

EEM-MA770-R - Measuring instrument



2907944

<https://www.phoenixcontact.com/us/products/2907944>

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Multi-functional energy measuring device with integrated Modbus RTU/TCP interface for measuring electrical parameters in low-voltage installations up to 690 V. ([phoenixcontact.com/empro-help](https://www.phoenixcontact.com/empro-help))

Commercial data

Item number	2907944
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C446
Product key	CK4C21
Catalog page	Page 202 (C-5-2019)
GTIN	4055626261089
Weight per piece (including packing)	554.8 g
Weight per piece (excluding packing)	543.366 g
Customs tariff number	90303100
Country of origin	DE

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Technical data

Product properties

Product type	Energy measuring device
Product family	EMpro

Electrical properties

Maximum power dissipation for nominal condition	10 VA
Mains type	3-phase (3 or 4-conductor), 2-phase (2-conductor), and single-phase (1-conductor)

Electrical isolation

Test voltage	4 kV AC (50 Hz, 60 s)
Pollution degree	2

Electrical isolation Housing against all potentials IEC 61010-1

Standards/regulations	IEC 61010-1
Overvoltage category	III (300 V AC) II (600 V AC)
Insulation	Reinforced insulation

Electrical isolation Supply against all other potentials IEC 61010-1

Standards/regulations	IEC 61010-1
Overvoltage category	III (300 V AC) II (600 V AC)
Insulation	Reinforced insulation

Electrical isolation Voltage measurement input against all other potentials IEC 61010-1

Standards/regulations	IEC 61010-1
Measuring category	III (300 V AC) II (600 V AC)
Insulation	Reinforced insulation

Electrical isolation Current measurement input against all other potentials

Insulation	Functional insulation
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Electrical isolation Digital I/Os

Insulation	Functional insulation
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Electrical isolation Communication interface

Insulation	Functional insulation
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Supply

Supply voltage range	100 V AC ... 400 V AC ($\pm 20\%$) 150 V DC ... 250 V DC ($\pm 20\%$)
Power consumption	≤ 4 W
Nominal frequency	50 Hz ... 60 Hz (AC sine)

Input data

General

Measuring principle	True RMS value measurement (TRMS)
Measured value	AC sine (50 Hz/60 Hz)
Acquisition of harmonics	up to 63rd harmonic
Description of the input	Digital input in accordance with IEC/EN 61131-2 (type 3)
Number	1
Voltage input signal	24 V DC 0 V DC ... 30 V DC
Current input signal	2 mA ... 15 mA
Protection	250 mA (fast-blow)

Measurement: Voltage

Input name	Voltage measuring input V1, V2, V3
Input voltage range direct	35 V AC ... 690 V AC (Phase/Phase) 20 V AC ... 400 V AC (Phase/neutral conductor)
Input voltage range via external transformers	60 V AC ... 2000000 V AC (primary) 60 V AC ... 400 V AC (secondary)
Surge voltage capacity	760 V AC (Phase/Phase)
Precision	0.2 %
Power consumption	< 2 VA

Measurement: Current

Input name	Current measurement I1, I2, I3
Input current	1 A (secondary) 5 A (secondary)
Measuring range	1 A ... 20000 A (primary)
Overload capacity	6 A (I_{max})
Response threshold from measuring range nominal value	10 mA (1 A) 50 mA (5 A)
Precision	0.2 %
Current overload	50 A for 1 s
Power consumption	< 0.5 VA

Measurement: Power

Precision	0.5 %
Active energy (IEC 62053-22)	Class 0.5 S
Reactive power (IEC 62053-23)	Class 2
ANSI C12.20	Class 0.5 S

Output data

Output description	Digital output in accordance with IEC/EN 61131-2 (type 3)
Number	1
Current output signal	≤ 100 mA

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Voltage output signal	24 V DC
Protection	250 mA (fast-blow)

Connection data

Current / voltage / supply

Connection method	Screw connection
Stripping length	8 mm
Screw thread	M3
Conductor cross section rigid	0.2 mm ² ... 6 mm ²
Conductor cross section flexible	0.2 mm ² ... 4 mm ²
Conductor cross section AWG	24 ... 10
Tightening torque	0.5 Nm ... 0.6 Nm

Digital I/O / communication

Connection method	Screw connection
Stripping length	7 mm
Screw thread	M3
Conductor cross section rigid	0.14 mm ² ... 2.5 mm ²
Conductor cross section flexible	0.14 mm ² ... 1.5 mm ²
Conductor cross section AWG	26 ... 14
Tightening torque	0.5 Nm ... 0.6 Nm

RS-485

Connection method	Screw connection
Stripping length	7 mm
Screw thread	M3
Conductor cross section rigid	0.2 mm ² ... 2.5 mm ²
Conductor cross section flexible	0.2 mm ² ... 2.5 mm ²
Conductor cross section AWG	24 ... 12
Tightening torque	0.5 Nm ... 0.6 Nm

Interfaces

Data: Network interface

Communication protocol	Modbus/TCP
	REST
Connection method	RJ45

Data: Network interface

Communication protocol	Modbus/RTU
Communication standard	RS-485
Connection method	Screw connection
Transmission speed range	2.4 kbps ... 115.2 kbps
Resistance	120 Ω (integrated)

