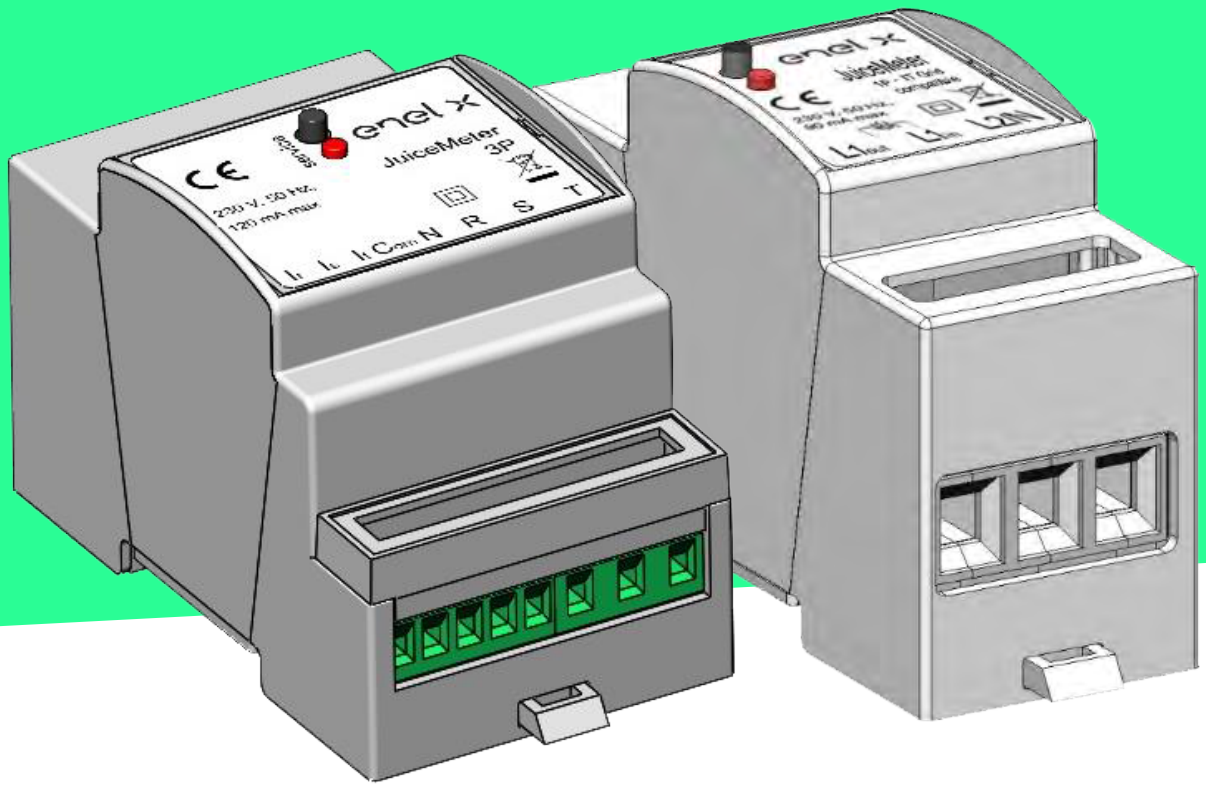
enel x



JuiceMeter Installation Manual

In this document

1 JuiceMeter

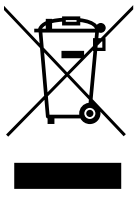
JuiceMeter is an energy meter that communicates with your JuiceBox to enable the Load Optimization Pro feature.

After pairing the two devices, JuiceMeter allows your JuiceBox to adapt its power level based on the consumption of other devices connected to the same power line. In this way, you can recharge at the maximum available power while avoiding the risk of triggering the meter.

The JuiceMeter is available in single-phase and three-phase versions. Both products are available in standard and IT GRID compatible versions depending on the type of installation.

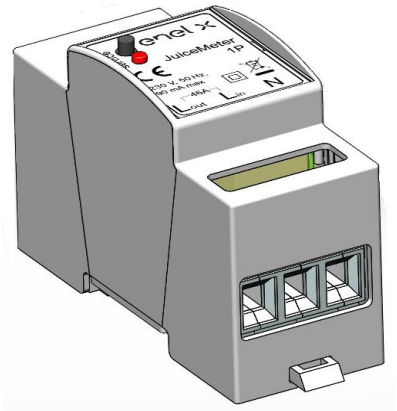
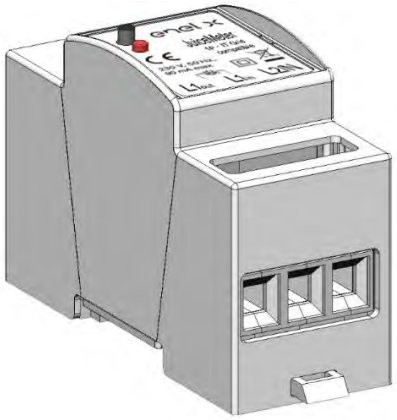
SINGLE-PHASE JUICEMETER	Standard version
	IT GRID compatibile version
THREE-PHASE JUICEMETER	Standard version
	IT GRID compatibile version

1.1 Electric and electronic equipment end of life user's information



Pursuant to local laws and regulations and according to art.14 of Directive 2012/19 / EU on waste electrical and electronic equipment (WEEE), crossed-out waste bin symbol on equipment or on its packaging means that the product shall be disposed of separately from household waste.
When this product reaches its end of life, take it to a collection point designated by local authorities. The separate collection and recycling of product at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

2 Single-phase JuiceMeter

STANDARD VERSION	IT GRID COMPATIBILE VERSION
Suitable for installation in the following types of system: > TT, TN, TN-S, TN-C, TN-C-S, IT with Neutral.	Suitable for installation in the following types of system: > TT, TN, TN-S, TN-C, TN-C-S, IT.
	

2.1 Features

- **Dimensions (W x H x D):** 36.3 x 90.5 x 62 mm (excluding DIN rail spring)
- **No. of DIN modules:** 2
- **Weight:** 120 g
- **Degree of protection:** IP20 (when the JuiceMeter is installed in an electrical cabinet with terminals covered by panels)
- **Plastic housing material:** PC/ABS
- **Flammability rating of housing:** UL94 V-0

OPERATING CONDITIONS

- **For Indoor use;**
- **Operating temperature:** -20 ÷ +50 °C
- **Storage temperature:** -30 to +70 °C
- **Relative humidity:** 5% ÷ 95% not condensed
- **Altitude:** <= 4000 m
- **Overvoltage class:** II
- **Pollution degree:** 2
- **Insulation class:** II

DIRECTIVE RED 2014/53/UE

CE Marking
Product distributed by ENEL X, 00191 Roma, Viale Tor di Quinto 45/47

POWER SUPPLY

- **Connection:**
  - STANDARD VERSION: The device is powered between terminals "Lin" and "N", which are also used for voltage measurement.
  - IT GRID COMPATIBLE VERSION: The device is powered between terminals "L1in" and "L2/N", which are also used for voltage measurement.
- **Nominal Voltage:** 230 Vac
- **Voltage operating range:** -20%/+15% of the nominal voltage
- **Frequency:** 50 Hz
- **Power consumption:** 90 mA max
- **Protections:** Integrated fuse (F1: T1A 300V) not replaceable. If the fuse is tripped, the device switches off and dynamic load modulation is lost.

