

Operating instructions for consumers

Electronic index EI3



themis® plus


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Safety

Please read and keep in a safe place



 Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

Explanation of symbols

- , 1, 2, 3... = Action

▷ = Instruction

Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:



Indicates potentially fatal situations.



Indicates possible danger to life and limb.



Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

Changes to edition 12.13

The following chapters have been changed:

- Checking the usage
- Logistics

Checking the usage

Electronic index EI3 for diaphragm gas meters BK-G...B

The electronic index EI3 indicates the volume at base conditions. It can be used for reading out absolute consumption values and for retrieving consumption data for the various tariffs.

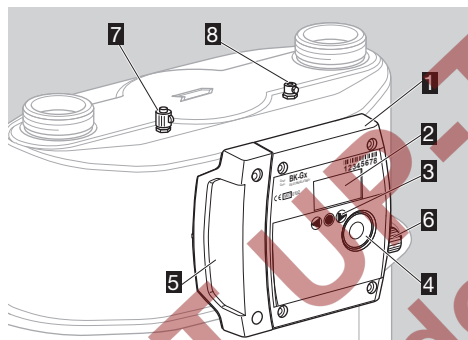
This function is only guaranteed when used within the specified limits – see page 6 (Technical data). Any other use is considered as non-compliant.

Type code

Code	Description
EI3	Electronic index based on EI3
	Variant
.00	Standard version
	Communication module
.05	ECM.05, GSM wireless technology

- ▷ The index version is shown on the index plate, see page 2 (Type label/Index plate).

Part designations

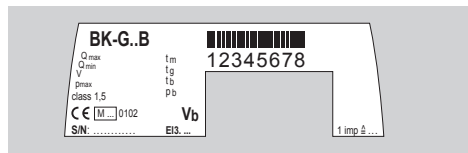


- 1 Electronic index EI3
- 2 Display
- 3 User keys
- 4 Opto-adaptor interface
- 5 Service cover
- 6 Pulse output
- 7 Pressure test point with sealing sleeve (optional)
- 8 Thermowell (optional)

Type label/Index plate

Please quote for all enquiries:

- ▷ Manufacturer's serial number S/N (at the bottom left)
- ▷ Index version EI (next to the serial number)



ATEX

- ▷ The electronic index is suitable for use in potentially explosive atmospheres. For the exact use (zone), see ATEX sticker on the diaphragm gas meter or see "Operating instructions for diaphragm gas meters BK-G1.6 to BK-G25" → http://docuthek.kromschroeder.com/doclib/main.php?language=1&folderid=400041&by_class=2&by_lang=-1
"Instruction Manual, Industrial Diaphragm Gas Meters Type BK-G40 · BK-G65 · BK-G100 and Type BK-G40T · BK-G65T · BK-G100T" → http://docuthek.kromschroeder.com/doclib/main.php?language=1&folderid=400045&by_class=2&by_lang=-1

Installation

Installing the gas meter

- ▷ For installing the gas meter in the pipe-work, see "Operating instructions for diaphragm gas meters BK-G1.6 to BK-G25" → http://docuthek.kromschroeder.com/doclib/main.php?language=1&folderid=400041&by_class=2&by_lang=-1
"Instruction Manual, Industrial Diaphragm Gas Meters Type BK-G40 · BK-G65 · BK-G100 and Type BK-G40T · BK-G65T · BK-G100T" → http://docuthek.kromschroeder.com/doclib/main.php?language=1&folderid=400045&by_class=2&by_lang=-1

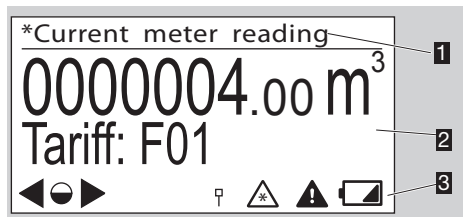
Operating the electronic index

- ▷ The display on the index is switched off.
- Briefly press any key.



- ▷ A beep sounds and the main screen appears.

