

## User Instructions

MQMe

Quantometer with electronic  
meter index



living gas

metreg   
Metreg Technologies GmbH

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# 1 General information

## 1.1 Manual

This technical manual is intended for service personnel in the gas supply and gas distribution industry who have received appropriate training and possess technical knowledge of the applicable technical standards as well as any higher-level or operational requirements. Only specialists, trained and qualified personnel (e.g. DVGW G 492 and G 495), may carry out work on the MQMe. The manual contains all information required to ensure safe and proper use of the device.

# 2 Safety

## 2.1 Symbols

The following symbols are used in this manual to indicate hazards or to provide information to assist the operators.

The manufacturer assumes no liability for damage resulting from improper or inappropriate use, nor for failure to follow the instructions.

### **WARNING** Risk of serious injury or even death!

There is a risk of serious injuries. Injuries can occur due to unprofessional handling or incorrect operation if the safety instructions are not observed.

### **NOTICE**

There is a possibility of damage to the device or the surrounding area if the instructions are not followed. The measurement or the behavior of the device may also be affected!

## 2.2 Personnel

There is a significant risk of injuries. Injuries can occur due to unprofessional handling or incorrect operation and result in serious injuries and, in the worst case, death if safety instructions are ignored.

- **Work on the gas lines**  
may only be carried out by suitable, reliable and trained personnel. Operating personnel must be trained and authorized for their assigned tasks by the system operator. Protective measures must be defined based on a risk assessment carried out in accordance with Article 5 of the German Occupational Safety Act (ArbSchG).
- **Occupational safety**  
Wear the personal protective equipment stipulated by the applicable national regulations and operator regulations when working on the meter.
- **Operational safety**  
The meter may be used in technically flawless and operationally safe condition only. Responsibility rests with the operator.
- **Product safety**  
The meter was manufactured and tested according to the latest state of the art. It fulfills all legal requirements and complies with the applicable EC Directives. The manufacturer declares this conformity by attaching the CE mark to the meter.  
The meter left the factory in perfect condition. A manufacturer's warranty is only provided if the meter is installed and operated in accordance with the operating instructions. For manufacturer's declaration and declaration of conformity see Annex A, page 31.

## 2.3 Intended use

MQMe Quantometers are designed for the measurement of the volume of combustible gases in the 1st, 2nd and 3rd families of gases (see also section 3 “Applications for the MQMe Quantometer”, page 5), processed and purified biogas and air, as well as other inert, non-aggressive and non-explosive gases that are used during operation. Depending on the variant, the permissible operating pressure range extends up to 16 bar absolute (ANSI 150 optional), the gas temperature range from -20°C to +55°C.

No other use is authorized.

**The manufacturer is not liable for damages resulting from improper or inappropriate use.**

## 2.4 Warranty

Our General Terms and Conditions of Sale as most recently amended apply. Any deviating agreements do not restrict the statutory rights of the consumer.

Any guarantee beyond this requires a contract and excludes software updates, consumables and vandalism to components.

## 3 Applications for the MQMe Quantometer

The MQMe Quantometer is designed for metering the volume of natural gas used within a company and is approved in accordance with European Regulation 2014/68/EU.

The MQMe Quantometer can be installed in potentially explosive atmospheres in category 1G (ATEX/IECEx Ex Zone 0) Ex ia II C T4 Ga (see Annex B, page 33).

- The MQMe Quantometer is suitable for measuring the volume of the following gases:
- Natural gas, town gas, propane, butane, ethylene, air, nitrogen, noble gases, liquid gas
- Biogas\*
- Natural gas with a maximum H<sub>2</sub> content of 20%
- Other gases can be metered on request

The MQMe Quantometer is not suitable for oxygen and highly corrosive gases, acetylene and other aggressive gases

The MQMe Quantometer should not be used in the presence of strong pulsations. These conditions will increase the number of measurement errors and could reduce the service life of the MQMe Quantometer.

### **NOTICE**

**Possible damage to the MQMe caused by aggressive gases**

\*Biogas – Please observe our special installation conditions, only in connection with installing an oil pump.

## 4 Design of the MQMe Quantometer

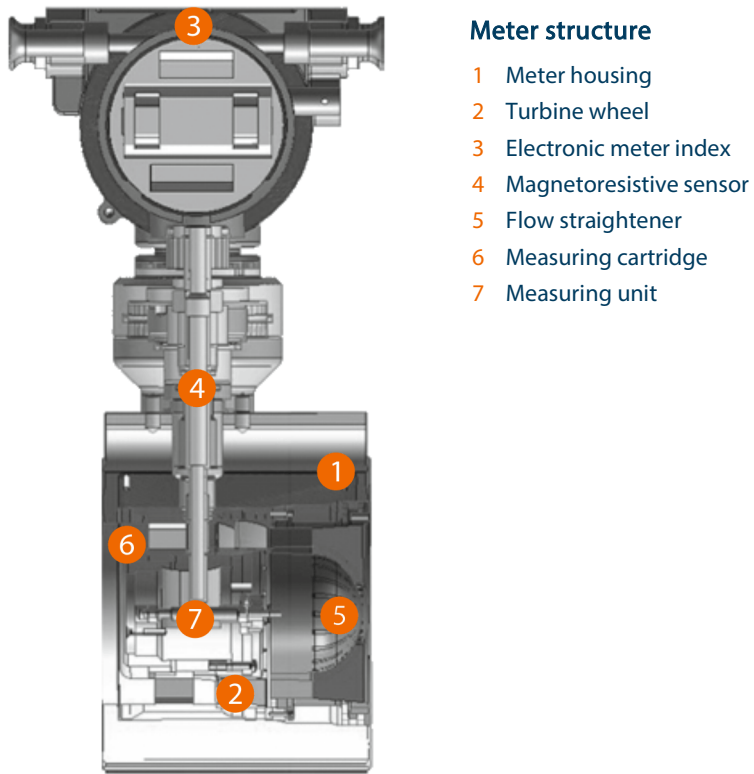


Fig. 1: Sectional drawing of the MQMe Quantometer

In the case of failure or damage: Repairs may be carried out solely by qualified and authorized service centers and after prior consultation with Metreg Technologies GmbH.

## 5 Technical Data

Meter data	
Approval	ATEX 2014/34/EU/IECEX Ex-Zone (*in preparation); Ex ia II C T4 Ga; PED 2014/68/EU
Size	G 10 to G 1.000
Nominal diameter	DN25 (1") to DN150 (6")
Pressure rating	PN 16 and ANSI CLASS 150, PN4 with screw connection
Measuring range	1:20, exception DN25 (1" and 1,5") with a range of 1:10
<b>Temperature range</b>	
Gas temperature	-20°C to +55°C
Ambient temperature	-25°C to +55°C
Storage temperature	-25°C to +55°C
Housing material	Aluminum
Max. operating temperature	16 bar absolute (ANSI 150 optional)
Accuracy	$Q_{\min} \leq Q < Q_{\max}$ : $\pm 1.0\%$ of $Q_{\max}$
Electronic meter index	
Counter	Electronic index with 9 digits
Meter index head	Aluminum alloy
Protection class	IP65
Battery	Lithium ion battery (calculated service life: 5 years under standard conditions, i.e. ambient temperature 15–20°C/59–68°F)
Display	LCD display for flow rate and volume under operating and standard conditions for pressure, temperature as well as battery status
Buttons	4 buttons
Memory	Non-volatile 512-k EEPROM memory for storage of parameters
Integrated volume corrector (option)	Compressibility factor calculation according to AGA NX-19 or $K = \text{constant}$ . For version with pressure and temperature sensor (AGA NX-19) only with external power supply
Standard conditions	Standard pressure 1,013.25 mbar, standard temperature 273.15 K (0°C); standard pressure and standard temperature are adjustable
Parameterization	Set in factory
Digital and analog outputs	
<b>LF pulser (standard)</b>	Floating reed contact (open collector)
Contact type	Normally open
Max. voltage	24 V
Max. current	110 mA
Max. resistance	5.1 $\Omega$
Max. switching frequency $f_{\max}$	10 Hz
<b>HF pulser (alternative)</b>	Floating reed contact (open collector)
Max. voltage	24 V
Max. current	110 mA
Max. resistance	5.1 $\Omega$
Max. switching frequency $f_{\max}$	1,000 Hz
<b>External HF pulser (option)</b>	Additional inductive sensor on the outside of the meter housing according to NAMUR (scanning at the turbine wheel, only with external power supply)
Supply voltage	8.2 VCC (internal resistance 1 k $\Omega$ )
Power consumption	(sensor covered) <1 mA
Power consumption	(sensor free) >2,1 mA
Max. switching frequency $f_{\max}$	2,500 Hz
<b>Analog output (option)</b>	4–20 mA output (only with external power supply)
Data communication	
RS485 interface (option)	Modbus RTU (only with external power supply)
M-Bus interface (option)	M-Bus

Frequent data retrievals on an MQMe in battery mode will affect battery life.