CONNECTION

- **Connectors:** Three-way terminal
- **Dimensions (min ÷ max):** 2.5 ÷ 10 mm2/ 12AWG ÷ 6AWG (see paragraph 2.2 "Installation" of this manual, point 4 "Wiring")

WI-FI / BLUETOOTH CONNECTIVITY (CURRENTLY NOT AVAILABLE)

- **Functionality:** for optional configuration via APP
- **Antenna:** integrated

- **Frequency:** 2.4 GHz
- **Standard:** 802.11 b/g/n

PLC NARROW BAND COMMUNICATION (CHAIN 2)

- **Modem:** C-Band, B-PSK Modulation
- **Application:** DLMS/COSEM IEC (IEC 62056-5-3)
- **Data Model:** COSEM Data Model (IEC 62056-6-1, IEC 62056-6-2)
- **Coupling:**
  - STANDARD VERSION: The PLC transmission is coupled in differential mode between terminals "Lin" and "N"
  - IT GRID COMPATIBILE VERSION: The PLC transmission is coupled in differential mode between terminals "L1in" and "L2/N"

USER INTERFACE:

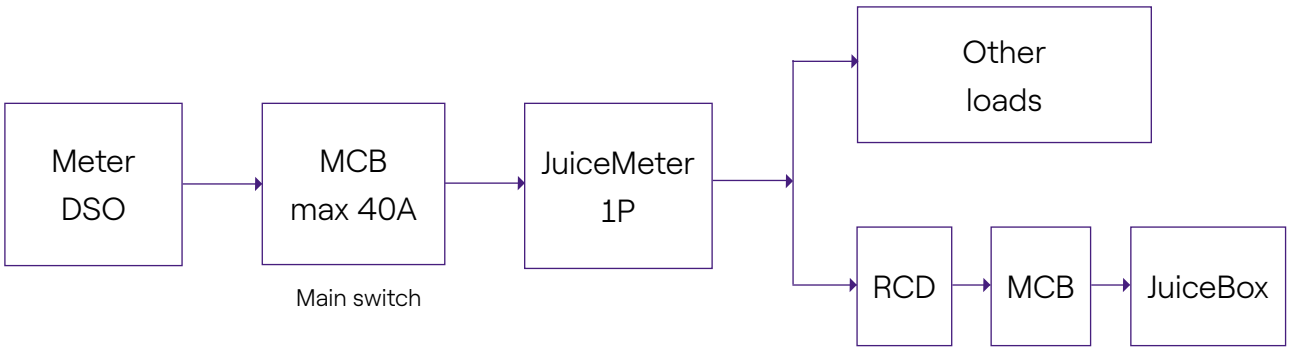
- **Service LED:** service indicator (red)
- **Button:** for initial configuration and reactivation of the device

REFERENCE REGULATIONS

- **Art. 3.1a Safety:** EN 61010-1:2010/A1: 2010, EN 61010-2-30:2010
- **Art. 3.1b EMC:** EN 55032:2015/A11:2010, EN 55035:2017/A11:2010, EN 61000-3- 2:2019, EN 61000-3-3:2013/A1:2019, ETSI EN 301 489-1 V2.2.3 (2019), ETSI EN 301 489-17 V3.2.2
- **Art. 3.2 Radio:** ETSI EN 300 328
- **Health**: EN 62311

2.2 Installation

Install the JuiceMeter downstream of the distributor's meter and the main circuit breaker to enable measurement of total consumption (see diagram below). The protection and disconnection device of the JuiceMeter will be the general MCB.



1. Read the **Safety Warnings** manual inside the packaging.

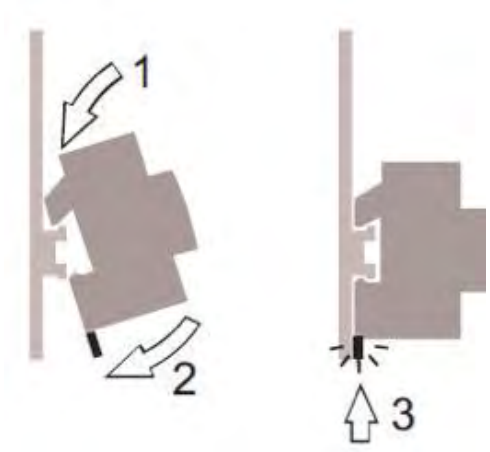
2. Install the product in an electrical cabinet that is accessible only to qualified personnel.

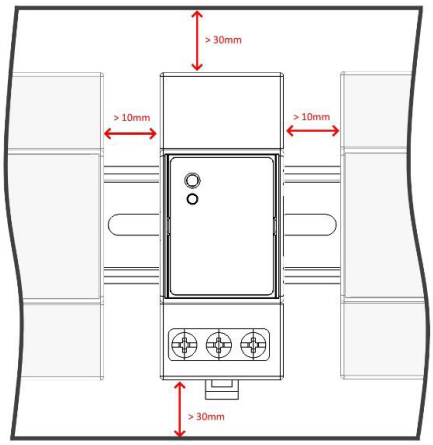
3. Din rail mounting.

> The product must be installed in a vertical position on a 35mm DIN rail, with the screw terminal facing downwards.

> Leave at least 30mm of space above and below the JuiceMeter, and at least 10mm of space to the right and left of the product in relation to adjacent DIN modules, to ensure proper heat dissipation.

> It is not recommended to install the product close to heat sources. If necessary, maintain adequate distance between the JuiceMeter and such heat sources.





4. Wiring:

> Use only flexible copper wires with the following cross sections for wiring the JuiceMeter:

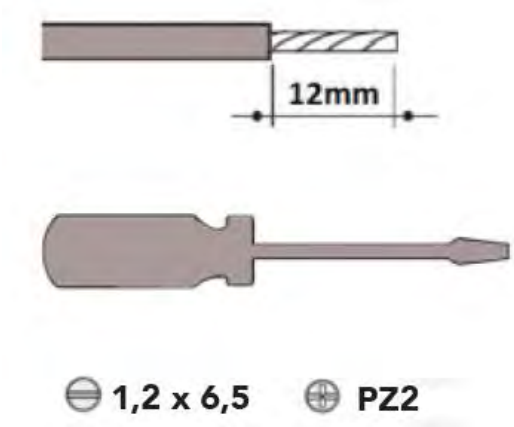
MAXIMUM PEAK CURRENT (A)	UP TO 16A	FROM 16A TO 25 A	FROM 25A TO 32A	FROM 32A TO 46A
Minimum wire cross-section (mm^2)	2.5	4	6	10
Minimum wire cross-section (AWG)	12	10	8	6

> Use PVC-insulated wires able to withstand temperatures of at least 80 °C. Such as H05V2-K, AWM Style 1007, or equivalent.

> Ensure that all stranded wires are inserted into the screw terminal to ensure good contact.

