



## SERIES OF THREE-PHASE ENERGY METERS IE38Mx

- COMPACT **THREE-PHASE** DIRECT CONNECTED **DIN-RAIL** MOUNTING METER.
- **CLASS B FOR ACTIVE ENERGY** AND **CLASS 2 FOR REACTIVE ENERGY**, MID APPROVED.
- MAXIMUM CURRENT **80 A** ( $I_{max}$ ).
- VARIANTS: **2 x S0**, **S0 + RS485 (Modbus)**, **S0 + M-BUS**.
- **TARIFF INPUT**.
- SIDE **IR COMMUNICATION** FOR ADDONS.
- **NFC** FOR EASY SETTING AND READING.
- **70°C** AMBIENT OPERATIONAL TEMPERATURE.

## FEATURES

- Three phase direct connected DIN-rail mounting meter.
- Class 1 for active energy according to EN 62053-21 and MID approval for class B according to EN 50470-3.
- Class 2 for reactive energy according to IEC 62053-23.
- Bidirectional energy measurement (import/export).
- Maximum current 80 A ( $I_{max}$ ).
- Display segment Matrix LCD.
- Multifunctional front red LED.
- IR serial communication.
- Measurements of:
  - power (active/reactive/apparent),
  - energy (active/reactive/apparent, each phase and total),
  - voltage for each phase,
  - current for each phase,
  - phase to phase voltage
  - phase to phase angle,
  - frequency,
  - power factor (for each phase and total),
  - power angle (for each phase and total),
  - active tariff,
  - THD of voltage,
  - THD of current.
- 2<sup>nd</sup> multifunction pulse output (*valid only for IE38MS*).
- Modbus RS485 Serial communication (*valid only for IE38MD*).
- M-bus Serial communication (*valid only for IE38MM*).
- Tariff input (230 V AC).
- Tariff management (up to 6 tariffs manageable via communication).
- -25°C - 70°C ambient operation temperature.
- Limit control (Alarm) function can give info about exceeded conditions and trigger BICOM switch through IR communication.
- Sealable terminal cover.
- DIN-rail mounting according to EN 60715.
- 3 DIN modules width.

## DESCRIPTION

The meters IE38Mx are intended for energy measurements in three-phase electrical power network and can be used in residential, industrial

and utility applications. Meter measures energy directly in 3-wire and 4-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. The meters are built to be fastened according to EN 60715 standard.

Meter has 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/>).

The meter can be equipped with:

- **SO<sub>1,2</sub> output** — intended for connection to the devices that are checking and monitoring consumed energy. The SO<sub>2</sub> output can be programmed as alarm output.
- **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 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.**

- **Tariff input** – provides measurement of two tariffs for selected energy registers.

Alarms are useful tool for fast detection of exceeded parameters, monitoring proper magnitude level and notification in combination with alarm outputs.

**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 3x80 A fuse for the line protection.

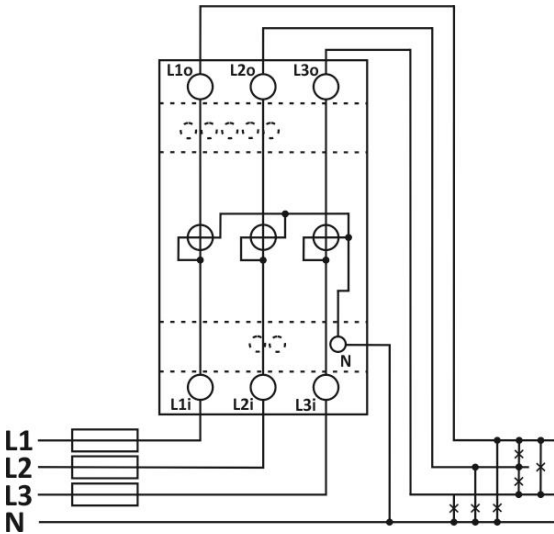


Figure 1: Three-phase 4-wire connection diagram (3W4)

