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KIZ

Compact industrial meter

EN Instructions for use

Issue date: 5 November 2020; subject to technical changes. KIZ-BIA-E-1.60

Scope of delivery

Please check that the contents of the packing box are complete before starting the installation and start-up procedure.

- 1 KIZ device
- 1 Instructions for use

If the contents are incomplete or damaged, please contact your supplier. Store, use and transport the device in such a way that it is protected against moisture, dirt and damage.

Important information

These instructions for use are part of the documentation. These instructions list all the different device versions. Some of the features described herein may not be applicable to your particular device.

Please see the product manual for more comprehensive information about the device. Please also observe all the documents included with other components.

Target audience

These instructions are intended for technicians who are responsible for the installation, connection and servicing of the devices. The device may only be installed and started up by qualified electricians in accordance with the generally accepted technology standards and, where applicable, the definitive regulations governing the erection of communication equipment and terminal devices.

Intended use

The meter is intended to be used solely for the measurement of electrical energy, and it must not be operated outside the specified technical data (see name plate).

Maintenance and warranty instructions

The device requires zero maintenance. It is not permitted to make any repairs in the event of any damage (e.g. due to transport, storage). If the device is opened, the warranty will be rendered null and void. The same applies where a defect is caused by external factors (e.g. lightning, water, fire, extreme temperatures and weather conditions), or by improper or careless use or handling.

The seals may only be broken by authorised personnel.

Care and disposal information

⚠ DANGER!

Risk of fatal injury in case of contact with live parts!

Before the housing of the meter is cleaned, all conductors that the meter is connected to must be de-energised.

Use a dry cloth to clean the device housing. Do not use any chemical cleaning agents!

The following table names the components and how they are to be treated at the end of their life cycle.

Components	Waste collection and disposal
Printed circuit boards	Electronic waste: dispose of such waste in accordance with the local regulations.
LEDs, LC display	Hazardous waste: dispose of such waste in accordance with the local regulations.
Metal parts	Recyclable material: sort such material and send it for recycling.
Plastic parts	Send sorted plastic parts to a recycling plant (regranulation) or, where applicable, to a waste incineration plant (thermal energy generation).

Basic safety instructions

Please adhere to the following basic safety instructions:

- Read all the enclosed instructions and information.
- Observe the warnings on the device and in the documents.
- Always be aware of safety issues and hazards when working on the device.
- The customary local occupational health and safety regulations for electrical installations must be observed during assembly, installation and removal of the device.
- Make sure that the installation and operating location of the device meets the specifications in the technical data.
- Before assembly, check the devices for any transport damage and other externally visible damage.
- Only use the device if it is in a technically flawless state, and solely in line with its intended use.
- The connection cables used to connect a meter must be selected to match the maximum load of the meter and the installation environment in terms of type, cross-section, voltage and temperature.
- Attach ferrules to flexible wires.
- Observe the maintenance and warranty instructions.
- If the mains power fails and then returns, there is no need to do anything to the meter.

General description

This meter is a digital single-rate or two-rate tariff meter for measuring positive active energy in 2 and 4-conductor networks.

Tariff switching is performed by means of an external control input.

The device is primarily designed for use in energy data collection for industrial engineering and building technology, and for use in the utility sector.

Its design provides for space-saving assembly (just 4 HP wide).

The meter has a 7-digit LC display. Energy consumption values are displayed in 6 digits before the decimal point and 1 digit after the decimal point.

It is also possible to output the energy consumption values via a pulse output (max. 27 V DC, 27 mA) and/or an electric interface (M-Bus as per EN 13757-2, -3). The pulse constant and pulse length are fixed.

The meter is in accuracy class B as per EN 50470-1, -3.

