

EMH metering

GmbH & Co. KG

Neu-Galliner Weg 1 • 19258 Gallin
GERMANY

Tel. +49 38851 326-0

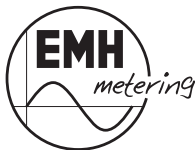
Fax +49 38851 326-1129

E-Mail info@emh-metering.com

Web www.emh-metering.com

Tel. +49 38851 326-1930 (Technical Support)

E-Mail support@emh-metering.com



XC-RACK

Digital 4-Quadrant-/Combi meter

EN Instructions for use

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Scope of delivery

Please check the content of the package, before starting with the installation and commissioning.

- 1 XC-RACK device
- 1 Instructions for use

If the content is incomplete or damaged, please contact your source of supply. Store, use and transport the meter such, that it is protected from moisture, dirt and damage.

Important notes

This instruction is part of the documentation. All versions of this device are described in this instruction. Therefore characteristic features may be described, which are not valid for your device.



Further informations about this device refer to the product manual. Pay attention to all component accompanying documents when operating this device.

Target group

This instruction is intended for technicians who are responsible for installation, connection and maintenance of the device. The device has to be installed and put into operation only by qualified electricians in accordance with generally accepted rules of technology and if necessary the regulations, which are relevant for the installation of telecommunications equipment and end devices.

Intended Use

The meter has to be used for measuring electrical energy only and has to operate within the specified values (refer to nameplate).

Maintenance and warranty instructions

The devices are maintenance-free. In case of damage (e. g. due to transportation, storage) no repairs may be carried out independently. Opening of the meter invalidates any warranty claim. The same applies for any defect caused by external influences (e. g. lightning, water, fire,

extreme temperatures and weather conditions) and any inappropriate or improper use or handling.

Only authorised personnel are allowed to break the sealing!

Care and disposal instructions

DANGER!

Contact of parts under voltage is extremely dangerous!

When cleaning the housing of the meter, the conductor to which the meter is connected must be de-energized.

Clean the housing with a dry cloth. Do not use chemical cleaning agents!

The following table lists the components and how to handle them at the end of their life cycle:

Components	Waste collection and disposal
PCB's	Electronic waste: dispose in accordance with local regulations.
LEDs, LC display	Special waste: dispose in accordance with local regulations.
Metal parts	Scrap, recyclable: separate according to type and recycle.
Plastic parts	Separate according to type and recycle (re-granulate). Send for waste incineration if necessary (energy generation by thermal process).
Batteries	When disposing you have to take safety measures to prevent short circuit. Dispose the batteries inside the original package or insulate the terminals. Do not throw the batteries into the domestic waste, but dispose them correctly in accordance with the local waste and environmental regulations.

Basic safety notes

The following safety notes have to be observed in principle:

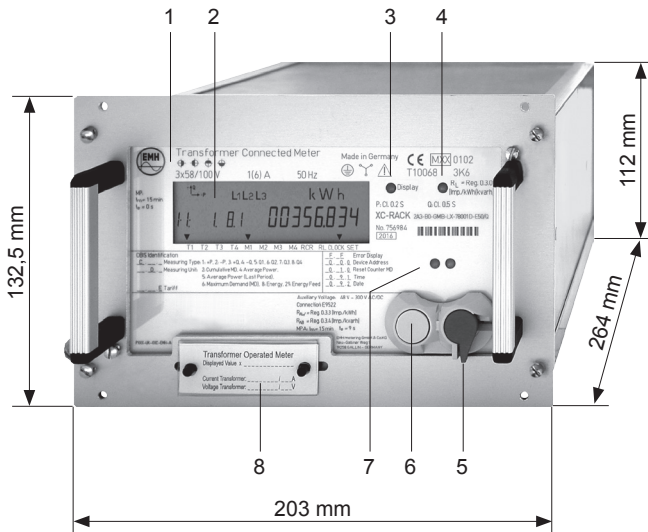
- Observe the local standards, guide lines, regulations and instructions for safety at work and electrical installations.

- Choose the conductor cross section corresponding to the maximum current loading.
- Provide flexible wires with ferrules.