## 5.1 Working range and pulse weighting data

Type	G-Type	DN/Rp	Connection type	Measuring range operating volume flow Q <sub>b</sub> [m <sup>3</sup> /h]		Measuring range ratio	pe max. gas	HF* [pulses/m <sup>3</sup> ] ext. pulse	HF* [pulses/m <sup>3</sup> ] int. pulse	NF* [pulses/m <sup>3</sup> ] int. pulse	Pressure drop [mbar]
				Q <sub>min</sub>	Q <sub>max</sub>						
MQMe	10	Rp 1"	Rp female thread	1,6	16	Rp 1"	4 bar	185.000–195.000	15.080–16.250	10	5
MQMe	16	Rp 1"	Rp female thread	2,5	25	Rp 1"	4 bar	185.000–195.000	15.080–16.250	10	5
MQMe	25	Rp 1"	Rp female thread	4	40	Rp 1"	4 bar	185.000–195.000	15.080–16.250	10	5
MQMe	40	Rp 1"	Rp female thread	6,5	65	Rp 1"	4 bar	185.000–195.000	15.080–16.250	10	5
MQMe	40	Rp 1½"	Rp female thread	6,5	65	Rp 1½"	4 bar	185.000–195.000	15.080–16.250	10	5
MQMe	10	DN25	Flange	1,6	16	DN25	16 bar	185.000–195.000	15.080–16.250	10	5
MQMe	16	DN25	Flange	2,5	25	DN25	16 bar	185.000–195.000	15.080–16.250	10	5
MQMe	25	DN25	Flange	4	40	DN25	16 bar	185.000–195.000	15.080–16.250	10	5
MQMe	40	DN25	Flange	6,5	65	DN25	16 bar	185.000–195.000	15.080–16.250	10	5
MQMe	40	DN50	Flange	6,5	65	DN50	16 bar	101.000–107.000	8.416–8.916	10	3
MQMe	65	DN50	Flange	5	100	DN50	16 bar	101.000–107.000	8.416–8.916	10	4
MQMe	100	DN80	Flange	8	160	DN80	16 bar	26.400–27.200	1.885–2.266	1	2
MQMe	160	DN80	Flange	12,5	250	DN80	16 bar	26.400–27.200	1.885–2.266	1	2
MQMe	250	DN80	Flange	20	400	DN80	16 bar	26.400–27.200	1.885–2.266	1	4
MQMe	160	DN100	Flange	12,5	250	DN100	16 bar	13.100–13.900	935–992	1	3
MQMe	250	DN100	Flange	20	400	DN100	16 bar	13.100–13.900	935–992	1	3
MQMe	400	DN100	Flange	32	650	DN100	16 bar	13.100–13.900	935–992	1	6
MQMe	400	DN150	Flange	32	650	DN150	16 bar	5.100–5.400	318–386	1	10
MQMe	650	DN150	Flange	50	1.000	DN150	16 bar	5.100–5.400	318–386	1	10
MQMe	1.000	DN150	Flange	80	1.600	DN150	16 bar	5.100–5.400	318–386	1	10

\* The precise number of HF pulses is dependent on the meter size and the calibrated meter itself. The stated values are typical numbers. The exact values determined for each meter during the calibration are stated on the type plate for the HF sensor.



## 6 Installation

### 6.1 Requirements and recommendations

**⚠ WARNING** Risk of injury from explosion!

Unprofessional planning and mounting can lead to explosion hazards:

- Escaping flammable gas in case of system leaks
- Bursting of the system due to the applied gas pressure in case of insufficient strength of components or incorrect assembly

Therefore, please note:

- All work on the gas supply system must be carried out by trained personnel only, see also section 2.2 "Personnel", page 4
- Observe DVGW rules and regulations. Observe national regulations.
- Carefully observe these operating instructions.

**NOTICE**

The following instructions are intended to support smooth installation of the MQMe Quantometer in the measuring system in order to prevent damage.

1. Remove the protective film from the inlet and outlet of the meter.
2. Check the completeness of the meter (e.g. cover plugs, volume of oil supplied) and for any possible transport damage.
3. Check that the turbine wheel rotates easily and stops smoothly, e.g. by blowing into the measuring cartridge of the MQMe Quantometer.
4. Ensure that there are no impurities, condensation, deposits or welding and drilling residues in the pipeline. It is especially important to clean any elbow pipes in vertical installations to prevent any damage if this dirt passes through the meter. A cone-shaped startup filter can be installed to protect the meter during its initial operation. This filter and the collected dirt should then be removed after 4–6 weeks at the latest to prevent any disruption to the flow profile and thus a reduction in the measuring accuracy
5. In order to achieve a high level of accuracy, it is recommended that a straight inlet pipe with a nominal size of  $\geq 3$  DN and an outlet pipe with a nominal size of  $\geq 2$  DN are used.
6. Vibrations and pulsations should be avoided at the measurement location. The installation of a suitable compensator can effectively dampen this kind of interference.
7. Abrupt changes in the flow rate and strong pulsating flows of gas will increase measurement errors. These issues can arise due to e.g. frequently switching on and off the gas flow with solenoid valves. Pressure surges due to the quick opening of valves can damage the ball bearings in the turbine wheel and cause the meter to fail.
8. Filters (with a small mesh size) should be installed upstream of the meter to protect it, in particular, against dirt particles  $>50 \mu\text{m}$  both during startup and in continuous operation.
9. The gas must be dry. If condensation can occur, it is recommended that a condensate separator is installed upstream of the meter (a separator is already integrated into some types of filter). In this case, it is recommended that the meter be installed:
  - with a flow direction from the top to the bottom, and
  - not at the lowest point of the pipeline.

## 6.2 Installation location/direction of flow of the gas



- 1 The arrow on the housing indicates the correct gas flow direction through the MQMe.

The MQMe Quantometer can either be installed horizontally or vertically.

### Horizontal installation

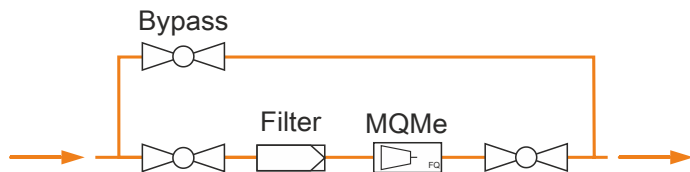


Fig. 2: Recommended horizontal installation of the MQMe, orange arrows indicate gas flow direction

### Vertical installation

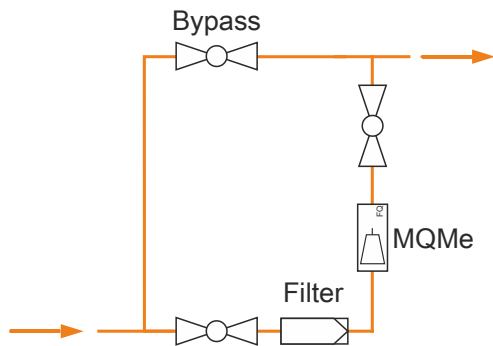


Fig. 3: Typical vertical installation of the MQMe

The specified gas flow direction must be observed.

### **NOTICE**

**Possible damage to the MQMe caused by excessive temperatures**

When the MQMe is installed, welding work on the pipe system in the vicinity of the MQMe is not permitted.

### 6.3 Required material

- Suitable and certified gaskets according to DIN EN 1514-1
- Screws according to DIN 976 DIN ISO 4014 and ASME B 1.1
- Nuts according to DIN 934 DIN EN ISO 4032 and ASME B 1.1
- Washers according to DIN EN ISO 7085 (DIN 125)
- Equipotential bonding with a minimum cross-section of 4 mm<sup>2</sup>
- For Quantometers with an oil pump: Oil according to the specifications Shell Morlina S2 BL 5 or Shell Morlina S2 BL 10

Flanges according to DIN EN 1092-1: Hexagon screws and nuts						
DN [mm]	Pressure class PN	Screws and nuts Operating temperature	Screws DIN 125 Quantity/size/washer	Strength class/material		Length of the threaded rods
				Screws	Nuts	
25*	16	-10°C	8 x M12x35**/B13-140HV	5.6/8.8/25CrMo4	5/8/25CrMo4	35
50			4 x M16x165***/B17-140HV			165
80			8 x M16x210***/B17-140HV			210
100			8 x M16x240***/B17-140HV			240
150			8 x M20x285***/B21-140HV			285

\* Flange on both sides with blind hole thread

\*\* Hexagon head screws ISO 4017, EN 1515-4

\*\*\* Screw bolt DIN 976-1 Form-B, EN 1515-4

Flanges according to ANSI B 16.5 – Threaded bolts with continuous thread and nuts						
DN [mm]	Pressure class ANSI	Screws and nuts Min. operating temperature	No. of screws	Strength class		Length of threaded rods ANSI B16.5 Class150
				Screws	Nuts	
25*	150	-25°C	8 x M12x35	ASTM A193 Grade B7	Grade 2H	
50	150	-25°C	4 x M16	ASTM A193 Grade B7	ASTM A194	170
80	150	-25°C	8 x M16	ASTM A193 Grade B7	ASTM A194 Grade 2H	225
100	150	-25°C	8 x M16	ASTM A193 Grade B7	ASTM A194 Grade 2H	255
150	150	-25°C	8 x M20	ASTM A193 Grade B7	ASTM A194 Grade 2H	312

\* Flange on both sides with blind hole thread

## 6.4 Installation process

### 6.4.1 Installation of the MQMe Quantometer

1. Clean the flange surfaces (e.g. with petroleum).
2. It is recommended to install the MQMe horizontally, with the meter index pointing upwards.
3. Ensure that the gas flow is in the direction of the arrow on the MQMe.
4. Ensure that the seals are mounted concentrically so that no seal parts protrude into the pipeline.
5. In addition to the length of the MQMe, provide enough room for the two gaskets between the inlet and outlet flanges for the installation.
6. Install the MQMe without any tension. For this purpose, ensure that the meter axis is properly aligned with the pipeline axis.
7. Carry out a proper leak test of the flange connections.
8. If necessary, turn the general direction of the meter display by 180°, see section 6.4.3 “Changing the turning range”, page 13.