Dimensions

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Width	96 mm
Height	96 mm
Depth	58 mm

Material specifications

Color	gray (RAL 7042)
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Environmental and real-life conditions

Ambient conditions

Degree of protection (Housing)	IP20 (Housing)
Degree of protection (Display)	IP54 (Display (+ EEM-MA-IP))
Ambient temperature (operation)	-25 °C ... 70 °C
Ambient temperature (storage/transport)	-30 °C ... 80 °C
Altitude	≤ 2000 m
Max. permissible relative humidity (operation)	≤ 95 % (non-condensing)

Approvals

CE

Certificate	CE-compliant
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UKCA

Certificate	UKCA-compliant
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UL, USA/Canada

Identification	UL/C-UL Listed UL 61010-1
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UL data

Operating mode	Indoor use
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UL data

Operating mode	Indoor use
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Mounting

Mounting type	Panel mount
Mounting position	Front panel installation, horizontal

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Approvals

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EAC

Approval ID: RU*DE*08.B.00734/19



UL Listed

Approval ID: FILE E 357804



cUL Listed

Approval ID: FILE E 357804

cULus Listed

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Classifications

ECLASS

ECLASS-11.0	27142330
ECLASS-12.0	27142330
ECLASS-13.0	27142330

ETIM

ETIM 9.0	EC002301
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UNSPSC

UNSPSC 21.0	41113600
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Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	091c4bd8-4733-4f41-a7ec-e50e8e41a213

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Accessories

EEM-MKT-DRA - DIN rail adapter

2902078

<https://www.phoenixcontact.com/us/products/2902078>



DIN rail adapter for EEM-MA770-X and EEM-MA771-X series energy measuring devices

PACT MCR-V1-21-44 - Current transformer

2277268

<https://www.phoenixcontact.com/us/products/2277268>



Bus-bar current transformer, primary current can be selected between 50...500 A AC; secondary current can be selected as 1 A AC or 5 A AC; accuracy class can be selected as 0.5 or 1; rated power can be selected

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PACT MCR-V2- 3015- 60 - Current transformer

2277271

<https://www.phoenixcontact.com/us/products/2277271>



Window-type current transformer, primary current can be selected between 50... 750 A AC; secondary current can be selected as 1 A AC or 5 A AC; accuracy class can be selected as 0.5 or 1; rated power can be selected

PACT MCR-V2-3015-60-PT - Current transformer

2907413

<https://www.phoenixcontact.com/us/products/2907413>



Window-type current transformer with screw and Push-in connection technology, conductor connection for Push-in: from directly above, no tools required. The following can be selected: primary current (50 ... 750) A AC, secondary current (1 or 5) A AC, accuracy class 0.5 or 1, VA power

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PACT MCR-V2- 4012- 70 - Current transformer

2277284

<https://www.phoenixcontact.com/us/products/2277284>



Window-type current transformer, primary current can be selected between 75... 1000 A AC; secondary current can be selected as 1 A AC or 5 A AC; accuracy class can be selected as 0.5 or 1; rated power can be selected

PACT MCR-V2-4012-70-PT - Current transformer

2907414

<https://www.phoenixcontact.com/us/products/2907414>



Window-type current transformer with screw and Push-in connection technology, conductor connection for Push-in: from directly above, no tools required. The following can be selected: primary current (100 ... 1000) A AC, secondary current (1 or 5) A AC, accuracy class 0.5 or 1, VA power

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PACT MCR-V2- 5012- 85 - Current transformer

2277297

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Window-type current transformer, primary current can be selected between 100..1500 A AC; secondary current can be selected as 1 A AC or 5 A AC; accuracy class can be selected as 0.5 or 1; rated power can be selected

PACT MCR-V2-5012-85-PT - Current transformer

2907416

<https://www.phoenixcontact.com/us/products/2907416>



Window-type current transformer with screw and Push-in connection technology, conductor connection for Push-in: from directly above, no tools required. The following can be selected: primary current (100 ... 1500) A AC, secondary current (1 or 5) A AC, accuracy class 0.5 or 1, VA power

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PACT MCR-V2- 6015- 85 - Current transformer

2277336

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Window-type current transformer, primary current can be selected between 200 . . . 1,250 A AC; secondary current can be selected as 1 A AC or 5 A AC; accuracy class can be selected as 0.5 or 1; rated power can be selected

PACT MCR-V2-6015-85-PT - Current transformer

2907417

<https://www.phoenixcontact.com/us/products/2907417>



Window-type current transformer with screw and Push-in connection technology, conductor connection for Push-in: from directly above, no tools required. The following can be selected: primary current (200 ... 1600) A AC, secondary current (1 or 5) A AC, accuracy class 0.5 or 1, VA power

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PACT MCR-V2-10020-129 - Current transformer

2277378

<https://www.phoenixcontact.com/us/products/2277378>



Window-type current transformer, primary current can be selected between 800 and 4,000 A AC, secondary current can be selected 1 A AC or 5 A AC, accuracy class can be selected 0.5 or 1, rated power can be selected

PACT MCR-V3-60 - Current transformer

2277417

<https://www.phoenixcontact.com/us/products/2277417>



Winding current transformer, primary current can be selected between 1...40 A AC; secondary current can be selected as 1 A AC or 5 A AC; accuracy class can be selected as 0.5 or 1; rated power can be selected

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