

Radial-blade turbine gas meter TRZ

Radial-blade turbine Quantometer EQZ/EQZK

Installation and operating instructions



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1 Field of application

Type	TRZ /EQZ /EQZK
Size	G/Q 16 - G/Q 400
Nominal diameter	DN 40 - DN 100
Maximum pressure (Design): Flange Screwed	6 bar 4 bar
Maximum operating pressure	4 bar
Temperature range - gas	-10 °C ... +55 °C /+60 °C/+60 °C
Temperature range - ambient	-10 °C ... +55 °C /+60 °C/+60 °C



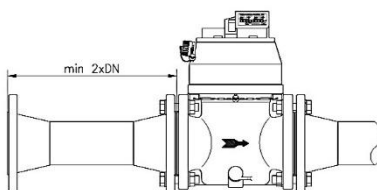
Turbine flow meters are suitable for custody transfer and Quantometers for internal and industrial measurements of clean and dry natural gas, town (city) gas, propane, butane, nitrogen (gas), air and inert gases.



Installation, connection, commissioning and maintenance must only be carried out by expert technicians who, first of all, have read and understood the operating instructions. These operating instructions include all important information required for the installation and operation of Radial-blade turbine gas meters type TRZ and Quantometer type EQZ/EQZK. They supplement the relevant national regulations with respect to the manufacturing and equipment of measuring systems as well as with respect to maintenance activities. For the installation in explosion sensitive areas please refer to section 5 in this manual.

2 Installation conditions

- If possible, the TRZ/EQZ should be installed in a closed area.
- When installing a meter outdoors, it should be protected from the direct effects of the weather. The meter has a protection rating of IP65 and is UV-resistant.
- Valves installed in front or after the gas meter should be opened slowly.
- Regulators, valves and armatures should be installed with a minimum distance of 2 x DN up-stream of the meter. (EN12261)



- The gas flow should be free of pulsations and vary only in a modulating way.
- Strong external vibrations (e.g. feed pumps) on the meter can damage it.

- The injection of odorants must be effected at a sufficient distance downstream of the meter.

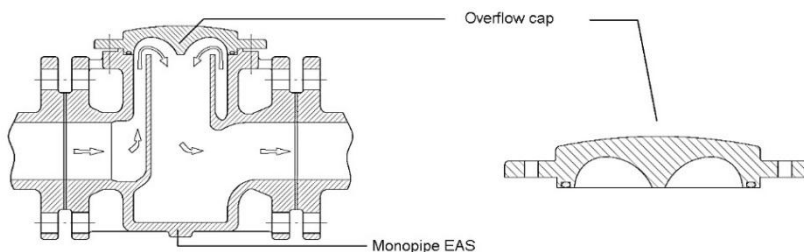
2.1 Installation of the monopipe adapter into the pipeline



- Prior to the installation of the meter, the monopipe adapter should be inspected to ensure that no damage has been inflicted to the meter during transportation. Faulty components should be replaced.
- The flow direction is indicated on the monopipe adapter EAS by means of an arrow and must correspond with the flow of gas in the pipeline. Never operate the meter in reverse flow.
- Use only approved types of flat gaskets. The gaskets must be aligned concentrically and must not protrude into the inside of the pipeline.
- Only screws, which correspond to the correct flange size, may be used. The screws must be tightened in a diagonal (crosswise) manner and to the correct torque rating. No screws can be left out.
- The preferred installation position is horizontal with the roller counter on top. The meter can also be installed vertically, axes of roller counter should be positioned horizontal.
- The EAS is subjected to a leak test:
PN16 (Flange): Test pressure = 24 bar
PN 4 (Threaded): Test pressure = 6 bar
- The EAS is a component of the pipework and is to be regarded and maintained / examined accordingly.