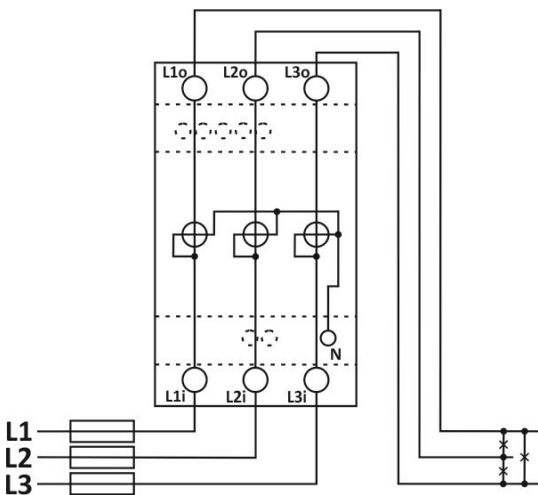


Figure 2: Three-phase 3-wire 3 system connection diagram (3W3)

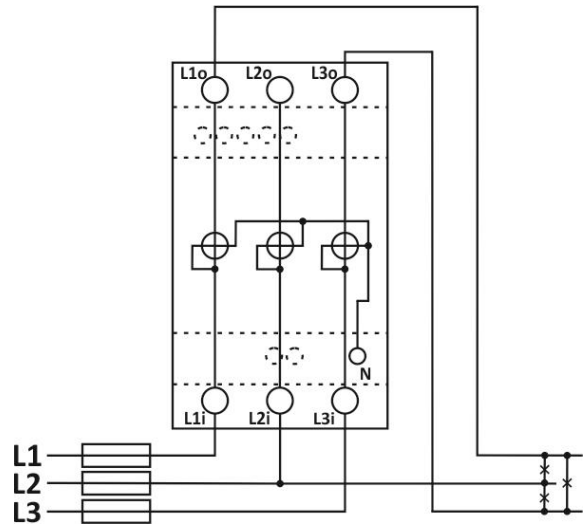


Figure 3: Three-phase 3-wire 2 system connection diagram (2W3)

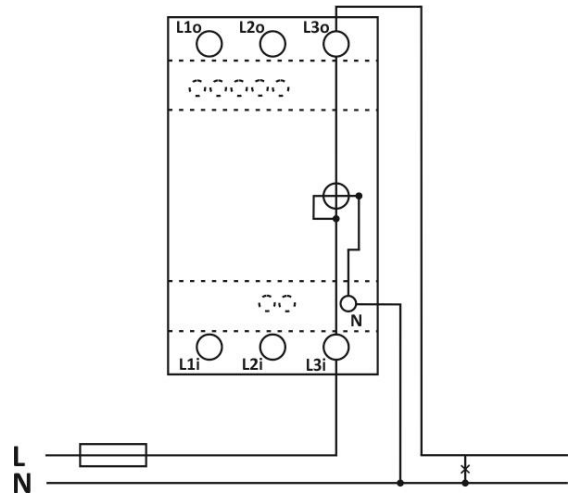
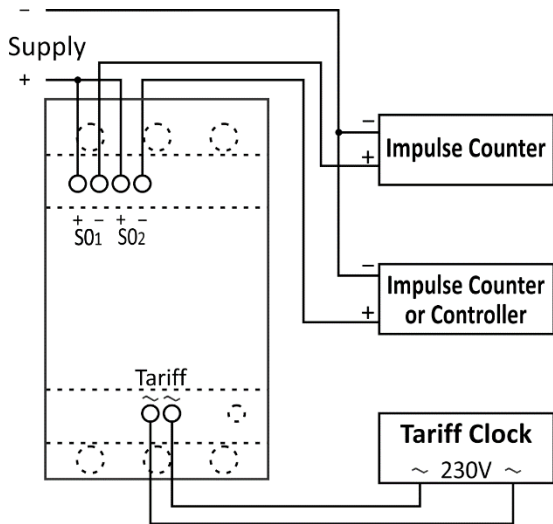
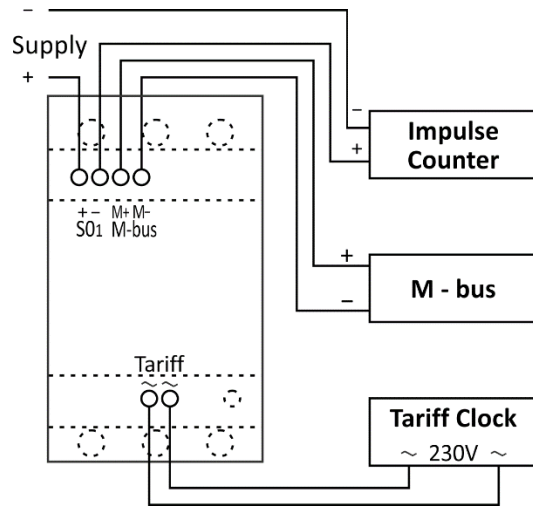


