



mag-flux T4 Electromagnetic Flow Sensor

Operating Instructions

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1 Safety Instructions

1.1 Intended use

Electromagnetic flow sensors are precision measuring devices, suitable for determining the flow rate of nearly any electrically conductive fluid.

Due to the magnetic field, the device can be used to measure flow rates up to 10 m/s (32,8 ft/s) and a minimum conductivity 50 $\mu\text{S}/\text{cm}$, when using a synchronized static field.

The intended use by the VdS directive does not allow that this Electromagnetic flow sensor (MID) is used for controlling the process.

The entire measuring device comprises a flow sensor and a dedicated transmitter.

Warning!



The operator of these measuring instruments is responsible for suitability, proper use and corrosion resistance of the used materials with regard to the measuring material. It must be ensured that the materials selected for the meter parts in contact with the medium are suitable for the used process media..

The manufacturer is not liable for any damage resulting from improper or unintended use of the devices.

No external loads may act upon the meter. The flowmeters are primarily designed for static applications.



Caution!

Hot surfaces resulting from hot process media!

Danger of burns resulting from surface temperatures above 70°C.

- *Take appropriate protective measures, for example contact protection.*
- *The design of the contact protection must meet the maximum permissible ambient temperature*

The flowmeter may only be operated within the pressure and voltage limits specified on the name plate.

Before taking the flowmeter out of operations, check that the unit is free of hazardous media and de-pressurized.

When returning mag-flux sensors to Mecon, please refer to the „ **Product Return Form**“ which is available for download on www.mecon.en/download. Due to safety reasons we are not allowed to repair or inspect devices without having received the completed and signed form.

Prior to shipping the device, any media residue must be removed. This is particularly important, if the media is potentially hazardous to health or the environment.

It is imperative that this completed and signed declaration is part of the shipping documentation. This also applies to additional safety data sheets and/or special requirements for handling the measuring media.

1.2 Safety instructions from the manufacturer

Disclaimer

The manufacturer is not liable for damages of any kind caused by the use of the device, including, but not limited to direct, indirect, incidental, punitiv and consequential damages.

For every product purchased from the manufacturer warranty applies, according to the relevant product documentation and our Terms and conditions.

The manufacturer reserves the right to revise the content of the documents, including this disclaimer, without notice, and is not liable in any way for possible consequences of such changes.

Product liability and warranty

The responsibility that the instruments are suitable for the particular application rests solely with the operator. The MECON GmbH assumes no liability for the consequences of misuse, modifications or repairs that were carried out by the customer without prior consultation.

In the case of a complaint, the offering parts must be returned to MECON GmbH, unless otherwise agreed.

General information

To prevent injury to the user or damage to the unit, it is necessary that you read the information in this manual carefully before operating the unit.

This manual is intended both for the correct installation, operation and maintance of the equipment. Special designs for special applications and custom models are not covered by this documentation.

1.3 Certifications

CE Marking



The manufacturer certifies that the device mag-flux T4 meets all statutory requirements of the following EC directives.

- VdS Approval: G414033
- Pressure equipment directive 97/23/EC

The hazardous permissible media are liquids of fluid group 2

Classification according to Pressure Equipment Directive 97/23/EC

	Permissible media	Categorie
≤ DN 200 / 8"	Liquids of fluid group 2	Art. 3.3
> DN 200 / 8"	Liquids of fluid group 2	I

Electromagnetic compatibility

- EMC Directive 89/336/EEC
- EN 61000-6-2:1999 (immunity for industrial environments)
- EN 61000-6-3:2001 (emissions residential environments)
- EN 55011:1998+A1:1999 group 1, class B (emitted interference)
- DIN EN 61000-4-2 to DIN EN 61000-4-6
- DIN EN 61000-4-8
- DIN EN 61000-4-11
- DIN EN 61000-4-29
- DIN EN 61326

General standards and directives

- EN 60529 Ingress protection class (IP-code)
- EN 61010 Safety requirements for electrical metering, control and laboratory devices
- NAMUR guideline NE21, Version 10/02/2004

2 Start-up

The mag-flux M1 transmitter is solely suitable to measure volume flow of liquids in conjunction with a sensor of series mag-flux.



It is essential that these operating instructions have been read before installing and operating the device. The device has to be installed and serviced by a qualified technician only. The mag-flux T4 transmitter is solely suitable to measure volume flow of electrically conductive liquids.

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Although the materials in the present document were prepared with extreme care, errors cannot be ruled out. Hence, neither the company, the programmer nor the author can be held legally or otherwise responsible for any erroneous information and /or any loss or damage arising from the use of the information enclosed.

MECON GmbH extends no express or implied warranty in regard to the applicability of the present document for any purpose other than that described.

We try hard to optimize and improve the products and particularly we appreciate any suggestions for improvement made by our customers. If you have any recommendation for improving our products please send your suggestions to the following address:

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MECON GmbH
Abteilung Entwicklung
Röntgenstraße 105
D-50169 Kerpen
Germany

or:

via Fax: +49 (0)2237 – 6 00 06 – 40

via E-Mail: customerservice@mecon.de



We reserve the right to change the technical data in this manual in the light of any technical progress that might be made. For latest updates regarding this product, please visit our website at www.mecon.de.

For information regarding our own sales operations, contact us at customerservice@mecon.de.

3 Installation and mode of operation

3.1 Installation instructions



Information!

All instruments are carefully checked for proper function before shipment. Please check immediately on receipt, the outer packing carefully for damage or signs of improper handling.

Report damage to the carrier and your local sale staff. In such cases, a description of the defect, the type and the serial number of the device is indicated.



Information!

Unpack the unit carefully to avoid damage.



Information!

Check the completeness of the delivery against the packing list. Check the name-plate, if the delivered flow meter was built according to your order. Particularly check devices with electrical components for the correct supply voltage.

3.2 Installation of the flow meter

At the installation of the magnetic-inductive flow sensor the instructions and notes of the assembly instructions and operating manuals have to be followed. Also observe the regulations of grounding, potential equalization and company internal grounding guidelines.

Potentials

All outputs of the transmitter mag-flux M1 are electrically isolated from the auxiliary power, the sensor circuit and from each other. The housing and the interference suppression filters of the power supply are connected to PE.

