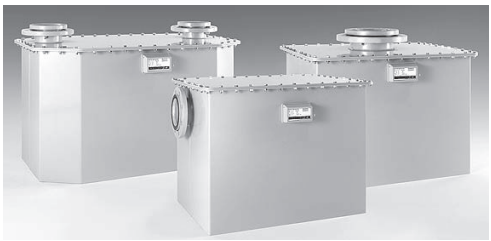
**Instruction Manual**

**Industrial Diaphragm Gas Meters**

Type BK-G40 · BK-G65 · BK-G100 and
Type BK-G40T · BK-G65T · BK-G100T

English



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**Important:**
**Read and note the operating instructions and**
**safety information before installing or commissioning!**
**Always pass them on to the operator.**

Please contact your Elster-Instromet Customer Service for assistance in commissioning or installation of encoders, pulse generators and volume correctors for instance.

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## *1. Intended Use and Field of Application*

**This product is intended to be used**

for the **fiscal** volumetric metering of

– flammable gases: natural gas / town gas / propane / butane,

– non-flammable gases: air / nitrogen / inert gases,

– inert gases pursuant to DVGW Code of Practice G260.

This product is **not** intended

– for metering of aggressive gases, e.g. biologically produced methane or sewage gases, oxygen, acetylene.

The permitted operating / ambient temperature is $t_m$ = -25°C to +55°C, unless otherwise specified on the main plate (index plate).

For meters on which conformity with Directive 2004/22/EC (MID) is declared on the main plate, the following specifications also apply:

The gas temperature where the measurement error still lies within the error limits as set out in the Directive is $t_g$ = 10°C to +40°C, unless otherwise specified on the main plate.

The meters are suitable for mechanical ambient conditions of Class M1 of the Directive. For meters with an encoder index, Class E2 for electromagnetic ambient conditions also applies.

Conformity with Directive 2004/22/EC is declared by affixing the following marking:

CE M .. 0102

on which the 2-digit year of the Declaration of Conformity (year of construction) is to be inserted after the letter “M”.

Elster’s industrial diaphragm gas meters are always to be transported and stored in the upright position.

The permitted storage temperature is -25°C to +60°C.

 

## *2. Technical Data*

| **Industrial diaphragm gas meter type** | **BK** |
|---|---|
| Size | G40, G65, G100 |
| Nominal size (pursuant to standard...) | DN 65, DN 80, DN 100 |
| Pipe layout | Co-axial connection – vertical<br>Two-pipe connection – horizontal<br>Two-pipe connection – vertical |

| **Index** | **Z6** |
|---|---|
| Number of digit rollers | 8 |
| Check digit | None |

| **Index with check digit facility** | **Z6 with CHEKKER®** |
|---|---|
| Number of digit rollers | 8 |
| Check digit | Two-digit notation |

| **Index with ENCODER** | **Absolute ENCODER** |
|---|---|
| Number of digit rollers | 8 |
| Interfaces | M-BUS, SCR- OBIS 2005, M-BUS & SCR- OMS |

| **Pulse generators** | **IN-Z61/IN-Z62/IN-Z63/IN-Z64** |
|---|---|
| Connection voltage | $U_{max}$ = 24 V DC |
| Connection current | $I_{max}$ = 50 mA |
| Connection rating | $P_{max}$ = 0.25 W |
| Min. pulse duration | $T_{min}$ = 0.25 s |
| Max. resistance | $R_{max}$ = 0.5 Ohm (contact closed) |
| IN-Z61 plug connection | Standard modular plug 6/4 pursuant to FCC, Part 68 |
| IN-Z62 terminal connection | Cable and luster terminals in housing |
| IN-Z63 plug connection | Circular plug (Binder series 723) |
| IN-Z64 plug connection | Circular plug (Binder series 723 and 423) |
| Pin assignment | Printed on the front of the pulse sensor |

| **Thermowell*)** | **Standard welded thermowell EBL 100** |
|---|---|
| Max. number in housing | 2 |
| Max. sensor diameter | 6 mm |
| Sensor attachment | Soft cable pressing; strain relief facility |

| **Pressure tap*)** | **Pipe screw unions to DIN 2353/ISO 8434-1** |
|---|---|
| Internal thread | Cylindrical thread M10x1 |
| Connection pipe | 6 mm |

## *3. Pressure and Temperature Test Points*)*

A straight male coupling in accordance with DIN 2353 is pre-fitted on the meter housing for connection of a pressure sensor for instance.