Main screen



- 1 Menu area
- 2 Information area
- 3 Status line (symbols)

User keys, selection key and symbols

- ▷ You can navigate through the menu using the user keys ►, ◀ and the selection key ●.

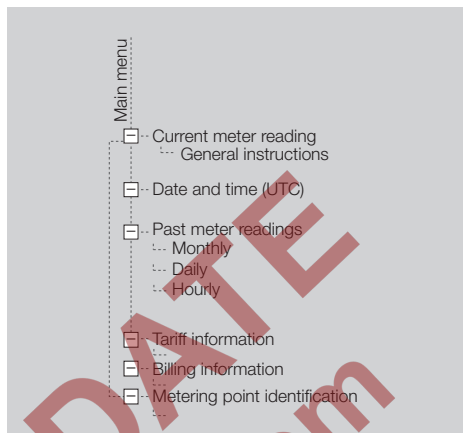
Symbol	Meaning
►, ◀	Navigate to the left or the right on each level using the user keys.
●	Briefly pressing the selection key selects a sub-menu. Holding the selection key pressed down switches the display back to the previous menu.
◐	Briefly pressing the selection key selects a sub-menu.
◑	Holding the selection key pressed down switches the display back to the previous menu.
▷, ○, ◀	Keys inactive
Ⓜ	RF module/communication is active
Ⓜ	RF module/communication is inactive
Ⓜ=Ⓜ	RF communication—pairing successful
⚠	Invalid data
⚠	Alarm
🔋	Low index battery. This symbol is only displayed when battery power is low.
⚠	Temperature out of operational range
⚠	Pressure out of operational range
⚠	Multiple sensor data out of operational range

- ▷ In each menu, the meaning of the symbols for the keys is described in the information area.
- ▷ In the main screen under “General instructions”, all the symbols are explained.

Navigating within the menu

- ▷ The menu is constructed hierarchically.
- ▷ The “Current meter reading” main screen appears when switching on the index.
- ▷ If you are in a different menu, the display will automatically change back to the main screen when no user key has been pressed for 30 s, and switches off after a further 30 s.
- ▷ You can navigate from the main screen to the various menus, such as “Date and time (UTC)” using the user keys ►, ◀.

Menu overview



Current meter reading

- ▷ UTC = coordinated universal time + X = offset for conversion to local time.
- ▷ The absolute meter reading and optionally the current tariff are indicated in the main screen.
- ▷ This appears when switching on the index.
- ▷ You can receive information about the symbols by pressing the selection key ● and the user keys ►, ◀, or see page 3 (User keys, selection key and symbols).


Date and time (UTC + X)

- ▷ Information on the date and time display.
- ▷ The current date and time appears when the selection key ● is pressed.
- ▷ Local time is supported.
- ▷ Daylight saving time can be supported.
- ▷ For further information, contact the meter operator.



- ▷ The date is given in the format DD-MM-YYYY.

Past meter readings



- ▷ Consumption data dating as far back as 20 weeks can be called up.
- ▷ By pressing the selection key , consumption data are displayed, which are given by month, day or hour intervals:
M: monthly
D: daily
H: hourly
- ▷ "hourly summary" example:

*H: 01-05-13 18:00->19:00
0000000.00->0000004.00m³

Vb 4.00m³

Tariff: F02



- ▷ The timeframe is displayed with date and time for the start and end of the period.
- ▷ The meter reading is displayed for the start and end of the period in m³.
- ▷ The consumption for this period is indicated in m³.
- ▷ The tariff (e.g. F02) may be displayed.
- ▷ The  symbol is displayed if, for example, the tolerance between the internal time recording and the actual time is too large. This can lead to invalid consumption data. After the next time synchronization, the consumption data are re-recorded again correctly and  disappears.

Tariff information

Tariff information

Tariff program &
Details



- ▷ This menu contains information on the current tariff program.
- ▷ By briefly pressing the selection key, you can access further information. Here, the active tariff program is displayed, as are the date and time of activation.

Tariff information

ID :Green Spring Demo

From : 01-01-2000 06:00



- ▷ By briefly pressing the selection key, you can visualize the consumption data.

