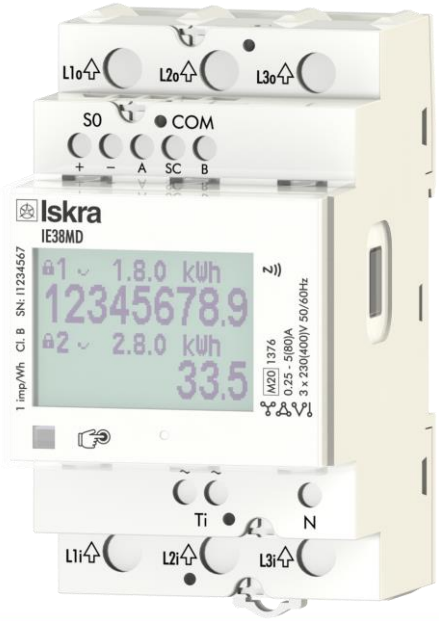
ENERGY SECTOR



SERIES OF THREE-PHASE ENERGY METERS

IE38Mx

- COMPACT **THREE-PHASE** DIRECT CONNECTED **DIN-RAIL** MOUNTING METER.
- **CLASS A 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.

Iskra®

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.
- 2nd 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:

- **$S0_{1,2}$ output** — intended for connection to the devices that are checking and monitoring consumed energy. The $S0_2$ 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. Special application available from our internet site has to be used to perform such operations.
- **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.