Figure 4: Single-phase connection diagram 1W

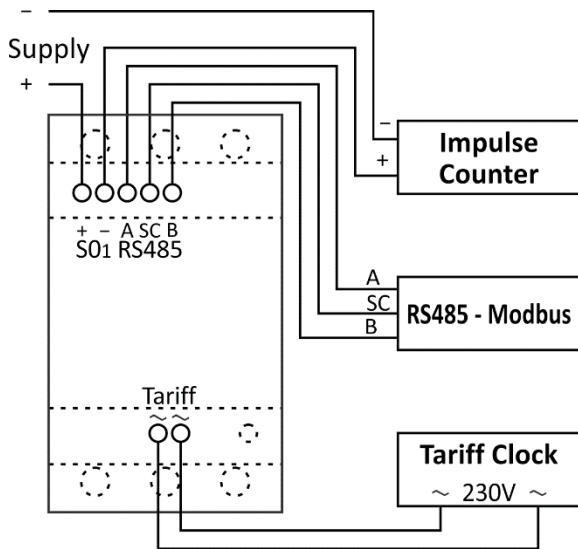
Mark	Meaning
L <sub>1,2,3</sub>	Line input
N	Neutral input



**Figure 5:** Connection diagram of S0 output, impulse counter, impulse counter or controller and tariff clock

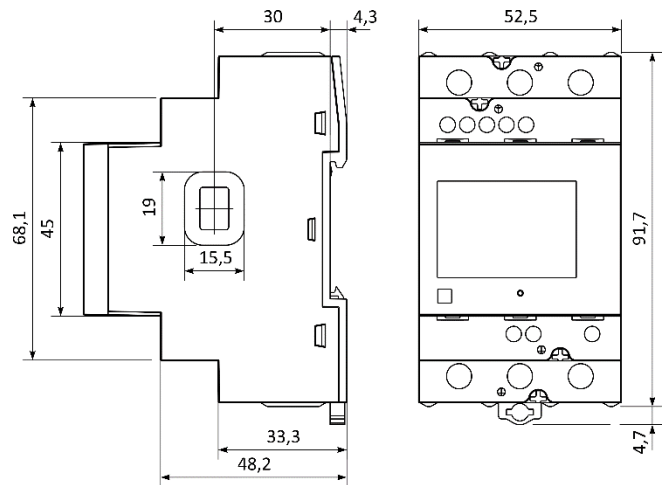


**Figure 7:** Connection diagram of S0 output, impulse counter, M - bus and tariff clock



**Figure 6:** Connection diagram of S0 output, impulse counter, RS485 - Modbus and tariff clock

**DIMENSIONAL DRAWINGS**



**Figure 8:** Dimensional drawing



## TECHNICAL DATA

Rail mounting according DIN EN60715.

### Mechanical characteristics of input:

#### Main inputs

- Contacts capacity:  
Flexible (Rigid) 1.5 mm<sup>2</sup> ...25 (16) mm<sup>2</sup>  
*\*Ferrule contact length should be 12 mm. Wire stripped to 14 mm.*
- Connection screws: M5
- Max torque: 3.5 Nm (PH2)
- Length or removed isolation: 10 mm

#### Auxiliary contacts

- Contact capacity: 0.05 mm<sup>2</sup>...1.5 mm<sup>2</sup>
- Screws: M3
- Max torque: 0.6 Nm
- Length or removed isolation: 8 mm

### Measuring input:

Type:	three-phase (3W4, 3W3, 2W3) single-phase (1W)
Reference (nominal) current ( $I_{ref}$ ):	5 A
Maximum current ( $I_{max}$ ):	80 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 ( $U_n$ ):	3x230 V/400 V (-20 %...+15 %)
Power consumption per phase at $U_n$ :	< 8 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
- $\pm 1.5$  % from  $I_{min}$  to  $I_{tr}$
- $\pm 1$  % from  $I_{tr}$  to  $I_{max}$