Technical data

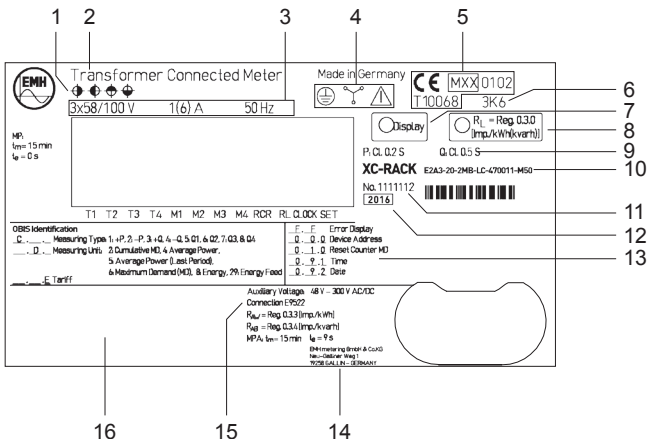
Voltage, current, frequency	see nameplate
Inputs S0-input low voltage or system voltage	maximum number: 1, max. 27 V DC, 27 mA (not potential-free) maximum number: 8, 18...40 V DC maximum number 8, 58...240 V AC
Outputs Opto-MOSFET	maximum number: 8, max. 250 V AC/DC, 100 mA (make contact)
Temperature range	specified operating range: -25 °C...+55 °C limit range for operation, storage and transport: -40 °C...+70 °C
Relative humidity	max. 95 %, non-condensing, according to IEC 62052-11, EN 50470-1 and IEC 60068-2-30
Class of protection	I
Degree of protection housing terminals housing material	IP 50 IP 20 aluminium alloy, polycarbonate, without halogen
Environmental conditions	mechanical: M1 according to Measuring Instruments Conditions Directive (2014/32/EU) electromagnetic: E2 according to Measuring Instruments Conditions Directive (2014/32/EU) intended location: indoor according to EN 50470-1
Weight	approx. 2,3 kg

Housing, display and operating elements



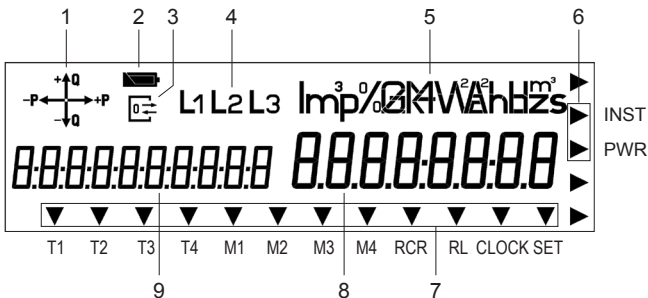
1	Nameplate
2	LC display
3	Call-up sensor (optical)
4	Test-LED (continuously lit-up = no energy consumption or incorrect flow direction)
5	Reset button (sealable)
6	Call-up button
7	Optical data interface (D0) with magnetic fixing for the optical communication head
8	Sealable transformer plate

Nameplate



1	Registered quadrants
2	Type designation
3	Voltage, current, frequency
4	Safety and instruction notes
5	Conformity and approval mark
6	Temperature class according to IEC 60721-3-3
7	Call-up sensor (optical)
8	Test-LED
9	Accuracy class
10	Type key
11	Serial number
12	Model year
13	OBIS-index of the most important registers
14	Manufacturer address
15	Contact sequence number
16	Space for ownership inscription

Display



- The **operation display** shows the current direction of energy as measured by the meter (export/import of active energy, export/import of inductive/capacitive reactive energy). If current is flowing it is possible to see in which quadrant is being measured by means of the energy direction arrow:



1. quadrant +P/+Q



3. quadrant -P/-Q



2. quadrant -P/+Q



4. quadrant +P/-Q

- The **battery status display** shows the charging status of the buffer battery of the real time clock. The following display are possible:



= Full voltage, real-time clock is buffered when there is no voltage



= discharged, no buffering of the real time clock is possible



The battery status display appears only with devices with a battery-buffered Real Time Clock.

- The **communication display** is continually lit-up when there is communication with the meter via data interfaces (optical or electrical) or the display flashes when the parameterisation status is active. At a XC-Rack with LMN-interface the Display lights up in irregular intervals, because it communicated intern, to provide the collection of the data by SMGW.

