Operating Instructions

for

Electromagnetic Flowmeter

Model: MIS

We don’t accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

1. Contents

Manufactured and sold by:

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2. Note

2.1 General

Before unpacking and commissioning the device, the operating instructions and the “General Safety Instructions” document must be read and followed carefully. The general safety instructions, the operating instructions, the data sheet as well as approvals and further information can be downloaded via the QR code on the device or under the respective product on www.kobold.com.

Due to technical changes, the device documentation available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the device should be used only when the entire machine fulfils the EU machinery directive.

2.2 Hazard warnings

The following instructions are intended to ensure your personal safety and to prevent damage to the product described or connected devices. Safety instructions and warnings to prevent danger to the life and health of users or maintenance personnel, or to prevent damage to property, are highlighted in this documentation using the symbols defined here. *The symbols and terms used have the following meaning in the documentation itself:*

Symbol	Explanation	Symbol	Explanation
 Note	Is important information about the product, the handling of the product or the respective part of the documentation to which particular attention should be drawn.	 Caution	Means that minor personal injury or minor property damage may occur if proper precautions are not taken.

Symbol	Explanation	Symbol	Explanation
 Warning	Indicates that serious personal injury or substantial property damage may occur if proper precautions are not taken.	 Danger	Means that death can occur if proper precautions are not taken.
 Warning	Attention: Hot surface!	 Warning	Warning: Dangerous electrical voltage

2.3 As per PED 2014/68/EU

In acc. with Article 4 Paragraph (3), "Sound Engineering Practice", of the PED 2014/68/EU no CE mark.

2.4 Overview of the device functionality

 Note	Depending on the installed device firmware, the MIS device may have different functionalities. The functional extensions are shown in the following table.

Function extension	Available from firmware version
Dosing function	REV180118
Menu languages Simulation function User function keys Analogue output 2-10 V_{DC} Analogue output behavior acc. to NAMUR NE43	REV180514
IO-Link Control input	REV190320
Filter function for flow measurement	REV200608
Flow meter overflow increased to 9.999999E9 liters	REV230615

The installed software version is displayed after starting the device below the manufacturer logo in the form REVxxxxxx for approx. 2 sec.

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.
Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:
The standard delivery includes:

- Electromagnetic Flowmeter model: MIS

4. Regulation Use

The MIS flow meter was specially developed for the measurement, display and transmission of flow rates of conductive liquids. The device has a graphic TFT display that can be rotated in 90 ° steps and can display the flow rate, daily volume counter (resettable) and total volume counter in the units of measurement selected by the operator. A clear menu guides the user through the parameterization of the device, which largely eliminates the need to look into the operating instructions.
Any use of the magnetic flowmeter, model: MIS, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Environment

The MIS device with stainless steel housing and stainless steel electrodes is weatherproof and conforms to protection class IP67. The meter is designed for harsh indoor or outdoor environments and complies with Directive 2014/30/EU (Electromagnetic Compatibility).

6. Operating principle

6.1 General

The new KOBOLD MIS Flowmeter is designed to measure and monitor small and medium flows of conductive fluids in piping.
The device works on the magnetic-inductive measuring principle. According to Faraday's law of induction, a voltage is induced in a conductor moving in a magnetic field. The electrically conductive measuring medium corresponds to the moving conductor in the process. The voltage induced by the measuring medium is proportional to the flow rate and thus a measure of the volume throughput. Prerequisite is a minimum electrical conductivity of the flowing medium. The induced voltage is fed to a measuring amplifier via two electrodes, which are in conductive contact with the medium. The volume flow is calculated via the defined pipe diameter.
The measurement is independent of the medium and its physical properties such as density, viscosity and temperature. The device can be configured via the display. There are two outputs available, which can each be configured as alarm, frequency, pulse, voltage, and current outputs.
The device also provides a dosing function. The dosing function can be activated in measuring mode via the four buttons. The dosing function controls simple filling tasks and also measures flow rate and partial amount.

6.2 Minimum electrical conductivity / Gas bubbles

For the correct function of the instrument, it is necessary that the flow channel is always completely filled with medium. From a minimum electrical conductivity of 20 µS / cm, the MIS operates within the specified error limits. The conductivity of the medium is constantly monitored by the device electronics. If the electronics detects that the minimum conductivity has fallen below min. value, this is signaled by displaying the error message 'Empty pipe' and the flow rate reading is set to '0'. Air bubbles in the flowing medium or media with varying conductivity in the range of the minimum conductivity can disturb the measuring function and reduce the measuring accuracy of the MIS. Gases contained in the liquid are also measured as a flow volume and lead to measurement errors. If necessary, install appropriate vents in the flow of the unit.