Fig. 4: Connection for the equipotential bonding

- 1 Screw connection on the meter index head for connecting an equipotential bonding cable with a minimum cross-section of 4 mm<sup>2</sup>.

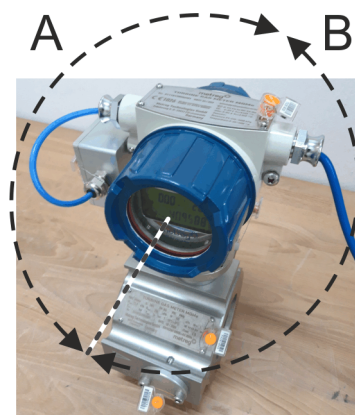
### 6.4.2 Checkpoints during and after installation of the MQMe Quantometer

1. The MQMe is installed in the correct flow direction, see also section 6.2 “Installation location/direction of flow of the gas”, page 10.
2. The MQMe has been installed without any leaks.
3. The MQMe has been installed without any tension.
  - In a horizontal pipeline, the MQMe is installed with the meter index head in an upright position. In the case of vertical installations, the oil pump (if present) must be installed in an upright position.
  - Connection screws and nuts must be tightened crosswise.
  - See section 12 “Measuring Points Pressure and Temperature”, page 29 for instructions on connecting to the pressure measuring points.
  - See section 12 “Measuring Points Pressure and Temperature”, page 29 for instructions on connecting to the temperature measuring points.
4. The angle of rotation of the meter display corresponds to the operator’s requirements, see section 6.4.3 “Changing the turning range”, page 13.

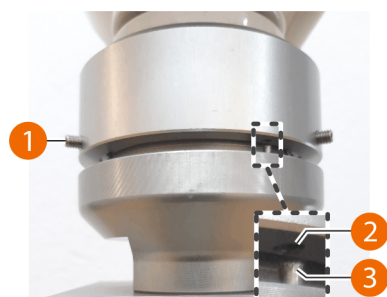
We recommend a protective cover in the case of external installations.

### 6.4.3 Changing the turning range

The MQMe has a rotatable display with a turning range of 180°(A). The angle of rotation can be changed to the other 180°(B) by turning the base by 180°.



1. Loosen the 3 radial stud screws (1) on the base of the meter index head.
2. Slightly lift up the meter index head until the positioning pin (3) has been completely pulled out of the drilled hole (2).
3. Turn the meter index head by 180° in a clockwise direction and lower it again so that the pin is now seated in the drilled hole on the opposite side (2).
4. Tighten the stud screws (1) again by hand.
5. Make a note of the turning direction so that if the meter index head is adjusted again you can avoid turning it in the same direction and possibly damaging the cable connections.



- 1 Stud screws
- 2 Positioning pin
- 3 Drilled hole

Fig. 5: Rotation of the meter head

## 7 Commissioning

The MQMe is commissioned after completed installation.

### **NOTICE**

Commissioning may be carried out only by authorized specialist personnel. The system may be cleared for unsupervised operation only after commissioning has been carried out correctly.

The following instructions must be observed carefully to avoid damage to the MQMe.

1. MQMe with oil pump: Lubricate the meter in accordance with section 8.2 "Lubrication of MQMe with oil pumps", page 15.
2. For filling of the gas line, carefully open the shut-off valve directly upstream of the MQMe (Fig. 2 and Fig. 3) until the operating pressure is reached. The rate of increase in pressure should not exceed 350 mbar/s.

### **NOTICE**

The MQMe may be damaged by pressure surges, see also "Pressure surges", page 9.

3. After reaching the operating pressure, the shut-off valve can be opened completely.
4. Carefully open the shut-off valve directly downstream of the MQMe (Fig. 2 and Fig. 3) until the operating pressure is reached.
5. After reaching the operating pressure, the shut-off valve can be opened completely.
6. If startup filters are installed, they can be removed after 4–6 weeks.

### **NOTICE**

Possible damage to the MQMe due to foreign bodies in the pipeline if startup filters are missing!

## 8 Maintenance/Lubrication

### 8.1 Maintenance

The MQMe may be maintained and repaired only by trained and authorized personnel, e.g. service engineers of Metreg Technologies GmbH.

Replace the battery after a maximum of 5 years.

MQMe without oil pumps do not require any special care. They are maintenance-free.

MQMe with oil pumps require regular lubrication.

### 8.2 Lubrication of MQMe with oil pumps

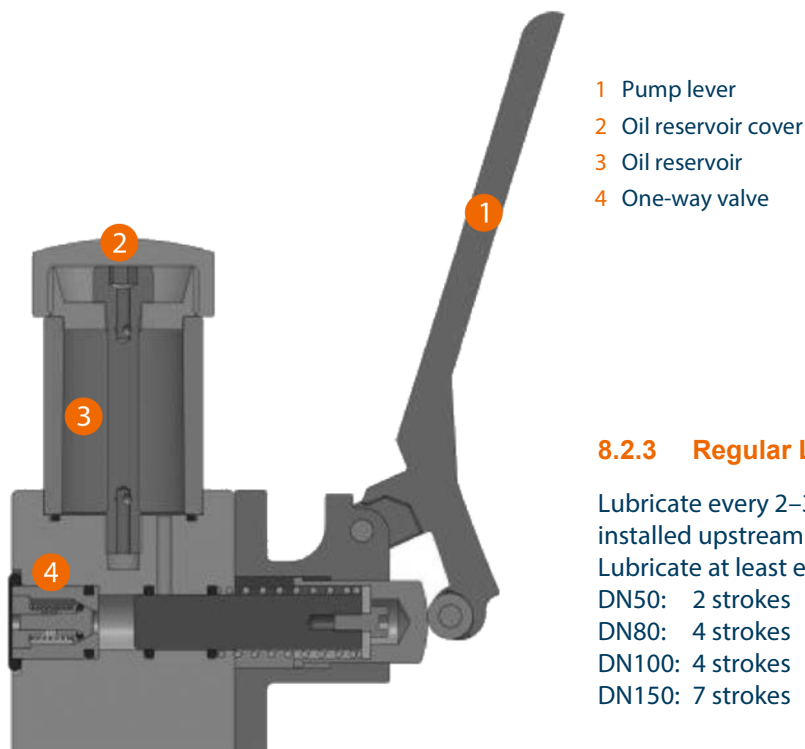
#### 8.2.1 Lubrication during commissioning

It is recommended that you use only oil sold by Metreg Technologies GmbH. A bottle of oil for the initial commissioning is supplied with the MQMe.

Approved oils are: Shell Morlina S2 BL 5 or Shell Morlina S2 BL 10.

1. Fill in the oil after completing the correct installation according to section 6 "Installation", page 9, and before starting up the MQMe. For this purpose, open the oil reservoir cover (2, Fig. 6) and fill in the appropriate amount of oil.
2. Depending on the size of the MQMe, operate the pump lever:
  - DN50: 3 strokes
  - DN80: 5 strokes
  - DN100: 5 strokes
  - DN150: 9 strokes
3. Once lubrication is complete, ensure that sufficient oil remains in the oil reservoir for re-lubrication, then close the oil reservoir cover tightly to prevent any contamination in the lubrication system.

#### 8.2.2 Layout of the oil pump



#### 8.2.3 Regular Lubrication

Lubricate every 2–3 months if the gas is clean and a filter has been installed upstream of the meter.

Lubricate at least every month, if the gas is dirty or contains moisture.

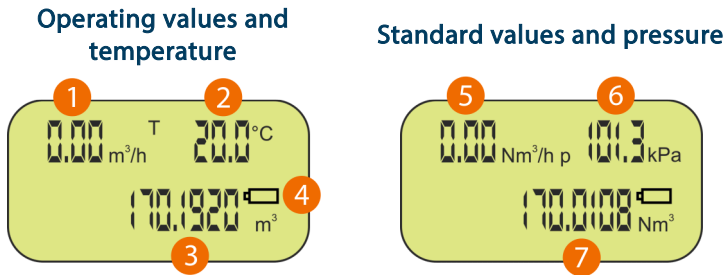
- DN50: 2 strokes
- DN80: 4 strokes
- DN100: 4 strokes
- DN150: 7 strokes

Fig. 6: Sectional drawing of the oil pump

## 9 Electronic Meter Index

### 9.1 Display

The meter indexes for operating and standard volume, the flow rates for operating and standard volume flow as well as pressure and temperature are shown on a segment LCD display. In addition, status information and faults are displayed.



- |  |   |
|--|---|
| 1 Flow rate $Q_b$ in $m^3/h$ , 2 decimal places    | 5 Flow rate $Q_n$ in $m^3/h$ , 2 decimal places   |
| 2 Temperature $T$ in $^{\circ}C$ , 1 decimal place | 6 Pressure $p$ in $kPa$ , 1 decimal place (the symbol $p$ is located directly next to the unit $Nm^3/h$ ) |
| 3 Meter index $V_b$ in $m^3$ , 4 decimal places    | 7 Meter index $V_n$ in $Nm^3$ , 4 decimal places  |
| 4 Battery symbol                                   |   |

#### 9.1.1 Pressure and temperature display

##### **HINWEIS**

Pressure and temperature displays can be used only when the volume corrector is activated (AGA or compressibility factor constant).