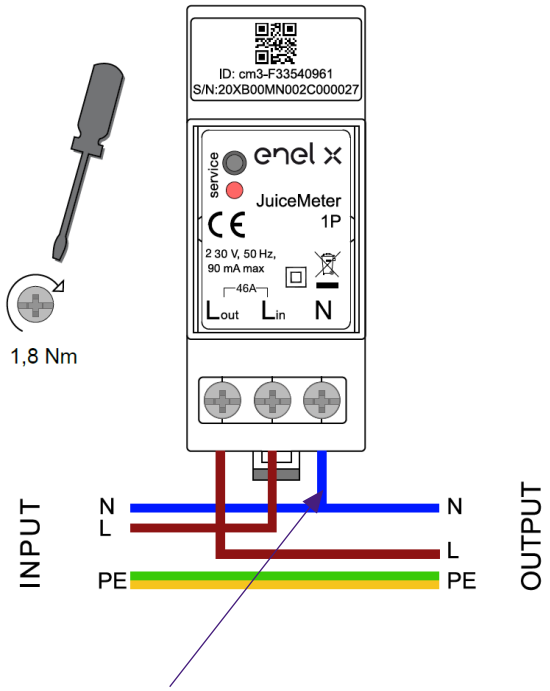
⚠ WARNING

Ensure that the terminals are tight to ensure good contact. The required tightening torque is 1.8Nm. Use a 1.2x6.5 slotted or PZ2 Phillips screwdriver.



5. Connections:

STANDARD VERSION



SINGLE-PHASE measurement method: with integrated shunt between terminals "Lin" and "Lout" for current measurement. Between terminals "Lin" and "N" (same as used for JuiceMeter power supply) for voltage measurement.

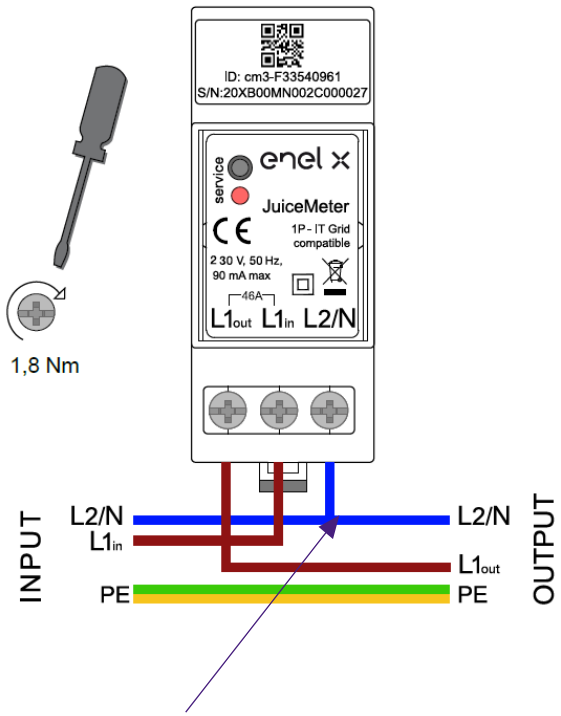
- **Minimum current:** 100 mA
- **Reference current:** 5 A
- **Maximum current:** 46 A
- **Nominal range:** 34 A; Contracted power up to 8 kW
- **Maximum Range (for short periods only):** 46 A. Power up to 10.6 KW.
- **Accuracy:** class I (±1%) for active energy
- **Measurement category:** CAT II according to EN 61010-2-030

For the neutral, the installer must make a branch from the power cables.

⚠ WARNING

Check that there is an MCB switch in the main switchboard that is suitable for the protection/disconnection of the JuiceMeter (In max 40 A). If this is not the case, it must be replaced. The MCB must be marked as JuiceMeter disconnecting device.

IT GRID COMPATIBILE VERSION



SINGLE-PHASE measurement method: with integrated shunt between terminals "L1in" and "L1out" for current measurement. Between terminals "L1in" and "L2/N" (same as used for JuiceMeter power supply) for voltage measurement.

- **Minimum current:** 100 mA
- **Reference current:** 5 A
- **Nominal range:** 34 A; Contracted power up to 8 kW
- **Maximum Range (for short periods only):** 46 A. Power up to 10.6 KW.
- **Accuracy:** class I (±1%) for active energy
- **Measurement category:** CAT II according to EN 61010-2-030

For the neutral, the installer must make a branch from the power cables.

⚠ WARNING

Check that there is an MCB switch in the main switchboard that is suitable for the protection/disconnection of the JuiceMeter (In max 40 A). If this is not the case, it must be replaced. The MCB must be marked as JuiceMeter disconnecting device.

POWER-UP AND COMMISSIONING

PLUG&PLAY PRODUCT

Power-up the product.

- FIXED RED SERVICE LED: powered and operational - Active communication and data transmission to JuiceBox.
- Flashing RED SERVICE LED (Fast blink): Modem Power Line fault.

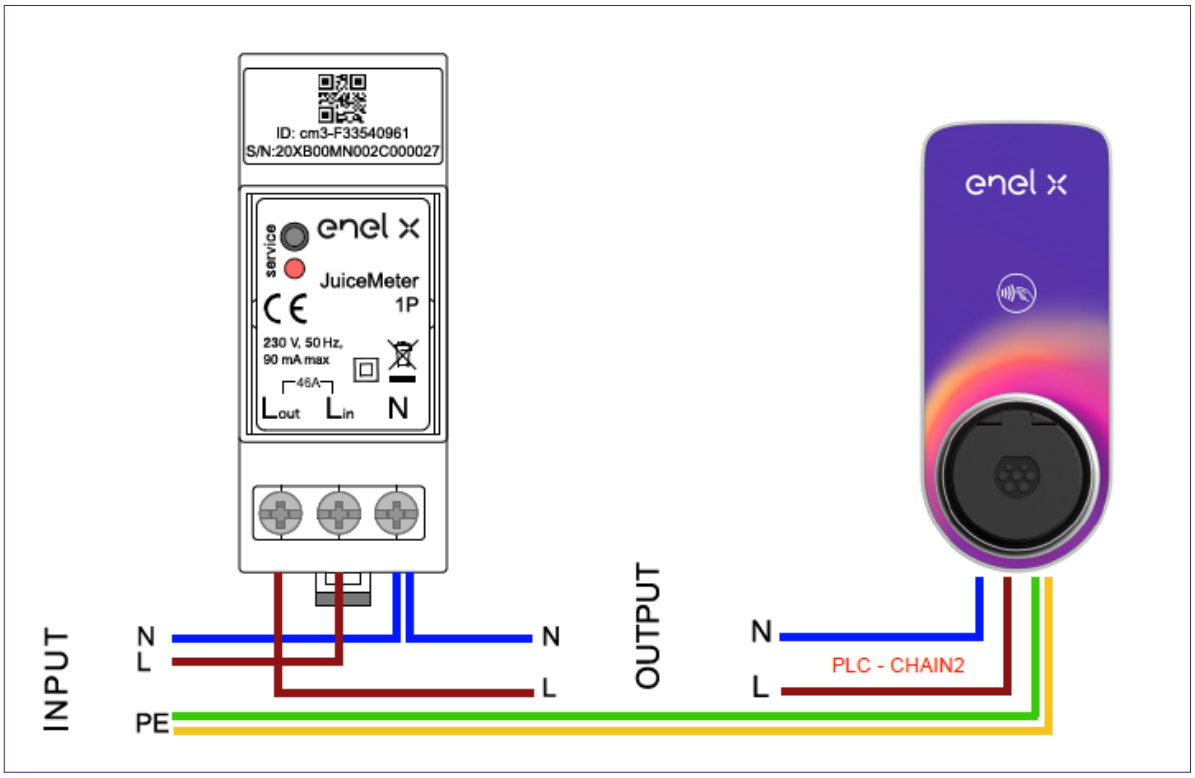
- BLINKING RED SERVICE LED (Slow blink): Measurement Unit fault.
- SERVICE BUTTON: Reset button for the device (press for at least three seconds to restart the device without performing an on-off cycle).