The electrodes and measuring electronics are related to the potential of the function earth FE of the sensor. FE is not connected to PE, but may be connected with each other in the sensor junction box. If the sensor is grounded by using grounddisks (earthing rings), these must in connected with the function earth FE.

Cathodic protective units

Using a cathodic protective unit to avoid corrosion, which put a voltage to the tube wall, it must be connected to terminal FE. The transmitter boards, control panel and internal switches are on the same potential as FE .

Installation and Repair

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



Warning

Before servicing the device, it must be completely switched off and disconnected from all peripheral devices. The technician must ensure that the device is completely off-circuit. Only original replacement parts have to be used.

MECON 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.

In the case of a problem with your device, please contact us

Phone : +49 (0)2237 – 6 00 06 - 0

Fax: +49 (0)2237 – 6 00 06 - 40

Contact our customer service department if your device needs repair or if you need assistance in diagnosing a problem with your device.

Safety advisory for the user

The present document includes all information you need for proper operation of the product. The document is intended for use by qualified personnel. This means personnel who are qualified to operate the device described herein safely, including

- either electronics engineers,
- or service technicians

who are conversant with the safety regulations pertaining to the use of electrical and automated technical devices and with the applicable laws and regulations in their own country. The personnel must be authorized by the facility operator to install commission and service the product described herein, and are to read and understand the contents of the present operating instructions before working with the device.

Hazard warnings

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

The safety advisories and hazard warnings in the present documents to avoid injury of placing operators and maintenance personnel and to avoid material damage are prioritized using the terms listed below, which are defined as follows:

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 light severe bodily injury or material damage!

Note

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

Proper use of the device**Warning**

The operator is responsible for ensuring that the material used in the sensor and housing is suitable and that such material meets the requirements for the fluid being used and the ambient site conditions. The manufacturer accepts no responsibility in regard to such material and housing

Warning

In order for the device to perform correctly and safely, it must be shipped, stored, set up, mounted operated and maintained properly.

3.3 Return for servicing or calibration

Before returning your flowmeter for servicing or calibration make sure it is completely clean. Any residues of substances that could be hazardous to the environment or human health are to be removed from all crevices, recesses, gaskets, and cavities of the housing before the device is shipped!

Warning

The operator is liable for any loss or damage of any kind, including personal injury, decontamination measures, removal operations and the like that are attributable to inadequate cleaning of the device.

Any device returned for servicing is to be accompanied by a decontamination certificate! Form can be downloaded from our website www.mecon.en/Download.

The device is to be accompanied by a document describing the problem. Please also quote the name of a contact person. This will help to repair your device as expeditiously as possible and therefore minimize the cost of repairing it.

3.4 Installation instructions

Basically, the measuring principle does not depend on the flow profile.

Ideally, the sensor should be installed in a pipeline with a sufficient straight run, both before and after the measuring point. Experience has shown that an inflow path of 5x nominal diameter (D) and an outflow zone of at least 2 to 3xD are required.

Provided that constant turbulence does not enter the area in which the measurement takes place (e.g. after elbows, during tangential feeds or if the valve in front of the sensor is partially open). However, should this be the case, appropriate actions must be taken to normalize the flow profile. The appropriate steps are:

- increasing the inflow and outflow zones
- using flow conditioners
- reducing the inner diameter of the pipe

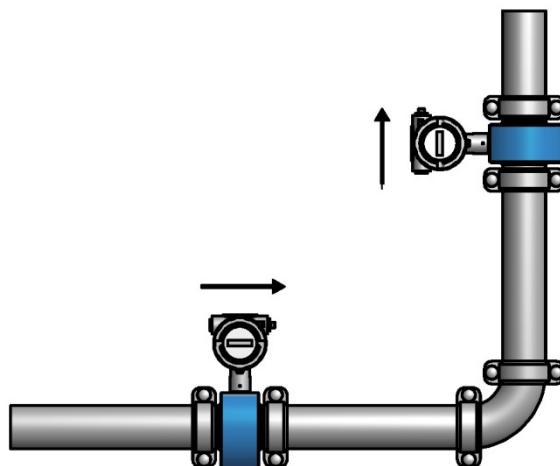


Fig. 1 Installation in horizontal and vertical pipeline

The sensors may be installed either horizontally or vertically (Fig. 1); however, it must be ensured, that the axes of the electrodes are running horizontally (see directional arrow on the electrode). This will avoid erroneous measurements due to deposits or air bubbles on the electrodes.

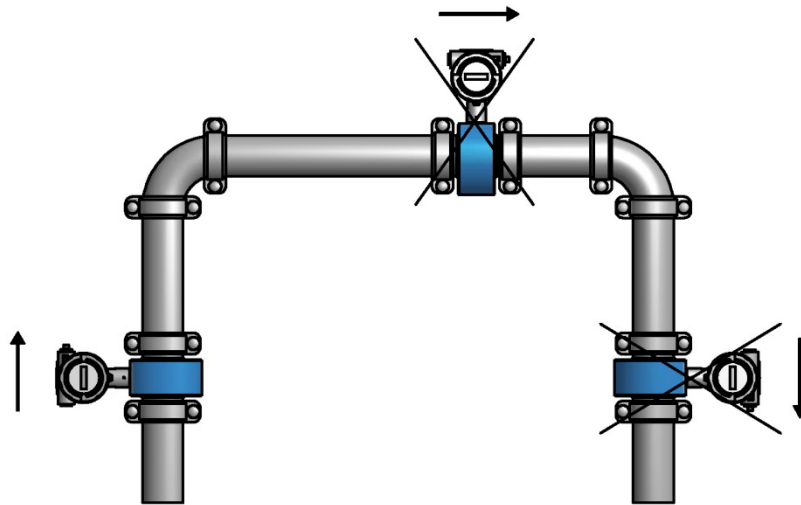


Fig. 2 installation in risers and down pipes

Do not install the sensor in a drainage area or pipeline (e.g. down pipe). If the sensor must be installed in a down pipe, ensure that portion of the pipeline is always filled 100 % with the media.