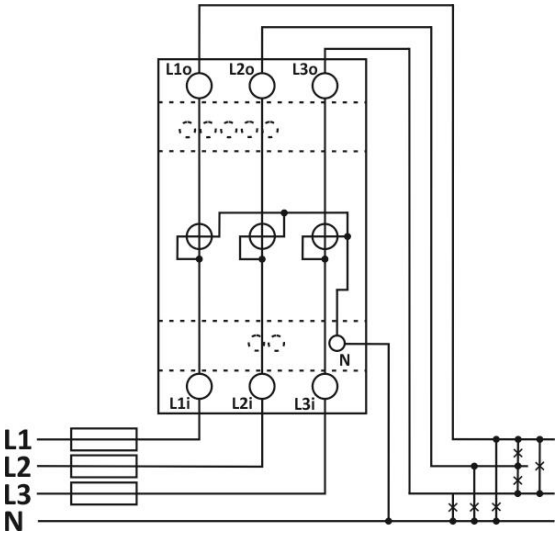


***Figure 1**: Three-phase 4-wire connection diagram (3W4)*

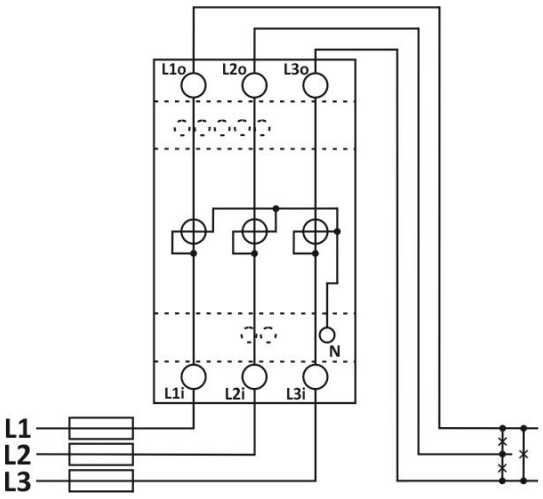


***Figure 2**: Three-phase 3-wire 3 system connection diagram (3W3)*

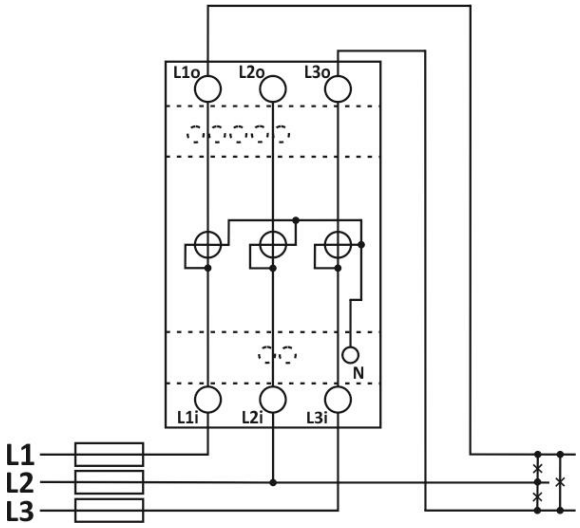


***Figure 3**: Three-phase 3-wire 2 system connection diagram (2W3)*

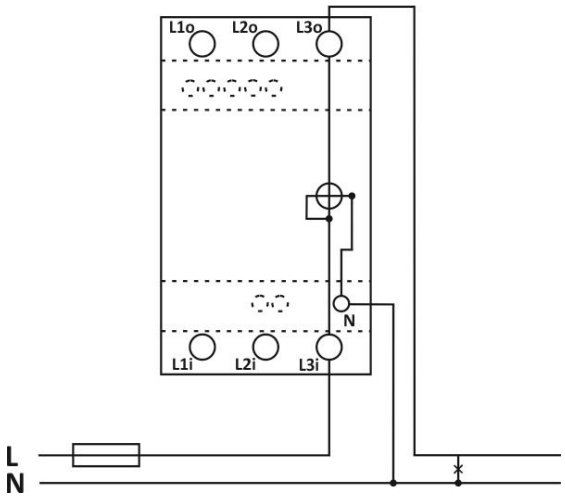


***Figure 4**: Single-phase connection diagram 1W*

Mark	*Meaning*
$L_{1,2,3}$	*Line input*
N	*Neutral input*

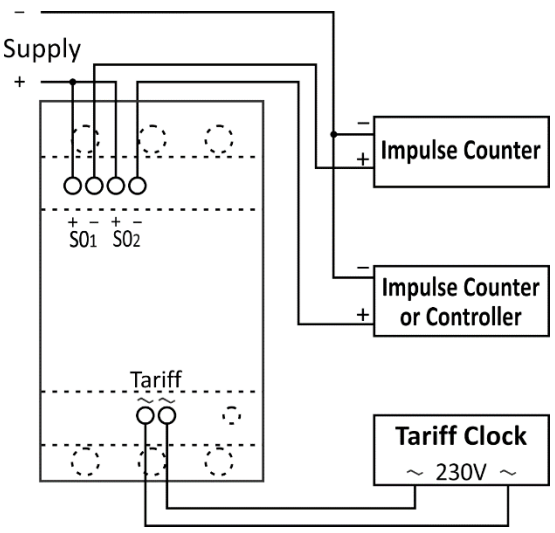


***Figure 5**: Connection diagram of S0 output, impulse counter, impulse counter or controller and tariff clock*

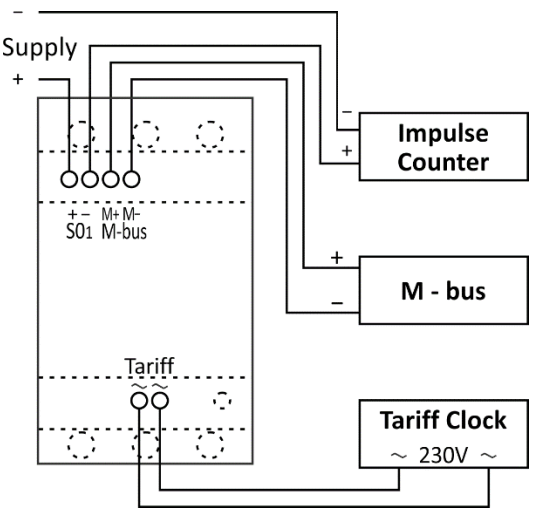


***Figure 7**: Connection diagram of S0 output, impulse counter, M - bus and tariff clock*

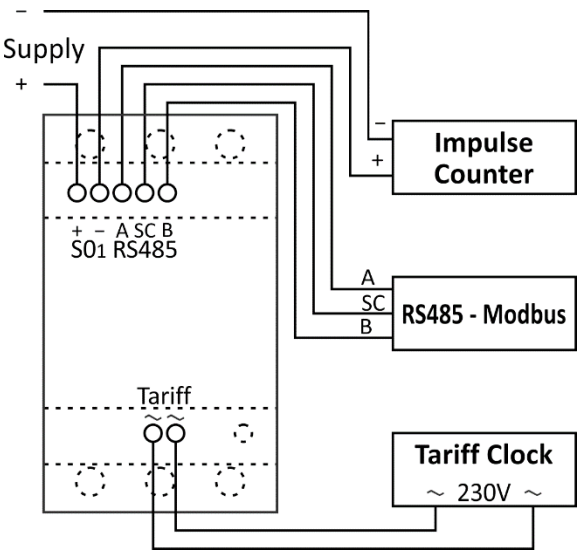


***Figure 6**: Connection diagram of S0 output, impulse counter, RS485 - Modbus and tariff clock*

DIMENSIONAL DRAWINGS

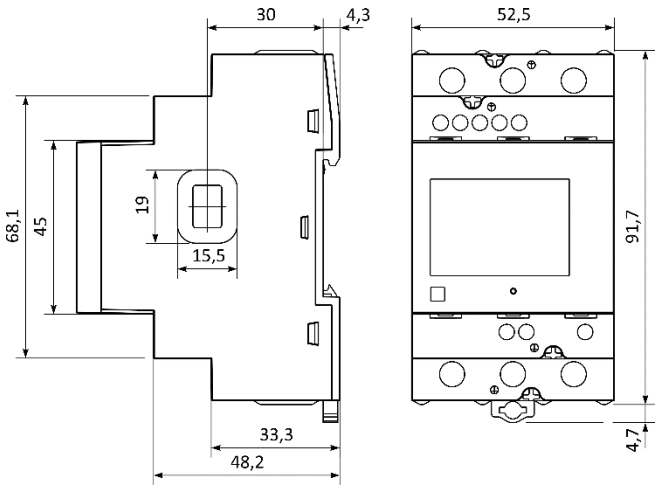


***Figure 8**: Dimensional drawing*

TECHNICAL DATA

Rail mounting according DIN EN60715.