6.3 Deposits

Minor deposits on the measuring tube generally do not affect the measuring accuracy unless their conductivity deviates significantly from the liquid. For liquids that have a tendency to deposit, periodically inspect the meter tube and, if necessary, clean it.

6.4 Measuring electrodes

The MIS uses electrodes with galvanic tapping. They are in direct contact with the medium. The standard electrodes are made of Hastelloy.

7. Mechanical connection

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 size 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 ≥ 5 x DN** and an **outlet section of ≥ 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 has 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.

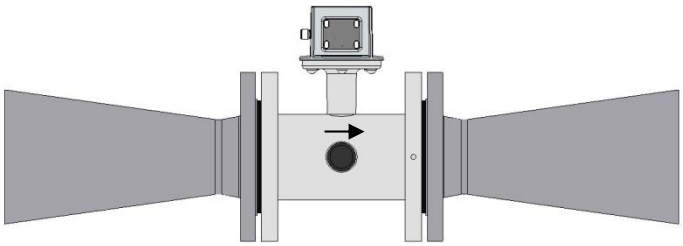
7.3 Installation

Screws, bolts, nuts and seals are not in the scope of delivery 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.

 Warning	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.

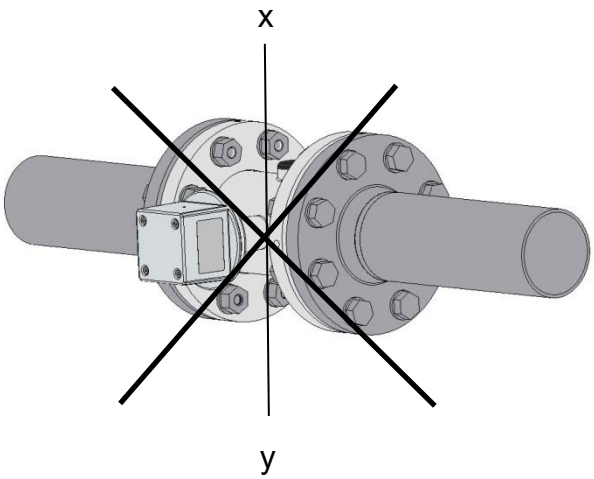
7.3.1 Installation in pipelines with larger nominal sizes

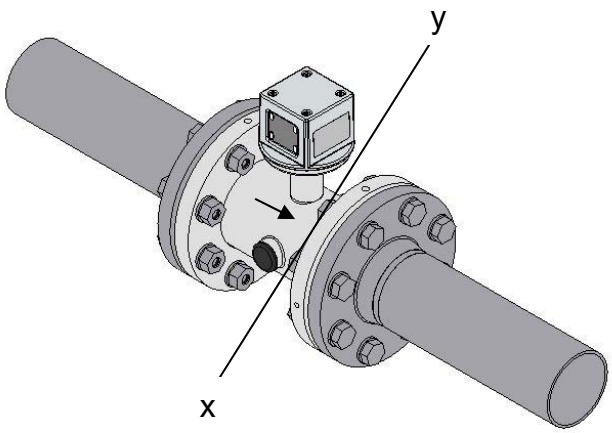
The flowmeter can also be installed in pipes with larger nominal sizes by using pipe tapers (e.g. flange transition pieces in accordance with DIN EN 545). However, the resulting pressure loss must be taken into consideration. To avoid flow interruptions in the flow tube, a reducing angle of □□8° for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



