SERIES OF SINGLE-PHASE METERS **IE14xx**

- **SINGLE-PHASE** DIRECT CONNECTED **DIN-RAIL** MOUNTING METER.
- **CLASS 1 FOR ACTIVE ENERGY** AND **CLASS 2 FOR REACTIVE ENERGY**.
- MAXIMUM CURRENT **40 A** (I_{max}).
- **OPTIONS**: S0, RS485 (Modbus), M-Bus.
- **SIDE IR COMMUNICATION** FOR ADDONS.
- **NFC** OPTION FOR EASY SETTING AND READING.
- **LIMIT CONTROL** (ALARM) FUNCTION.

Iskra®

FEATURES

- Single-phase direct connected DIN-rail mounting meter.
- Class 1 for active energy according to EN 62053-21 and MID approval (option) for class B according to EN 50470-3.
- Class 2 for reactive energy according to IEC 62053-23.
- Bidirectional energy measurement (imp./exp.).
- Maximum current 40 A (I_{max}).
- Basic current 5 A (I_b).
- 230 V rated system voltage input (U_n).
- Voltage operating range (-20 % ... +15 %) U_n.
- Reference frequencies 50 Hz and 60 Hz.
- Power consumption voltage circuit < 10 VA at U_n.
- Power consumption current circuit < 0.1 VA at I_b.
- Temperature range climatic condition as indoor meter according IEC 62052-11.
- Custom LCD display with 7 digits (100 Wh resolution).
- Multifunctional front red LED.
- LED constant 1000 imp/kWh.
- IR serial communication (optional).
- Capacitive touch button for setting and control.
- Backlight for better visibility.
- Special functions added for easier integration into monitoring and control systems.
- Measurements of:
  - power (active/reactive/apparent),
  - energy (active/reactive/apparent),
  - voltage,
  - current,
  - frequency,
  - power factor,
  - power angle,
  - active tariff (option),
  - THD of voltage,
  - THD of current.
- Pulse output according to IEC 62053-31 (option).
- RS485 Serial communication with Modbus protocol (option).
- M-Bus Serial communication (option).
- NFC communication for easy setting and downloading meter data.
- Tariff management (up to 4 tariffs manageable via communication – option).
- DIN-rail mounting according to EN 60715.
- Ambient operation temperature 55 °C/70 °C (*valid only for IE14MD).*
- Limit control (Alarm) function can give info about exceeded conditions and trigger BICOM switch through IR communication.
- Sealable terminal cover.
- 1 DIN module width.

DESCRIPTION

The meters IE14xx and IE14Mx (MID certified) are intended for energy measurements in a single-phase electrical power network, and can be used in residential, industrial and utility applications. Meters measure energy directly in 2-wire networks according to the principle of fast sampling of voltage and current signals. A built-in microprocessor calculates energy and other electrical quantities from the measured signals. It also controls LCD, LED, IR communication, and optional extensions.

A capacitive touch button on the front of the energy meter enables access to switch between measurements and settings in the menu.

Connecting terminals can be sealed up against non-authorised access with protection covers. They are built to be fastened according to EN 60715 standard.

Meter has an optional built-in optical (IR) communication port on the side. It can be used for controlling Bistable switch – BICOM or in combination with SG smart gateway (more info about BICOM and SG can be found on ***https://www.iskra.eu/***)

Meter can be equipped with:

- **S0 output** — intended for connection to the devices that are checking and monitoring consumed energy.
- **RS485 serial communication with the MODBUS protocol** — data is available in different formats prepared for easier integration into third party control and monitoring systems.
- **M-Bus serial communication** — which enables data transmission and thus the connection of the measuring places into the network for the control and management with energy.
- **NFC communication** — implemented for parametrization as well as for reading data (e.g. counters, measurements, etc.) from the smart meter.
  PLEASE NOTE mobile application for NFC communication is not available at our company.

INSTALLATION

WARNING: Installation must be carried out and inspected by a specialist or under his supervision. When working on the meter, switch off the mains voltage! It is recommended to use 40 A fuse for the line protection.

NOTE: Neutral wire must be connected to the meter.