The pressure test point is marked $p_m$ and is designed for connection of d = 6 mm steel tubes in accordance with DIN EN 10305-1 (e.g. steel grade E 235).

**Important:** Do not connect the straight male coupling to pipes made of stainless steel or pipes made of nonferrous materials.

The pressure test point is only present on meters with two temperature test points!

You can use a maximum of two temperature sensors for measuring the gas temperature in the meter housing. In order to achieve optimum thermal conduction, you must fill the thermowells with a heat-conductive fluid or paste.

*) Pressure and temperature test points are optional!

## *4. Index / Index with Check Digit Facility / Absolute ENCODER*

The meter can be equipped with various index versions:

**Z6 index**

– This is the standard version with an 8-digit mechanical roller index.

– Designed for LF pulse generators which can be plugged on from the outside and which can be exchanged on site.

 

**Z6 index with check digit facility (CHEKKER®)**

– This has the same features as index Z6.

– In addition, it also has a 2-digit check digit, which is set up in a particular ratio to the meter reading and which checks whether the read value and the device number are correct. A software package is installed in the data logging unit, which enables the test process (decoding).

**Absolute ENCODER Z6**

– This has the same features as index Z6.

– It can be used as a main index.

– The ENCODER is suitable for connection to a series-connected additional device (data logger or bus system).

## *5. Pulse Generator*

**Mode of operation:**

A magnet in the last or last but one roller of the mechanical index switches a reed contact in the pulse generator.

A second reed contact allows magnetic manipulation attempts and cable breaks to be detected (not in the IN-Z62).

Meters with mechanical index Z6 are delivered with an enclosed pulse generator IN-Z61, with connection cable, rivet and seal. Pulse generators IN-Z62/63 and 64 are mounted on the index.

**Connecting the pulse generator:**

– Attach the pulse generator in the opening located on the bottom of the meter and swing it into the sealable plug connector on the right-hand side of the meter. Now secure it with the enclosed rivet and seal (for this you will need a pair of sealing pliers or a similar tool).

– Pull the locking pin provided with a snap mechanism out of its guide (only for IN-Z61).

– Then connect the plug at the end of the prefabricated cable in the designated opening on the bottom of the pulse generator.

– Secure the plug by re-inserting the locking pin into its guide (only for IN-Z61).

– Assign the terminals in accordance with the pin assignment on the pulse generator.

– IN-Z61, IN-Z62, IN-Z63 and IN-Z64 can be retrofitted onto the Z6 index at any time without breaking the calibration seal.

## *6. Installation / Connection / Commissioning*

The meter may only be installed by authorized trained personnel.

The meter must be installed in accordance with the regulations in force. Compliance with the directives of the gas supply company or, in the case of Germany, of the DVGW Code of Practice G600 (DVGW-TRGI), in the version currently valid in each case, is required for the installation of gas meters.

**Before installation please ensure:**

– that the protective caps and/or plastic sheeting is or are removed,

– that the meter and accessories have been inspected for transport damage,

– that the accessories have been checked for completeness and

– that you only use seals made from approved materials.

**Then install the meter**

– gas-tight,

– in the driest possible environment and where it may be easily read (the meter must not come into contact with surrounding masonry),

– only in flow direction (as marked by an arrow on the meter housing),

– free of mechanical stress, and make sure when inserting the seals that the seal faces are clean and undamaged, and that the seals are concentrically aligned and do not protrude into the pipe cross-section. For the compression of seals and the resulting tightening torques for the connection elements, the seal or the screw manufacturers' specifications must be observed.

– Only use the seals once!

**Placing the system into operation**

– Slowly fill the system until operating pressure is reached.

– The pressure rise may not exceed 15 mbar/s.

– Do not exceed the measuring range or the max. operating pressure even briefly!

– Pipe tests at pressures exceeding the maximum allowable operating pressure of the gas meter are to be performed without the meter.

