



THREE-PHASE ENERGY METERS

WM3 & WM3M4C FOR CHARGING STATIONS

- COMPACT **THREE-PHASE DIRECT CONNECTED DIN-RAIL** MOUNTING METER.
- ACCORDING TO REQUIREMENTS OF **PTB, VDE and OCMF**.
- **MID** APPROVED.
- **CLASS 1 FOR ACTIVE ENERGY**.
- MAXIMUM CURRENT **40 A** (I_{max}).
- **SECURE DATA TRANSFER** (DIGITAL SIGNATURE) (valid only for WM3M4C).
- **70°C** AMBIENT OPERATION TEMPERATURE.
- POSSIBILITY TO CONNECT ONLY ON ONE PHASE.

FEATURES

- 3 DIN modules with three phase direct connected DIN-rail mounting meter.
- Class 1 for active energy according to EN 62053-21.
- MID approval WM3M4 & WM3M4C for class B according to EN 50470-3.
- Reference frequency 50 Hz or 60 Hz.
- Maximum current 40 A (I_{max}).
- Reference current 5 A (I_{ref}).
- Reference voltage 3×230 V/400 V (U_n).
- Voltage operating range (-20 % ... +15 %) U_n .
- Two row display 6+2 digit (10 Wh resolution) with backlight.
- Multifunctional front LED.
- IR Serial communication.
- RS485 Serial communication.
- Measurement of:
 - power (active/reactive/apparent),
 - active energy (import and export)
 - voltage (each phase),
 - current (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),
 - THD of voltage,
 - THD of current.
- Crypto engine (Hash, signature) for generation of secure datasets (*valid only for WM3M4C*).
- Possibility to connect only on one phase (on L3).
- Remote control of backlight LCD.
- Secure data transfer (digital signature) (*valid only for WM3M4C*).
- 70°C ambient operation temperature.
- Sealable terminal cover.

DESCRIPTION

The WM3M4 & WM3M4C energy meters are intended for energy measurements in the three-phase and single phase electrical charger stations. The WM3M4C energy meter features high temperature operation and digital signing for a charging event, whereas WM3M4 features only high temperature operation. Both meters measure energy directly in 4-wire networks according to the principle of fast sampling of voltage and current signals. A built-in microprocessor calculates power, energy, current, voltage, power factor, power angle, frequency, harmonics of THD voltage and THD current harmonics. WM3M4C meter can detect and log events relevant for charging via RS485 communication. Thus the

meter can produce relevant digital signature for charging event.

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.

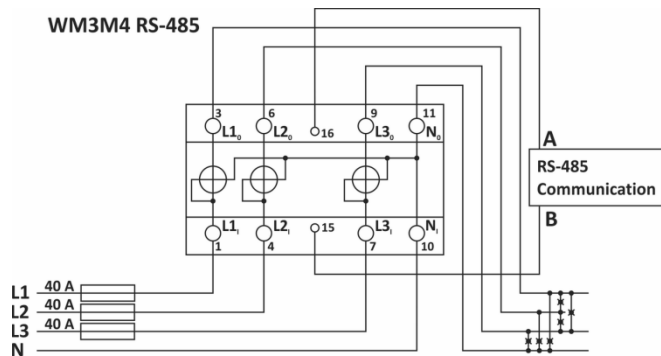


Figure 1: 3-phase connection diagram

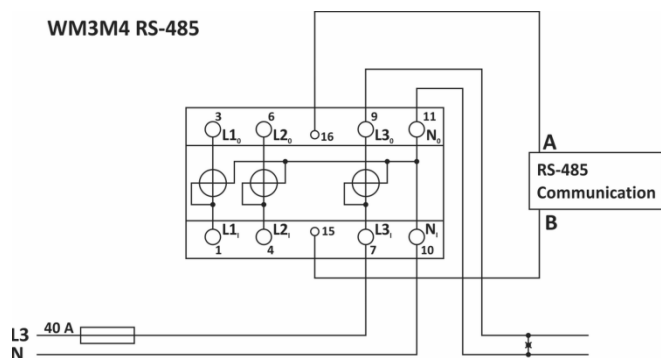


Figure 2: Single-phase connection diagram

NOTE: Neutral wire must be connected to the meter.

Mark	Meaning
L_i	Line input
N_i	Neutral input
L_o	Line output
N_o	Neutral output

TECHNICAL DATA

Rail mounting according DIN EN 60715.