If no pressure and temperature sensor was selected in the configuration of the MQMe, the substitute values are displayed. These must be known when ordering the MQMe. If the MQMe is equipped with pressure and temperature sensor, the last valid measured value is displayed in case of failure of a sensor.



### 9.1.2 Display symbols

A battery symbol (4) is also shown at the bottom right of the display behind the meter index readings.

#### Power supply display

If the battery voltage is insufficient, the battery symbol flashes, see also section 9.1.4 “Replacing the Battery”, page 18.

If the MQMe is additionally connected to the mains supply, a plug symbol is displayed above the battery symbol. If the plug symbol is not displayed, the power supply must be checked.

If the battery symbol flashes while the mains supply is connected, no battery is inserted in the MQMe, or the battery plug is not connected to the MQMe.

#### Indication of pressure sensor failure

If the pressure sensor fails, the **p** and **kPa** symbols of the pressure display start flashing. For further internal processing, the last valid measured value before the failure of the pressure sensor is used.

#### Indication of temperature sensor failure

If the temperature sensor fails, the **T** and **°C** symbols of the temperature display start flashing. For further internal processing, the last valid measured value before the failure of the temperature sensor is used.

#### Flow rate limit violation at the 4–20 mA output

When the meter displays 0 (no flow), a current of 4 mA is output. If the flow exceeds the maximum flow value  $Q_{max}$ , a current of 20 mA is output.

#### Failure of pressure and temperature sensors plus power supply

If the pressure and temperature sensors and the power supply fail, and if the pressure and temperature sensors continue to malfunction after the power supply has been restored, the fixed substitute values for pressure and temperature are used until the pressure and temperature sensors start working properly again.

#### Flow sensors failure

The meter indexes stop, and no flow is displayed. The current output decreases to 4 mA and outputs 4 mA permanently.

### 9.1.3 Power Supply

The MQMe is powered by an internal 3.6 V lithium battery with a power consumption of <0.7 mW or by a direct 24 VDC mains supply.

The calculated service life of the lithium battery under standard conditions (temperature 5–25°C/41–77°F) is 5 years. The charging status of the battery is shown on the LCD display. When the battery voltage drops below 3.0 V, the battery symbol starts flashing. The battery must be replaced within 30 days. The voltage of the internal lithium battery is monitored continuously.

Alternatively, the MQMe Quantometer can also be operated with line voltage only. The internal battery is not active in this case, and additionally a power plug symbol is displayed above the battery symbol. When it is connected to the mains supply, the MQMe can be operated without a battery as well. The battery symbol flashes continuously in this case.

### 9.1.4 Replacing the Battery

Ensure the following before changing the battery:

- Use only special lithium batteries by Metreg Technologies GmbH. The batteries are equipped with a plug that prevents mix-up of the connections.
- For systems in hazardous areas, only a person trained in explosion protection may replace the battery.
- Ensure that no gas is present before carrying out the work!
- Observe the locally applicable explosion protection requirements.

#### **⚠ WARNING Risk of fire!**

- Observe the general safety instructions for handling lithium batteries (new or replaced)!
- Ensure that the cable connections (red and black) on the connecting plug do not touch or are short-circuited.
- There must be no explosive atmosphere during the replacement of the battery.  
It must be guaranteed that the area is not hazardous!

**The manufacturer assumes no liability for damages resulting from improper battery replacement.**

#### **NOTICE**

No data transmission is possible while the battery is being replaced.

### Reordering of replacement batteries

Order no.	Order text
88000255	Replacement set consisting of: 1 x meter seal 1 x lithium battery 1 x replacement instructions

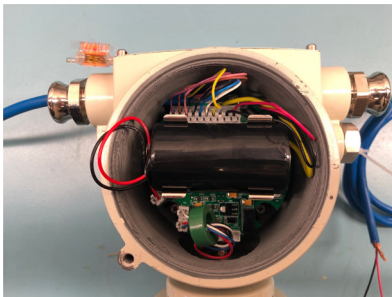


Fig. 7: Battery connection



Fig. 8: Seal and safety screw

- 1 Seal
- 2 Screw
- 3 Cover

1. Remove the seal (1) on the rear of the electronic meter index head.
2. Loosen the screws (2) on the rear of the electronic meter index head and unscrew the cover (3).

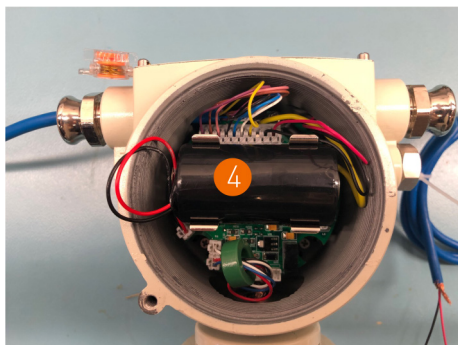


Fig. 9: Battery position

- 4 Battery

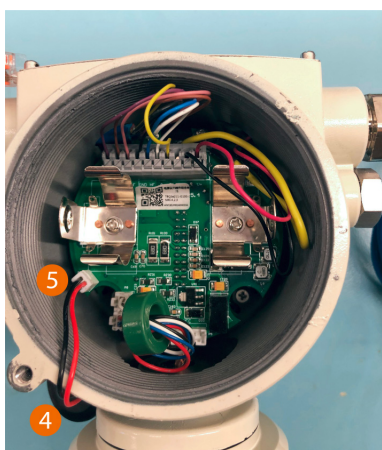


Fig. 10: Connection of the battery

- 4 Battery
  - 5 Plug
3. Pull off the plug (5) with the black and red cable.
  4. Plug the plug (5) of the new battery in the connector.
  5. Position the new battery in the battery holder.
  6. The connection is OK when the battery symbol is shown on the display.

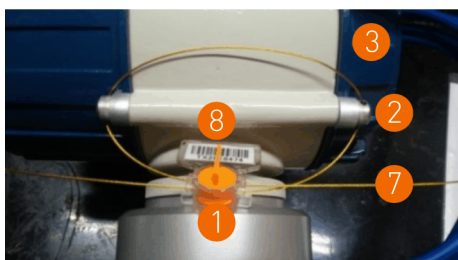


Fig. 11: Closing the housing

- 1 Seal
- 2 Screw
- 3 Cover
- 7 Sealing wire
- 8 Crosspiece

1. Carefully screw down the rear cover (3) on the electronic meter index head and make sure that none of the internal wires are jammed.
2. Secure the cover against unscrewing using the screw (2).
3. Seal the meter against unauthorized access again using the supplied safety seal (1).
4. To do this, insert the ends of the sealing wire (7) into the holes in the seal (1) from both sides.
5. Turn the crosspiece (8) in a clockwise direction until the wire has been inserted so far that the crosspiece breaks.

## 9.2 Integrated volume corrector with compressibility factor calculation

### With external pressure and temperature sensor

If the MQMe features the option of compressibility factor calculation (compressibility calculation), the values for the density ratio  $dv$  and the  $\text{CO}_2$  and  $\text{N}_2$  content of the gas must be known. If a pressure and temperature sensor is also integrated, the compressibility of the gas is continuously determined using the AGA NX-19 equation.

Pressure and temperature sensor are connected to the MQMe via a bus interface. The temperature sensor operates in the range from  $-25^\circ\text{C}$  to  $+100^\circ\text{C}$ . There are three absolute pressure sensors available for pressure measurement: 0.1–5 bar, 2–10 bar and 6–20 bar.

### Without pressure and temperature sensor

If no pressure and temperature sensor is integrated in the MQMe, the compressibility factor of the gas can be determined using a fixed pressure and temperature. In this case, the compressibility factor can be calculated once if required and stored as a constant value in the MQMe.

### Conversion (state number)

Conversion of the operating volume to the standard volume:

$$ZU = \frac{pn + (t + Tn)}{p \cdot Tn} \cdot K^{-1}$$

ZU State number (C \*)

pn Standard pressure (101.325 kPa)

t Gas temperature ( $^\circ\text{C}$ )

Tn Standard temperature (273.15 K = Kelvin)

K Compressibility factor

p Pressure (kPa)

\* International designation

The calculation of compressibility and state number is based on standard pressure and standard temperature. The standard temperature is not identical in all countries.

Any deviations from the local standard values (101.325 kPa and  $0^\circ\text{C} = 273.15 \text{ K}$ ) for the country in which the MQMe is to be used must be known.

### Conversion (standard volume and standard volume flow)

$$V_n = V_b \cdot ZU \quad Q_n = Q_b \cdot ZU$$

$V_n$  Standard volume  $\text{Nm}^3$  ( $V_b$  \*)

$V_b$  Operating volume  $\text{m}^3$  ( $V_m$  \*)

ZU State number (C \*)

$Q_n$  Standard volume flow  $\text{Nm}^3/\text{h}$  ( $Q_b$  \*)

$Q_b$  Operating volume flow  $\text{m}^3/\text{h}$  ( $Q_m$  \*)

\* International designation

### Pressure and temperature sensor

If an external pressure and temperature sensor is connected to the MQMe Quantometer, the necessary wiring is described in section 10 "Connections", page 23.