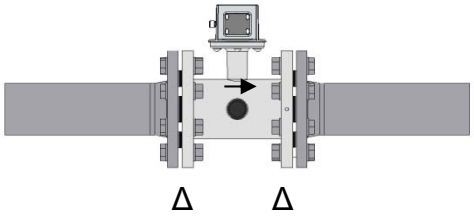


7.3.3 Installation examples

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

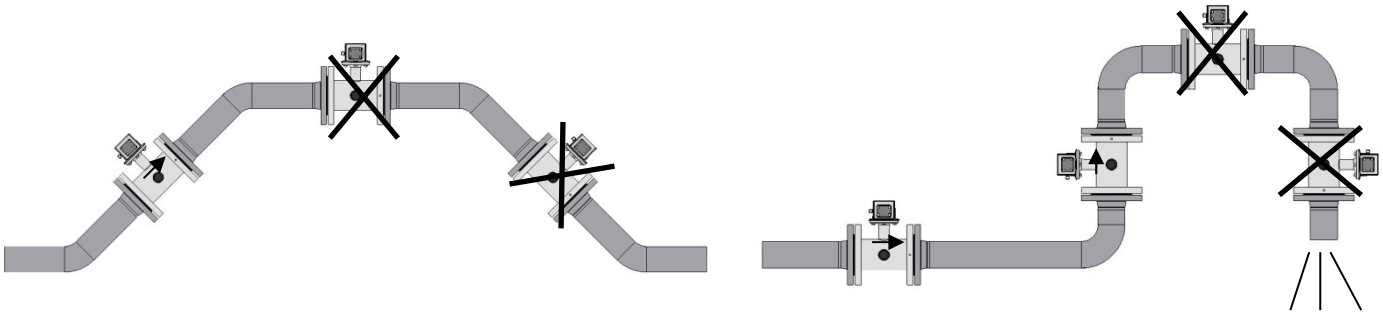
Vibrations

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

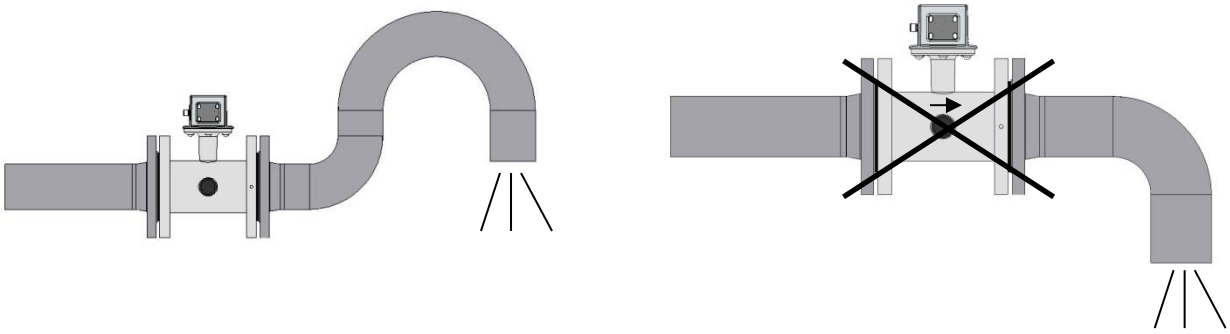
Install preferably in slightly ascending pipes.



Open inlet or outlet

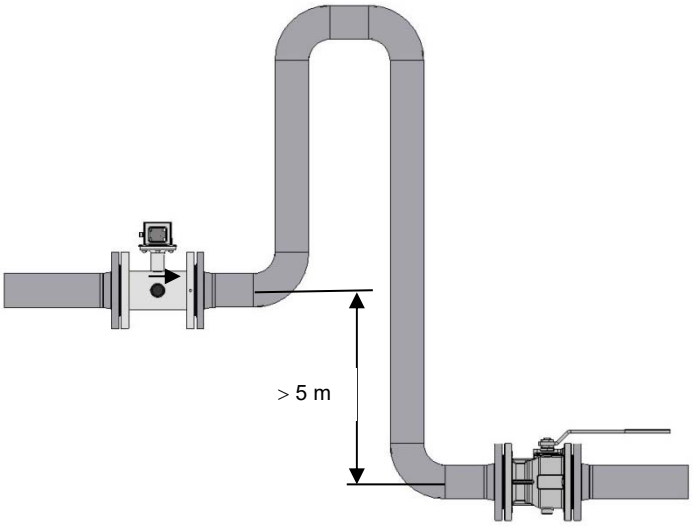
Where possible, the device should be installed in a syphon. The empty pipe detection circuit of the transmitter is an additional safety feature for recognizing empty or partially filled pipes.

Caution! There is the danger of accumulation of solids in the siphon. The installation of a cleaning aperture in the pipe is therefore advisable.



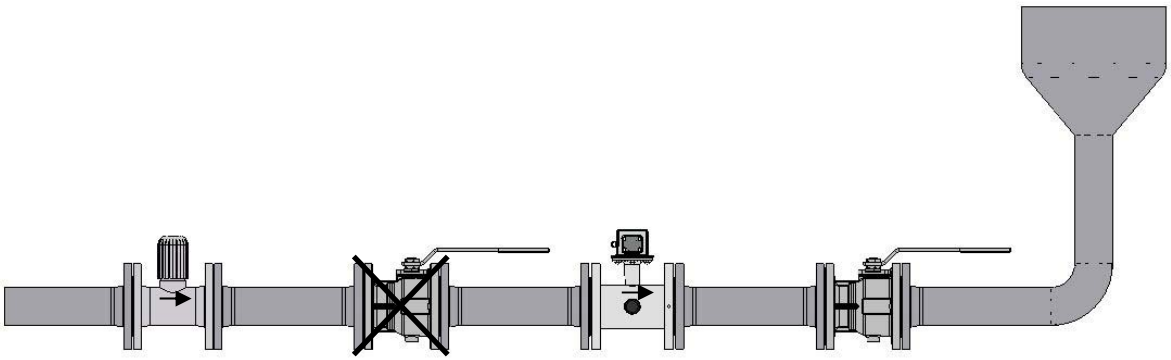
Down pipes

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.