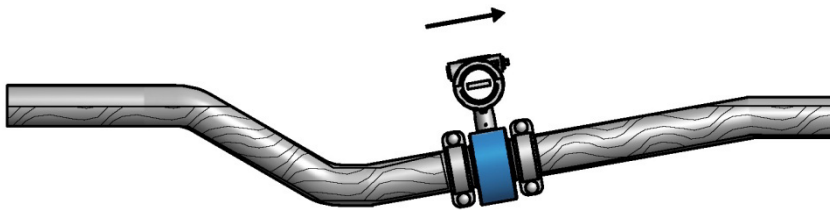


Fig. 3 Installation in a pipeline which is always filled with media

The sensor must be installed in an area of the pipe which will always be filled with media. If a pipeline is not always filled, or in case of an open channel (drainage), the sensor must be installed in a siphon (Fig.3).

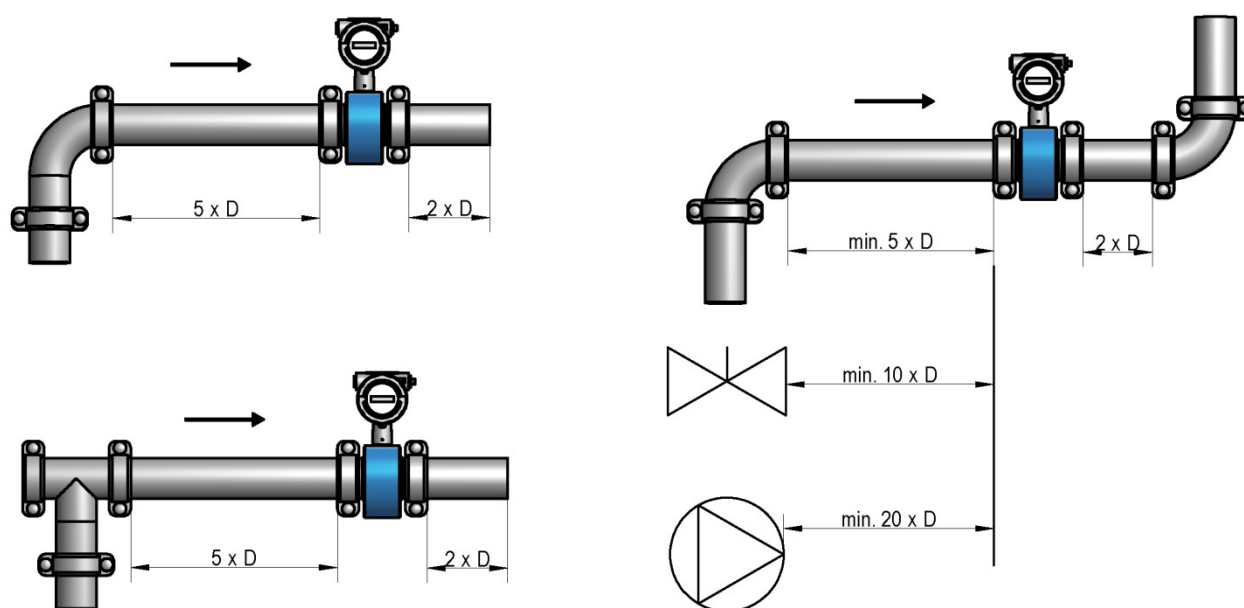


Fig. 4 Installation between tees, valves and pumps

Always maintain the distance of the pipe's straight run (Fig. 4.). If these distances cannot be maintained, flow conditioners must be installed or pipes with smaller diameter must be used.

If several sensors are installed in series, the distance between each sensor must be equal to the length of one sensor. If two or more sensors are to be installed in parallel, the distance between sensors must be at least 1 m.

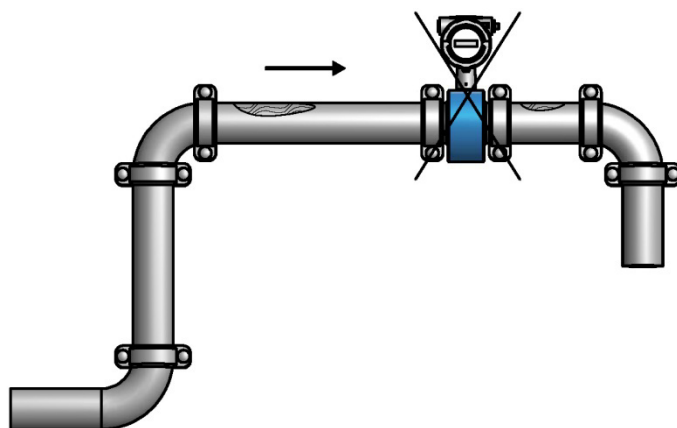


Fig. 5 Installation at highest point

Due to possible accumulation of gases, the sensor should not be installed at the highest point of a pipeline.

3.5 Startup conditions

The device is not subject to specific startup conditions.

3.6 Mode of operation

The measuring principle is based on the law of electromagnetic induction as described by Faraday. A conductive liquid flowing through the sensor's magnetic field generates voltage which is directly proportional to the flow velocity.

Measuring principle

It was back in 1832 that Faraday suggested utilizing the principle of electrodynamic induction for measuring flow velocities. His experiments in the Thames, though unsuccessful due to superimposed polarization effects, are nonetheless regarded as the first experiment in the field of magnetic-inductive flow measurement. According to Faraday's law of electromagnetic induction, an electrical field E is generated in a conductive liquid moving through a magnetic field B at a velocity v in accordance with the vector product $E = [v \times B]$.

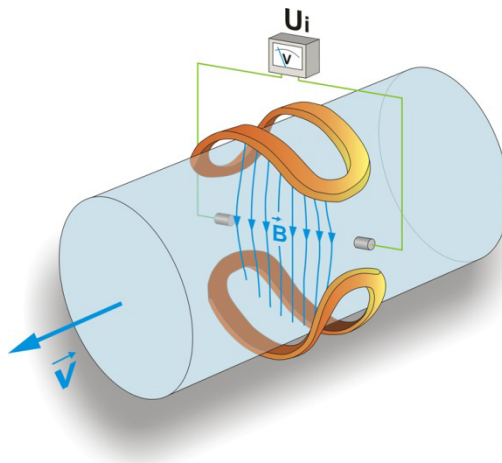


Fig.6 Principle of the magnetic-inductive flow measurement

Through a meter tube provided with an insulating lining a liquid flows at velocity v and a flow rate Q , producing a measuring-circuit voltage U_m at the two electrodes at right angles to the direction of flow. The size of this measuring-circuit voltage is proportional to the mean flow velocity and the volume flow rate.