Communication with the external sensors is via a bus system.

Pressure sensors with measuring ranges of 5, 10, and 20 bar absolute pressure are supported.

### 9.3 Communications data interface

The MQMe has several options for transmitting the measured and calculated data to a digital control system (DCS) or SCADA.

#### **NOTICE**

External power supply required!

All changes of the parameters for the communication interfaces can be made solely in the factory.

The MQMe can be optionally equipped with either a RS485 Modbus or a M-Bus interface in the factory.

A baud rate of 300, 1,200, 2,400 or 9,600 can be selected for both transmission protocols. The parity bit can be set to NONE or EVEN.

The number of 8 data bits and 1 stop bit cannot be changed.

For wiring for M-Bus or RS485-Modbus see section 10 "Connections", page 23.

#### **Communication Modbus (option)**

Default setting for RS485 operation for Modbus (unless explicitly specified otherwise):

Modbus: 9,600 Bd, 8 data bits, parity NONE, 1 stop bit (96008N1) address = 2

#### **Communication M-Bus (option)**

Default setting for the operation of the M-Bus interface (unless explicitly specified otherwise):

M-Bus: 2,400 Bd, 8 data bits, parity EVEN, 1 stop bit (24008E1),  
primary address = 2, secondary address = last 8 digits of the serial number of the MQMe

#### **4–20 mA interface (option)**

The MQMe has a configurable passive two-wire output signal (4–20 mA). The operating or standard volume flow (configuration with volume corrector) can be transmitted via this signal. The flow rate is 0 at 4 mA, and a corresponding maximum flow value can be set for 20 mA.

The maximum deviation is:  $\pm 0.5\%$  FS. See also section 10 "Connections", page 23.

#### **Output pulses of the pulser**

The standard version of the MQMe is equipped with an integrated LF pulser output **or** an HF pulser output. The HF pulser can determine the current gas flow at high resolution.

#### **Terminals in the MQMe**

#### **NOTICE**

See also section 10 "Connections", page 23.

- Pink (LF) for standard volume (volume corrector option is required) or operating volume (without volume corrector option)
- Black (GND)
- Blue (HF) for operating volume

In the configuration of the MQMe with integrated volume corrector and the standard volume calculation, the standard volume can be read only at the LF pulser output. The output pulse can be set between 0.01, 0.1, 1 and 10 m<sup>3</sup>/pulse. Alternatively, the operating volume can be read at the LF pulser output. The settings are made exclusively in the factory under consideration of the customer's request.

#### **NOTICE**

HF and LF pulser output cannot be used at the same time.

All of the pulsers are intrinsically safe. If the MQMe is installed in a potentially explosive atmosphere, connections to devices such as volume correctors or station computers that are located outside the potentially explosive atmosphere may be established only via intrinsically safe circuits.

### External HF pulser (option)

One additional HF pulser can be optionally installed on the meter to scan the turbine wheel. The external HF pulser is designed in accordance with the NAMUR specifications and is typically connected to an input port on the station computer or a correspondingly equipped volume corrector. Shielded cables are to be used for the connection cables. The rotating blades on the turbine wheel are scanned by the HF sensor as they pass by the surface of the sensor. Each blade generates a pulse when passing the sensor.

Wiring of the internal pulsers: see section 10 "Connections", page 23.

The HF pulser is connected via the connection cables of the external HF sensor (NAMUR):

- Black (-)
- Red (+)

#### **NOTICE**

External HF pulser (option): Scanning of the turbine wheel is possible only with an external power supply; the signal cannot be routed to the electronics on the MQMe.

#### **NOTICE**

##### **Important for obtaining ATEX approval**

All of the pulsers are intrinsically safe. If the MQMe is installed in a potentially explosive atmosphere, connections to devices such as volume correctors or station computers that are located outside the potentially explosive atmosphere may be established only via intrinsically safe circuits.

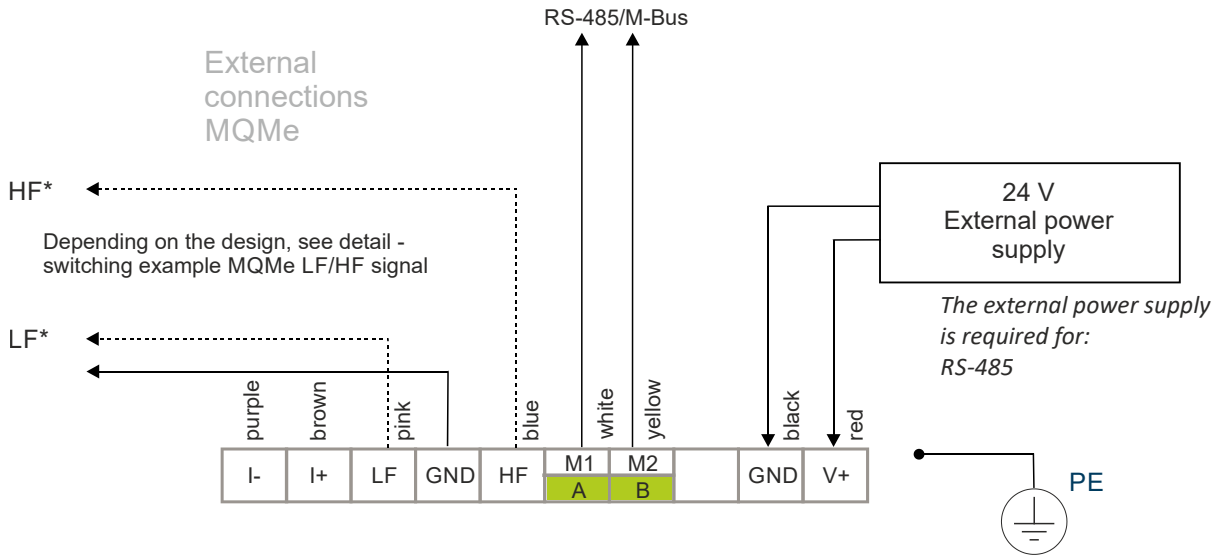
**The manufacturer assumes no liability for damages resulting from improper connection procedures.**

## 10 Connections

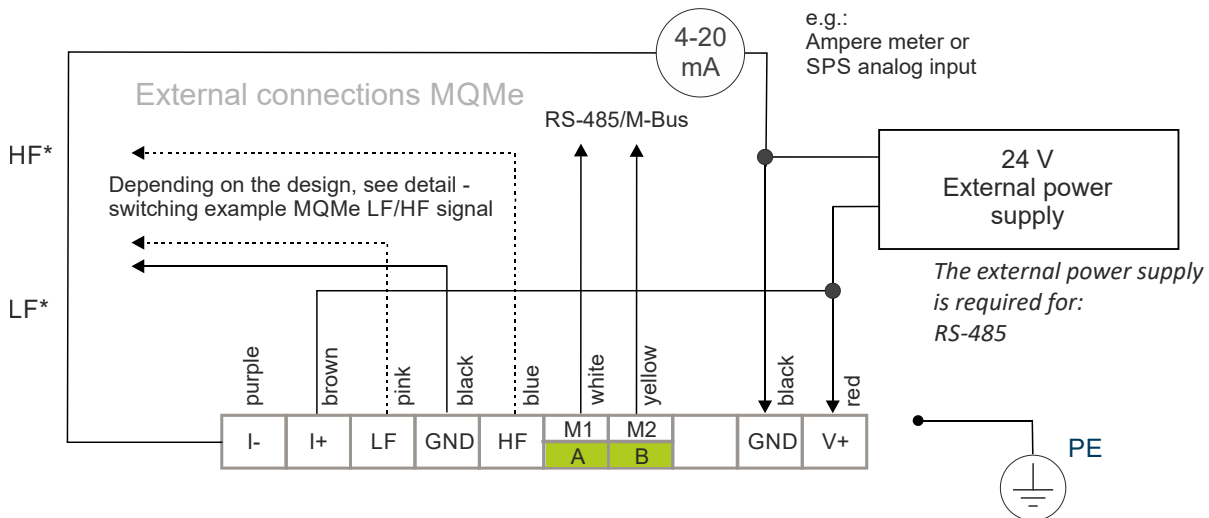
### NOTICE

\* HF and LF signal cannot be used simultaneously.

