EEM-MA770-R - Measuring device

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)

Commercial data

Item number	2907944
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C446
Product key	CMMC21
GTIN	4055626261089
Weight per piece (including packing)	436.86 g
Weight per piece (excluding packing)	543.366 g
Customs tariff number	90303100
Country of origin	DE

Technical data

Product properties

Product type	Energy measuring device
Product family	EMpro
Number (Ethernet ports)	1

Display

Display type	LCD display, backlit, 2-color, multi-line

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
Insulation	Reinforced insulation

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 61010-2-030

Standards/regulations	IEC 61010-2-030
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

Electrical isolation Digital I/Os

Insulation	Functional insulation

Electrical isolation Communication interface

Insulation	Functional insulation

Supply

Supply voltage range	100 V AC ... 400 V AC (±20 %)
	150 V DC ... 250 V DC (±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)
Protective circuit	Protection against incorrect DC connection (max. 30 V)

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	< 0.5 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
	20 A (4 x I_N, continuous)
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
Voltage output signal	24 V DC
Protection	250 mA (fast-blow)
Protective circuit	Protection against incorrect DC connection (max. 30 V)

Connection data

Current / voltage / supply

Connection method	Screw connection
Stripping length	8 mm
Screw thread	M3
Conductor cross-section rigid	0.2 mm² ... 6 mm²
Conductor cross-section flexible	0.2 mm² ... 4 mm²
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 mm² ... 2.5 mm²
Conductor cross-section flexible	0.14 mm² ... 1.5 mm²
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 mm² ... 2.5 mm²
Conductor cross-section flexible	0.2 mm² ... 2.5 mm²
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

Width	96 mm
Height	96 mm
Depth	95 mm
	80 mm (Installation depth)

Material specifications

Color	gray (RAL 7042)

Environmental and real-life conditions

Ambient conditions

Degree of protection (Housing)	IP20 (Housing)
Degree of protection (Display)	IP54 (Display with seal (included))
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

UKCA

Certificate	UKCA-compliant

UL, USA/Canada

Identification	UL/C-UL Listed UL 61010-1

UL data

Operating mode	Indoor use

Standards and regulations

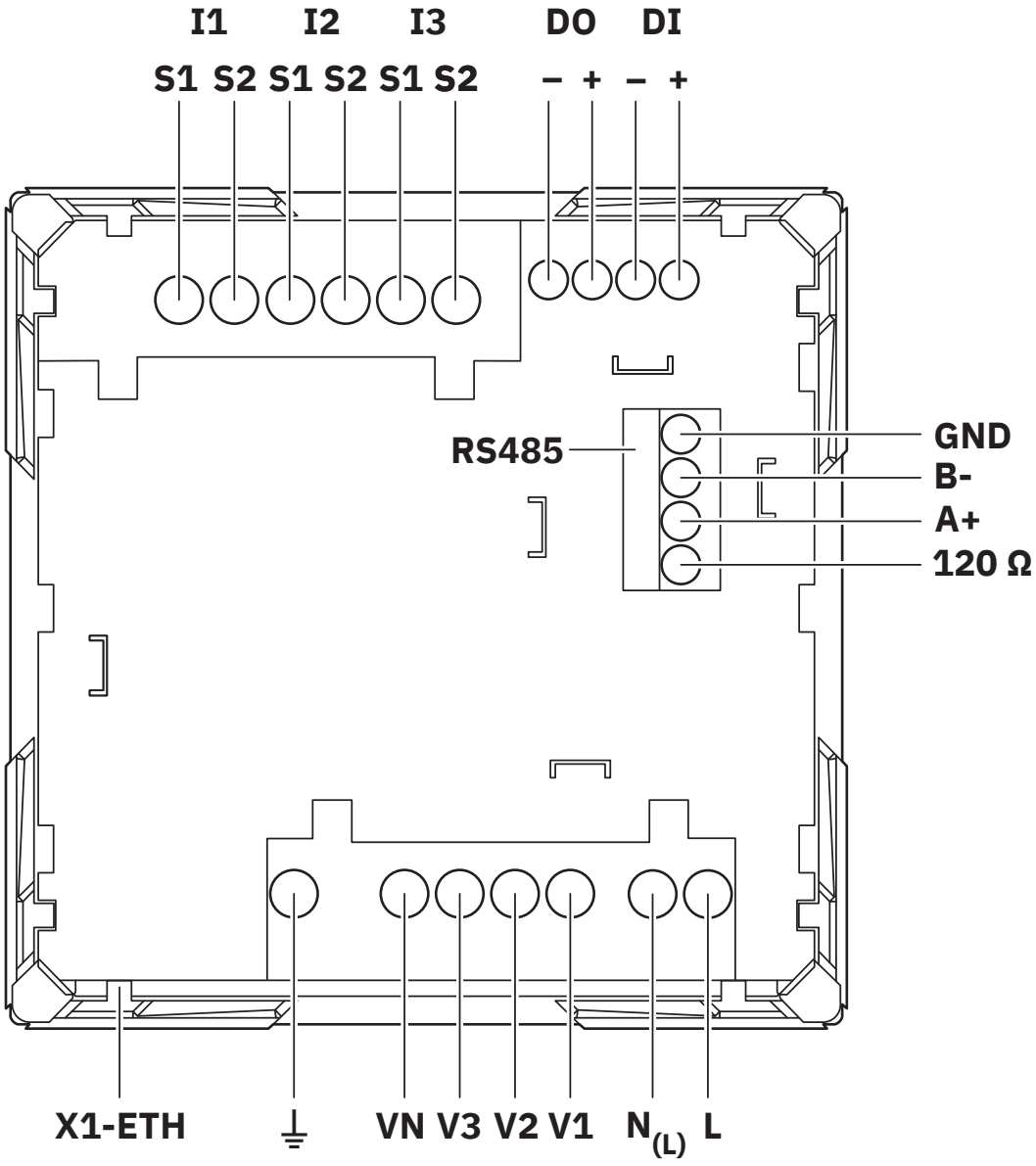
Standards/regulations	IEC 61010-1
	IEC 61326-1
	IEC 61557-12