2.3 JuiceBox connection diagrams

STANDARD VERSION

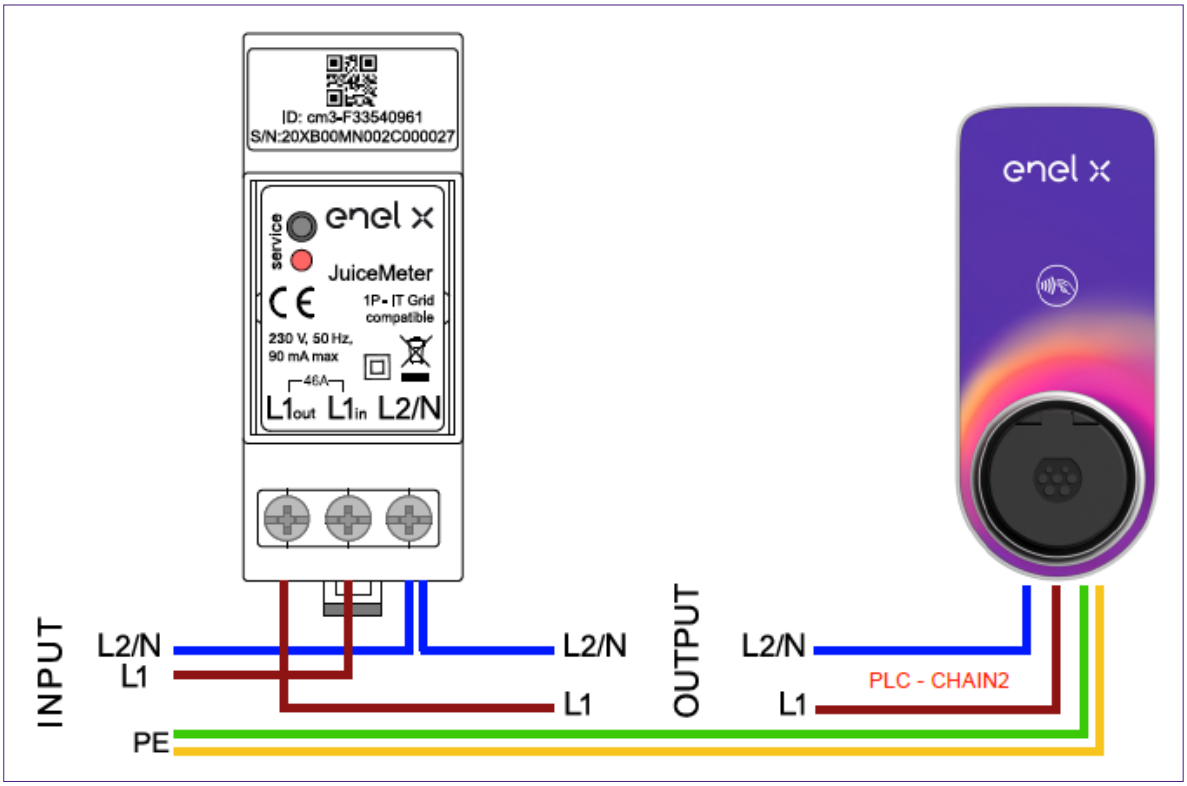
NOTE:

PLC - CHAIN2 (*) communication takes place on connections L and N.

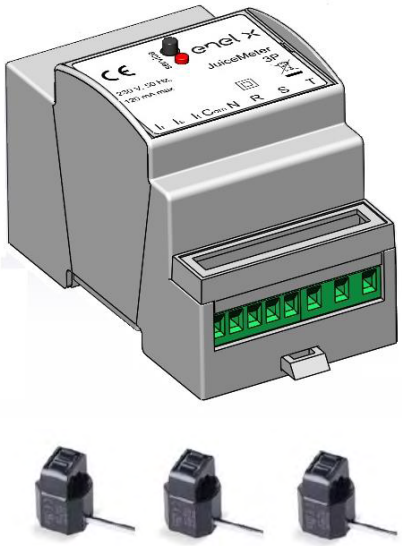
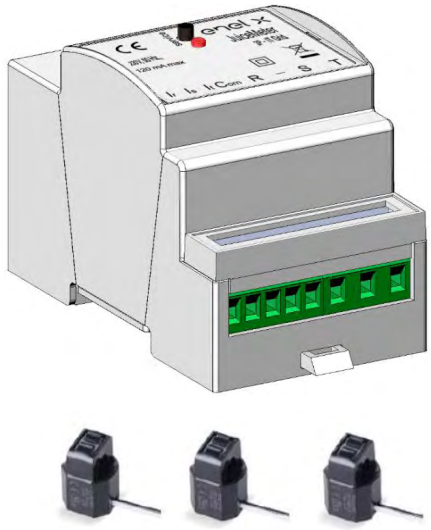


(*) The chain2 protocol is customised with more measurement data than the standard one.

IT GRID COMPATIBILE VERSION



3 Three-phase JuiceMeter

STANDARD VERSION	IT GRID COMPATIBILE VERSION
Suitable for installation in the following types of system: > TT, TN, TN-S, TN-C, TN-C-S, IT with Neutral.	Suitable for installation in the following types of system: > TT no neutral, IT no neutral.
	

3.1 Features

- **Dimensions (W x H x D):** 53.5 x 90.5 x 62 mm (excluding DIN rail spring)
- **No. of DIN modules:** 3
- **Weight:** 150 g
- **Degree of protection:** IP20 (when the JuiceMeter is installed in an electrical cabinet with terminals covered by panels)
- **Plastic housing material:** PC/ABS
- **Flammability rating of housing:** UL94 V-0

OPERATING CONDITIONS

- **For Indoor use;**
- **Operating temperature:** -20 ÷ +50 °C
- **Storage temperature:** -30 to +70 °C

- **Relative humidity:** 5% ÷ 95% not condensed
- **Altitude:** <= 4000 m
- **Overvoltage class:** II
- **Pollution degree:** 2
- **Insulation class:** II

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CE Marking
Product distributed by ENEL X, 00191 Roma, Viale Tor di Quinto 45/47

POWER SUPPLY

- **Connection:**
  - STANDARD VERSION: The device is powered in single-phase between terminals "T" and "N", which are also used for voltage measurement.
  - IT GRID COMPATIBLE VERSION: The device is powered in single-phase between terminals "T" and "R", which are also used for voltage measurement.
- **Nominal Voltage:** 230 Vac
- **Voltage operating range:** -20%/+15% of the nominal voltage
- **Frequency:** 50 Hz
- **Power consumption:** 120 mA max
- **Protections:** Integrated fuse (F1: T1A 300V) not replaceable. If the fuse is tripped, the device switches off and dynamic load modulation is lost.