Consumption results

F01: 0.00m³

F02: 0.00m³

F03: 0.00m³

UES:0x0240000000000000



- ▷ In lines F01 to F03, the current absolute gas consumption values of the relevant tariff register are displayed.
- ▷ In the "UES" (UNI-TS 11291, event status) field, the current diagnostic information is displayed.
- ▷ The data are updated hourly.

Billing information

Billing information

Current &
previous billing



- ▷ This menu provides further information on the gas consumption values within the periods in the register.
- ▷ By briefly pressing the selection key, you can visualize the overview of the saved billing periods.



Billing information (1/5)

ID :SPIDER NET

From :01-01-2000 06:00

To :01-01-2000 03:26



- ▷ At this menu level, you will find the identification and the scope of validity (length of time) of the relevant billing period.
- ▷ By pressing the ,  keys, you can change between the current billing period and the last four billing periods.

- By briefly pressing the selection key, you can visualize the relevant consumption data.

Billing information (1/5)	
Vb :	4.00 m ³
F01 :	0.00m ³
F02 :	0.00m ³
F03 :	0.00m ³
UES:0x0240000000000000	
◀ ● ▶	

- V_b is the absolute value of the gas meter reading.
- In lines F01 to F03, the absolute values of the tariff registers are displayed.
- In the "UES" (UNI-TS 11291 event status) field, the current diagnostic information is displayed.
- All figures are absolute values, which are saved at the end of the relevant billing period.
- The data for the current billing period are updated hourly.

Electrical pulse output

⚠ WARNING

Risk of explosion in explosion-hazard areas!

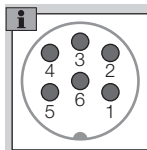
- As a general rule, maintenance and repair work should be avoided in explosive atmospheres.
 - Check that the electrical system complies with the special electrical explosion protection requirements.
 - When working on electrical equipment in an explosion-hazard area, only design-approved electrical operating equipment may be used.
 - This pulse output is **not** suitable for metrological testing purposes, but for monitoring the consumption.
- The generated pulses correspond to the values shown in the technical data, see page 6 (Technical data).
 - When gas consumption is higher than the output can transmit its pulses, the pulses are buffered and will be transmitted afterwards when consumption is low.

Pin assignment:

Pin 1, 2, 4, 6: not connected

Pin 3: output +

Pin 5: output -



- To connect the pulse output, use a socket type IEC 60130-9.

Assistance in the event of malfunction

- ? Fault
- ! Cause
- Remedy

Possible faults and suggested solutions

? The ⚠ symbol is displayed.

- ! If the ⚠ symbol appears next to a measured value, this means that the value is invalid.
- After the next time synchronization, the data are recorded again correctly and ⚠ disappears.

? When pressing the user keys, the display remains switched off. A beep can nevertheless be heard.

- ! Energy-saving mode is active. Due to excessive use of the index, the average energy consumption has been exceeded.
- Leave the index unused for an extended period, e.g. 24 hours. After this, the user interface will once again be available.

? When pressing the user keys, the display remains switched off and no beep can be heard.

- ! The index is defective.
- Contact the manufacturer.

? The 🔋 symbol is displayed.

- ! Low index battery. This symbol is only displayed when index battery power is low.
- Replace the index battery.

? Display light is off.

- ! Low index battery voltage.
- Replace the index battery.
- ! Display light is defective.
- Contact the manufacturer.

- In the case of faults which are not described here, contact the manufacturer immediately.

Technical data

RoHS compliant

Application with diaphragm gas meters BK..B

Enclosure: IP 65.

Maximum allowable operating pressure p_{\max} (as overpressure): see index plate,

base gas pressure p_b : see index plate,

operating pressure range (absolute) p_g :

800 to 1600 mbar.

Life of battery for index: approx. 15 years.

Life of battery for communication module:

approx. 5 years.

Ambient temperature of index: -25 to +55°C (for entire meter, see index plate).

Accuracy of the clock: 0.4 s/day at 20°C on the day of manufacture.