#### Reactive, Apparent energy:

- class 2 IEC 62053-23
- $\pm 2.5$  % from  $I_{min}$  to  $I_{tr}$
- $\pm 2$  % from  $I_{tr}$  to  $I_{max}$

#### Voltage:

- $\pm 1$  % of measured value

#### Current:

- $\pm 1$  % of  $I_{ref}$  from  $I_{st}$  to  $I_{ref}$
- $\pm 1$  % of measured value from  $I_{ref}$  to  $I_{max}$

#### Active Power:

- $\pm 1$  % of nominal power ( $U_n * I_{ref}$ ) from  $I_{st}$  to  $I_{ref}$
- $\pm 1$  % of measured value from  $I_{ref}$  to  $I_{max}$

#### Reactive, Apparent power:

- $\pm 2$  % of nominal power from  $I_{st}$  to  $I_{ref}$
- $\pm 2$  % of measured value from  $I_{ref}$  to  $I_{max}$

#### Frequency:

- $\pm 0.5$  % of measured value

### LCD:

#### Display type:

Matrix (128 x 64)

#### Illumination:

white (normal operation)  
red (alarm indication)

### LED:

#### Colour:

red

#### Pulse rate:

1000 imp/kWh

#### LED on:

no load indication

**Pulse output SO<sub>1</sub>:**

Pulse rate:	500 imp/kWh
Pulse duration:	32 ms ± 2 ms
Rated voltage DC (max):	27 V
Switched current (max):	27 mA
Standard:	EN 62053-31 (A&B)

**Pulse output SO<sub>2</sub> (option):**

Type:	Programmable
Rated voltage DC (max):	27 V
Switched current (max):	27 mA

**Tariff input:**

Rated voltage:	230 V (-20 %...+15 %)
Input resistance:	360 kΩ

**M-BUS Serial communication (option):**

Type:	M-bus
Speed:	300 bit/s to 9600 bit/s (default 2400 bit/s)
Protocol:	M-bus
Address:	0 – (default)

**RS485 Serial communication (option):**

Type:	RS485
Speed:	1200 bit/s to 115200 bit/s (default 115200 bit/s)
Frame:	8, N, 2
Protocol:	MODBUS RTU
Address:	33 – (default)

**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:**

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 EN 62052-11:

- Dust/water protection IP50 (For IP51 it should be installed in appropriate cabinet.)
- Operating temp. range:  
-25°C... +70°C (non-condensing humidity)
- Storage temp. range  
-40 °C... +85°C
- Enclosure material:  
self-extinguish complying UL94 V
- Indoor meter: yes
- Degree of pollution: 2
- Protection class: II
- Installation category 300 V<sub>rms</sub> cat.III
- Standard: IEC 62052-31

Mechanical environment:	M1
Electromagnetic environment:	E2
Humidity:	non condensing
Max weight (with packaging):	225 g (258.5 g)
Installation:	DIN Rail 35 mm
Dimensions (W x H x D):	52.5 mm x 91.7 mm x 68.2 mm
Package dimensions (W x H x D):	74 mm x 106 mm x 80 mm
Colour:	RAL 7035