CONNECTION

- **Connectors:** 8-pin screw terminal
- **Wire cross-section (min ÷ max):** 0.5 ÷ 2.5 mm2/ 22AWG ÷ 14AWG

WI-FI / BLUETOOTH CONNECTIVITY (CURRENTLY NOT AVAILABLE)

- **Functionality:** for optional configuration via APP
- **Antenna:** integrated
- **Frequency:** 2.4 GHz
- **Standard:** 802.11 b/g/n

PLC NARROW BAND COMMUNICATION (CHAIN 2)

- **Modem:** C-Band, B-PSK Modulation
- **Application:** DLMS/COSEM IEC (IEC 62056-5-3)

- **Data Model:** COSEM Data Model (IEC 62056-6-1, IEC 62056-6-2)
- **Coupling:**
  - STANDARD VERSION: The PLC transmission is coupled in differential mode between erminals "T" and "N"
  - STANDARD VERSION: The PLC transmission is coupled in differential mode between terminals "T" and "R"

USER INTERFACE:

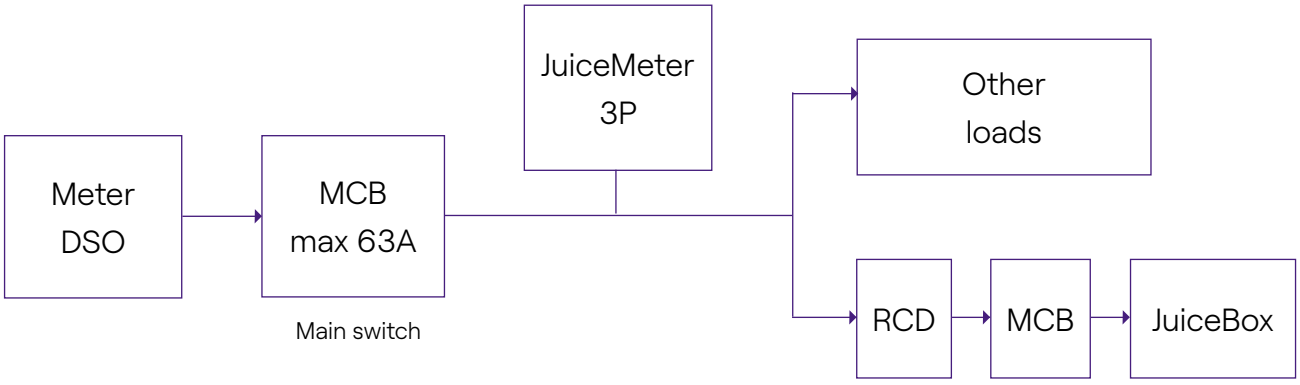
- **Service LED:** service indicator (red)
- **Button:** for initial configuration and reactivation of the device

REFERENCE REGULATIONS

- **Art. 3.1a Safety:** EN 61010-1:2010/A1: 2010, EN 61010-2-30:2010
- **Art. 3.1b EMC:** EN 55032:2015/A11:2010, EN 55035:2017/A11:2010, EN 61000-3- 2:2019, EN 61000-3-3:2013/A1:2019, ETSI EN 301 489-1 V2.2.3 (2019), ETSI EN 301 489-17 V3.2.2
- **Art. 3.2 Radio:** ETSI EN 300 328
- **Health:** EN 62311

3.2 Installation

Install the JuiceMeter downstream of the distributor's meter and the main circuit breaker to enable measurement of total consumption (see diagram below). The protection and disconnection device of the JuiceMeter will be the general MCB.



1. Read the **Safety Warnings** manual inside the packaging before performing any work on the product.

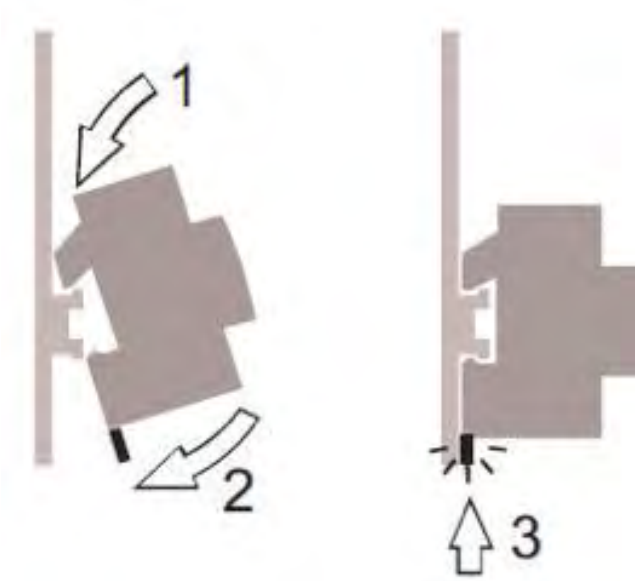
2. Install the product in an electrical cabinet that is accessible only to qualified personnel.

3. Din rail mounting.

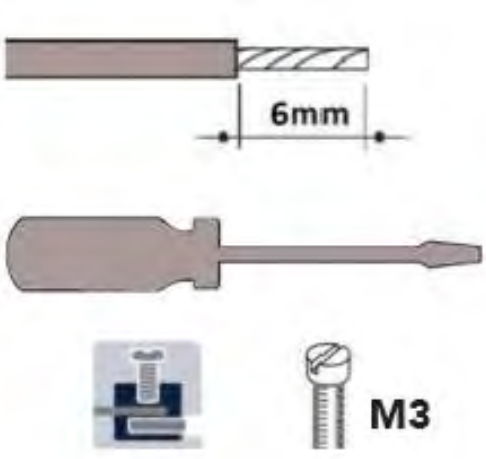
> The product must be installed in a vertical position on a 35mm DIN rail, with the screw terminal facing downwards.

> Leave at least 30mm of space above and below the JuiceMeter, to ensure proper heat dissipation.

> It is not recommended to install the product close to heat sources. If necessary, maintain adequate distance between the JuiceMeter and such heat sources.