4. The **phase display** signals connection of the individual phase voltages. With an incorrect rotating field all three symbols flash.
5. The **unit** is displayed corresponding to the measured energy type or the displayed measured value.
6. In the **additional cursor field** operation conditions of the meter are represented. The black arrows show if an installation error has been registered or if the power threshold has been exceeded.

INST The cursor is active if an entry has been registered in the installation check register.

PWR The cursor is active, if a power threshold set in the meter is exceeded.

7. In the **standard cursor field** operation conditions of the meter are represented. The black arrows show which tariff and maximum demand is active and via which hardware (clock or ripple control receiver) the meter is controlled.

T1 - T4 Tariff information for energy. All tariff registers which can be activated are displayed on the nameplate.

M1 - M4 Tariff information for maximum demand. All tariff registers which can be activated are displayed on the nameplate

RCR The cursor flashes, when the internal ripple control receiver is activated and ready to receive. The relevant cursor is continually active when the internal RCR receives a telegram.

RL The cursor flashes for the duration of the activation of a reset inhibition.

CLOCK The cursor is active, if the internal clock controls the tariff device.

SET The cursor is active, when the meter is in the set mode.

8. In the **value area** the measured values are represented.
9. In this **OBIS code area** the measured values are defined by means of the OBIS code. The display is capable of displaying the long OBIS code.

Installation and commissioning

DANGER!

Contact of parts under voltage is extremely dangerous!

When installing or changing the meter, the conductor to which the meter is connected must be de-energized.

- Remove the relevant back-up fuses, for two-sided supply on the mains side as well as on the generation side.
- Store the back-up fuses in such a way that other people cannot refit them unnoticed.
- If you use selective circuit breakers for disconnection from the mains, secure them against being switched on again unnoticed.
- Only use the dedicated screw terminals for installation and connection of the meter.

DANGER!

Risk of danger to life due to electric arc and electric shock!

The in- and outputs including the external power supply inputs are not secured internally.

- Secure the inputs/external power supply inputs with back-up fuses of $\leq 0,5$ A according to valid technical directives.
- Secure the outputs in compliance with the current value specified on the nameplate of the meter according to valid technical directives.

NOTICE!

Damage of the terminals due to excessive torque!

The appropriate torque depends on the type of the connection line and on the maximum current.

- Tighten the terminals with the required torque according to IEC 60999-1.

Mounting an connection

The meters are suitable for mounting in a 19" racks.

DANGER!

Low voltage inputs are separated from hazardous live voltages only by basic insulation. Therefore the low voltage inputs **should not be accessible** under normal operational conditions.

DANGER!

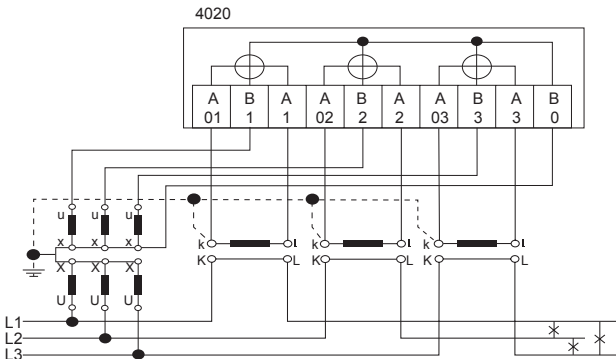
Contact of parts under voltage is life endangering!

S0-inputs are not potential-free. The S0-inputs are, depending on the voltage version, internally electrical connected to the measurement connections or to the auxiliary voltage and therefore potential carrying.

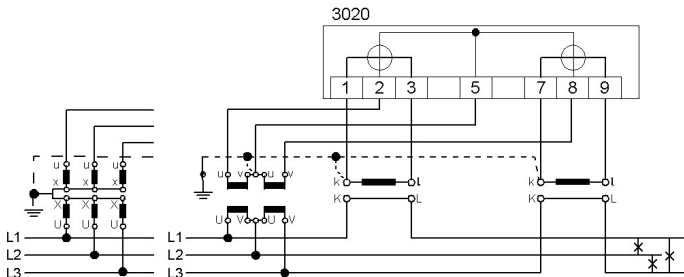
- Observe the device-specific wiring diagram inside the terminal cover.