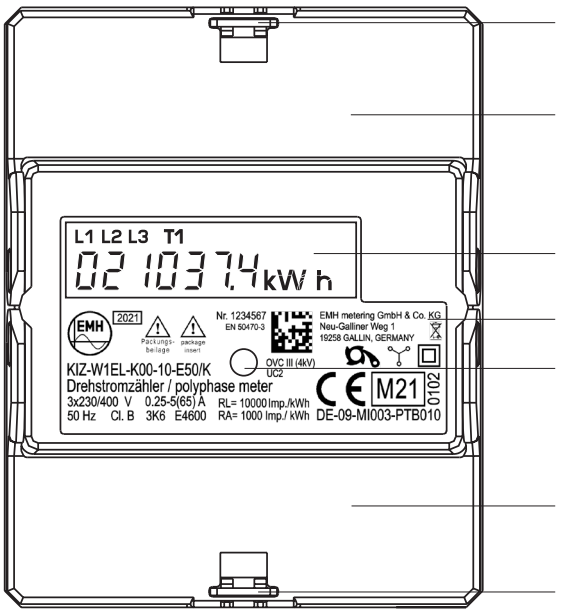
Main features of the meter

- Measurement of active energy +A with return lock
- Designed as a direct connected meter
- Up to 2 tariffs
- Bus-enabled: M-Bus interface
- 7-digit LC display
- Pulse output for transfer of energy-proportional pulses
- Test LED for testing the meter
- Recording of instantaneous values for P (per phase and total), U and I (per phase)

Technical data

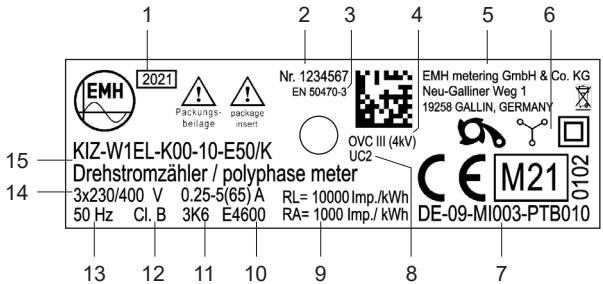
Voltage, current	230V or 3x 230/400V 5(65) A
Utilisation category	UC2
Overvoltage category	OVC III (as per EN 62052-31)
Rated impulse voltage	4 kV (as per EN 62052-31)
Frequency	50 Hz
Input	
System voltage	230 V
Output	
S0 output	Max. 27 V DC, 27 mA (passive)
Power consumption per phase	Voltage circuit: < 0.55 VA / < 0.4 W Current path: < 0.01 VA
Temperature range	Defined operating range: -25 °C...+55 °C Limit range for operation, storage and transport: -40 °C...+70 °C
Humidity	Maximum 95%, non-condensing, as per EN 62052-11, EN 50470-1 and EN 60068-2-30
Altitude	up to 3,000 m
Protection class	II
Degree of protection	Housing, connections: IP20
Installation environment	The device may only be used in switch and meter cabinets with a degree of protection of IP51 (or higher). This ensures protection against penetration by dust and water as specified by the relevant standards (EN 50470-1, EN 62052-31).
Fire properties	As per EN 62052-11
Environmental conditions	Mechanical: M1 according to the Measuring Instruments Directive (2014/32/EU) Electromagnetic: E2 according to the Measuring Instruments Directive (2014/32/EU) Intended operating location: Interior as per EN 50470-1
Weight	Approx. 350 g

Housing and display elements



1	Sealing eye
2	Terminal cover with connection diagram
3	Display
4	Name plate
5	Test LED
6	Terminal cover with designation of additional terminals
7	Sealing eye
8	Catch mechanism on the back of the meter