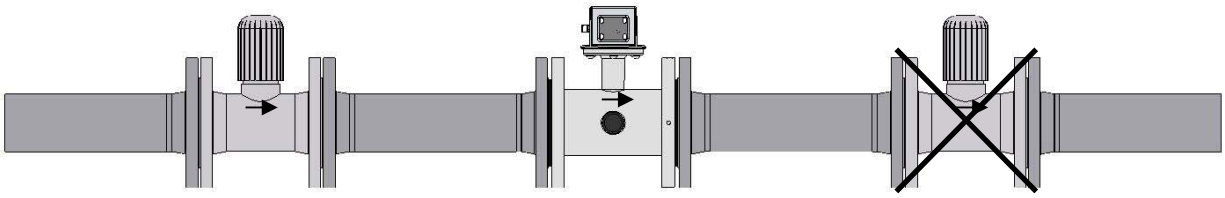


Long pipelines

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.



NOTE Note	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

7.3.5 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.

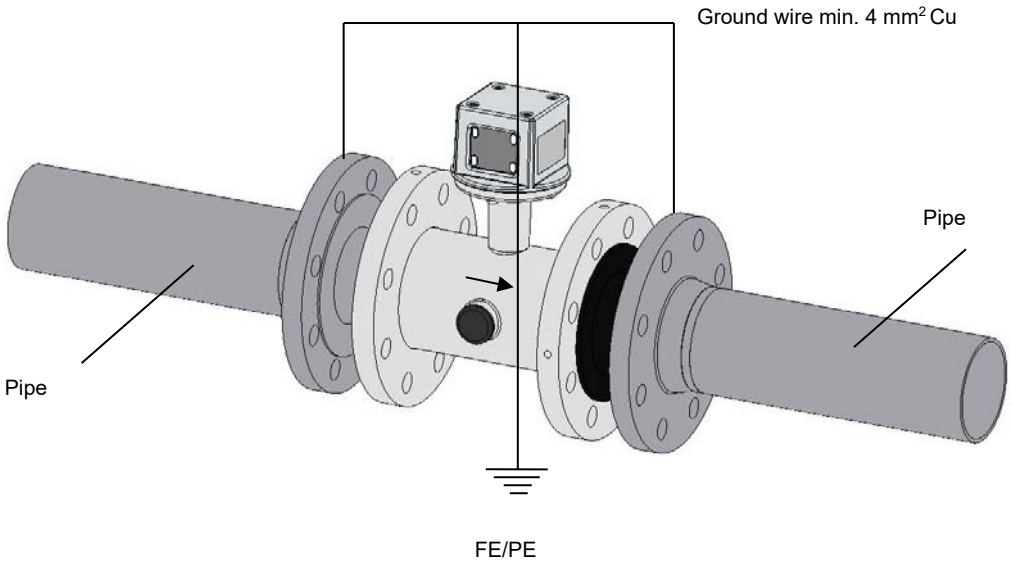
7.3.6 Earthing with earthing rings

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!

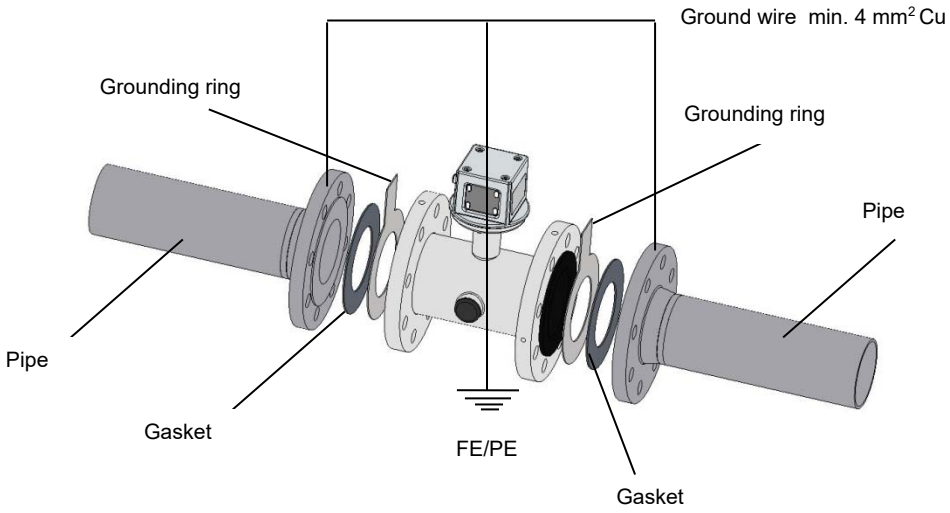
The grounding cables are not included in the scope of your delivery and must be provided by the plant operator.
The grounding rings can be ordered as accessories.