– Conduct a tightness test!

– Compliance with the specified operating and ambient conditions as indicated on the type label is absolutely essential for safe operation of the meter and additional equipment.

– Recalibration is made in accordance with national Directives.

**Maintenance:**

– Elster industrial diaphragm gas meters are maintenance-free.

 

**WARNING:**

Improper installation, pressure tests, modifications or incorrect use can cause personal injury or damage to property.

If the seal has been damaged or removed, the gas meter is no longer approved for fiscal measurements.

## *7. Recycling and Environmental Protection*

Elster GmbH has reduced the transport packagings of its measuring instruments to the bare essentials. Packaging materials are always selected consistently with a view to recycling. The cardboard items used constitute secondary raw materials for the paperboard and paper industry. The Instapak® **foam packaging** items are **recyclable** and can be **reused**.

Plastic sheeting and strips/bands are also made of recyclable plastic. At Elster GmbH, subsequent recycling and disposal are already elements of the product development process. When selecting the materials, we allow for reusability of the materials, suitability of materials and subassemblies for dismantling and separation, and the risks of environmental pollution and health risks when recycling and dumping on landfill sites. The industrial diaphragm gas meters mainly consist of metallic materials which can be melted down again in steelworks and metallurgical plants and which can thus be reused a virtually unlimited number of times. The plastics used are listed below so that sorting and separating of the materials for the purposes of subsequent recycling is possible.

| Plastic parts | Abbreviation | Chemical name |
|---|---|---|
| Counter | PBTP | Polybutylenterephthalat |
| Digit rollers | PA 12 / PPO | Polyamid / Polyphenylenoxyd |
| Counter cover | ASA | Acrylnitril-Styrol-Acrylester |
| Viewing glass | PC | Polycarbonat |
| Counter buttom section | PPE | Polyphenylenether |
| Gears and small parts | PBTP / ASA | Polybutylenterephthalat / Acrylnitril-Styrol-Acrylester |
| Measuring unit | PBT / PF / POM | Polybutylenterephthalat / Phenolformaldehyd / Acetalhomopolymerisat |

## *8. Declaration of Conformity*

CE

**Declaration of Conformity**
*Konformitätserklärung*

elster

**Product**
*Produkt*

Gas Meter – Industrial Diaphragm Gas Meter
*Gaszähler – Industrie Balgengaszähler*

**Type, Model**
*Typ, Ausführung*

BK-G 40 – G 100 BK-G 40T – G 100T

| | MID | MID | ATEX |
|---|---|---|---|
| **Product marking**<br>*Produkt-Kennzeichnung* | CE Mxx 0102<br>DE-07-MI002-PTB009 | CE Mxx 0102<br>DE-10-MI002-PTB003 | Ex II 2 G c IIB T4 |
| **EC-Directives**<br>*EG-Richtlinien* | **2004/22/EC**<br>*2004/22/EG* | **2004/22/EC**<br>*2004/22/EG* | **94/9/CE** |
| **Standards**<br>*Normen* | EN 1359 | EN 1359 | EN 13463-1<br>EN 13463-5 |
| **EC Type-Examination**<br>*EG-Baumusterprüfung* | Notified Body 0102<br>Physikalisch-Technische Bundesanstalt (PTB)<br>D-38116 Braunschweig | Notified Body 0102<br>Physikalisch-Technische Bundesanstalt (PTB)<br>D-38116 Braunschweig | |
| **Surveillance Procedure**<br>*Überwachungsverfahren* | Notified Body 0102<br>2004/22/EC Annex D<br>*2004/22/EG Anhang D* | Notified Body 0102<br>2004/22/EC Annex D<br>*2004/22/EG Anhang D* | |

**We declare as manufacturer:**

Products labelled accordingly are manufactured according of the listed Directives and Standards. They correspond to the tested type samples. The production is subject to the stated surveillance procedure. No additional ignition sources are created by assembly of the product's components.

***Wir erklären als Hersteller:***

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

**16.06.2014**

**Segment Leader Gas Measurement**
*Segment Leiter Gas Messung*

**Head of R&D Industrial Gas Metering**
*Leiter Entwicklung GGM*

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