System design

The complete meter consists of a sensor and a *mag-flux M1* transmitter. The device is qualified to measure liquids. The *mag-flux M1* transmitter generates the inductive current necessary for the magnetic field and preprocesses the induced voltage at the electrodes.

4 Service

4.1 Storage

Store the device in a dry and dust-free place.

Keep away from direct and permanent sun and heat.

Avoid external load to the device.

The storage temperature range for standard devices with electrical components is $- 20... + 60^{\circ}\text{C}$.

4.2 Maintenance

The transmitter *mag-flux M1* is designed for maintenance-free performance. It contains no parts, which have to be replaced or adjusted cyclically.

Although the devices are maintenance-free, we recommend to check the flow meter for signs of corrosion, mechanical wear and damage at regular intervals.

We recommend routine inspections at least once a year.

For a detailed inspection and cleaning the device has to be removed from the pipe.



Caution!

While commissioning or maintenance, mains power must be switched off.



Caution!

When removing the device from the pipeline appropriate safety precautions must be taken. Basically in case of new installation in the pipeline new seals have to be used.

5 Device description

5.1 Scope of delivery



1. Flow meter mag-flux T4
2. Operating Instructions
3. Certificate (optional)



Information!

Please check the delivery for completeness using the packing list.

5.2 Device versions

The entire measuring device comprises a flow sensor and a dedicated transmitter. Those can be delivered inly as a compact version.

Special features

- Fully welded steel design for robust, error-free operation
- Fast signal processing with 16-bit microcontroller
- Short delivery time
- Permanently pre-configured measurement ranges
- VdS-Approval
- Easy installation thanks to coupling connection
- Simple electrical connection thanks to M12 plug
- Fixed parameter set

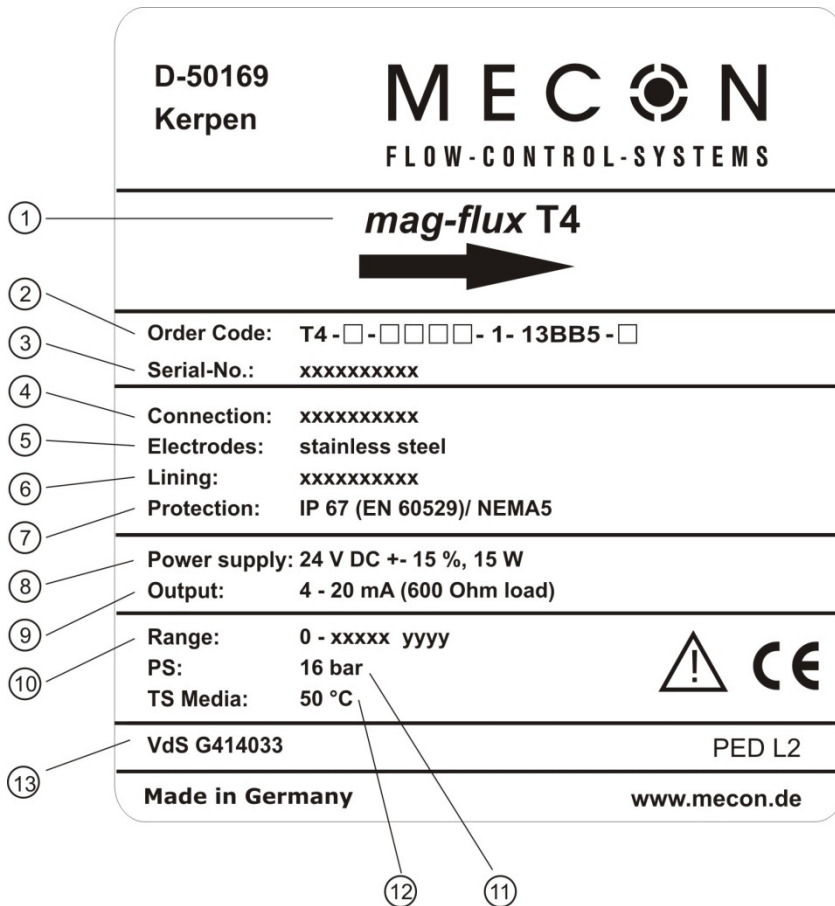
5.3 Nameplate



Important!

Please refer to the device nameplate to ensure that the device is built according to your order.

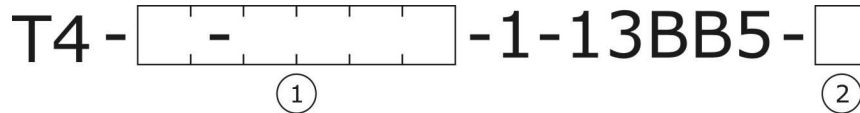
Check particularly for the correct supply voltage.



- | | | |
|---|---------------|---|
| ① | Type: | Device type |
| ② | Order Code: | Device specific code number |
| ③ | Serial No.: | Device specific serial number |
| ④ | Connection: | Nominal diameter and process connection |
| ⑤ | Electrodes: | Electrodes material |
| ⑥ | Lining: | Lining material |
| ⑦ | Protection: | Protection class |
| ⑧ | Power supply: | Power supply |
| ⑨ | Output: | Electrical output |
| ⑩ | Range: | Measuring range |
| ⑪ | PS: | Maximum pressure of the medium |
| ⑫ | TS Media: | Maximum temperature of the medium |
| ⑬ | VdS | VdS Approval |

6 Description code

The description code consists of the following elements:



- ① Process connections and nominal diameter

For hard rubber lining:

	Process connection	Measuring ranges
H-K050	Coupling connection DN 50	0 - 1180 l/min 0 - 310 USGPM
H-K065	Coupling connection DN 65	0 - 2000 l/min. 0 - 525 USGPM
H-K080	Coupling connection DN 80	0 - 3000 l/min. 0 - 800 USGPM
H-K100	Coupling connection DN 100	0 - 4700 l/min. 0 - 1250 USGPM
H-K125	Coupling connection DN 100	0 - 7350 l/min. 0 - 1950 USGPM
H-K150	Coupling connection DN 150	0 - 10600 l/min. 0 - 2800 USGPM
H-K200	Coupling connection DN 200	0 - 18850 l/min. 0 - 5000 USGPM
H-K250	Coupling connection DN 250	0 - 29500 l/min. 0 - 7800 USGPM
H-D015	Flange connection EN 1092-1 DN 15 PN 40	0 - 106 l/min. 0 - 28 USGPM
H-D020	Flange connection EN 1092-1 DN 20 PN 40	0 - 188 l/min. 0 - 50 USGPM
H-D025	Flange connection EN 1092-1 DN 25 PN 40	0 - 295 l/min. 0 - 78 USGPM
H-D032	Flange connection EN 1092-1 DN 32 PN 40	0 - 480 l/min. 0 - 128 USGPM
H-D040	Flange connection EN 1092-1 DN 40 PN 40	0 - 750 l/min. 0 - 200 USGPM
H-D050	Flange connection EN 1092-1 DN 50 PN 40	0 - 1180 l/min 0 - 310 USGPM
H-D065	Flange connection EN 1092-1 DN 65 PN 16	0 - 2000 l/min. 0 - 525 USGPM
H-D080	Flange connection EN 1092-1 DN 80 PN 16	0 - 3000 l/min. 0 - 800 USGPM
H-D100	Flange connection EN 1092-1 DN 100 PN 16	0 - 4700 l/min. 0 - 1250 USGPM
H-D125	Flange connection EN 1092-1 DN 125 PN 16	0 - 7350 l/min. 0 - 1950 USGPM
H-D150	Flange connection EN 1092-1 DN 150 PN 16	0 - 10600 l/min. 0 - 2800 USGPM
H-D200	Flange connection EN 1092-1 DN 200 PN 16	0 - 18850 l/min. 0 - 5000 USGPM
H-D250	Flange connection EN 1092-1 DN 250 PN 16	0 - 29500 l/min. 0 - 7800 USGPM
H-A015	Flange connection ½" ANSI B16.5 150RF	0 - 106 l/min. 0 - 28 USGPM
H-A020	Flange connection ¾" ANSI B16.5 150RF	0 - 188 l/min. 0 - 50 USGPM
H-A025	Flange connection 1" ANSI B16.5 150RF	0 - 295 l/min. 0 - 78 USGPM
H-A032	Flange connection 1 ¼" ANSI B16.5 150RF	0 - 480 l/min. 0 - 128 USGPM
H-A040	Flange connection 1 ½" ANSI B16.5 150RF	0 - 750 l/min. 0 - 200 USGPM
H-A050	Flange connection 2" ANSI B16.5 150RF	0 - 1180 l/min 0 - 310 USGPM
H-A065	Flange connection 2 ½" ANSI B16.5 150RF	0 - 2000 l/min. 0 - 525 USGPM
H-A080	Flange connection 3" ANSI B16.5 150RF	0 - 3000 l/min. 0 - 800 USGPM
H-A100	Flange connection 4" ANSI B16.5 150RF	0 - 4700 l/min. 0 - 1250 USGPM
H-A125	Flange connection 5" ANSI B16.5 150RF	0 - 7350 l/min. 0 - 1950 USGPM
H-A150	Flange connection 6" ANSI B16.5 150RF	0 - 10600 l/min. 0 - 2800 USGPM
H-A200	Flange connection 8" ANSI B16.5 150RF	0 - 18850 l/min. 0 - 5000 USGPM
H-A250	Flange connection 10" ANSI B16.5 150RF	0 - 29500 l/min. 0 - 7800 USGPM

For PTFE lining:

	Process connection	Measuring ranges	
P-G015	Thread connection G 1/2	0 - 106 l/min.	0 - 28 USGPM
P-G020	Thread connection G 3/4	0 - 188 l/min.	0 - 50 USGPM
P-G025	Thread connection G 1	0 - 295 l/min.	0 - 78 USGPM
P-G032	Thread connection G 1 1/4	0 - 480 l/min.	0 - 128 USGPM
P-G040	Thread connection G 1 1/2	0 - 750 l/min.	0 - 200 USGPM
P-G050	Thread connection G 2	0 - 1180 l/min.	0 - 310 USGPM
P-D015	Flange connection EN 1092-1 DN 15 PN 40	0 - 106 l/min.	0 - 16 USGPM
P-D020	Flange connection EN 1092-1 DN 20 PN 40	0 - 188 l/min.	0 - 30 USGPM
P-D025	Flange connection EN 1092-1 DN 25 PN 40	0 - 295 l/min.	0 - 45 USGPM
P-D032	Flange connection EN 1092-1 DN 32 PN 40	0 - 480 l/min.	0 - 75 USGPM
P-D040	Flange connection EN 1092-1 DN 40 PN 40	0 - 750 l/min.	0 - 120 USGPM
P-D050	Flange connection EN 1092-1 DN 50 PN 40	0 - 1180 l/min.	0 - 190 USGPM
P-D065	Flange connection EN 1092-1 DN 65 PN 16	0 - 2000 l/min.	0 - 300 USGPM
P-D080	Flange connection EN 1092-1 DN 80 PN 16	0 - 3000 l/min.	0 - 480 USGPM
P-D100	Flange connection EN 1092-1 DN 100 PN 16	0 - 4700 l/min.	0 - 750 USGPM
P-D125	Flange connection EN 1092-1 DN 125 PN 16	0 - 7350 l/min.	0 - 1150 USGPM
P-D150	Flange connection EN 1092-1 DN 150 PN 16	0 - 10600 l/min.	0 - 1700 USGPM
P-D200	Flange connection EN 1092-1 DN 200 PN 16	0 - 18850 l/min.	0 - 3000 USGPM
P-D250	Flange connection EN 1092-1 DN 250 PN 16	0 - 29500 l/min.	0 - 4600 USGPM
P-A015	Flange connection 1/2" ANSI B16.5 150RF	0 - 106 l/min.	0 - 28 USGPM
P-A020	Flange connection 3/4" ANSI B16.5 150RF	0 - 188 l/min.	0 - 50 USGPM
P-A025	Flange connection 1" ANSI B16.5 150RF	0 - 295 l/min.	0 - 78 USGPM
P-A032	Flange connection 1 1/4" ANSI B16.5 150RF	0 - 480 l/min.	0 - 128 USGPM
P-A040	Flange connection 1 1/2" ANSI B16.5 150RF	0 - 750 l/min.	0 - 200 USGPM
P-A050	Flange connection 2" ANSI B16.5 150RF	0 - 1180 l/min.	0 - 310 USGPM
P-A065	Flange connection 2 1/2" ANSI B16.5 150RF	0 - 2000 l/min.	0 - 525 USGPM
P-A080	Flange connection 3" ANSI B16.5 150RF	0 - 3000 l/min.	0 - 800 USGPM
P-A100	Flange connection 4" ANSI B16.5 150RF	0 - 4700 l/min.	0 - 1250 USGPM
P-A125	Flange connection 5" ANSI B16.5 150RF	0 - 7350 l/min.	0 - 1950 USGPM
P-A150	Flange connection 6" ANSI B16.5 150RF	0 - 10600 l/min.	0 - 2800 USGPM
P-A200	Flange connection 8" ANSI B16.5 150RF	0 - 18850 l/min.	0 - 5000 USGPM
P-A250	Flange connection 10" ANSI B16.5 150RF	0 - 29500 l/min.	0 - 7800 USGPM