Mounting

Mounting type	Panel mount
Mounting position	Front panel installation, horizontal

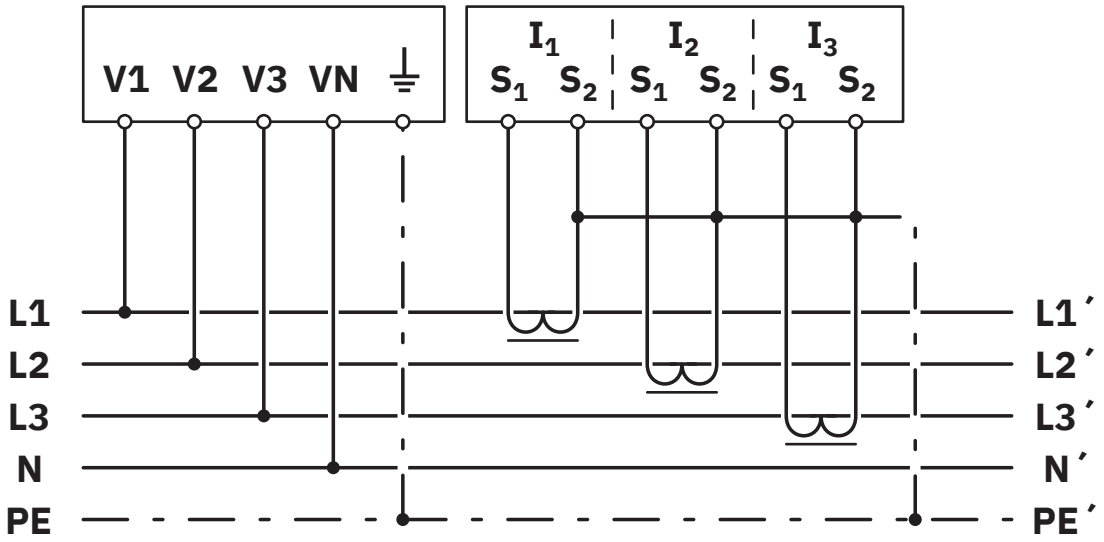
Drawings

Connection diagram



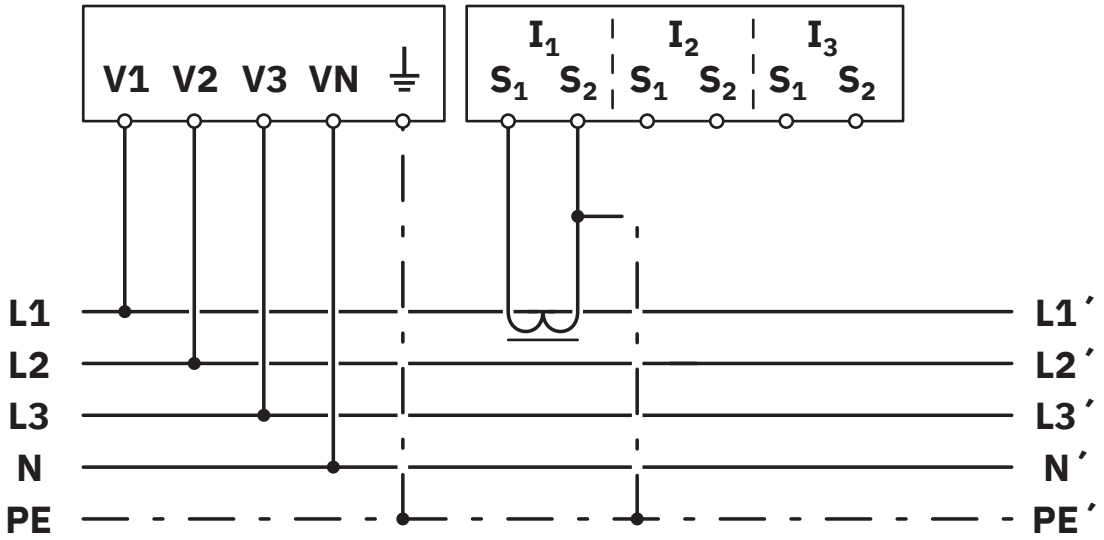
Connection assignment

Connection diagram



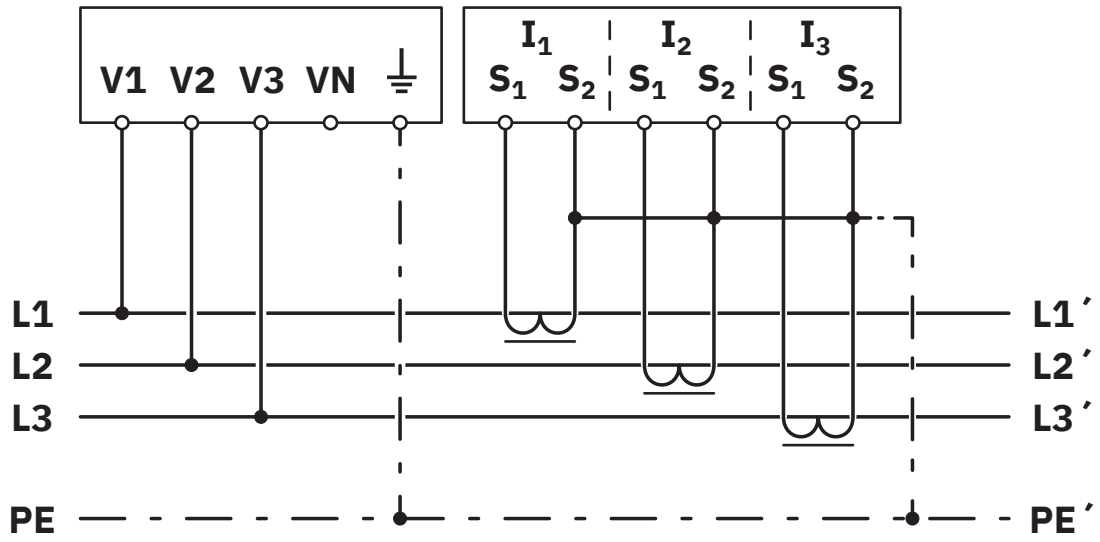