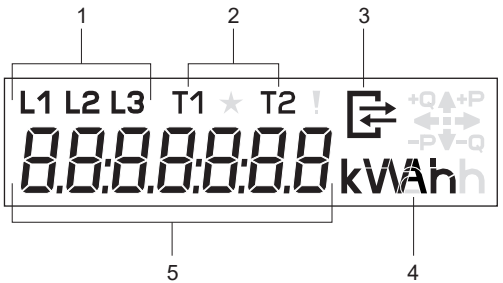
Name plate



1	Year of construction
2	Serial number
3	Product standard
4	Overvoltage category, rated impulse voltage
5	Manufacturer’s address
6	Safety and application information
7	Conformity and certification marking
8	Utilisation category
9	LED and output pulse constant
10	Circuit number
11	Temperature class as per EN 60721-3-3
12	Accuracy class
13	Frequency
14	Voltage and current
15	Type designation and type code

Display

The display is a liquid crystal display (LCD) with the following design:



1	**Phase indication L1, L2, L3**	
	lit:	Phase voltages are present
	flashing:	Rotating field of the voltage is wrong
	off:	Failure of the phase
2	**Display of the active tariff**	
	T1 lit:	Tariff 1 active, display of tariff register 1
	T1 lit and T2 flashing:	Tariff 1 active, display of tariff register 2
	T2 lit:	Tariff 2 active, display of tariff register 2
	T2 lit and T1 flashing:	Tariff 2 active, display of tariff register 1
3	**Communication symbol**	
	lit:	communication via the electrical interface
4	**Units**	Unit of the value displayed in the value area
5	**Value area**	Display of tab contents

M-Bus interface

The M-Bus interface is designed as per EN 13757-2, -3.

The following parameters can be transferred via the M-Bus:

- Manufacturer identification
- Medium
- Primary and secondary address of the M-Bus
- Energy values
- Instantaneous values:
  - P_{total}
  - Individual power values (P_1, P_2, P_3)
  - Currents (I_1, I_2, I_3)
  - Voltages (U_1, U_2, U_3)
- Error status

These data are output as a standard response and can be displayed by standard tools such as “Lorus”.

The primary M-Bus address, secondary M-Bus address and baud rate can be modified using standard M-Bus commands.

Ex works, the meter has the following settings:

- Primary address: 001
- Secondary address: 8-digit, e.g. 12345678 (serial number)
- Baud rate: 2400 baud

Further functions and details are described in the M-Bus description for this meter.

Input

In case of a two-tariff version, the meter is equipped with a control input (system voltage) for tariff switching.

Specifications	
System voltage	230 V AC (standard)

Output

The meter has a potential-free S0 pulse output (as per EN 62053-31).

Specifications	
S0	Max. 27 V DC, 27 mA (passive)

The pulse duration is 30 or 100 ms, depending on the device version.

Depending on the device version, the energy pulses (R_A) are 100 or 1 000 pulses/kWh.

Test LED

The test LED is used to output active-energy-proportional pulses and to display standstill and start-up.

The LED constant is 10 000 pulse/kWh, the pulse length is 2.5 ms.

If the meter is at a standstill, the LED is permanently lit. If the meter has started up, the LED flashes and outputs the active-energy-proportional pulses.

Installation and start-up

⚠ DANGER!

Risk of fatal injury in case of contact with live parts!

During installation or when replacing the meter, the wires connected to the meter must be de-energised.

- Remove the corresponding pre-fuses, on the mains side and on the creation side in case of a two-sided feed.
- Store them in a secure location to ensure that no one else can insert them again without being noticed.
- If you use selective automatic circuit breakers for system disconnection, secure them to prevent them from being switched-on again without being noticed.
- Before the installation of a meter, make sure that the consequences of disconnecting the electrical system will not result in immediate danger to the life or health of persons or cause any economic damage.
- To avoid any immediate hazards or damage, take appropriate measures to prevent malfunctions before disconnection of the system.
- Use the specified screw-type terminals only for installation and connection of the meter.

⚠ DANGER!

Risk of fatal injury due to arcing and electric shock!

The inputs and outputs for the additional terminals are not fuse-protected in the meter.