The valid wiring diagram can be found on the top of the meter and also in the delivery documents. Please refer also to the chapter "installation check register C.86.0" on page 14.

Transformer operated meter for connection to current and voltage transformers in four-wire systems.

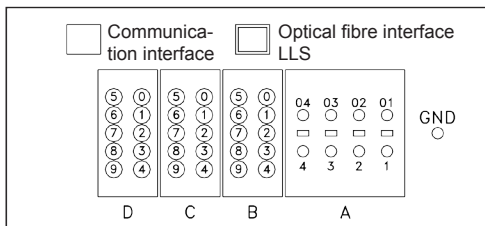


Transformer connected meter for connection at current and voltage transformers in three-wire systems (Aron circuit).



The terminals of the meter are at the back. Following variants for connecting the meter are available:

a) Meter with Essailec-plug-in system



The configuration of the contacts is variable and can be set by the customer. For example:

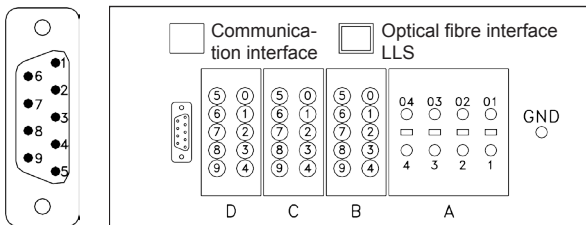
Contact	Meaning
D0	RS485 B+
D5	RS485 A-
D1	RS485 GND
D2	S0-
D7	S0+
D4	MPA+
D9	MPA-

Contact	Meaning
C0	A+ GND
C1	A+ Pulses
C3	R+ Pulses
C4	R+ GND
C5	A- Pulses
C6	A- GND
C8	R- Pulses
C9	R- GND

Contact	Meaning
B0	N = Neutral
B1	Voltage phase 1
B2	Voltage phase 2
B3	Voltage phase 3
B5	Auxiliary voltage
B6	Auxiliary voltage

Contact	Meaning
A1 - A01	Current phase 1
A2 - A02	Current phase 2
A3 - A03	Current phase 3

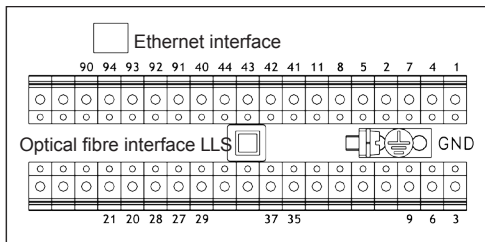
b) Meter with Sub-D plug



The configuration of the Essalec contacts is variable and can be set as shown above. Pin assignment of the Sub-D plug is fix:

Contact	Meaning
5	GND
3	RS485 B+
8	RS485 A-

c) Meter with Phoenix screw-type terminals



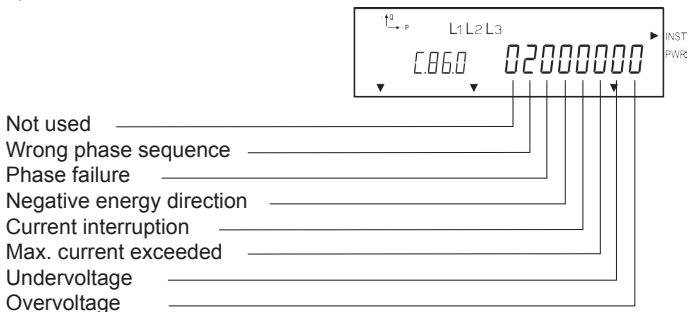
The configuration of the contacts is variable and can be set by the customer. For example:

Contact	Meaning
1	Current phase 1 In
4	Current phase 2 In
7	Current phase 3 In
2	Voltage phase 1
5	Voltage phase 2
8	Voltage phase 3
11	N = Neutral
40	GND pulses
41	A+ Pulses
42	A- Pulses
43	R+ Pulses
44	R- Pulses

Contact	Meaning
3	Current phase 1 Out
6	Current phase 2 Out
9	Current phase 3 Out
20	S0+
21	S0-
27	RS485 A-
28	RS485 B+
29	RS485 GND
37	MPA+
35	MPA-
90	GND pulse inputs
91	Pulse input 1
92	Pulse input 2
93	Pulse input 3
94	Pulse input 4

Installation check register C.86.0 (optional)

The installation check register C.86.0 registers installation errors. Normally, it is shown in the scrolling list or can be called up via the call-up list.