Mechanical characteristics of input:

Main inputs

- Contacts capacity:
  Flexible (Rigid) 1.5 mm^2 ...25 (16) mm^2
  **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^2...1.5 mm^2
- 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
- ±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:

- ±0.5 % 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 $S0_1$:

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 $S0_2$:

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

Tariff input:

Rated voltage: 230 V (-20 %...+15 %)
Input resistance: 450 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_{rms} 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

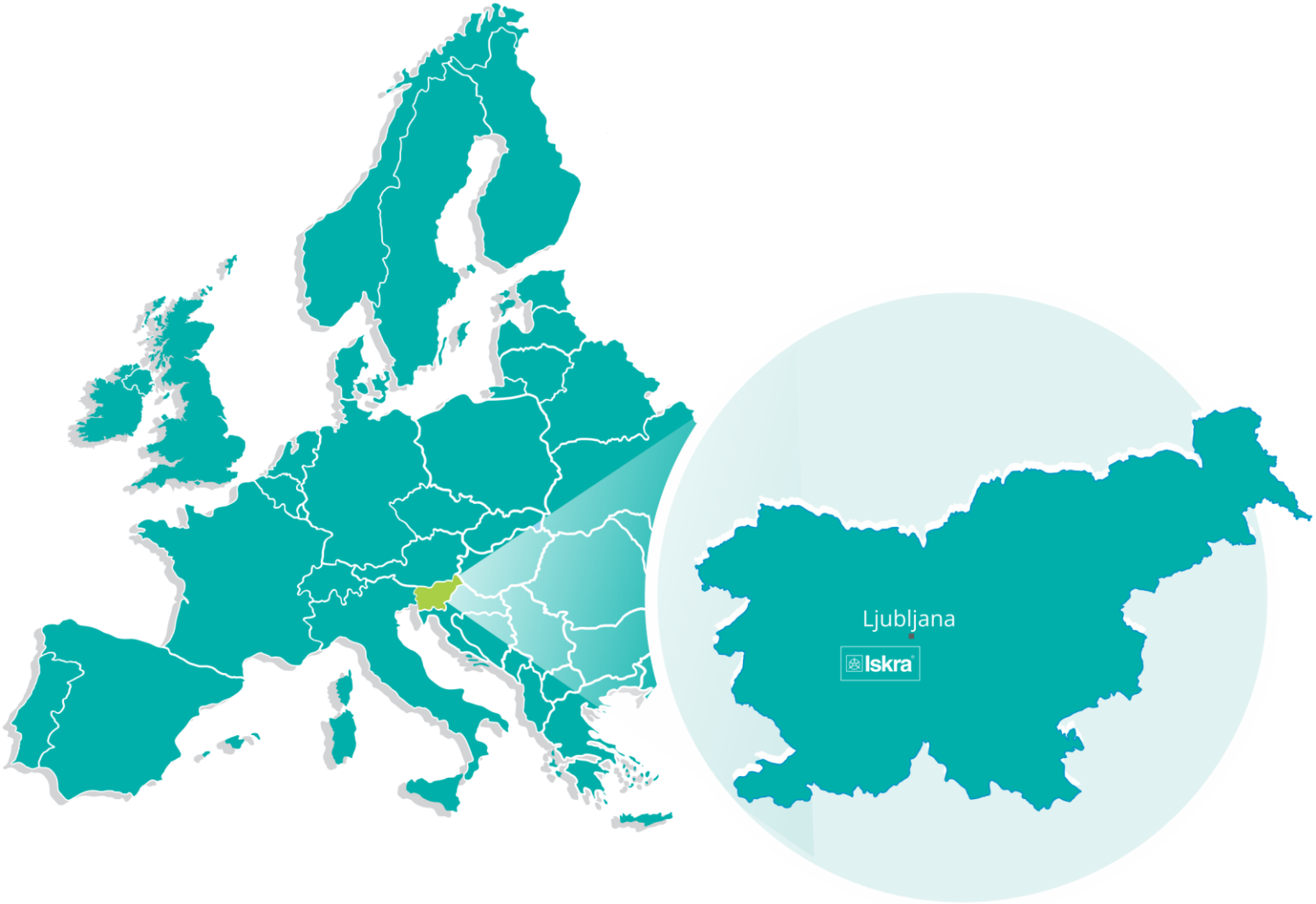
It is forbidden to deposit electrical and electronic equipment as municipal waste.
The manufacturer or provider shall take waste equipment free of charge.

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:

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



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