Network type: 3PH-4W-3CT

Connection diagram



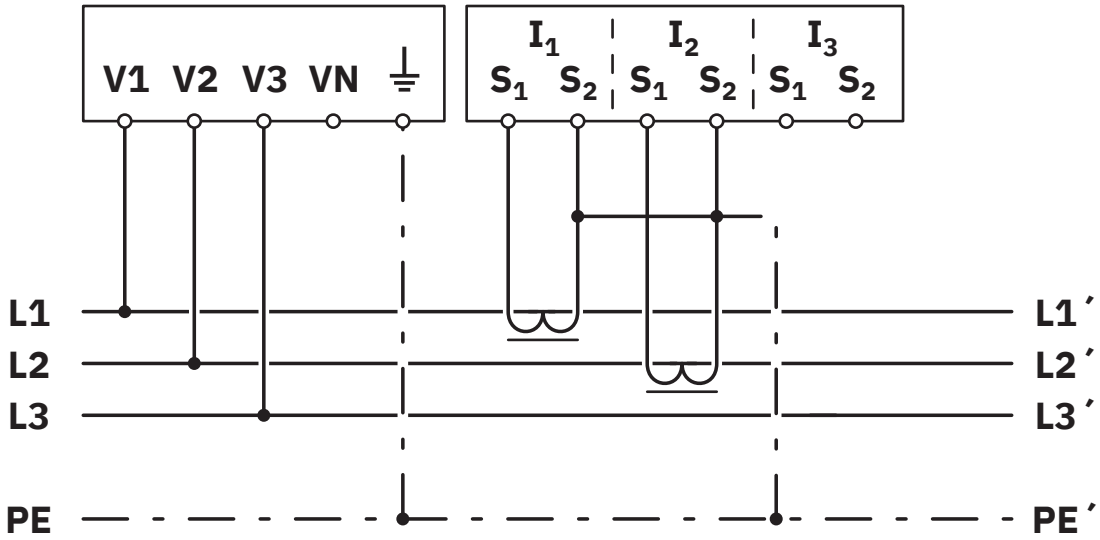
Network type: 3PH-4W-1CT

Connection diagram



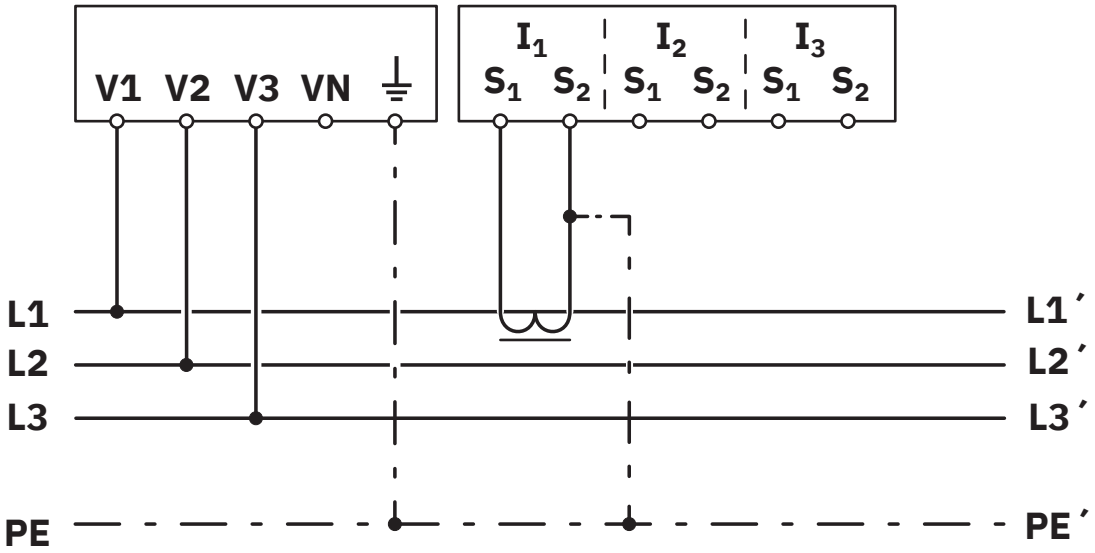
Network type: 3PH-3W-3CT

Connection diagram



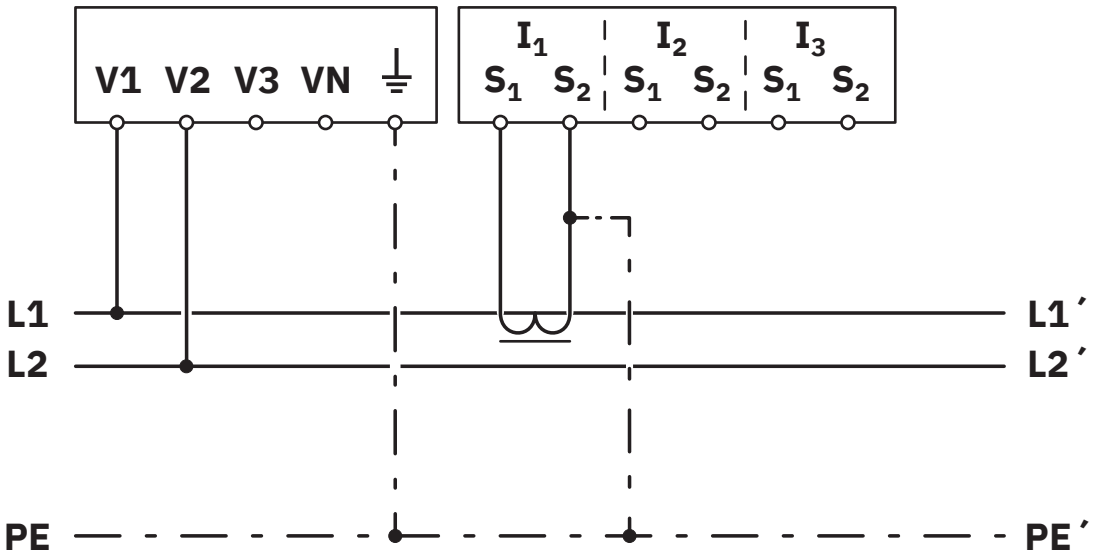