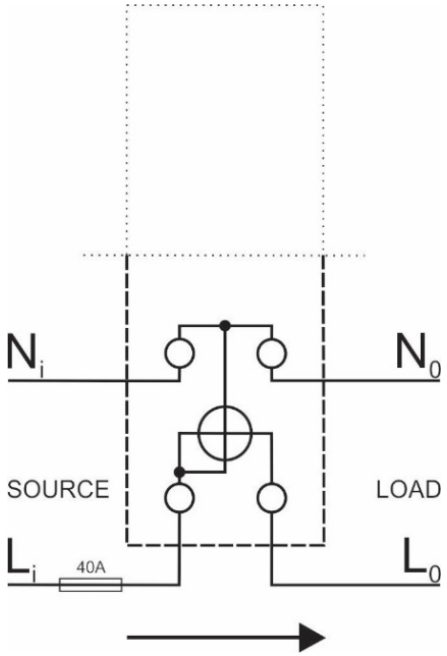


Figure 1: *Connection diagram*

Mark	*Meaning*
L_I	*Line input*
N_I	*Neutral input*
L_O	*Line output*
N_O	*Neutral output*

Connection of modules:

Meter can be equipped with different modules.

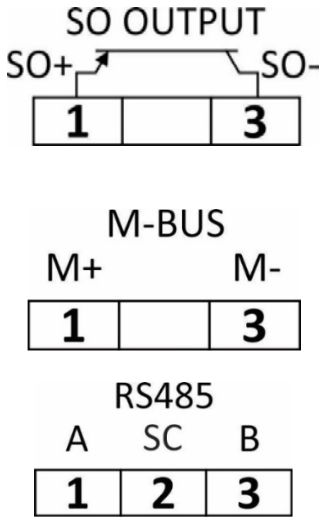


Figure 2: *Types of modules*

Table below is showing equipped combinations.

Auxiliary terminal	**1**	**2**	**3**
Pulse output	S0+		S0-
M-Bus	M+		M-
RS485*	A	**SC	B

**It is recommended to use ferrite bead on communication line RS485 (two turns) to reduce radiated emission.*

***It is intended to be used for shielding for RS485.*

Table 1*: Survey of communication connection*

DIMENSIONAL DRAWINGS

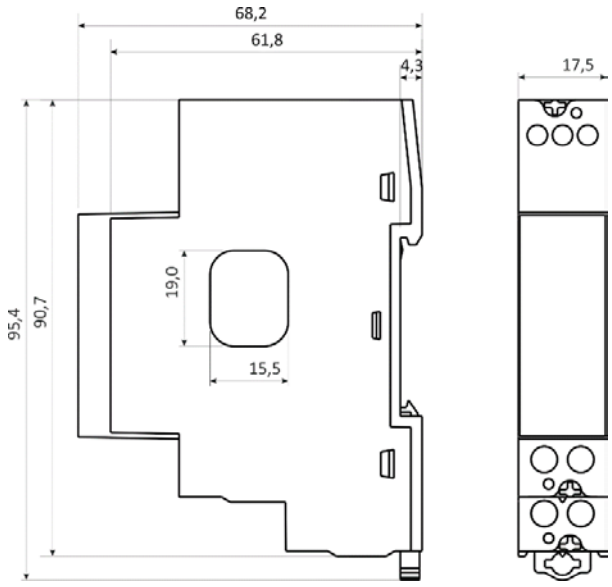


Figure 3: *Dimensional drawing of IE14xx*

TECHNICAL DATA

Rail mounting according DIN EN 60715.

Mechanical characteristics of input:

Main inputs:

- Contacts capacity:
  Flexible (Rigid) 1.5 mm^2 ...10 mm^2
  **Ferrule contact length should be 10 mm.*
- Connection screws: M3.5
- Recommended/Max torque: 0.8/0.9 Nm (PH1)
- Length or removed isolation: 10 mm

Auxiliary contacts:

- Contact capacity: 0.25 mm^2...1 (2.5) mm^2
- Screws: M3
- Recommended/Max torque: 0.5/0.6 Nm
- Length or removed isolation: 8 mm

Measuring input:

Type:	Single phase (1b)
Reference current (I_{ref}):	5 A
Maximum current (I_{max}):	40 A
Minimum current (I_{min}):	0.25 A
Transitional current (I_{tr}):	0.5 A
Starting current:	20 mA
Power consumption at I_{ref}:	< 0.1 VA
Nominal voltage (U_n):	230 V (-20 %...+15 %)
Power consumption at U_n:	< 10 VA
Nominal frequency (f_n):	50 Hz and 60 Hz
Minimum measuring time:	10 s