7.3.6.1 Examples of earthing the MIS

7.3.6.1.1 Metal piping electrically conductive

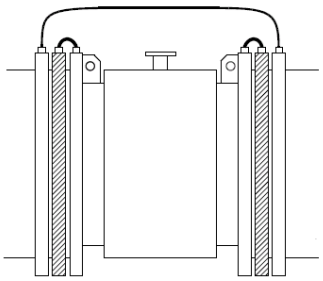


7.3.6.1.2 Plastic piping, or internally coated metal piping



7.3.6.1.3 Cathodic piping protection

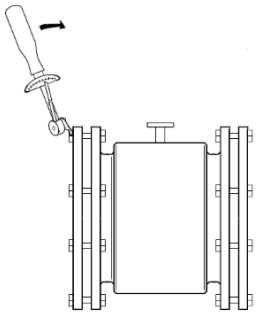
Special care must be taken with cathodic protection pipelines.
For compact installation:
The transmitter must be powered by an isolation transformer. The connection "PE" must never be connected.
With separate installation:
The shield must be connected to the sensor end via a 1.5 µF capacitor. The shield must never be connected to both ends.
For isolated installation:
If the above connections are unacceptable, isolate the sensor from the piping.



7.3.7 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

mm	inch	NBR										Ebonite / soft rubber						PTFE										DN2 + DN3 zirconium; DN6	
		PN10		PN16		PN40		DN2		AWWA		PN10		PN16		PN40		PN6		PN10		PN16		PN25		PN40			
		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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	10
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	10
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	10
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	10
15	½"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	7	16	12
25	1"	-	-	-	-	10	7	7	5	-	-	-	-	-	-	16	12	-	-	-	-	-	-	-	-	16	12	30	22
40	1½"	-	-	-	-	16	12	9	7	-	-	-	-	-	-	34	25	-	-	-	-	-	-	-	-	34	25	54	40
50	2"	-	-	25	18	-	-	25	18	-	-	-	-	-	-	46	34	-	-	-	-	-	-	-	-	46	34	90	66
65	2½"	-	-	25	18	-	-	25	18	-	-	-	-	25	18	-	-	10	7	-	-	25	18	-	-	34	25	90	66
80	3"	-	-	25	18	-	-	34	25	-	-	-	-	25	18	-	-	25	18	-	-	25	18	-	-	42	31	90	66
100	4"	-	-	25	18	-	-	26	19	-	-	-	-	25	18	-	-	25	18	-	-	25	18	-	-	72	53	115	84
125	5"	-	-	29	21	-	-	42	31	-	-	-	-	32	24	-	-	25	18	-	-	32	24	-	-	114	84	-	-
150	6"	-	-	50	37	-	-	57	42	-	-	-	-	50	37	-	-	25	18	-	-	50	37	-	-	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	122	900	-	-
700	28"	200	148	304	224	-	-	-	-	200	148	200	148	304	224	-	-	-	-	-	-	-	-	-	-	-	-	-	-
750	30"	-	-	-	-	-	-	-	-	240	177	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
800	32"	274	202	386	285	-	-	-	-	260	192	274	202	386	285	-	-	-	-	-	-	-	-	-	-	-	-	-	-
900	36"	288	213	408	301	-	-	-	-	240	177	288	213	408	301	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1000	40"	382	282	546	403	-	-	-	-	280	207	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
   Flow meter and associated flanges are properly aligned

8. Electrical Connection

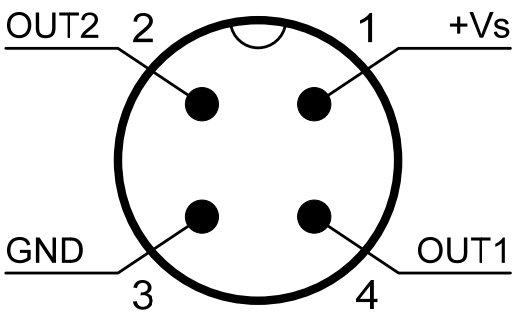
8.1 General

NOTE Note	Attention! Make sure that the voltage values of your system correspond with the voltage values of the measuring unit.

- Make sure that the supply wires are de-energised.
- Connect the supply voltage and the output signal **to the plug PIN's as stated below.**
- We recommend the use of wires with cross sectional area of min. 0.25 mm².