2.2 Cleaning of the pipeline prior to measuring insert installation

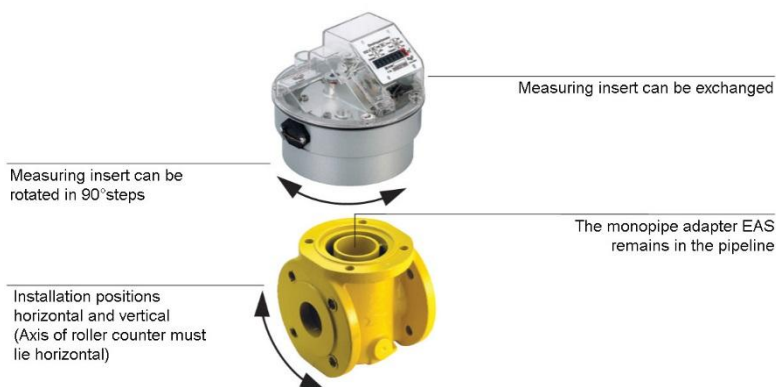
- Before installing the meter onto the EAS, the pipeline must be cleaned so that no foreign objects, dust or fluids remain inside.
- On request ELGAS, s.r.o. can supply an overflow cap, which allows the gas to flow through the meter in place of the measuring insert.



- The installation of a filter upstream of the meter is recommended.
- The pipework can now be flushed, so that excess dirt is expelled without damaging the measuring insert.

2.3 Installing the meter onto the monopipe adapter EAS

- Prior to the installation of the meter, the measuring insert should be inspected to ensure that no damage has been inflicted on the meter during transportation. Accessories should be inspected for completeness (e.g. Pulse generator). Faulty components should be replaced.
- The measuring insert is delivered in special protective packaging. This should only be removed shortly before installation.
- Installation of the meter is possible horizontally or vertically; the meter head can be rotated in 90° steps. However, it should always be ensured that the axis of the roller counter is horizontal (i.e. volume value can be read). The meter must not be installed upside down.



- Before mounting the meter onto the EAS, make sure that the pipeline has been flushed and is clean. If not please refer to section 2.2 "Cleaning of the pipeline prior to measuring insert installation".
- The gas should be dry and free of dirt and dust. Particles may not be larger than 5 micrometers. Otherwise, we strongly recommend the installation of a dust-moisture filter and/or condensation drain.
- Elimination of humidity is key term for lifetime of special version EQZK for measuring sewage gas or dry biogas. The meter is equipped by bearings with ceramic balls, which could be subject of fast degradation under higher humidity. The maximum levels of H_2S or NH_3 in the gas should be under 200 ppm level. EQZK meter may not be installed in the lowest part of pipeline, neither directly to upstream the biogas-storage unit.
- In case of new systems, the temporary installation of a filter or conical screen (mesh width: 0,5 mm) is recommended to protect the meter. The cone screen should be removed after 4 weeks.
- The O-rings mounted on the meter must be firmly seated and must not be damaged during installation.
- The meter is mounted to the EAS by tightening the cylinder screws in a crosswise manner. Please keep to the recommended tightening torque:



Nominal Diameter	DN 50 = 40 Nm
Nominal Diameter	DN 80 = 65 Nm
Nominal Diameter	DN 100 = 100 Nm

Only the ELGAS, s.r.o. delivered screws may be used for this purpose.

- After installation of the meter a leak test must be carried out on the entire unit.
- To prevent sabotage and leakage through the loss of screws the meter can be sealed.

2.4 Pulse generators

For the remote transmission of operating volume, the following pulse generators are available:

• NF (IPG-NF1/2) Reed-contact (Standard)

pulse value = 1m³ per pulse

For use within explosive sensitive areas with gas, steam and mist
II 2G Ex ia IIC T6 Gb

The intrinsic safety can only be guaranteed with the correct operating materials, together with the written confirmation/proof of intrinsic safety and the verified following maximum values.

$U_{\max} = 24 \text{ VDC}$ $I_{\max} = 10 \text{ mA}$	$P_{\max} = 120 \text{ mW}$ $f_{\max} = 0.18 \text{ Hz}$	$C_{\text{effective internal capacity}} = \text{negligibly small}$ $L_{\text{effective internal inductivity}} = \text{negligibly small}$
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• MF Namur Sensor (optional)

pulse value = 1m³ per 100 pulses

For use within explosive sensitive areas with gas, steam and mist
II 2G EEx ia IIC T6

The intrinsic safety can only be guaranteed with the correct operating materials, together with the written confirmation/proof of intrinsic safety and the verified following maximum values.

