



MZ

002-099-4115

Instruction manual

Mode d'emploi

Betriebsanleitung

Istruzioni d'uso

Manual de instrucciones

Installatie voorschrift

CE Certificate of Conformity

Actaris Gaszählerbau GmbH
76161 Karlsruhe

declares that the product:

- Qantometer MZ/MTZ

is in conformity with the following directives:

1. 97/23/EG modules B+D category IV (Pressure Equipment Directive), with EC type approval certificate N°: DVGW: **CE-0085BM 0417**.

The module D is supervised by TÜV Süddeutschland Bau und Betrieb GmbH (CE 0036);
Dudenstrasse 28, 68167 Mannheim.

EC Certificate N°: **DGR-0036-QS-135-1**.

2. 89/336/EEC-89 (electromagnetic compatibility) with modifications under consideration of the norms EN50081-2/1992 and EN50082-2/1995.

3. 94/9/EG (ATEX) module B (Annex III), with EC type approval certificate
N°: **L.C.I.E 02 ATEX 6255 X**

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The module D (Annex IV) is supervised by TÜV Product Service GmbH (CE 0123)
Gottlieb-Daimler-Straße 7,
D-70794 Filderstadt.

EC Certificate N°: **EX2 02 10 48391 001**.

Karlsruhe, 08.04.2003



St. Feller
Head of Production

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Keep this manual easily accessible for all users. Please respect all national rules for installation, operation and service of gas meters.

1 Characteristics:

Turbines gas meters are flow meters. The flow of gas turns a turbine wheel and the rotating speed of the turbine is proportional to the linear speed of the gas. The movement is mechanically transmitted to the totaliser through the magnetic coupling. Detailed characteristics are given in Annex 1

2 Packing of the MZ

2.1 Packing

The meter, depending on the size is delivered in an individual carton box or on a wood pallet. The packaging contains the plugs for the installed transmitters and the lubricant when an oil pump is installed.

2.2 Storage

If the meter is not going to be used immediately, it should be stored under cover in a clean, dry environment. The caps fitted at the inlet and the outlet pipe must stay in place until installation.

2.3 Handling

Meters should be handled with care. They must be lifted only with belts around the main body or on the eyelets.

3 Installation

3.1 General recommendations:

See Annex 2

- The standard MZ is designed for use with clean and non-aggressive gases. For use with aggressive gases please contact ACTARIS for special versions.
- If the meter is equipped with an oil pump, turn oil tank according to the installation position.
- (1) Before installation, check visually that the meter has not been damaged during transport.
- (2) Do NOT weld pipework with a meter installed.
- (3) The meter should be installed without stress in the pipework. The flanges must be correctly lined up. The tightening torque of the bolts must not exceed (Nm):

M16	M20	M24	M27	M30	M33	M36
120	200	300	400	550	700	1200

Please tighten bolts in opposite pairs.

- (4) To ensure accuracy, The meter has to be installed with an inlet straight pipe of 3 DN minimum.
- (5) Transmitters connection: Gas Meters are often installed in areas where there is a risk that Gas will be present. Therefore, electrical connections to meters need to be made with consideration of the use of Ex marked equipment or otherwise approved circuits. For plug assignment and pulse values refer to the main name plate.
- (6) Dirt particles may damage the turbine wheel therefore the use of starting sieve and filter are recommended.

- (7) Pressure pulses must be avoided during starting and operating to preserve the turbine wheel. To prevent damage during starting, increase the pressure slowly at less than 0,3 bar per second.

3.2 Recommended installation

Turbine meters are flow meters therefore their metrology can be affected by disturbances existing in the flow of gas.

The best accuracy is achieved by respecting the following rules:

- Use preferably elbow pieces with large radius (≥ 5 DN) to be installed at the inlet of the meter.
- For diameter variations, use preferably concentric convergent and divergent pieces, sudden changes must be avoided.
- Obstacles such as thermowells must not protrude in the pipe within 2 DN upstream of the meter. Gaskets should be correctly centred between the flanges and not protrude into the pipe.