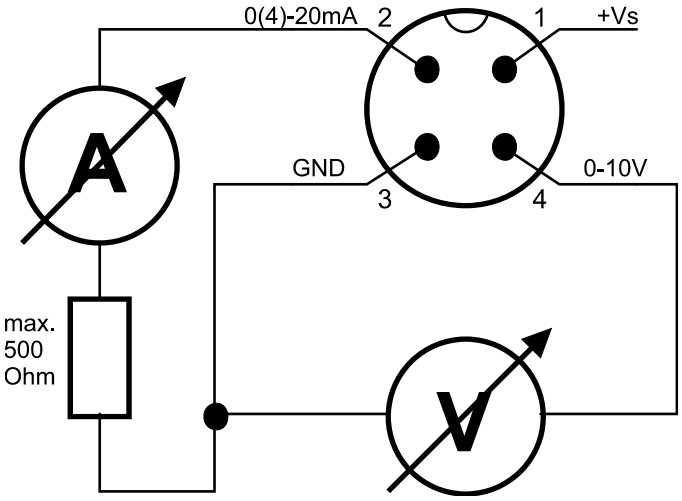
NOTE Note	Attention! The measuring electrodes are galvanically connected with the reference potential of the supply voltage and the signal output.

8.2 Pin assignment



8.3 Connection example outputs:

OUT2: analogue output 4-20 mA
OUT1: analogue output 0-10 V



Configurable output functions:

Out 1	Out 2
analogue output 4-20 mA	analogue output 4-20 mA
analogue output 0-20 mA	analogue output 0-20 mA
analogue output 2-10 V	analogue output 2-10 V
analogue output 0-10 V	analogue output 0-10 V
alarm output	alarm output
pulse output	pulse output
frequency output	frequency output
communication mode KofiCom	
communication mode IO Link	
control input	
control input dosing function	dosing output

9. Operation and menu structure

See "User Manual Supplement for U-PACE Electronics"

Please note: The MIS does **NOT** have a temperature sensor!

10. Status

The electromagnetic flowmeter can detect and display various device or application errors.
If there is a status or error message, the STATUS symbol in the display alternately flashes orange / red. To call up the status / error information, the status key must be pressed, then the status window that appears then lists all the messages that have accumulated up to this point in time. By pressing the ·⮜⮜⮜·· key, the user confirms the knowledge of the displayed errors, the status memory is cleared and the status window is closed. If one of the displayed errors persists, it will be reported again by flashing the status icon.
The following status / error messages are generated:

Display text	Description	Debugging
Empty Pipe	Measuring tube is not completely filled with medium or medium with too low conductivity is used.	Check the filling of the measuring circuit or conductivity of the medium (> 20 µs / cm)
Meas saturated	Flow measuring circuit overdriven	Reduce flow rate
No Subslave	Internal hardware error	Repair by KOBOLD Service necessary
Simulation	Simulation function active	-

11. IO-Link function

As of firmware version REV190320, the MIS flowmeter has an IO-Link communication interface as standard. Process and diagnostic data can be accessed directly via this interface and the device can be parameterized.

Output 1 is factory configured for IO-Link function. If the IO-Link communication mode is active, the "IOLINK" symbol in the status display for the outputs is displayed in green. The setup menu remains locked when the IOLINK mode is active and is inaccessible.
To ensure that the IO-Link device can be operated correctly on the connected IO-Link master, it is necessary to install the device description file matching the device.

The device description files (IODD) are available in the IODDfinder database under ioddfinder.io-link.com. There may be different IODD versions available for devices of the same type. To select the correct IODD, the device ID can either be read out via the connected IO-Link master or, alternatively, identification can be made using the device's firmware identifier.
The IODD assignment can be found in the following table.

Firmware ID	Product type	Device-ID [hex]	Device-ID [dec]	Remarks
V01.11_Rxxxxxx	MIS-	0x010A00	68096	-
From V01.11_R230615	MIS-	0x010C00	68608	-
From V02.11_R231018	MIS- xxxxxxxC3Tx	0x010D01	68865	-

How to download the correct IODD:

- Read out the firmware ID of the device from the INFO menu
- Find out the device ID (decimal) from the table above according to the firmware identification and the product type
- In the IODD finder, identify the correct IODD using the Device ID column and download the associated ZIP file using the download button.

If the device is operated on an IO-Link master with port class A, only a maximum output current of 50 mA may be drawn from output 2 (OUT2) (current or binary output), otherwise the IO-Link master will be overloaded and it can cause malfunctions.