Mechanical characteristics of input:

Main inputs:

- Contacts capacity:
Rigid (flexible) 1.5 mm²...25 (16) mm²
- Connection screws: M5
- Recommended/Max torque: 3/3.5 Nm (PZ2)
- Length of removed isolation: 10 mm

Communication terminals:

- Contacts capacity: 1 mm²... 2.5 mm²
- Connection screws: M3
- Recommended/Max torque: 0.7/0.8 Nm (PZ1)
- Length or removed isolation: 8 mm

Electrical characteristics of input:

Type (connection):	three-phase (4u)
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} :	< 0.05 VA
Nominal voltage (U_n):	3x230 V/400 V (-20 %...+15 %)
Power consumption per phase at U_n :	< 8 VA, 0.6 W
Nominal frequency (f_n):	50 Hz in 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}

Voltage:

- ± 1 % measured value

Current:

- ± 1 % I_{ref} (from I_{st} to I_{ref})
- ± 1 % 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:

Type:	LCD
Number of energy display rows:	2
Number of digits:	8 (6+2)
Height of digits:	4.52 mm

LED:

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

Security (valid only for WM3M4C):

Hash generation:	SHA256
Hashing billing dataset + user information (user ID, station ID, RTC, tariff,...)	
One time private key generation	

RS485 Serial communication:

Type:	RS485
Speed:	1200 bit/s to 115200 bit/s (default 115200 bit/s)
Frame:	8, N, 1
Protocol:	MODBUS RTU
Address:	33 (default)

Optical communication:

Type:	IR
Connection:	via WM-USB adapter
Speed:	19200 bit/s
Frame:	8, N, 1
Protocol:	MODBUS RTU
Address:	33 (locked)

SAFETY AND AMBIENT CONDITIONS:

According to standards for indoor active energy meters.

Temperature and climatic condition according to EN 62052-11:

- Dust/water protection: IP50
- Operating temperature range: -25 °C...+70 °C
- Storage temperature range: -30 °C...+80 °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

MECHANICAL CHARACTERISTICS:

Weight (with packaging):	228 g (248 g)
Installation:	DIN rail 35 mm
Dimensions (W x H x D):	53.6 mm x 84 mm x 69.4 mm
Package dimensions (W x H x D):	57 mm x 93 mm x 85 mm
Colour:	RAL 7035

DIMENSIONAL DRAWING

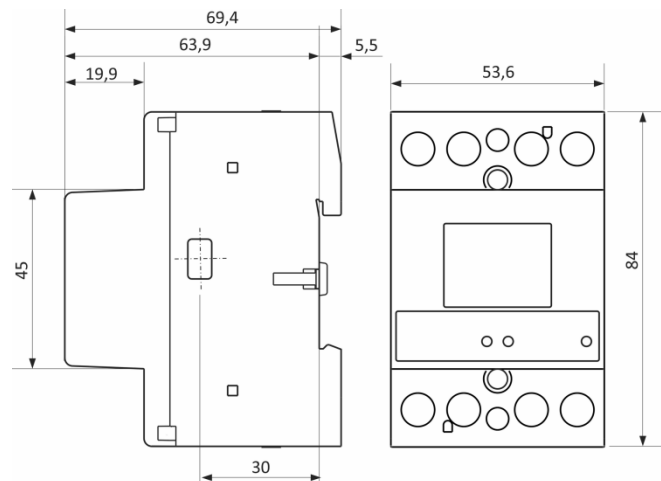


Figure 3: Dimensional drawing of WM3M4 & WM3M4C

EU DIRECTIVES CONFORMITY

EU Directive on EMC **2014/30/EU**.

EU Directive on Low Voltage **2014/35/EU**.

EU Directive WEEE **2002/96/EC**.

List of considered harmonized standards confirming appliance with the essential requirements of the Regulation:

EN 50470-1:2006 Electricity metering equipment (ac) - Part 1: General requirements, tests and test conditions - Metering equipment (class indexes A, B and C).

EN 50470-3:2006 Electricity metering equipment (ac) - Part 3: Particular requirements - Static meters for active energy (class indexes A, B and C).

Other standards taken into account in the design and testing of the meter:

EN 62052-11:2003, EN 62052-11:2003/A1:2017 Electricity metering equipment (ac) - General requirements, tests and test conditions - Part 11: Metering equipment.

EN 62053-21:2003, EN 62053-21:2003/A1:2017 Electricity metering equipment (ac) - Particular requirements - Part 21: Static meters for active energy (classes 1 and 2).

EN 62053-31:1998 Electricity metering equipment (a.c.) - Particular requirements - Part 31: Pulse output devices for electromechanical and electronic meters (two wires only).

EN 62052-31:2016 Electricity metering equipment (a.c.) - General requirements, tests and test conditions - Part 31: Safety requirements and tests.

EN 62059-32-1:2012 Electricity metering equipment - Dependability - Part 32-1: Durability - Testing of the stability of metrological characteristics by applying elevated temperature.