Temperature measurement accuracy on the day of manufacture:

$\pm 0.2^\circ\text{C}$ in the range from -10 to +55°C.

$\pm 0.25^\circ\text{C}$ in the range from -25 to -10°C.

Pressure measurement accuracy: ± 5 mbar on the day of manufacture.

Pulse value V_{Imp} for pulse tests via optical interface:

Gas meter	Decimal place in display	Pulse value V_{Imp} in dm^3
BK-G6	3	1
BK-G10–BK-G40	2	10

Communication module: GSM RF technology.

Data logger for past meter readings:

up to 20 weeks in hourly intervals.

Optical interface; pursuant to EN 62056-21.

Mode (E), Annex B.2.

Pulse output

Type of switch: open collector transistor, normally closed.

For switching voltage and current, see section

"ATEX explosion protection" below.

Resolution: 1 pulse per 10 litres of base volume.

Maximum pulse frequency: 4 Hz.

Minimum pulse duration: 125 ms.

For further technical data on diaphragm gas meters BK, see:

"Operating instructions for diaphragm gas meters BK-G1.6 to BK-G25" →

http://docuthek.kromschroeder.com/doclib/main.php?language=1&folderid=400041&by_class=2&by_lang=-1

"Instruction Manual, Industrial Diaphragm Gas Meters Type BK-G40 · BK-G65 · BK-G100 and Type BK-G40T · BK-G65T · BK-G100T" →

http://docuthek.kromschroeder.com/doclib/main.php?language=1&folderid=400045&by_class=2&by_lang=-1

ATEX explosion protection

The index EI3 is certified as an ATEX subassembly and is marked as follows:

⊕ II 2 G Ex ib IIA T4 Gb

⊕ = Specific explosion protection mark

II = Equipment group for "non-mining"

2G = Equipment category 2 (zone 1) for gas

EX = Symbol for electrical equipment built according to European standards

ib = Type of ignition protection:

i = intrinsically safe

b = suitable for use in zone 1

IIA = Explosion group for gases

T4 = Temperature class: maximum allowable surface temperature: 135°C

Gb = Equipment protection level (zone 1)

The batteries and communication modules are certified as parts of the electronic index. Use only spare parts from Elster.

The electrical interfaces feature the following parameters:

Pulse output:

– $U_i = 26.6$ V

– $I_i = 250$ mA

– $P_i = 414$ mW

– $C_i = 0.012$ μF

– $L_i = 0$ mH

For further technical data on diaphragm gas meters BK, see:

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"Instruction Manual, Industrial Diaphragm Gas Meters Type BK-G40 · BK-G65 · BK-G100 and Type BK-G40T · BK-G65T · BK-G100T" → http://docuthek.kromschroeder.com/doclib/main.php?language=1&folderid=400045&by_class=2&by_lang=-1

Transport

Diaphragm gas meters are always to be transported in the upright position. On receipt of the product, check that the delivery is complete, (see page 2 (Part designations)). Report any transport damage immediately.

Storage

Diaphragm gas meters are always to be stored in the upright position and in a dry place. Ambient temperature: see page 6 (Technical data).

Disposal

Meters with electronic components:

Components, particularly batteries, are to be disposed of separately.

On request, old units may be returned carriage paid to the manufacturer, see page 8 (Contact), in accordance with the relevant waste legislation requirements.

NOT UP-TO-DATE
www.docuthek.com

Contact

Honeywell

Germany

Elster GmbH
Strotheweg 1
49504 Lotte
Tel. +49 541 1214-0
Fax +49 541 1214-370
info@elster-instromet.com
www.elster-instromet.com

United Kingdom

Elster Metering Limited
Paton Drive
Tollgate Business Park
Beaconside
Stafford, ST16 3EF
Tel. +44 1785 275200
Fax +44 1785 275305
jeavons.info@gb.elster.com
www.elstermetering.co.uk

Ireland

Active Energy Control Ltd.
Unit 4, Clare Marts
Quin Road
Ennis, Co. Clare
Tel. +353 65 6840600
Fax +353 65 6840610
info@aec.ie
www.aec.ie