11.1 Specification

Manufacturer	ID 1105 (decimal), 0x0451 (hex)
Manufacturer name	Kobold Messring GmbH
IO-Link specification	V1.1
Bitrate	COM3
Minimum cycle time	1.1 ms
SIO mode	yes (OUT1 in configuration IO-Link)
Block parameterisation	yes
Ready for operation	10 sec.
Max. cable length	20 m
IO-Link master port class	A

12. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

13. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

14. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

15. Disposal

See “General Safety Instructions” - via the QR code on the device or via www.kobold.com

16. Annex

The specifications and parameters for the MIS devices with IO-Link function are available on the website

https://ioddfinder.io-link.com

The necessary information is available here
- Process data structure
- Diagnostic functions
- IO-Link commands
- ISDU parameters

The following table provides links to the different versions

Firmware ID	Device-ID [hex]	Device-ID [dec]	Link
V01.11_Rxxxxxx	0x010A00	68096	https://ioddfinder.io-link.com/productvariants/search/19589
From V01.11_R230615	0x010C00	68608	https://ioddfinder.io-link.com/productvariants/search/39474
From V02.11_R231018	0x010D01	68865	https://ioddfinder.io-link.com/productvariants/search/43586

Parameters that relate to the measured values of flow, temperature or volume must be entered in the basic units and, if necessary, converted beforehand. The basic units are:

Flow: **L/min**
Temperature: **°C**
Volume: **Liter**

Units conversion table

Category: **Flow**		
Unit	description	conversion
L/m	Liters per minute (basic unit)	-
L/h	Liters per hour	1 L/h = 0.0167 L/m
mL/m	Milliliters per minute	1 mL/m = 0.001 L/m
m^3/h	Cubic meters per hour	1 m^3/h = 16.667 L/m
gal/m	US gallons per minute	1 gal/m = 3.7854 L/m
gal/h	US gallons per hour	1 gal/h = 0.06309 L/m
galk/m	UK gallons per minute	1 galk/m = 4.54609 L/m
galk/h	UK gallons per hour	1 galk/h = 0.07577 L/m
L/s	Liters per second	1 L/s = 60 L/m
mL/s	Milliliters per second	1 mL/s = 0.0000167 L/m
USER	user unit	1 user unit = USER * L/m

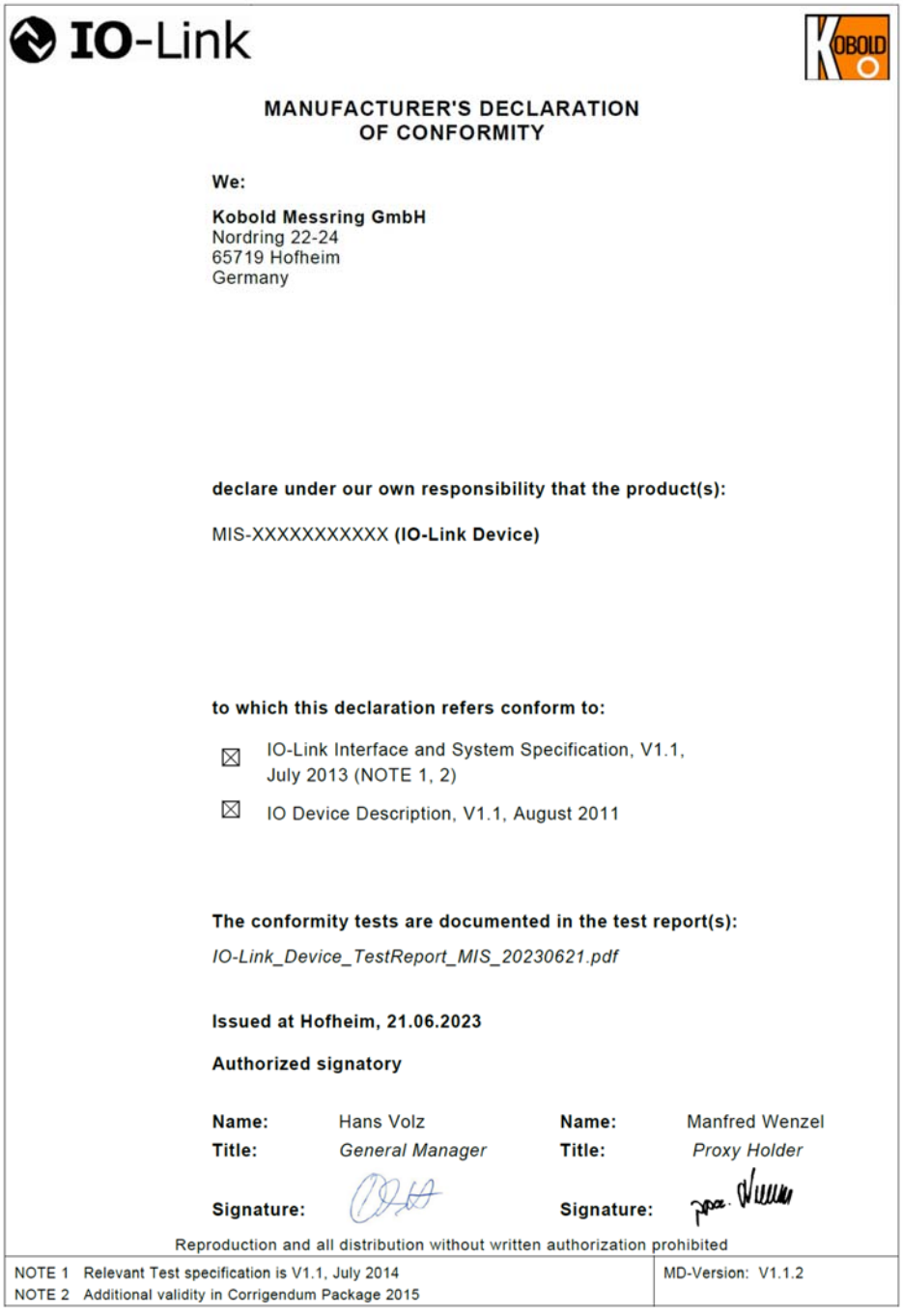
Category: **Temperature**		
Unit	description	conversion
°C	degree Celsius (basic unit)	-
°F	degree Fahrenheit	**x** °C = (32 + **x** *1,8) °F
USER	user unit	1 user unit = USER * °C