$U_{\max} = 25 \text{ VDC}$ $U_{\text{Nom}} = 8 \text{ VDC}$ $I_{\max} = 4 \text{ mA}$	$I_{\text{Mark}} = >2.2 \text{ mA}$ $I_{\text{Space}} = <1.0 \text{ mA}$ $P_{\max} = 100 \text{ mW}$	$f_{\max} = 18 \text{ Hz}$ $C_{\text{effective internal capacity}} = <= 30 \text{ nF}$ $L_{\text{effective internal inductivity}} = <= 100 \text{ }\mu\text{H}$
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• NF Reed-contact IN-Z61 (optional)

pulse value = 1m³ per pulse

This reed pulser can be retrofitted at later time without breaking the meter seal.



Note: This pulser is only designed for an ambient temperature of -10°C to 50°C .

For use within explosive sensitive areas with gas, steam and mist

EEx ia IIC/IIB/IIA

EEx ib IIC/IIB/IIA

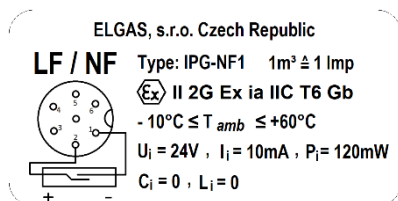
The intrinsic safety can only be guaranteed with the correct operating materials, together with the written confirmation/proof of intrinsic safety and the verified following maximum values.



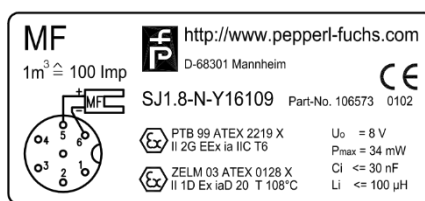
$U_{\max} = 25 \text{ VDC}$	$P_{\max} = 250 \text{ mW}$	$C_{\text{effective internal capacity}} = \text{negligibly small}$
$I_{\max} = 50 \text{ mA}$	$f_{\max} = 0.18 \text{ Hz}$	$L_{\text{effective internal inductivity}} = \text{negligibly small}$

2.5 Electrical connection of pulse generator

- The electrical connections for the two pulse generators NF Reed-contact and MF Namur Sensor in the register area is made possible by a 6-pole circular plug.
- The NF Reed-contact and MF Namur Sensor (if installed) are indicated by a sticker, which is positioned on the outer casing of the measuring insert.



Pulse generator sticker for NF-Reed contact
(Low frequency)



Pulse generator sticker for MF-Namur Sensor
(Middle frequency)

- In addition to the type description on each sticker, information about the number of pulses per m³ (pulse value), the Ex-identification number of the pulse generator and the permissible maximum electrical values are displayed.
- The cable is correctly connected when the circular plug is inserted into the socket and is fastened by tightening the coupling ring.
- The NF Reed-contact IN-Z61 has its own direct connection point and is indicated on the sensor. The plug is pushed as far into the opening of the housing, until the connecting point engages. With an additional pin, the plug is secured before removing it again. The pin has a diagonal hole in it through which wire is placed to seal the pulse generator.
- Only the original supplied plug connection may be used for this purpose.



3 Commissioning



- Fill the measuring section slowly by opening valves gradually (at least 1 minute) until the operating pressure is reached.

- Note: Pressure surges (shocks) and / or excessive start-up flowrates may damage the meter.
- The maximum flowrate $Q_{\max}$ of the meter may not be exceeded.
- Carry out a leak test.
- Please take note of the maximum and minimum flowrates indicated on the typeplate of the meter.

3.1 Maintenance and service centre

TRZ, EQZ and EQZK have permanently lubricated bearings. Lubrication of the bearings is not necessary.

Service centre:

ELGAS, s.r.o., Provozovna Chrudim, Pardubicka 199, 537 01 Chrudim, Czech republic, Tel.: +420 469 623 087, Email.: sales@elgas.cz

4 Disassembly and disposal

- To disassemble the gas meter measuring insert from the monopipe adapter the 4 cylinder screws must be unscrewed. Until such time that a new measuring insert can be installed, use can be made of the over-flow cap which is fastened to the EAS. The flow is therefore ensured during the interim.
- For revisions, it is advisable to return these to the manufacturer in the original packaging or to the closest service centre.
- Meters, which are to be retired from service, can be sent to ELGAS, s.r.o. or the nearest service centre or in addition be sent for scrap metal use.