## 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**.

## DISPOSAL



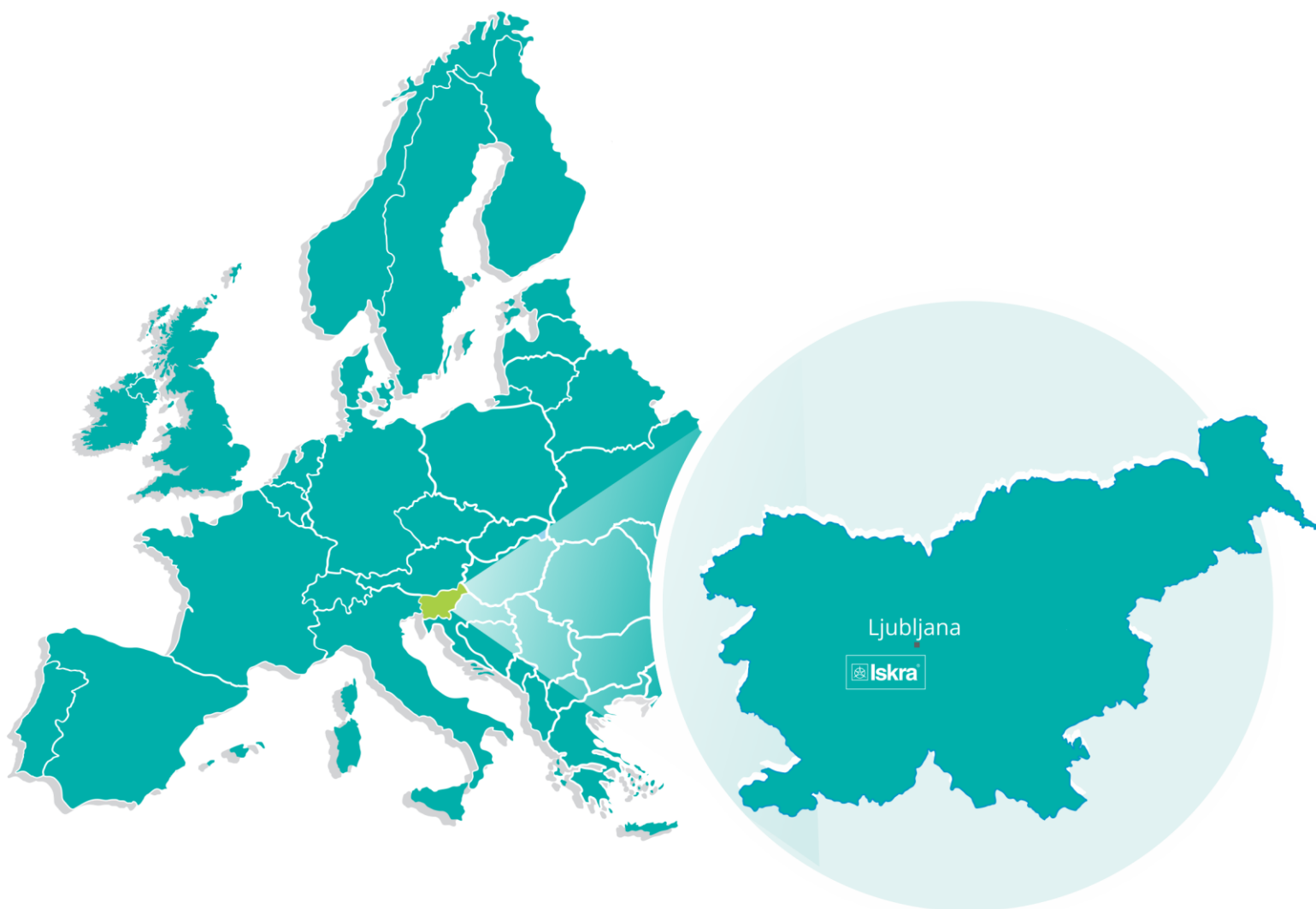
It is forbidden to deposit electrical and electronic equipment as municipal waste.  
The manufacturer or provider shall take waste equipment free of charge.

## ORDERING CODE

022433926000	IE38MS	MID (IR, NFC) 2xS0, DUAL TARIFF, 80 A, 3-PM
022433926100	IE38MM	MID (IR, NFC, M-bus) S0, DUAL TARIFF, 80 A, 3-PM
022433926200	IE38MD	MID (IR, NFC, Modbus) S0, DUAL TARIFF, 80 A, 3-PM

## DICTIONARY:

<i>RMS</i>	<i>Root Mean Square</i>
<i>TRMS</i>	<i>True Root Mean Square</i>
<i>AC</i>	<i>Alternating quantity</i>
<i>PF</i>	<i>Power factor</i>
<i>THD</i>	<i>Total harmonic distortion</i>
<i>MODBUS</i>	<i>Industrial protocol for data transmission</i>
<i>MiQen</i>	<i>ISKRA setting and acquisition Software</i>
<i>IR</i>	<i>Infrared (optical) communication</i>
<i>NFC</i>	<i>Near Field Communication</i>
<i>RTC</i>	<i>Real-time clock</i>
<i>MID</i>	<i>Measuring Instruments Directive</i>
<i>NC</i>	<i>Not connected</i>
<i>SC</i>	<i>Shield</i>
<i>SW</i>	<i>Software</i>



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