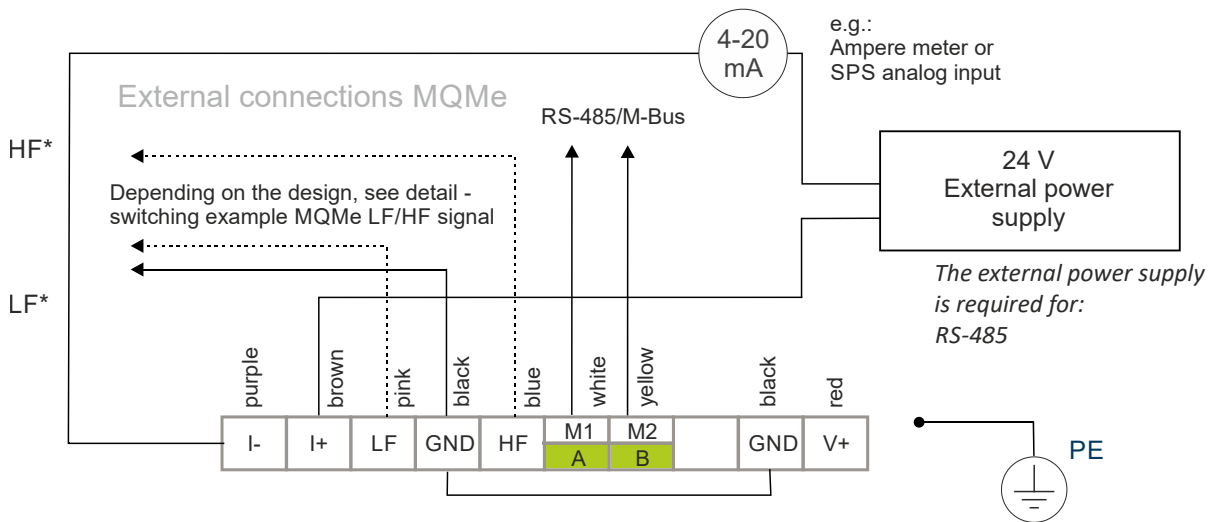
### 10.1 MQMe without 4–20 mA, with external supply for the MQMe



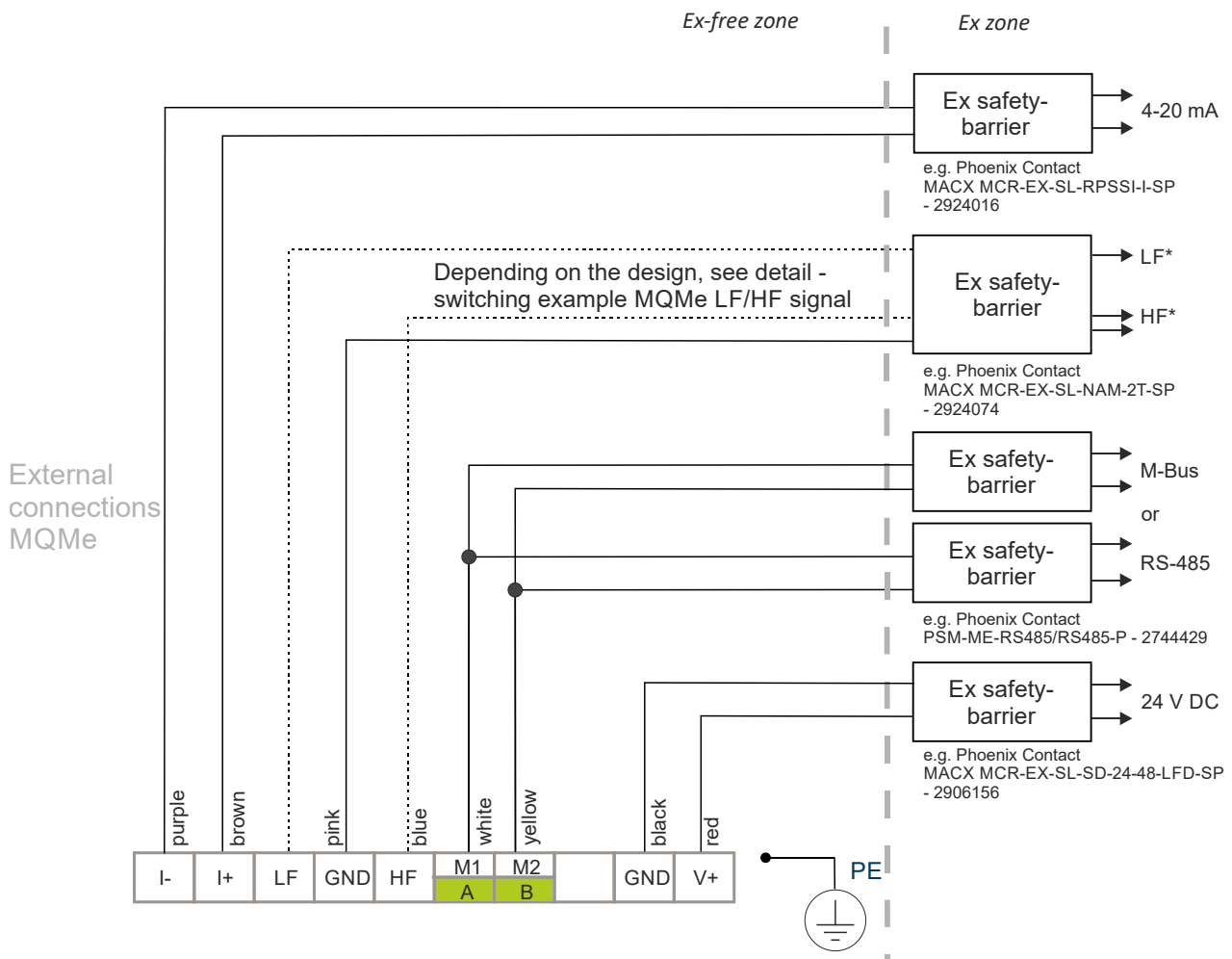
### 10.2 MQMe with external power supply for 4–20 mA and MQMe



### 10.3 MQMe with battery without external power supply for 4–20 mA

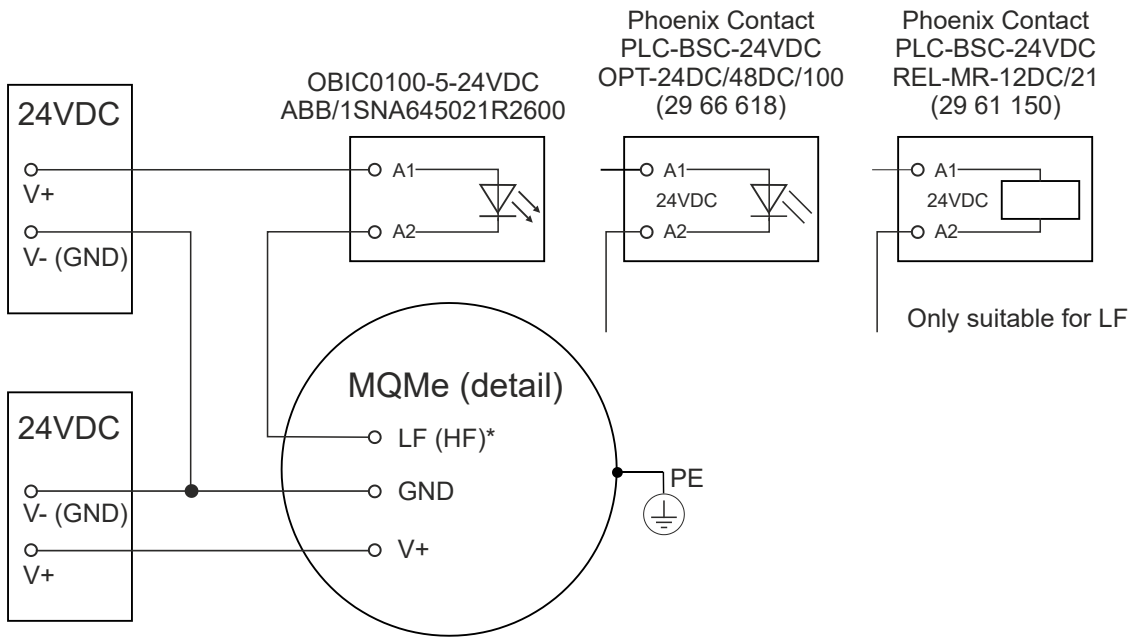


### 10.4 MQMe operation in the Ex zone





## 10.5 Switching example for the MQMe LF and HF output



The MQMe is equipped with two connection cables:



- 1 two-wire cable for external power supply
- 2 multi-wire communication cable

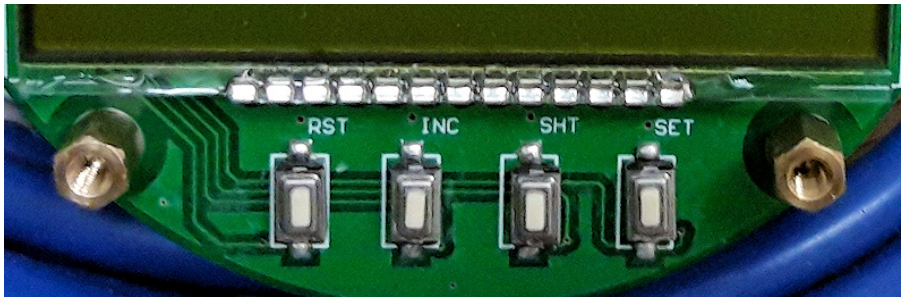
Depending on the version, customer-specific connection cables may also be installed.

### Cable type

	Communication cable	Cable for external power supply
Length	ca. 2.5 m	ca. 2.5 m
Version	8-wire, shielded, 0.25 mm <sup>2</sup>	2-wire, shielded, 0.25 mm <sup>2</sup>
Example	LiYCY 8e 0.25	LiYCY 2e 0.25

## 11 Parameter Setting

### 11.1 Buttons



The electronic meter index is equipped with 4 buttons:

- **RST**: Reset button
- **INC**: Increment button
- **SHT**: Shift button
- **SET**: Setting button

The user can change, set and save various parameters on site using the corresponding buttons or combination of buttons.

### 11.2 Preparation

The four buttons underneath the front screw-on cover on the meter index head can be used to adjust the settings directly on the MQMe.