② Display

Code	Line 1	Line 2
L	l/min.	m/s
G	USGPM	feet/s

7 Technical Data

7.1 Reference conditions

Medium temperature	+10 °C to 30 °C
Environmental temperaturer	+20 °C to 30 °C
Heating period	30 min.
Length of straight pipe	Inflow path 5 x nominal diameter Outflow zone 2 x nominal diameter Properly centered Properly grounded

7.2 Sensor

Application field	See page 13
Measuring principle	Pulsed constant field (DC)
Inlet	
Process connection/Nominal size	Coupling connection 50/2" – 250/10" Thread connection G ½ - G 2 Flange connection EN 1092-1 DN 15 – DN 250 Flange connection ANSI B16.5 150RF ½" – 10"
Measuring accuracy	
Error of measurement	± 0,5 % of the measured value from 1 m/s to 10 m/s ± 0,4 % of the measured value + 1mm/s to < 1 m/s
Repeat accuracy	± 0,15 % of the measured value form 0,5 m/s to 10 m/s
Operating conditions	
Direction of installation	See page 12 Installation instructions
Inflow path	5 x nominal diameter
Outflow zone	2 x nominal diameter
Medium temperature	4 - 50°C / 39 - 122°F
Environmental temperature	
Hard rubber lining	0 – 50 °C (see 7.2 as well)
PTFE liningg	0 – 50 °C (see 7.2 as well)
Pressure limit	Coupling connection: max. 16 bar Flange connection ≤ 50/2": max. 20 bar Flange connection >50/2": max. 16 bar Thread connection: max. 20 bar
Protection classt	IP 67

Requirements on the media

Aggregate state of the medium	Liquid
Viscosity of the medium	No restriction
Minimum conductivity	> 50 $\mu\text{S}/\text{cm}$
Minimum flow rate	0,1 – 10 m/s

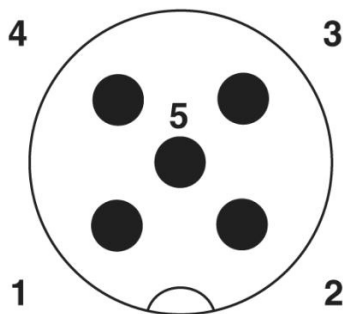
Specifications

Design	Fully welded steel design
Weight	See page 23 – 24
Sensor material	
• Measuring tube	Stainless steel
• Solenoid chamber	Steel
• Lining	Hard rubber/PTFE
Electrodes material	Stainless steel
Corrosion –protection class	C2 (low polluted atmosphere, dry climate)

7.3 Transmitter:

Housing material	Die-cast aluminum
Electrical output	1 x circular plug-in connector M12 x 1 (5 pol) with 5 m cable
Power supply:	24 V DC; ±15 %
Power consumption:	10 W
Analog output	Electrical output 4-20 mA active
Influence of ambient temperature	± 0,1 % per 10 K
Load of the current output	Standard: ≤ 600 Ohm
Damping	3 s
Low-flow cut-off	< 0,1 m/s
Display	
- Line 1	Flow in l/min. / USGPM
- Line 2	Flow velocity in m/s / feet/s.
Corrosion protection class	C2 (low polluted atmosphere, dry climate)
Ambient temperature	- 20 °C to + 60 °C, below 0 °C the readability of the LCD display will be limited In the case of an outdoor installation, the device must be protected against direct solar irradiation with a weather shield.

7.4 Connector plug:



- | | | |
|----|-------|-------------------------|
| 1. | Brown | +24 V |
| 2. | White | not occupied |
| 3. | Blue | mass / 0 V |
| 4. | Black | not occupied |
| 5. | Grey | Analog output 4 – 20 mA |