Category: **Volume**		
Unit	description	conversion
L	Liters (basic unit)	-
mL	Milliliters	1 mL = 0.001 L
m^3	Cubik meters	1 m^3 = 1000 L
galUS	US gallons	1 galUS = 3.7854 L
galUK	UK gallons	1 galk = 4.54609 L
barrel	Barrel (US)	1 barrel = 158.99 L
USER	user unit	1 user unit = USER * L

 Note	If a measured value is invalid due to an error status (NAN), the corresponding process value is output with the value "0". In this case, the device status and the events must also be taken into account.

17. Manufacturer's Declaration

For IO-Link Device-ID no. 68096:



IO-Link

MANUFACTURER'S DECLARATION OF CONFORMITY

We:

Kobold Messring GmbH
Nordring 22-24
65719 Hofheim
Germany

declare under our own responsibility that the product(s):

MIS-XXXXXXXXXXX **(IO-Link Device)**

to which this declaration refers conform to:

☒ IO-Link Interface and System Specification, V1.1, July 2013 (NOTE 1, 2)

☒ IO Device Description, V1.1, August 2011

The conformity tests are documented in the test report(s):

IO-Link_Device_TestReport_MIS_20230621.pdf

Issued at Hofheim, 21.06.2023

Authorized signatory

Name:	Hans Volz	**Name:**	Manfred Wenzel
Title:	*General Manager*	**Title:**	*Proxy Holder*
Signature:		**Signature:**	ppa.

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NOTE 1 Relevant Test specification is V1.1, July 2014 NOTE 2 Additional validity in Corrigendum Package 2015	MD-Version: V1.1.2

For IO-Link Device-ID no. 68608:
https://ioddfinder.io-link.com/productvariants/search/39474
For IO-Link Device-ID no. 68865:
https://ioddfinder.io-link.com/productvariants/search/43586

18. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Electromagnetic flowmeter **Model: MIS-...**

to which this declaration relates is in conformity with the following EU directives stated below:

2014/30/EU	**EMC Directive**
2011/65/EU	**RoHS** (category 9)
2015/863/EU	Delegated Directive (RoHS III)

Also, the following standards are fulfilled:

EN IEC 61326-1:2021
Electrical equipment for measurement, control and laboratory use – EMC requirements - Part 1: General requirements, Industrial area (measurement of immunity to RF fields up to 2.7 GHz)

EN 60529:2014 Degrees of protection provided by enclosures (IP Code)

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Hofheim, 21 Sept 2023

H. Volz
General Manager

J. Burke
Compliance Manager

19. UK Declaration of Conformity

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Electromagnetic flowmeter **Model: MIS-...**

to which this declaration relates is in conformity with the following UK directives stated below:

S.I. 2016/1091	Electromagnetic Compatibility Regulations 2016
S.I. 2012/3032	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Also, the following standards are fulfilled:

BS EN IEC 61326-1:2021
Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements, Industrial area (measurement of immunity to RF fields up to 2.7 GHz)

BS EN 60529:1992+A2:2013
Degrees of protection provided by enclosures (IP Code)

BS EN IEC 63000:2018
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Hofheim, 21 Sept. 2023

H. Volz
General Manager

J. Burke
Compliance Manager