Accuracy:

Active energy:
- class 1 EN 62053-21
- class B EN 50470-3
- ±1.5 % from I_{min} to I_{tr}
- ±1 % from I_{tr} to I_{max}

Reactive, Apparent energy:
- class 2 IEC 62053-23
- ±2.5 % from $I_{min}$to I_{tr}
- ±2 % from I_{tr} to I_{max}

Voltage:
- ±1 % of measured value

Current:
- ±1 % of I_{ref} from I_{st} to I_{ref}
- ±1 % of measured value from I_{ref} to I_{max}

Active Power:
- ±1 % of nominal power ($U_n * I_{ref}$) from I_{st} to I_{ref}
- ±1 % of measured value from I_{ref} to I_{max}

Reactive, Apparent power:
- ±2 % of nominal power from I_{st} to I_{ref}
- ±2 % of measured value from I_{ref} to I_{max}

Frequency:
- ±0.1 % of measured value

LCD:

Number of digits:	7
Height of digits:	5.5 mm

LED:

Colour:	red
Pulse rate:	1000 imp/kWh
LED on:	no load indication

Pulse output:

Pulse rate:	1000 imp/kWh
Pulse duration:	32 ms ± 2 ms
Rated voltage DC:	27 V max
Switched current:	27 mA max
Standard:	IEC 62053-31 (A&B)

M-Bus Serial communication (option):

Type:	M-Bus
Speed:	300 bit/s to 9600 bit/s
Protocol:	M-Bus

RS485 Serial communication (option):

Type:	RS485
Speed:	1200 bit/s to 115200 bit/s
Protocol:	MODBUS RTU

Optical IR communication (option):

Type:	IR
Connection:	via USB adapter
Speed:	19200 bit/s
Frame:	8, N, 2
Protocol:	MODBUS RTU
Address:	33
Remark:	all settings are fixed

NFC (option):

Protocol	ISO/IEC 14443 Part 2 and 3 compliant
Frequency range	13.56 Mhz
Baudrate	106 kbps
Operating distance	up to 15 mm from LCD (distance depends on used reader)

Ambient conditions and Safety:

According standards for indoor active energy meters.
Temperature and climatic condition according to IEC 62052-11:
- Dust/water protection IP50 (For IP51 it should be installed in appropriate cabinet.)
- Operating temp. range:
  -25°C... +55°C (non-condensing humidity)
  -25°C... +70°C (non-condensing humidity) – *valid only for IE14MD*
- Storage temp. range -30°C... +70°C
- Enclosure material: self-extinguish complying UL94 V
- Indoor meter: yes
- Degree of pollution: 2
- Protection class: II
- Installation category 300 V_{rms} cat.III
- Standard: IEC 62052-31

Mechanical environment:	M1
Electromagnetic environment:	E2
Humidity:	non condensing
Weight (with packaging):	150 g (170 g)
Installation:	DIN Rail 35 mm
Dimensions (W x H x D):	17.5 mm x 90.7 mm x 68.2 mm
Package dimensions (W x H x D):	37 mm x 91 mm x 78 mm
Colour:	RAL 7035
Security seals:	must be from plastic material (MID types are shipped with two plastic sealing wires)

EU DIRECTIVES CONFORMITY:

EU Directive on Measuring Instruments **2014/32/EU.**
EU Directive on EMC **2014/30/EU.**
EU Directive on Low Voltage **2014/35/EU.**
EC Directive WEEE **2002/96/EC.**
EU Directive RED **2014/53/EU**