7.5 Dimensions and weights

Hard rubber with coupling connection

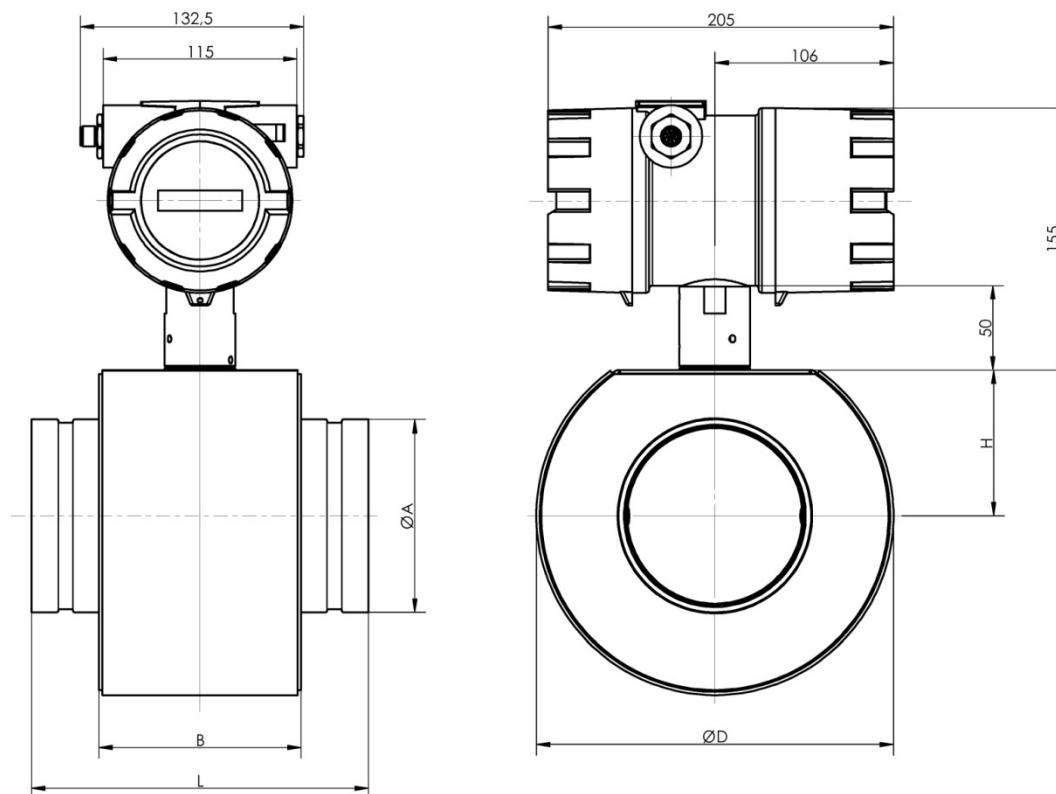


Fig. 7 Hard rubber with coupling connection

Nominal diameter	ØA	Build-in-length	Dimensions of housing			Weight in kg		
			L	Tolerance	B		D	H
50	2"	60,3	150	+0 / -2	80	140	57	6,5
65	2½"	76,1	150	+0 / -2	80	155	63	7,0
80	3"	88,9	150	+0 / -2	80	170	70	9,0
100	4"	114,3	200	+0 / -2	120	210	86	10,0
125	5"	139,7	200	+0 / -2	120	240	98	10,5
150	6"	168,3	200	+0 / -2	120	285	117	13,5
200	8"	219,1	300	+0 / -2	200	350	143	21,5
250	10"	273,0	300	+0 / -3	200	440	180	32,0

The version with grooved ends may only be used in combination with VdS approved manufacturer of pipe couplings Minimax, Modgal and Victaulic (except pipe couplings of the type "Style77").

Hard rubber and PTFE with flange connection:

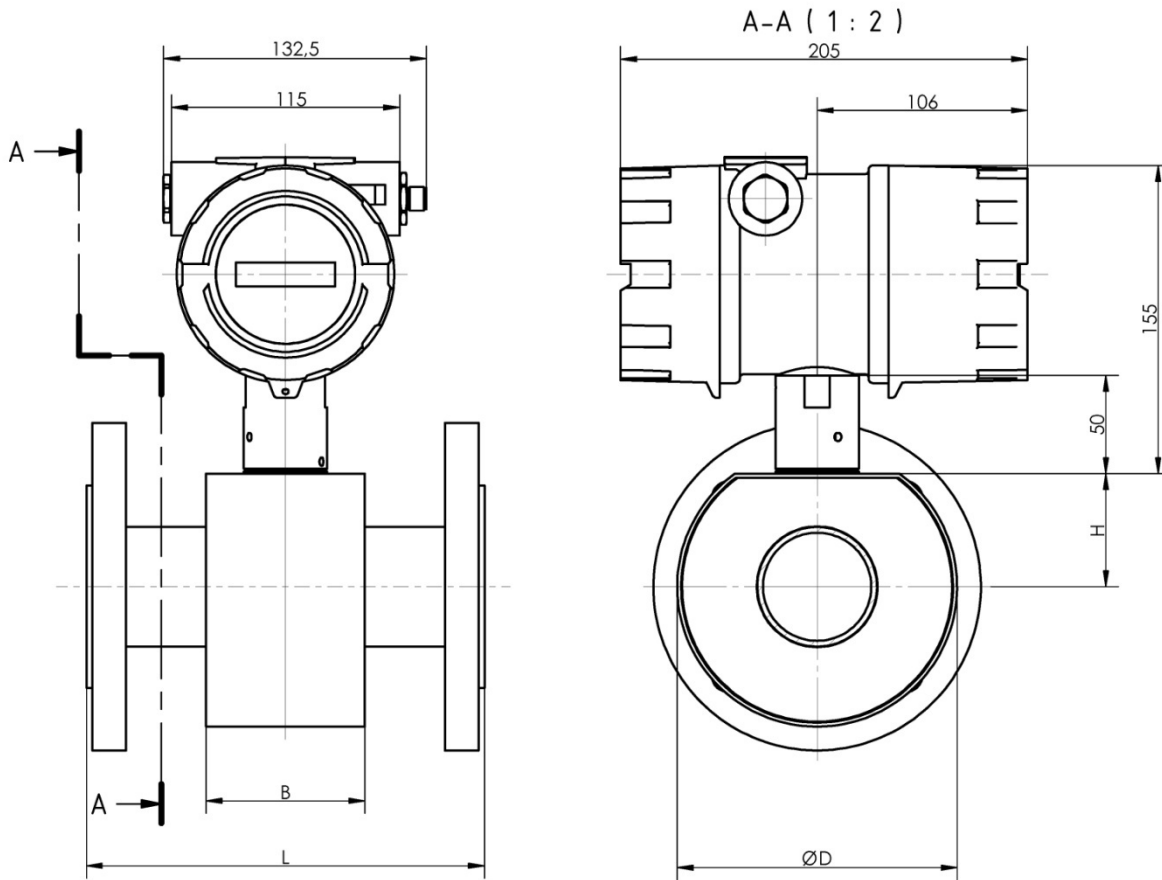


Fig. 9 Hard rubber and PTFE with flange connection

Nominal diameter		Build-in-length		Dimensions of housing			Weight in kg
		L	Tolerance	B	D	H	
15	1/2"	200	+0 / -2	80	130	53	5,0
20	3/4"	200	+0 / -2	80	130	53	5,5
25	1"	200	+0 / -2	80	130	53	6,0
32	1 1/4"	200	+0 / -2	80	130	53	7,0
40	1 1/2"	200	+0 / -2	80	130	53	7,5
50	2"	200	+0 / -2	80	140	57	9,0
65	2 1/2"	200	+0 / -2	80	155	63	10
80	3"	200	+0 / -2	80	170	70	13
100	4"	250	+0 / -2	120	210	86	15
125	5"	250	+0 / -2	120	240	98	19
150	6"	300	+0 / -2	120	285	117	23
200	8"	350	+0 / -2	200	350	143	36
250	10"	450	+0 / -3	200	440	180	52