- Fuse-protect the inputs with a pre-fuse of ≤ 0.5 A in accordance with the applicable technical regulations.
- Fuse-protect the outputs as per the current specification on the connection diagram of the meter, and the optocoupler MOSFET output with a pre-fuse of 0.1 A in accordance with the applicable technical regulations.

⚠ DANGER!

Risk of fatal injury due to arcing and electric shock!

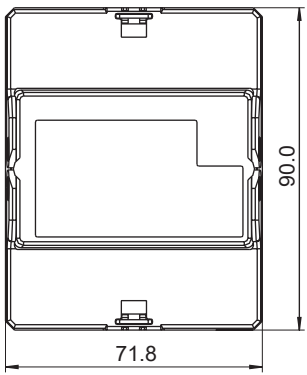
The voltage taps in the meter are not fuse-protected, and are connected directly to the main voltage.

- External devices that are operated using the meter's voltage taps must be fuse-protected with a pre-fuse of ≤ 0.5 A in accordance with the applicable technical regulations.

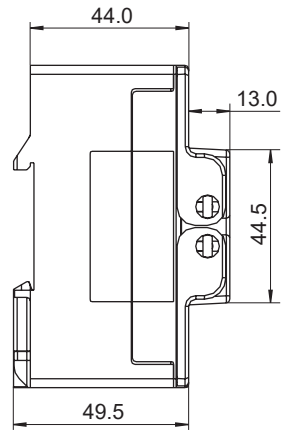
Mounting the meter

The meter can be mounted on TH 35-7.5 cap rails as per EN 60715. The meter is designed only for cap-rail mounting in switch and meter cabinets. The following figures show the dimensions (in mm) relevant for mounting.

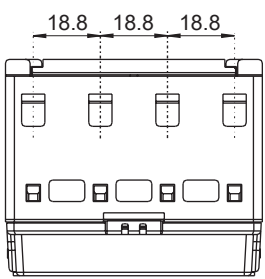
Front view



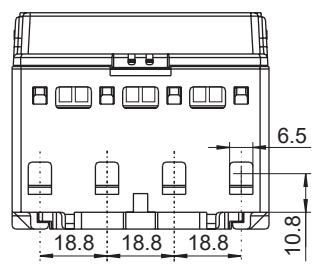
Left side view



View from above



View from below



Removing the meter

To remove the meter from the cap rail, it is possible to undo the catch mechanism on the underside of the meter with a suitable screwdriver.

Connecting the meter

When connecting the meter, always observe the corresponding connection diagrams, which you will find in the terminal covers of the meter. If there is no connection diagram, please contact your supplier.

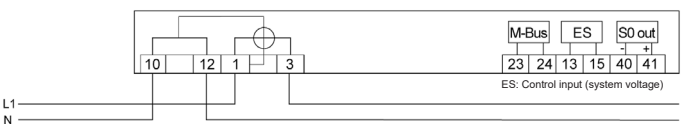
Example connection diagrams

⚠ DANGER!

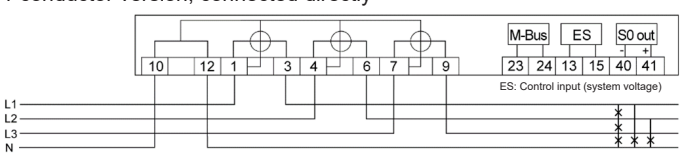
Improper installation endangers life and health, and can lead to malfunctions and material damage!

- When connecting the meter, make sure that the neutral conductor terminals 10 and 12 are on the left.

2-conductor version, connected directly



4-conductor version, connected directly



Terminal block

ATTENTION!

Application of excessive torque will damage the connection terminals!

The appropriate torque is dependent on the type of connection line involved and its maximum current.

- Tighten the connection terminals to the corresponding torque as per EN 60999-1.

⚠ DANGER!

Improper installation endangers life and health, and can lead to malfunctions and material damage!

