M20 x 1,5
C	Remote transmitter	incl 2,5 m cable, c/w pipe-/wall mounting bracket	cable > 10m add. term.conn.box or	
D	Remote transmitter	incl 2,5 m cable, c/w pipe-/wall mounting bracket	cable > 10m add, term.conn.box o	
	IP 68			r da neo x 1,0
L	compact transmitter IP68			1/2" NPT (f)
М	compact transmitter IP68			M20x1,5
G	remote transmitter	incl 2,5 m cable, c/w pipe-/wall mounting bracket	transmitter c/w term.conn.box	1/2" NPT (f)
Н	remote transmitter	incl 2,5 m cable, c/w pipe-/wall mounting bracket	transmitter c/w term.conn.box	M20 x 1,5
	Display and control unit			
1	integrated			
	Power supply			
1	230V AC (+10%, -15%), 50/60Hz			
2	115V AC (+10%, -15%), 50/60Hz			ĺ
4	24V DC (±15%)			
	Output signal			
F	current output: 1x 0/4-20 mA			
G	current output: 1x 0/4-20 mA c/w HART p	rotocoll		
	Design			
0BH	Heinrichs			
0BK	Kobold			
UBK	Rubulu			
	Kubula			
delcode				
delcode	Longer cable			
delcode				
delcode	Longer cable	breakout cable		
delcode options	Longer cable IP 67 2,5m standard on remote version 5m	breakout cable breakout cable		
delcode options	Longer cable IP 67 2,5m standard on remote version			
delcode options 0 1	Longer cable IP 67 2,5m standard on remote version 5m	breakout cable		
delcode options 0 1 2	Longer cable IP 67 2,5m standard on remote version 5m 10m	breakout cable breakout cable		
delcode options 0 1 2 3	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m	breakout cable breakout cable add junction box to transmitter		
0 1 2 3 4	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m	breakout cable breakout cable add junction box to transmitter add junction box to transmitter		
0 0 1 2 3 4 5	Longer cable IP 67 2.5m standard on remote version 5m 10m 15m 20m 30m	breakout cable breakout cable add junction box to transmitter add junction box to transmitter add junction box to transmitter		
0 1 2 3 4 5 6	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m 30m 40m	breakout cable breakout cable add junction box to transmitter add junction box to transmitter add junction box to transmitter add junction box to transmitter		
0 1 2 3 4 5 6	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m 30m 40m 50m	breakout cable breakout cable add junction box to transmitter add junction box to transmitter		
delcode options 0 1 2 3 4 5 6 7 A B	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m 30m 40m 50m IP 68	breakout cable breakout cable add junction box to transmitter add junction box to transmitter add junction box to transmitter add junction box to transmitter add junction box to transmitter		
delcode options 0 1 2 3 4 5 6 7 7 A	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m 30m 40m 50m IP 68 2,5m standard on remote version	breakout cable breakout cable add junction box to transmitter add junction box to transmitter		
delcode options 0 1 2 3 4 5 6 7 A B	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m 30m 40m 50m IP 68 2,5m standard on remote version 5m	breakout cable breakout cable add junction box to transmitter add junction box to transmitter		
delcode options 0 1 2 3 4 5 6 7 7 A B C	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m 30m 40m 50m IP 68 2,5m standard on remote version 5m 10m	breakout cable breakout cable add junction box to transmitter		
delcode options 0 1 2 3 4 5 6 6 7 7 A B C D	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m 30m 40m 50m IP 68 2,5m standard on remote version 5m 10m 15m	breakout cable breakout cable add junction box to transmitter		
delcode options 0 1 2 3 4 5 6 7 7 7 A B C D E	Longer cable IP 67 2.5m standard on remote version 5m 10m 15m 20m 30m 40m 50m IP 68 2.5m standard on remote version 5m 10m 15m 20m	breakout cable breakout cable add junction box to transmitter		
delcode options 0 1 2 3 4 5 6 6 7 7 A B C C D E F	Longer cable IP 67 2,5m standard on remote version 5m 10m 15m 20m 30m 40m 50m IP 68 2,5m standard on remote version 5m 10m 15m 20m 30m 30m 20m 30m 30m 30m 30m 30m 30m 30m 3	breakout cable breakout cable add junction box to transmitter		

* Reference: EN 1092-1:2013

Consequently, whilst the mating dimensions, the flange and facing types and designations are compatible with those given in ISO 7005-1, it is important to take account of the following differences which exist in EN1092-1:

- 1. The p/T ratings of this standard have been reduced in many cases by either limiting the lower temperature ratings which can no longer exceed the PN value, or by increasing the rate at which allowable pressures shall reduce with increase in temperature.
- 2. In addition to the range of PN 2,5 to PN 40 DIN origin flanges contained in the ISO standard,EN1092-1 also includes PN63 and PN100 flanges.
- 3. This standard specifies grades of European steels similar to those specified in ISO 7005-1, but in addition permits the use of those grades of ASTM steels which are specified in the ISO standard for use with the ANSI/ASME based flanges.
- 4. This standard gives an informative annex concerning requirements of EU Directives.

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