3.3 Start up

3.3.1. Installation with an upstream valve

Open the valve very slowly until the meter starts to operate. Increase slowly the pressure in the downstream pipe (max. 0,3 bar/second). When the downstream pressure is stabilised, open the valve completely.

3.3.2 Installation with upstream and downstream valves

Close the downstream valve. Open slowly the upstream valve (max. 0,3 bar/second). When the pressure is stabilised in the meter, open gently the downstream valve to maintain the pressure in the meter and to avoid overflow.

3.3.3 Installation with a by-pass

Close all valves. Slowly open the by-pass and wait until the downstream pressure is stabilised. Then proceed as §3.3.2. Close the bypass.

4 Transmitters

The MZ is equipped as standard with 2 Low Frequency (LF), Reed switches and an anti-tampering switch. As option, it can be also fitted with inductive low, medium or high frequencies (HF) transmitters.

Remarks about using the meter in potentially hazardous areas (ATEX)

- Pulse transmitters must be connected to circuits intrinsic safe circuits, according to EN50020.
- All exposed aluminium parts must be suitably protected (using paint, varnish, etc) if a film of rust is possible from dust in the environment.
- The meter must be earthed.
- Tools used for installing, removing, or repairing the meter on site must be appropriate for use in the hazardous area bearing in mind that the hazardous area classification during meter replacement may differ from that during normal meter operations.
- The meter shall not be exposed to flames, ionising radiation, and ultrasound.

- Pulse values and maximum frequencies are given in Annex 1. Electrical characteristics and wiring of the socket are given in Annex 3. The wiring of the transmitters is written on the name plate of the meter.

5 Maintenance

When properly installed and put into service, the MZ need no particular attention and will provide you with many years of satisfactory service.

5.1 Lubrication

Meters equipped with an oil pump have to be periodically lubricated. Oil is delivered with the meter. Specific oil has to be used, for example

- Aeroshell fluid 12 MIL6085A
- Isoflex PDP38 (Klüber)
- Anderol 401D (Mobil Oil)
- Univis P38 (Shell)

Quantity of oil to be filled:

- a) On commissioning to fill the volume between the pump and the bearings

DN	Oil vol. (cm ³)	Push
50/80	2	10
100	3	15
150/200	4	20
≥ 250	5	25

- b) In Service

DN	Oil vol. (cm ³)	Push
50/80	0,5	2-3
100	0,8	4
150/200	1,0	5
≥ 250	1,2	6

- c) Recommended lubrication periodicity

Application	Lubrication periodicity
Dry gas, no dust	6 months
Gas comprising light condensates and little dust	Monthly
Gas with high percentage of condensates and dust	Weekly

5.2 External silicagel cartridge

The meter can be equipped with an external silicagel cartridge for installation in severe environment conditions. The cartridge has to be replaced when its colour has changed. To replace the cartridge, unscrew the old cartridge, remove the protective plug of the new cartridge and screw it into the totaliser.

5.3 Inspection and repair

It is possible to check the good functioning of the MZ by applying a spin test. This test will give information about eventual friction in the turbine ball bearings.

The test has to be conducted as follow:

- Accelerate the turbine wheel around 30 to 50% of Qmax then to measure the time until the turbine wheel stops.
- Measure the spin time (ST) until the turbine wheel stops.

See Annex 4 for typical values of spin time.

The following recommendations have to be observed for repair:

- In case of use with aggressive or dangerous gas, it may be necessary to send a

safety statement with the meter, detailing the type of Gas that has been measured.

- Some gas may still be present inside the meter and the pipe, therefore sufficient ventilation is required.
- Repairs and maintenance must be done by trained or qualified personal. Afterwards a tightness test with $1.1 \times PS$ (P_{max}) must be performed.
- When changing pressure-bearing parts, ensure that spare parts which comply with the PED are used.
- If used with wet gas, internal and external effect of corrosion has to be checked regularly and in case of severe corrosion, the meter must be replaced.
- Use solvent and alcohol free cleaning product to clean the meter.