- Use an overcurrent protection device rated for a maximum of 63 A as per the applicable Technical Connection Rules for Power Installations (e.g. selective main line circuit breaker) upstream of a meter with direct connection.
- The connecting paths must be fuse-protected as per the applicable technical regulations and in accordance with the current specification on the meter's name plate.
- The installer bears responsibility for coordinating the rated values and parameters of the supply-side overcurrent protection devices with the maximum rated currents as well as the rated consumption category of the meter system for directly connected meters.
- The connection cables used to connect a meter must be selected to match the maximum load of the meter and the installation environment in terms of type, cross-section, voltage and temperature.

ATTENTION!

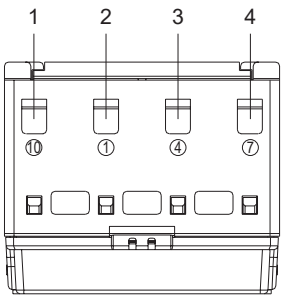
Damage to meter due to missing pre-fuse on control input!

- Fuse-protect the control input with a pre-fuse of 0.1 A.

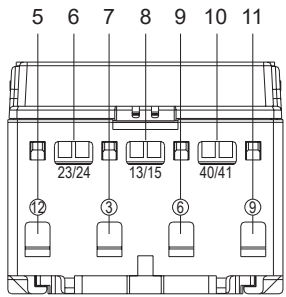
	Current and N terminals	Voltage and additional terminals
Terminal dimensions W x H or d (mm)	6.4 x 6.5	2.5
Minimum connection cross sections (mm²)	1.5	0.5
Maximum connection cross sections (mm²)*	16.0	2.5
Maximum torques (Nm)	3.0	0.8
Screw type	Cross slot combination screw type PZ2	Slotted screw
Thread size	M6	M3

* Rated connection capacity based on EN 60999-1

Terminal layout, top



Terminal layout, bottom



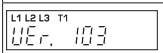
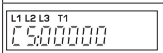
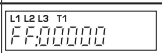
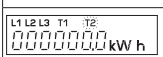
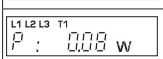
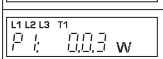
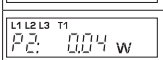
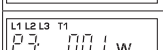
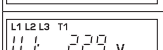
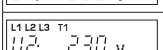
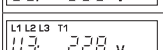
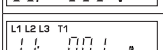
1	Neutral conductor N
2	Current input I1
3	Current input I2
4	Current input I3
5	Neutral conductor N
6	M-Bus interface (protected against reverse polarity, optional)
7	Current output I1
8	Control input
9	Current output I2
10	S0 output
11	Current output I3

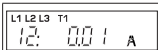
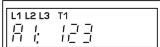
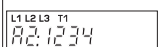
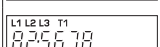
Terminal cover

To protect the meter from unauthorised access, fit each sealing eye (see page 7) with a seal. To protect the terminals and corresponding labelling, the meter must be operated and stored with the terminal covers closed.

Display elements

Unavailable functions, e.g. M-Bus, do not appear on the display.

		Display test	All display elements flash for approx. 4 s after start-up
		Firmware version	Appears for 5 s (once after start-up)
		Code checksum	Appears for 5 s (once after start-up)
Alternating display		Error display	Appears for 60 s when an error has occurred
		Energy value of the active tariff	Appears for 10 s (for only 4 s when an error has occurred)
		Energy value of the inactive tariff	Appears for 5 s
		Total power P	Appears for 2 s each
		Power P for phase 1	
		Power P for phase 2	
		Power P for phase 3	
		Voltage U for phase 1	
		Voltage U for phase 2	
		Voltage U for phase 3	
		Current I for phase 1	

Alternating display		Current I for phase 2	Appears for 2 s each
		Current I for phase 3	
		Primary M-Bus address	
		Secondary M-Bus address: MSW (most significant word) = 4 highest-value characters	
		LSW (least significant word) = 4 lowest-value characters	
		Display test	

Operating states

To ensure fault-free operation of the meter, the following are checked when voltage returns, and every 18.2 hours during operation:

- Checksum across entire code range
- Configuration and synchronisation data
- Correct transfer of configuration and synchronisation data
- Correctness of saved energy measurements

If an error occurs during this check, this will be displayed on the display as an error code:

0000**1**	Checksum error, code
0000**2**	Checksum error, data
0000**4**	Measuring system cannot be configured
0000**8**	Checksum error, energy registers

If an error is displayed, the meter data must no longer be used for billing, and operation of the device can be affected.
The error code can only be reset at the manufacturer's plant.
If the device is to be used for billing again, it must be put back into service in accordance with the law on weights and measurements after it has been repaired.

Abbreviations

A	Active energy
+A	Positive active energy (customer obtains from utility company)
Cl.	Accuracy class
DIN	Deutsches Institut für Normung e.V. (German Standardisation Institute)
EN	European Norm
EVU	Utility company
I	Current
Pulse	Pulses
pulse/kWh	Pulses per kilowatt hour
IP	Ingress Protection (protection classification)
L1, L2, L3	External conductor
LC	Liquid Crystal
LCD	Liquid Crystal Display
LED	Light emitting diode
N	Neutral conductor
OVC	Over Voltage Category
P	Active power
SH	Selective main line protection
S0	Interface as per EN 62053-31
TAB	Technical Connection Rules
HP	Unit of division according to DIN 43880
U	Voltage
UC	Utilisation Category

Declaration of Conformity

EU-Konformitätserklärung
EU Declaration of Conformity

Der Hersteller
The manufacturer

EMH metering GmbH & Co. KG
Neu-Galliner Weg 1
19258 Gallin
GERMANY

erklärt hiermit in alleiniger Verantwortung, dass folgendes Produkt
declares under his sole responsibility that the following product

Produktbezeichnung: *Product designation:*	Elektrizitätszähler *Electricity meter*
Typenbezeichnung: *Type designation:*	KIZ-...

übereinstimmt mit den grundlegenden Anforderungen folgender EU-Richtlinien:
conforms to the essential requirements of the following EU directives:

2014/32/EU *2014/32/EU*	Messgeräte (MID) *Measuring instruments (MID)*	EU Amtsblatt L 96 *Official Journal of the EU L96*
2014/30/EU *2014/30/EU*	Elektromagnetische Verträglichkeit (EMV) *Electromagnetic compatibility (EMC)*	EU Amtsblatt L 96 *Official Journal of the EU L96*
2011/65/EU *2011/65/EU*	Beschränkung der Verwendung bestimmter gefährlicher Stoffe (RoHS) *Restriction of the use of certain hazardous substances (RoHS)*	EU Amtsblatt L 174 *Official Journal of the EU L174*

Im Rahmen der MID wurde die Konformität des Baumusters (Modul B) festgestellt und
Within the MID the conformity of the type (annex B) was attested and
die Konformitätsbewertung wurde nach Modul D durch den Hersteller vorgenommen:
the conformity assessment was performed by manufacturer according to annex D:

	Modul B *(annex B)*	**Modul D** *(annex D)*
Benannte Stelle (Name/Nummer): *Notified body (name/number):*	PTB/0102	PTB/0102
Zertifikats-Nummer: *Certificate number:*	DE-08-MI003-PTB015	DE-M-AQ-PTB026

Es wurden die folgenden harmonisierten Normen angewendet:
The following harmonized standards were applied:

MID:	EMV *(EMC)*:	RoHS:
EN 50470-1:2006	EN 55032:2012/AC:2013	EN IEC 63000:2018
EN 50470-3:2006	EN 62052-11:2003+A1:2017	
	EN 62053-21:2003+A1:2017	

Ort, Datum: Gallin, 17 NOV 2020
Place, Date:

Dipl.-Ing. Norbert Malek
Geschäftsführer
Managing director

You will find the current EU Declaration of Conformity at www.emh-metering.com.