CLC/TR 50579:2012 Electricity metering equipment - Severity levels, immunity requirements and test methods for conducted disturbances in the frequency range 2 -150 kHz.

DISPOSAL



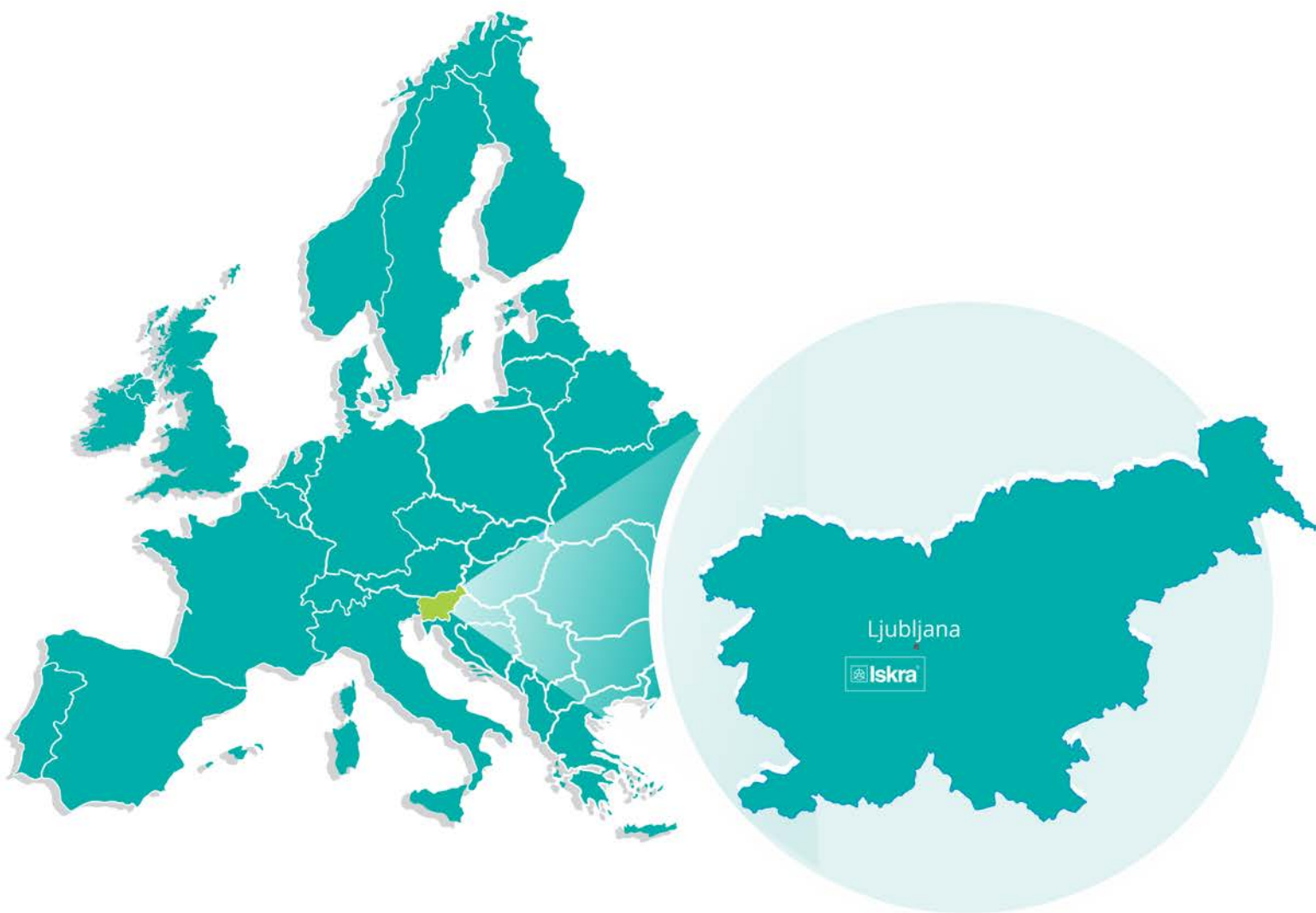
It is forbidden to deposit electrical and electronic equipment as municipal waste. The manufacturer or provider shall take waste equipment free of charge.

ORDERING CODE

022433922000	WM3M4 230	WM3M4 230 energy meter 40 A
022433922100	WM3M4C 230	WM3M4 230 energy meter 40 A with digital signature

DICTIONARY:

<i>RMS</i>	<i>Root Mean Square</i>
<i>THD</i>	<i>Total harmonic distortion</i>
<i>MODBUS</i>	<i>Industrial protocol for data transmission</i>
<i>AC</i>	<i>Alternating</i>
<i>IR</i>	<i>Infrared (optical) communication</i>



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