Network type: 3PH-3W-2CT

Connection diagram



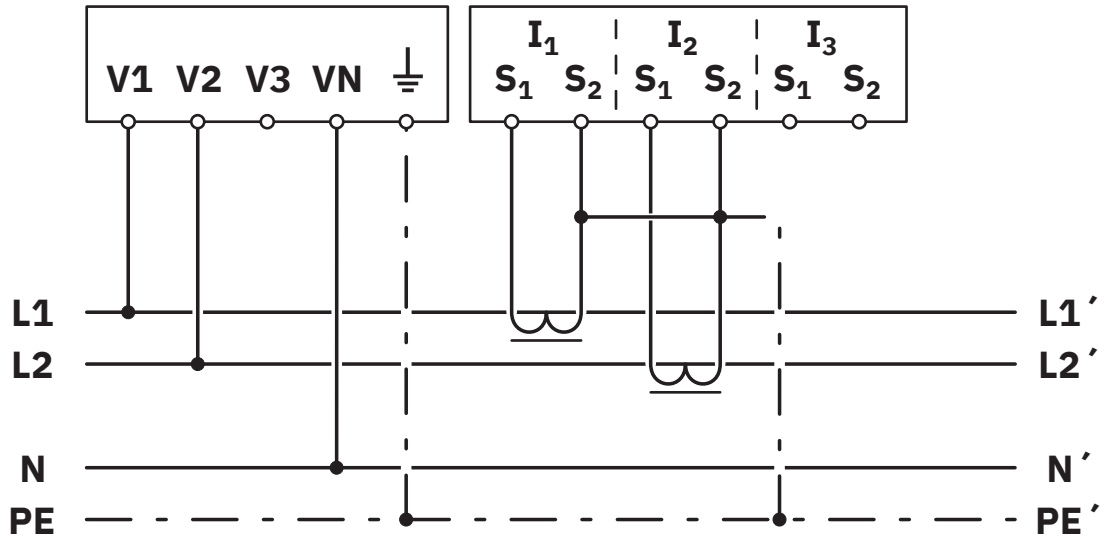
Network type: 3PH-3W-1CT

Connection diagram



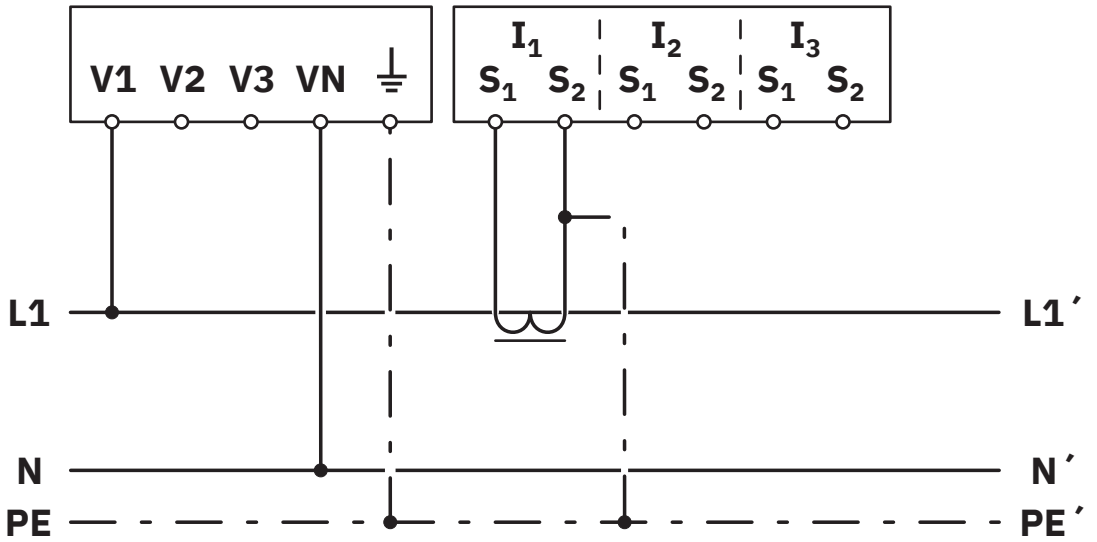
Network type: 2PH-2W-1CT

Connection diagram



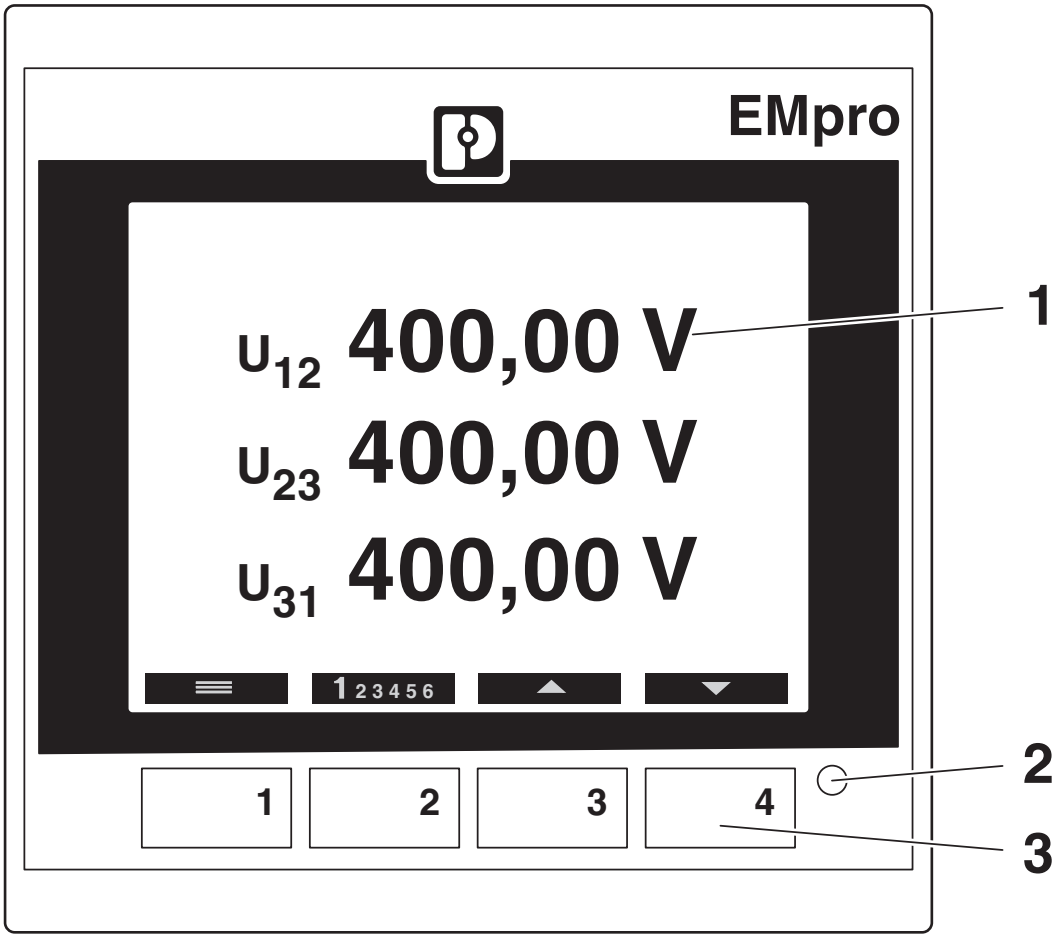
Network type: 2PH-3W-2CT