5 Information for installation in explosive areas

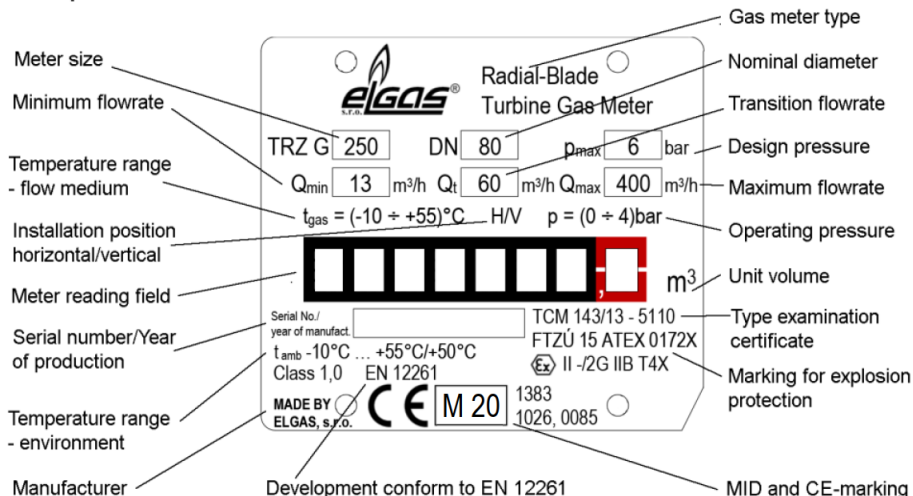
- Markings on the complete meter as an explosion proof operating device:
for TRZ: **Ex II -/2G IIB T4X Tamb -10 °C ... 55 °C**
for EQZ/EQZK: **Ex II -/2G IIB T4X Tamb -10 °C ... 60 °C**
- The regulations for explosion proof applications for the pulse generators are described in detail in this manual in Chapter 2.4.
- If the optional pulse generator IN-Z61 is used, then the ambient temperature may not fall outside the stipulated range of -10 °C ... 50 °C.
- **Cleaning of the register cover with a dry tissue/cloth must be strictly avoided.** Danger of contact - brush discharge i.e. sparks may occur during contact.
- Where the danger exists of falling objects the pressure connection p_r , the connection plug for the electrical connection and the optional pulse generator INZ-61 should be protected by a protective covering. Otherwise the danger exists that an impact on the pressure connection p_r , a leak could be caused. By impact



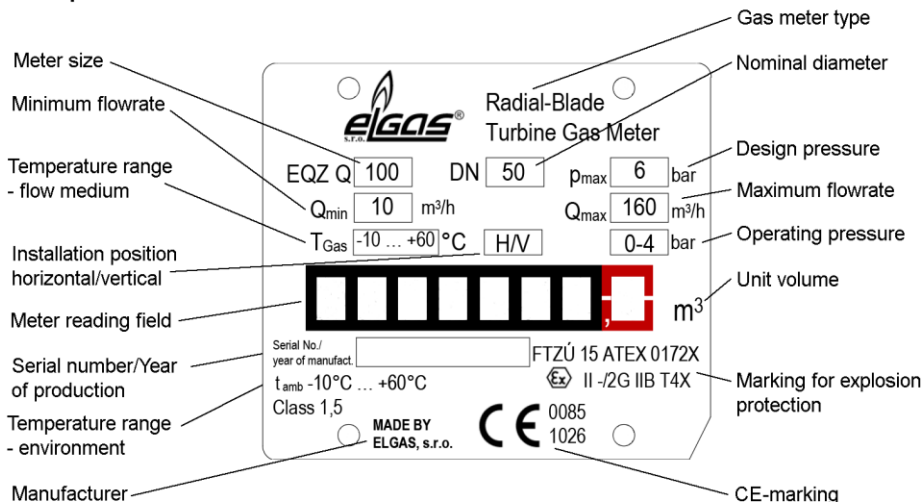
on the register covering, the danger exists that the mounted plug or IN-Z61 electrical components could be destroyed leading to sparks. Such protective coverings for each nominal size can be sourced from ELGAS, s.r.o.. Other protective coverings may also be used provided that they meet the above mentioned requirements.

6 Detailed description - type plate

Example TRZ:



Example EQZ/EQZK:



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Prepared by:	Collective of authors	
Issued by:	ELGAS, s.r.o Ohrazenice 211 533 53 Pardubice Czech republic	Phone: +420 466 414 500. 511 Fax: +420 466 411 190 http://www.elgas.cz e-mail: sales@elgas.cz
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