DISPOSAL

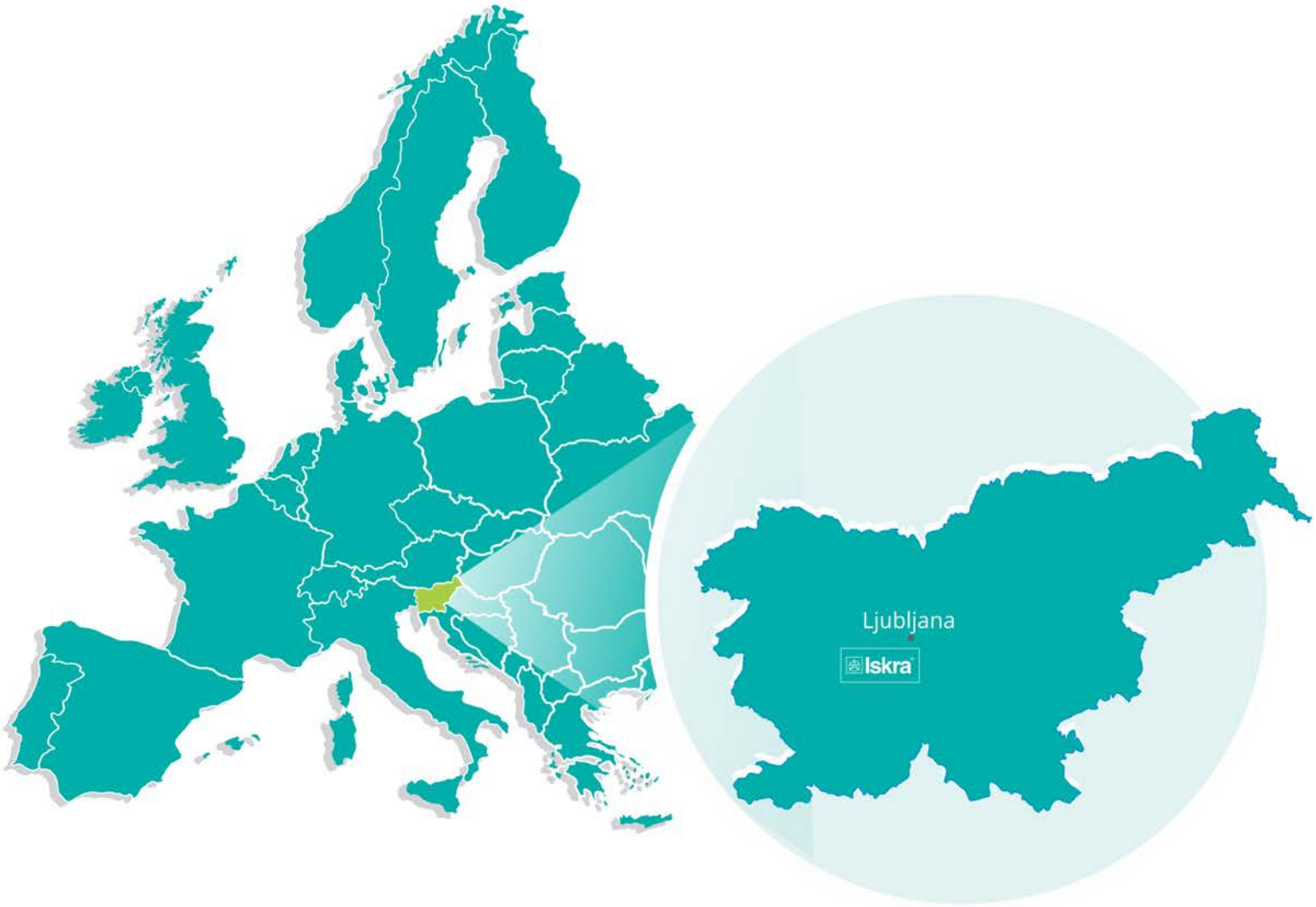
It is forbidden to deposit electrical and electronic equipment as municipal waste.
The manufacturer or provider shall take waste equipment free of charge.

ORDERING CODE

022433925000	IE14-S	Single phase energy meter 40 A, S0, without capacitive touch button
022433925100	IE14MS	Single phase energy meter 40 A, S0, MID
022433925200	IE14MN	Single phase energy meter 40 A, S0, IR, NFC, MID
022433925300	IE14MM	Single phase energy meter 40 A, M-Bus, IR, NFC, MID
022433925400	IE14MD	Single phase energy meter 40 A, RS485 MODBUS, IR, NFC, 70°C range, MID

DICTIONARY:

RMS	*Root Mean Square*
PO	*Pulse output*
PA	*Power angle (between current and voltage)*
PF	*Power factor*
THD	*Total harmonic distortion*
MODBUS/DNP3	*Industrial protocol for data transmission*
MiQen	*ISKRA setting and acquisition Software*
AC	*Alternating quantity*
IR	*Infrared (optical) communication*
SC	*Shield*



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