Connection diagram



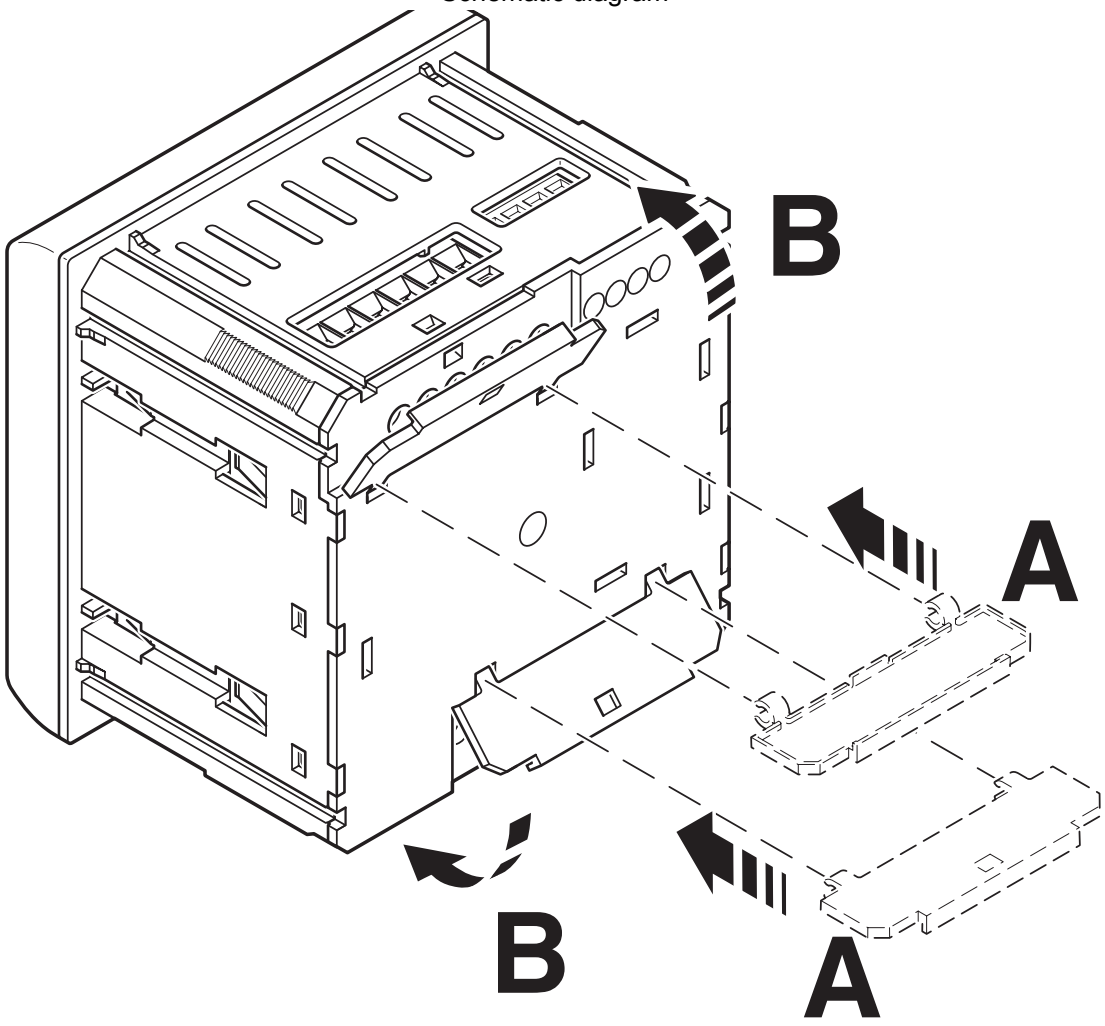
Network type: 1PH-2W-1CT

Schematic diagram



Operating and indication elements
1 Backlit LCD
2 Pulse LED
3 Operating buttons for displaying measured values and for changing the configuration

Schematic diagram



Mounting

Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2907944

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

UL Listed
Approval ID: E357804

cUL Listed
Approval ID: FILE E 357804

cULus Listed
Approval ID: E357804

Classifications

ECLASS

ECLASS-13.0	27142330
ECLASS-15.0	27142330

ETIM

ETIM 9.0	EC002301

UNSPSC

UNSPSC 21.0	41113600

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)
	Perfluorobutane sulfonic acid (PFBS) and its salts(CAS: n/a)
SCIP	091c4bd8-4733-4f41-a7ec-e50e8e41a213

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