To reach the buttons, proceed as follows:

1. Remove the seal between the front and rear screws on the cover for the electronic meter index.
2. Loosen the screws on the front of the meter index head and unscrew the cover.
3. Remove the three screws from the display cover.
4. Change the relevant parameter using the 4 buttons
5. After changing the parameter, screw on the display cover and then screw the cover on the electronic meter index head.
6. Fix the cover in place using the connection screws.



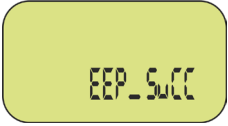
### 11.3 Changing the Primary Address

Set the desired primary address using the 4 buttons:

Action	Display	Input/output
1. Press <b>INC</b> , then <b>SET</b> .		PASS_0000 User password 1 <ul style="list-style-type: none"><li>• No entry is required.</li></ul>
2. Press <b>SET</b> .		002 _n Primary address (0-255) <ul style="list-style-type: none"><li>• Change the digit with <b>INC</b>.</li><li>• Change the position with <b>SHT</b>.</li></ul>
3. Press <b>RST</b> .		SPA_0000 User password 2 <ul style="list-style-type: none"><li>• Enter 1111 using <b>INC</b> (digit) and <b>SHT</b> (position).</li></ul>
4. Press <b>RST</b> .		EEP_SuCC Data has been saved successfully. EEP_Err Error when saving.

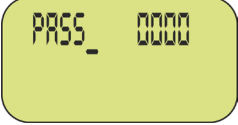
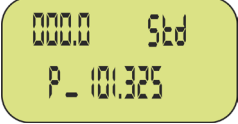


## 11.4 Changing the maximum value for the 20 mA current output

Set the desired measuring range using the 4 buttons:

Action	Display	Input/output
1. Press <b>INC</b> , 5 x <b>SET</b> and 1 x <b>SHT</b> .		A_000000 Flow at 20 mA Example: A_002500 = 2.500 m <sup>3</sup> /h (flow at 20 mA) <ul style="list-style-type: none"> <li>• Change the digit with <b>INC</b>.</li> <li>• Change the position with <b>SHT</b>.</li> </ul>
2. Press <b>RST</b> .		SPA_0000 User password 2 <ul style="list-style-type: none"> <li>• Enter 1111 using <b>INC</b> (digit) and <b>SHT</b> (position).</li> </ul>
3. Press <b>RST</b> .		EEP_SuCC Data has been saved successfully. EEP_Err Error when saving.

## 11.5 Changing the Standard Conditions for Pressure and Temperature

Set the desired standard values for the pressure and temperature using the 4 buttons:

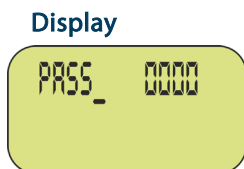
Action	Display	Input/output
1. Press <b>SHT</b> , then <b>SET</b> .		PASS_0000 User password 1 <ul style="list-style-type: none"> <li>• No entry is required.</li> </ul>
2. Press 2 x <b>SET</b> .		000.0 Standard temperature Tn in °C (DE: 0°C) P_101.325 Standard pressure pn in kPa (DE: 101,325 kPa) <ul style="list-style-type: none"> <li>• Change the digit with <b>INC</b>.</li> <li>• Change the position with <b>SHT</b>.</li> </ul>
3. Press <b>RST</b> .		SPA_0000 User password 2 <ul style="list-style-type: none"> <li>• Enter 1111 using <b>INC</b> (digit) and <b>SHT</b> (position).</li> </ul>
4. Press <b>RST</b> .		EEP_SuCC Data has been saved successfully. EEP_Err Error when saving.

## 11.6 Resetting the Volume Counter

Reset the counter.

### Action

1. Press **SET**.



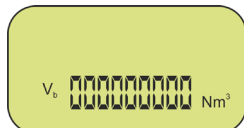
### Input/output

PASS\_0000

User password 1

- No entry is required.

2. Press **SET**.



Vb 000000000<sub>Nm3</sub>

Volume under measuring conditions

- Change the digit with **INC**.

- Change the position with **SHT**.

The decimal places cannot be changed.

3. Press **SET**.



Vm 000000000<sub>m3</sub>

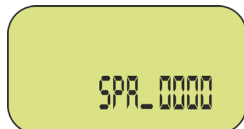
Volume under measuring conditions

- Change the digit with **INC**.

- Change the position with **SHT**.

The decimal places cannot be changed.

4. Press **RST**.

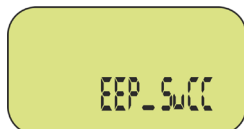


SPA\_0000

User password 2

- Enter 1111 using **INC** (digit) and **SHT** (position).

5. Press **RST**.



EEP\_SuCC

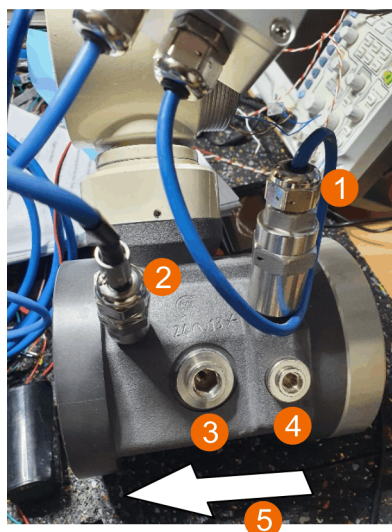
Data has been saved successfully.

EEP\_Err

Error when saving.

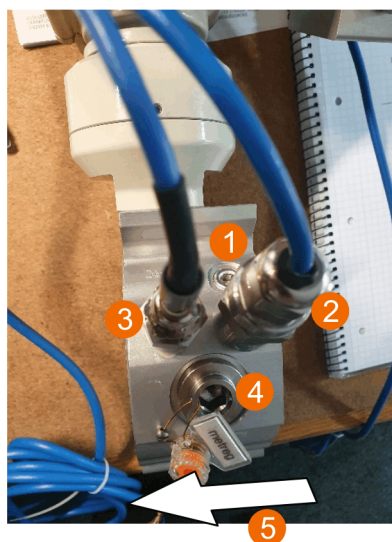
## 12 Measuring Points Pressure and Temperature

Pressure measuring points (1, Fig. 12) and (2, Fig. 13) for measuring the pressure of natural gas and temperature measuring point (2, Fig. 12 and 3, Fig. 13) for measuring the gas temperature:



- 1 Pressure measuring point for natural gas
- 2 Temperature measuring point for natural gas
- 3 External HF sensor
- 4 Reference pressure measuring point
- 5 Flow direction

Fig. 12: MQMe DN25 position of the measuring points



- 1 Reference pressure measuring point
- 2 Pressure measuring point for natural gas
- 3 Temperature measuring point for natural gas
- 4 External HF sensor
- 5 Flow direction

Fig. 13: MQMe DN50 position of the measuring points

The connections have ½" with volume correction via a pressure and temperature sensor.

" NPT conn

If no pressure and temperature sensor is required, the connections are closed using safety screws (G ¼" ).

### Pressure measuring point

Three absolute-pressure sensors are available for the pressure measuring point:

- 0,1–5 bar
- 2–10 bar
- 6–20 bar

### Temperature measuring point

Temperature sensors with a diameter of 6 mm are available for temperature measurement.

## 13 Cleaning

It is not permitted to use any solvents to clean dust and dirt from the meter. Only a damp cleaning cloth is suitable for this purpose.

## 14 Transport and Storage

The MQMe and all its accessories should be stored in their original packaging. Ensure that the meter is secured to prevent it rotating or slipping. Take special care when loading and transporting the meter to the installation location.

### To be observed during transport and storage

- Fit protective foil to both flanges on the MQMe.
- The oil pump (if present) is not filled during transport.
- Protect the meter against rain and moisture.
- Protect the meter against mechanical impact or shocks.
- Carefully check the following when unpacking the meter:
  - Packing list: Are all the parts listed completely present?
  - Each individual part: Is there any damage?

## 15 Außerbetriebnahme

1. Ensure suitable ventilation of the installation room.
2. Release gas into the free air only in locations where there are no active ignition sources.
3. Reduce the operating pressure slowly (e.g. <math><350\text{ mbar/s}</math>).
4. The screws and nuts on the flanges may be removed only when the pipeline has been completely depressurized.
5. Carefully remove the MQMe from the pipeline.

## 16 Disposal

Particular care was taken during the design of the MQMe to ensure that as few composite materials were used as possible. This design concept enables a high degree of recycling. Therefore, we are also willing to take back the device/product and dispose of it professionally.



All products marked with this symbol are electrical and electronic devices (Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)) and must not be disposed of together with unsorted household waste. Instead, to protect human health and the environment, you must take your waste equipment to an officially designated collection point for the recycling of waste electrical and electronic equipment. Proper disposal and recycling help to avert potentially harmful consequences for the environment and people.

For further information on the location and conditions of such collection points, please contact the installer or local authorities.

### National regulations

The national regulations and disposal guidelines must be observed for all disposal measures.