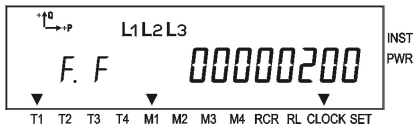


Event	Value	Meaning
Wrong phase sequence	1	Loss of neutral
	2	Wrong phase sequence
	4	Assymmetric current, e. g. 30 %
	8	Assymmetric voltage, e. g. 18 %
Phase failure	1	Phase failure L1
	2	Phase failure L2
	4	Phase failure L3
	8	Failure of auxiliary supply voltage
Negative energy direction	1	Negative energy direction L1 (P)
	2	Negative energy direction L2 (P)
	4	Negative energy direction L3 (P)
Current interruption	1	Current interruption L1
	2	Current interruption L2
	4	Current interruption L3
Maximum current exceeded ($I > I_{max}$)	1	Maximum current exceeded L1
	2	Maximum current exceeded L2
	4	Maximum current exceeded L3

Event	Value	Meaning
Undervoltage (U < 80 %)	1	Undervoltage L1
	2	Undervoltage L2
	4	Undervoltage L3
Overvoltage (U > 115 %)	1	Overvoltage L1
	2	Overvoltage L2
	4	Overvoltage L3

Error register F.F

The meter has 32 error flags which are represented by a 8 digit Hex-code. With the help of this register, functional errors in the meter are registered. Output of the error register takes place via the display and one of the readout lists.



Clearing the error register

To clear the error register use the W5-write command F.F(). To be able to execute this command the meter must be in the parameterisation status. After carrying out the command the parameterisation status is switched off.

Further informations about the error register F.F refer to the product manual.

Abbreviations

DIN	Deutsches Institut für Normung e.V. (German Institute for standards)
EN	European standards
GND	Ground
IEC	International Electrotechnical Commission
IP	Ingress Protection
L1, L2, L3	External conductor
LC	Liquid Crystal
LED	Light Emitting Diode
OBIS	Object-Identification-System
P	Active power
+P	Positive active power (customer imports from utility)
-P	Negative active power (customer exports to utility)
PCB	Printed Circuit Board
Q	Reactive power
+Q	Positive reactive power
-Q	Negative reactive power
RCR	Ripple control receiver
S0	Interface according to IEC 62053-31

EU 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:	XC-Rack-...

übereinstimmt bis 19. April 2016 mit den grundlegenden Anforderungen folgender EG-Richtlinien:

conforms until 19. April 2016 to the essential requirements of the following EC directives:

2004/108/EG	Elektromagnetische Verträglichkeit (EMV)	EU Amtsblatt L 390
2004/108/EC	Electromagnetic compatibility (EMC)	EU Official Gazette L 390

Ab dem 20. April 2016 mit den grundlegenden Anforderungen folgender EU-Richtlinien:

As of 20. April 2016 conforms to the essential requirements of the following EU directives:

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

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/Number): Notified body (name/number):	NMI/0122	PTB/0102
Zertifikats-Nummer: Certificate number:	T10068	DE-MAQ-PTB026

Es wurden die folgenden harmonisierten Normen angewendet:

The following harmonized standards were applied:

MID:	EMV (EMC):	RoHS II:
EN 50470-1:2006	EN 55022:2010	EN 50581:2012
EN 50470-3:2006	EN 55024:2010	
	EN 62052-11:2003	
	EN 62053-22:2003	
	EN 62053-23:2003	

Ort, Datum: Gallin, 12 APR 2016
Place, Date:

A handwritten signature in black ink, appearing to read 'Norbert Malek', written over a horizontal line.

Dipl.-Ing. Norbert Malek
Geschäftsführer
Managing director



The current EU Declaration of Conformity can be found in the download area of www.emh-metering.com.