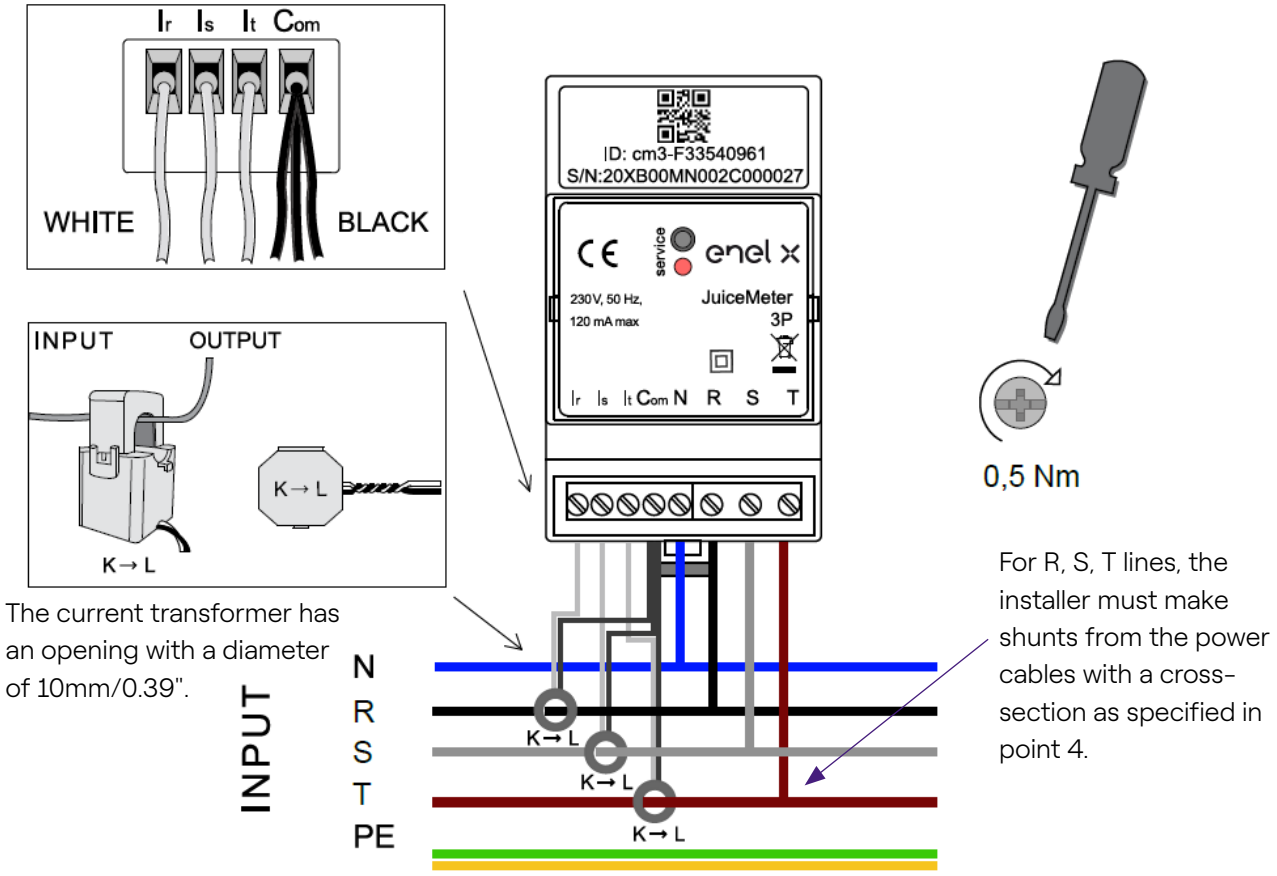


4. Nominal cross-section (min÷max):0.5÷2.5mm2/22AWG÷14AWG



5. Connections:

STANDARD VERSION



THREE-PHASE measurement method: with "split core" current transformers for measuring current, to be connected with the black wires in common on terminal "Com" and the white wires on the respective terminals "Ir", "Is" and "It" as shown in the wiring diagram.

The voltage is measured across terminals “R” and “N”, “S” and “N”, “T” and “N”. The latter pair is also used for the single-phase power supply of the device.

Current transformers: to be installed on the three-phase cables, as shown in the wiring diagram below. Pay attention to the "K → L" marking on the transformers.
Pay attention to the terminals for connecting the current transformers, which are referred to the primary circuit. The current transformers must be wired and used inside the electrical panel that must guarantee insulation for users.

Nameplate data per phase

- **Minimum current:** 100 mA
- **Reference current:** 5 A
- **Nominal range:** 45.5 A; Contracted power up to 10 kW

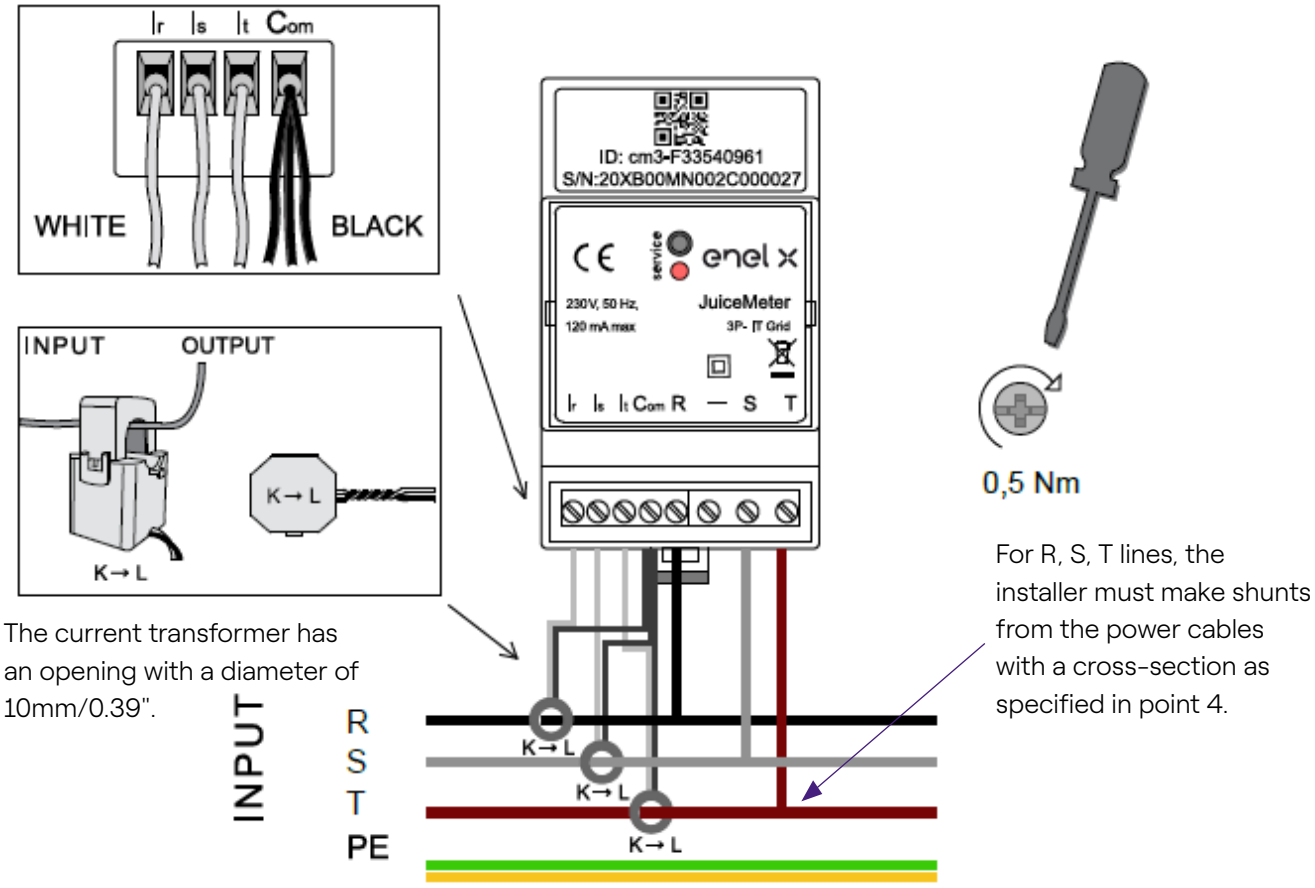
NOTE:

If connected to a single-phase mains, contracted power up to 10kW. Connect the single-phase mains supply to terminals T and N of the JuiceMeter (refer to the relevant configurations in section 3.3 of this manual).

- **Maximum Range for single phase (for short periods only):** 60 A. Power up to 13.8 KW.
- **Accuracy:** class I (±1%) for active energy
- **Measurement category:** CAT II according to EN 61010-2-030

IT GRID VERSION

Three-phase IT system without Neutral, with phase-to-phase voltage 230V.



THREE-PHASE measurement method: with "split core" current transformers for measuring current, to be connected with the black wires in common on terminal "Com" and the white wires on the respective terminals "Ir", "Is" and "It" as shown in the wiring diagram.

Voltage is measured across terminals “R” and “S”, “R” and “T”. The latter pair is also used for the single-phase power supply of the device.

Current transformers: to be installed on the three-phase cables, as shown in the wiring diagram below. Pay attention to the "K → L" marking on the transformers.
Pay attention to the terminals for connecting the current transformers, which are referred to the primary circuit. The current transformers must be wired and used inside the electrical panel that must guarantee insulation for users.