PTFE with thread connection:

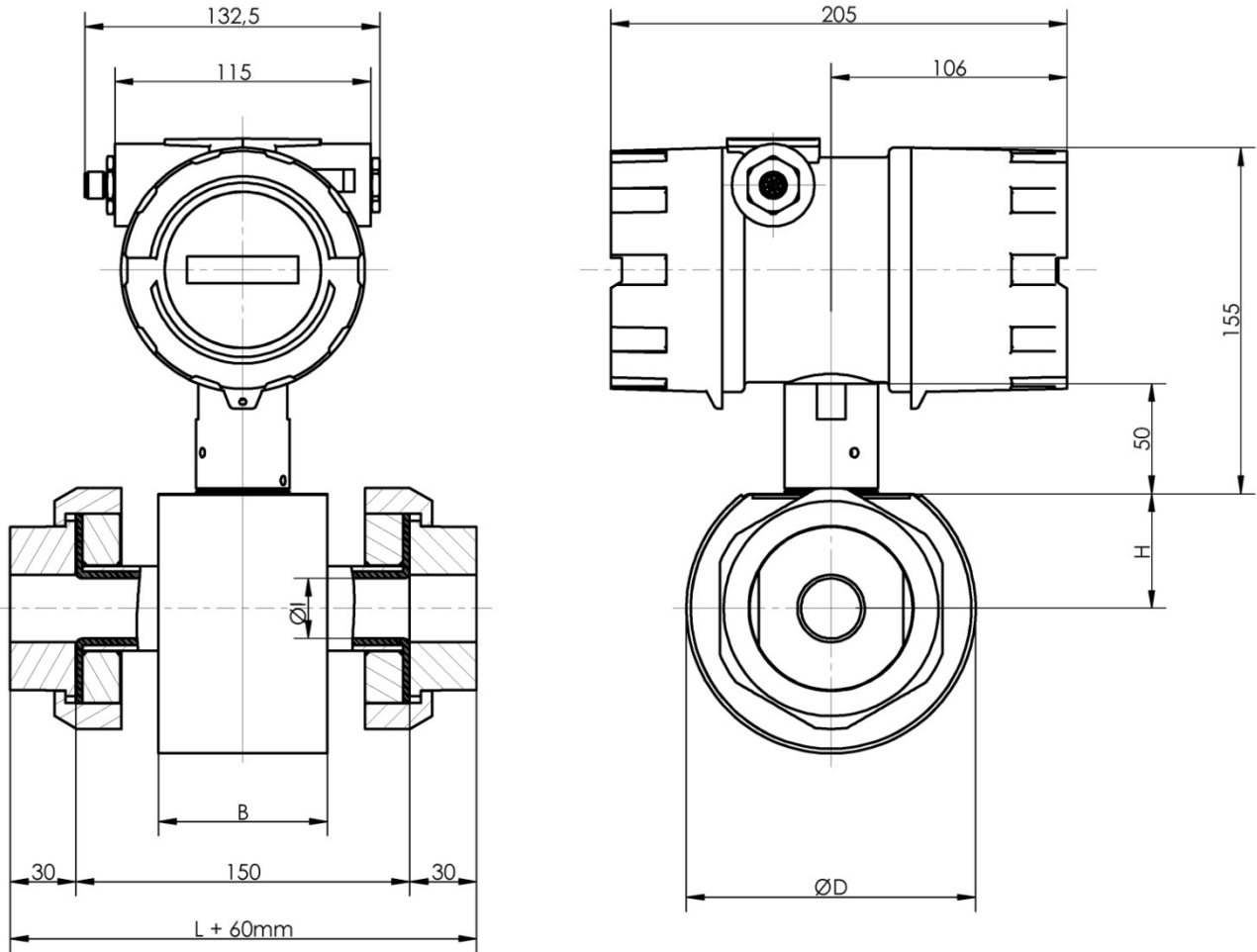


Fig. 10 PTFE with thread connection

Nominal diameter	Ø I*	Build-in-length		Dimensions of housing			Weight in kg
		L	Tolerance	B	D	H	
G ½	14	150	+0 / -2	80	130	53	5,0
G ¾	19	150	+0 / -2	80	130	53	5,5
G 1	27	150	+0 / -2	80	130	53	6,0
G 1 ¼	33	150	+0 / -2	80	130	53	7,0
G 1 ½	38	150	+0 / -2	80	130	53	7,5
G 2	48,5	150	+0 / -2	80	130	53	9,0

* minimum permissible pipe inner diameter

8 Error messages

List of error messages – self-test error

When a **self-test error** occurs, the corresponding error message is displayed as plain text in the second line of the LCD. According to the selected language the message is displayed in German (standard) or English.

Display	Description	Possible cause of trouble and Trouble-shooting
Empty pipe	Empty-pipe detection has been activated. Pipe is empty.	Ensure filling
Exciter current	Interruption / short circuit in the excitation coil. All signal outputs will be set to zero.	Return mag-flux T4 to MECON
meas. circ .sat	The input circuit is overloaded / the measured electrode voltage is too high All signal outputs will be set to zero.	Flow rate too high $V > 10$ m/s
Curr. saturated	The current output is overloaded.	Flow rate too high. $V > 10$ m/s
Ext. EEPROM missing	The data memory module (DSM) with the calibration data of the sensor and the customer-specific settings of the transmitter is missing.	Return mag-flux T4 to MECON

9 Return and disposal

9.1 Returning to the manufacturer

Due to careful production process, functional check and final inspections of the device, when installed and operated in accordance with this manual is a trouble-free use of mag-flux T4 expected.

Should it be necessary to return the unit to the Mecon GmbH, the following points should be noted:



Caution!

*For reason of legal regulations on environmental protection, occupational safety and preservation of the health and safety of our employees, **all devices which will be returned to Mecon GmbH have to be free of toxic and hazardous substances. This also applies to the device cavities. When needed, the device is prior to returning to the MECON GmbH by the customer to neutralize or flush.***

The customer has to confirm this by completing an appropriate form, which is located for download at the website of the Mecon GmbH.

www.mecon.de/de/Erklaerungen/Dekontaminierungserklaerung.pdf

9.2 Disposal



Caution!

For the disposal of the equipment the relevant requirements of your country must be observed.

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