**Produkt**  
Product  
Produit

**EU-Konformitätserklärung**  
EU-Declaration of Conformity  
Déclaration UE de conformité

Elektronisches Quantometer  
Electronical Quantometer - Turbine Gas Flow Meters  
Quantomètres électronique - Compteurs de gaz



Metreg Technologies GmbH  
Tränkeweg 9  
15517 Fürstenwalde

**Typ, Ausführung**  
Type, Model  
Marquage de produit

**MQMe**

Richtlinie Directive Directive	PED	ATEX
<b>Produktkennzeichnung</b> Product marking Marquage de produit	ohne/without/sans - DN25 CE - DN50 CE 0035 - DN80-DN150	II 1G Ex ia IIC T4 Ga CE 1026
<b>EU-Richtlinien</b> EU-Directives Directives européenne	2014/68/EU	2014/34/EU
<b>Normen</b> Standards Normes	OIML 137-1&2 DIN EN 12261	EN 60079-0:2012+A11:2013 EN 60079-11:2012
<b>EU-Baumusterprüfung</b> EU Type-Examination Décision d'approbation européenne	HpiVS/P1001-103-Q-04	CNEX 17 ATEX 0008X
<b>Überwachungsverfahren</b> Surveillance Procedure Methode à garder	2014/68/EU Annex III Modul H	EN ISO/IEC 80079-34 FTZÚ 17 ATEX Q 004
<b>Überwachungsinstanz des Systems</b> Surveyor of the System Auditeur de la système	Notified Body 0035 TÜV Rheinland Industrie Service GmbH Am Grauen Stein 51105 Köln	Notified Body 1026 FTZÚ, s.p. Pikartská 7 716 07 Ostrava-Radvanice

**Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.**

Die entsprechend gekennzeichneten Produkte sind nach den aufgeführten Richtlinien und Normen hergestellt. Sie stimmen mit den geprüften Baumustern überein. Die Herstellung unterliegt dem genannten Überwachungsverfahren. Durch den Zusammenbau der Produktkomponenten werden keine zusätzlichen Zündquellen erzeugt.

**This declaration of conformity is issued under the sole responsibility of the manufacturer.**

Products labelled accordingly are manufactured according to the listed directives and standards. They correspond to the type approval samples. The production is subject to the stated surveillance procedures. No additional ignition sources are being created by assembly of the product's components.

**La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.**

Les produits désignés en conséquence ont été fabriqués conformément aux exigences des Directives et Normes citées. Ils conformes au type éprouvé. La fabrication est soumise au Procédé de surveillance indiqué. L'assemblage des composants du produit ne génère aucune source d'allumage supplémentaire.

Unterzeichnet für und im Namen von: Metreg Technologies GmbH

Signed for and on behalf of:

Signé pour et au nom de:



Till Kirchner  
Geschäftsführer

Fürstenwalde, 06.04.2021



**Produkt**Product  
Produit**EU-Konformitätserklärung**EU-Declaration of Conformity  
Déclaration UE de conformitéElektronisches Quantometer  
Electronical Quantometer - Turbine Gas Flow Meters  
Quantomètres électronique - Compteurs de gaz

Metreg Technologies GmbH

Tränkeweg 9  
15517 Fürstenwalde**Typ, Ausführung**Type, Model  
Marquage de produit**MQMe**

<b>Richtlinie</b> Directive Directive	<b>PED</b>	<b>ATEX</b>
<b>Produktkennzeichnung</b> Product marking Marquage de produit	ohne/without/sans - DN25 CE - DN50 CE 0035 - DN80-DN150	II 1G Ex ia IIC T4 Ga CE 1026
<b>EU-Richtlinien</b> EU-Directives Directives européenne	2014/68/EU	2014/34/EU
<b>Normen</b> Standards Normes	OIML 137-1&2 DIN EN 12261	EN 60079-0:2012+A11:2013 EN 60079-11:2012
<b>EU-Baumusterprüfung</b> EU Type-Examination Décision d'approbation européenne	HpiVS/P1001-103-Q-04	CNEX 17 ATEX 0008X
<b>Überwachungsverfahren</b> Surveillance Procedure Methode à garder	2014/68/EU Annex III Modul H	EN ISO/IEC 80079-34 FTZÚ 17 ATEX Q 004
<b>Überwachungsinstanz des Systems</b> Surveyor of the System Auditeur de la système	Notified Body 0035 TÜV Rheinland Industrie Service GmbH Am Grauen Stein 51105 Köln	Notified Body 1026 FTZÚ, s.p. Pikartská 7 716 07 Ostrava-Radvanice

**Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.**

Die entsprechend gekennzeichneten Produkte sind nach den aufgeführten Richtlinien und Normen hergestellt. Sie stimmen mit den geprüften Baumustern überein. Die Herstellung unterliegt dem genannten Überwachungsverfahren. Durch den Zusammenbau der Produktkomponenten werden keine zusätzlichen Zündquellen erzeugt.

**This declaration of conformity is issued under the sole responsibility of the manufacturer.**

Products labelled accordingly are manufactured according to the listed directives and standards. They correspond to the type approval samples. The production is subject to the stated surveillance procedures. No additional ignition sources are being created by assembly of the product's components.

**La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.**

Les produits désignés en conséquence ont été fabriqués conformément aux exigences des Directives et Normes citées. Ils conformes au type éprouvé. La fabrication est soumise au Procédé de surveillance indiqué. L'assemblage des composants du produit ne génère aucune source d'allumage supplémentaire.

Unterzeichnet für und im Namen von: Metreg Technologies GmbH

Signed for and on behalf of:

Signé pour et au nom de:





Till Kirchner  
Geschäftsführer

Fürstenwalde, 06.04.2021



## 18 Annex B

The external pulser, which directly scans the turbine wheel, has its own ATEX approval with the following markings:

HF pulser	Proximity switch According to NAMUR specifications	PTB 01 ATEX 2192 IECEx PTB 08.0058  II 1G Ex ia IIC T6 Ga Ta: -25°C to +55°C  II 1G Ex ia IIC T5 Ga Ta: -25°C to +60°C  II 1G Ex ia IIC T4 Ga Ta: -25°C to +70°C  Ex ia IIC T6 Ga Ta: -25°C to +55°C  Ex ia IIC T5 Ga Ta: -25°C to +60°C  Ex ia IIC T4 Ga Ta: -25°C to +70°C
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## 19 MQMe specification

Order no. \_\_\_\_\_

Item no. \_\_\_\_\_

### Mandatory information

Medium  Nat. gas  Propane  Butane  Air  Liquid gas  Liquid gas + up to 20% hydrogen

Biogas

- maximum sulfur content [%] \_\_\_\_\_

- maximum ammonia content [%] \_\_\_\_\_

- rel. humidity in any expected  
operating condition [%] \_\_\_\_\_

Max. inlet pressure [mbar (abs)]: \_\_\_\_\_

Operating pressure/range [bar  
(abs)]: \_\_\_\_\_

### Pulse output

(Factory setting: HF pulser for operating volume without EVC option or LF pulser for standard volume with EVC option.)

HF pulser for operating volume [m<sup>3</sup>]

or

NF pulser for operating volume [m<sup>3</sup>]

or

NF pulser for standard volume [Nm<sup>3</sup>] (EVC option required)

### Options

Volume corrector (EVC)

EVC with fixed p/T values acc. to AGA NX-19

or

EVC with pressure and temperature sensor acc. to AGA NX-19

### **NOTICE**

For the EVC option, information in sections 1. Gas composition, 2. Operating condition, and 3. Standard conditions is required!

4–20 mA analog output

(Factory setting: output of the operating volume flow without EVC option or output of the standard volume flow with EVC option.)

\* Output of the operating volume flow [m<sup>3</sup>/h]  
(Factory setting: 4 mA = no flow; 20 mA = permitted maximum flow.)

or

Output of the standard volume flow [Nm<sup>3</sup>/h] (EVC option required)  
(Factory setting: 4 mA = no flow; 20 mA = permitted maximum flow.)

\* 20 mA [Nm<sup>3</sup>/h] = \_\_\_\_\_

Communication interface

Modbus RTU (RS485)

(Factory setting: Address: 2; baud rate: 9,600; parity: none)

\* Baud rate     9.600     2.400     1.200     300

\* Parity         none     odd

or

M-Bus

(Factory setting:

Primary address: 2; secondary address: last eight digits of the serial number; baud rate: 2,400; parity: even)

\* Baud rate     9.600     2.400     1.200     300

\* Parity         none     even

**Additional specification**

1. Gas composition

(Factory setting for natural gas: relative humidity: 0.65; nitrogen: 0.8 mol%; carbon dioxide: 0.2 mol%)

	MQMe setting range:
Relative density [-] _____	(0,55–0,75)
Nitrogen [mol%] _____	(0,28–0,86 Mol-%)
Carbon dioxide [mol%] _____	(0,0–0,2 Mol-%)

Specification of further gas and substance fractions in biogas

Component	Fraction [mol%]
_____	_____
_____	_____
_____	_____
_____	_____

2. Operating condition (at the installation location of the meter)

(Factory setting: Operating temperature: 10°C, operating pressure: 1.1 bar (abs))

Operating temperature/range [°C] \_\_\_\_\_

Operating pressure/range [bar(abs)] \_\_\_\_\_

3. Standard conditions

(Factory setting: Tb: 0°C; pb: 1.01325 bar (abs))

Standard temperature Tb [°C]: \_\_\_\_\_

The parameters for the values marked with \* can be set ex works according to the customer's requirements. If not specified, the parameters are set according to the factory defaults.

To ensure data privacy, please send the completed form to us as a PDF file only.



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MQMe\_Manual\_EN\_04/2023  
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