Nameplate data per phase

- **Minimum current:** 100 mA
- **Reference current:** 5 A
- **Nominal range:** 45.5 A; Contracted power up to 10 kW
- **Maximum Range for single phase (for short periods only):** 60 A. Power up to 13.8 KW.

NOTE:
If connected to a single-phase grid, contracted power up to 10kW. Connect the single-phase mains supply to terminals T and R of the JuiceMeter (refer to the relevant configurations in section 3.3 of this manual).

- **Accuracy:** class I (±1%) for active energy
- **Measurement category:** CAT II according to EN 61010-2-030

> ⚠ **WARNING**
> **Check that there is an MCB switch in the main switchboard that is suitable for the protection/disconnection of the JuiceMeter (In max 63 A). If this is not the case, it must be replaced. The MCB must be marked as JuiceMeter disconnecting device.**

POWER-UP AND COMMISSIONING

PLUG&PLAY PRODUCT

Power-up the product.

- FIXED RED SERVICE LED: powered and operational - Active communication and data transmission to JuiceBox.
- Flashing RED SERVICE LED (Fast blink): Modem Power Line fault.
- BLINKING RED SERVICE LED (Slow blink): Measurement Unit fault.
- SERVICE BUTTON: Reset button for the device (press for at least three seconds to restart the device without performing an on-off cycle).

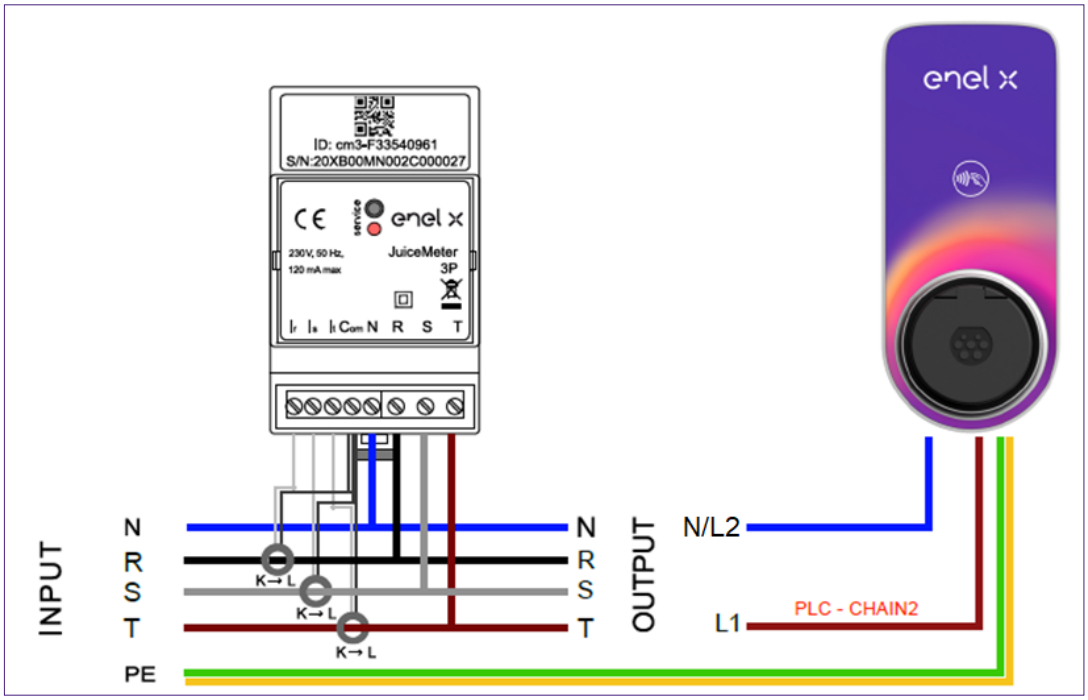
3.3 JuiceBox connection diagrams

STANDARD VERSION

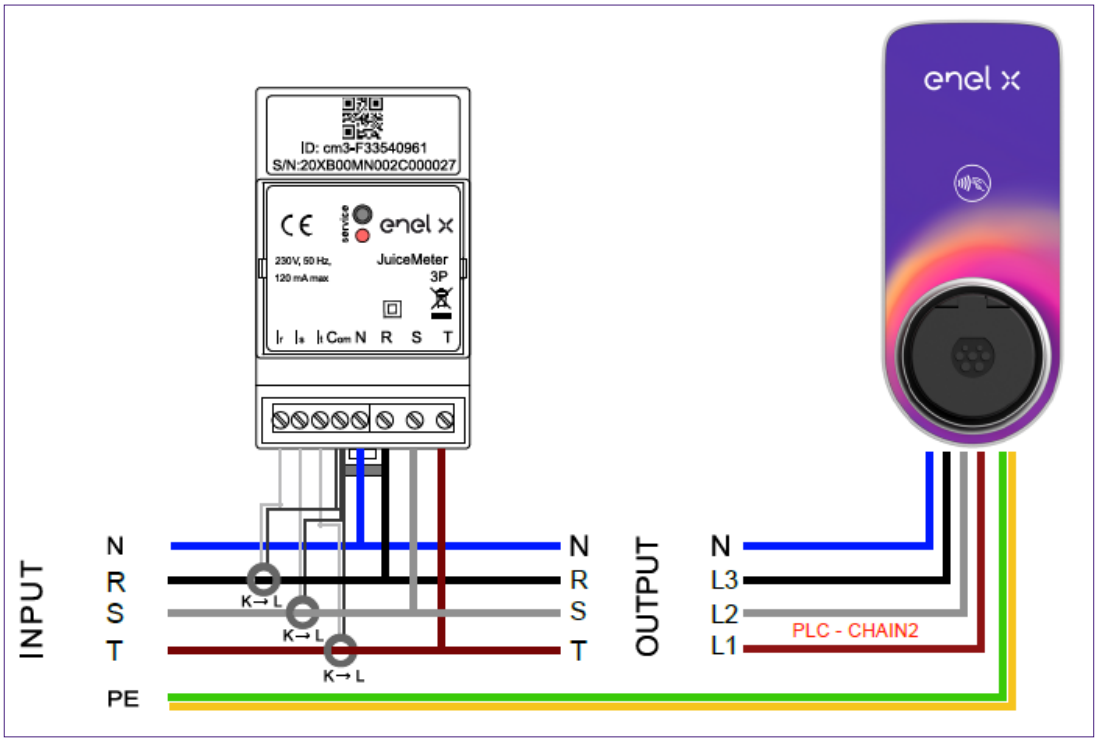
NOTE:

PLC – CHAIN2 communication (*) takes place on connections T- L1 and N.

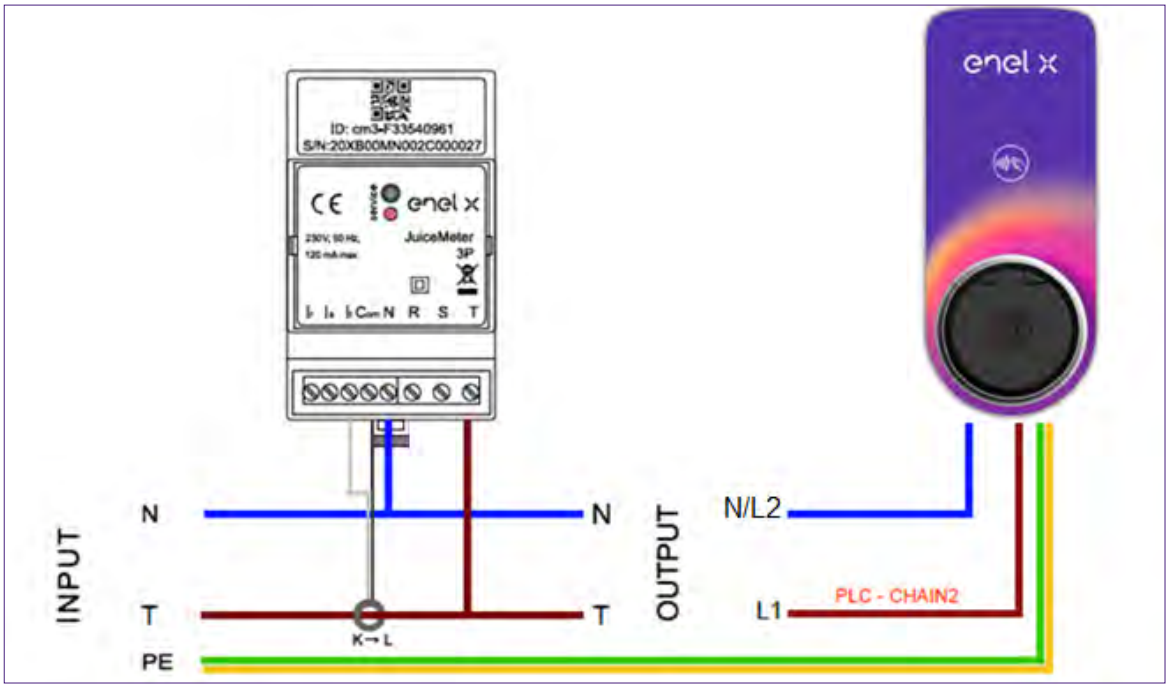
THREE-PHASE JUICEMETER + JUICEBOX 1P (three-phase mains supply)



THREE-PHASE JUICEMETER + JUICEBOX 3P (three-phase mains supply)



THREE-PHASE JUICEMETER + JUICEBOX 1P (single-phase mains supply)



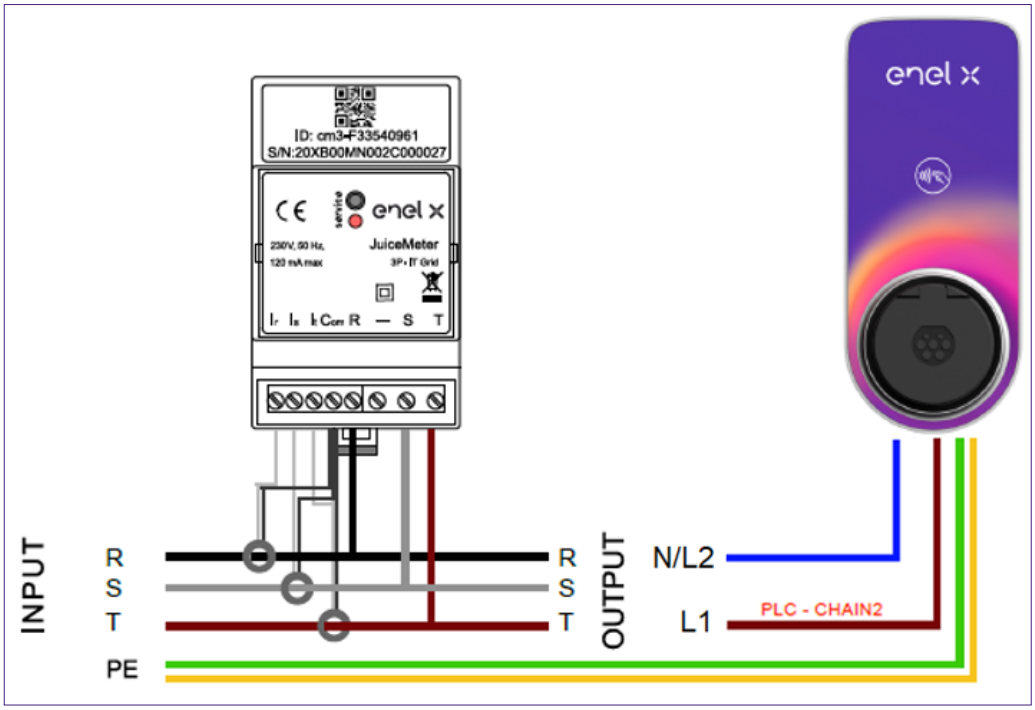
(*) The chain2 protocol is customised with more measurement data than the standard one.

IT GRID VERSION

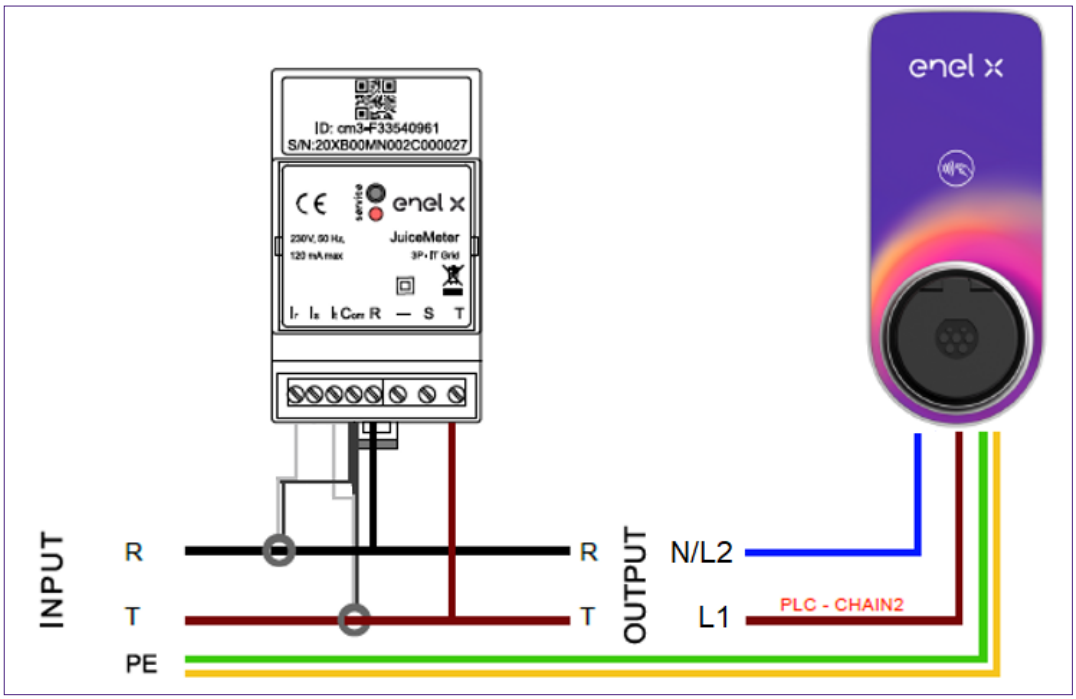
NOTE:

PLC – CHAIN2 communication (*) takes place on connections T- L1 and R.

THREE-PHASE IT GRID JUICEMETER + JUICEBOX 1P (three-phase mains supply)



THREE-PHASE IT GRID JUICEMETER + JUICEBOX 1P (single-phase mains supply)



(*) The chain2 protocol is customised with more measurement data than the standard one.