English

Instruction and operation manual

S 110-P-V2

Power Meter

Dear Customer,

Thank you for choosing our product.

The operating instructions must be read in full and carefully observed before starting up the device. The manufacturer cannot be held liable for any damage which occurs as a result of non-observance or non-compliance with this manual.

Should the device be tampered with in any manner other than a procedure which is described and specified in the manual, the warranty is cancelled and the manufacturer is exempt from liability.

The device is destined exclusively for the described application.

SUTO offers no guarantee for the suitability for any other purpose. SUTO is also not liable for consequential damage resulting from the delivery, capability or use of this device.

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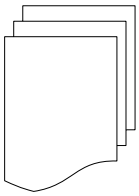
1. Safety instructions



Please check if this instruction manual accords to the product type.

Please observe all notes and instructions indicated in this manual. It contains essential information which have to be observed before and during installation, operation and maintenance. Therefore this instruction manual has to be read carefully by the technician as well as by the responsible user / qualified personnel.

This instruction manual has to be available at the operation site of the power meter at any time. In case of any obscurities or questions, regarding this manual or the product, please contact the manufacturer.

WARNING!

Dangerous Voltage levels!

Any contact with energized parts of the product, may lead to a electrical shock which can lead to serious injuries or even death!

- Consider all regulations for electrical installations.
- The system must be disconnected from any power supply during maintenance work.
- Any electrical work on the system is only allowed by authorized qualified personal.

WARNING!

Permitted operating parameters!

Observe the permitted operating parameters, any operation exceeding this parameters can lead to malfunctions and may lead to damage on the instrument or the system.

- Do not exceed the permitted operating parameters.
- Make sure the product is operated in its permitted limitations.
- Do not exceed or undercut the permitted storage and operation temperature.
- The product should be maintained frequently, at least annually.

General safety instructions

- It is not allowed to use the product in explosive areas.
- Please observe the national regulations before/during installation and operation.

Remarks

- It is not allowed to disassemble the product.

ATTENTION!

Measurement values can be affected by malfunction!

The product must be installed properly and frequently maintained, otherwise it may lead to wrong measurement values, which can lead to wrong results.

Storage and transportation

- Make sure that the transportation temperature of device is between -30°C ... +70°C.
- For transportation it is recommended to use the packaging which comes with the device.
- Please make sure that the storage temperature of the device is between -40°C ... +85°C.
- Avoid direct UV and solar radiation during storage.
- For the storage the humidity has to be <90%, no condensation.

2. Application

The power meter is designed to measures the actual power consumption in kW and accumulates the energy consumption in kWh of a 3-phase load. Additionally other measured parameters such as current, voltage, cos phi etc. are available as well.

3. Features

- Measures active and reactive power, frequency, voltage, currents, power factor.
- Accumulates active energy [kWh].
- 3 phase 3 wire, 3 phase 4 wire, 1 phase 2 wire measurement
- Modbus / RTU output to S 551.

4. Technical Data

4.1 General

CE	
Parameters (rms values)	Voltage of each phase and average voltage [V] Current of each phase and average current [A] Active Power [kW] Reactive Power [kvar] Apparent Power [kVA] Energy (per phase and summery) Power factors Frequency [Hz] Total Harmonic Distortion [%]
Nominal voltage range	100V ... 500V
Power range	up to 2500 kW (depends on Rogowski coil)
Frequency range	50 / 60 Hz
Harmonic	up to 52th
Sampling rate	8 k/sec
Available clamp sensors	Rogowski coil 1 ... 100 A 10 ... 1000 A 30 ... 3000 A

Operating temperature	-25℃ ... +55℃
Storage temperature	-40℃ ... +85℃
Protection class	IP20 conforming to IEC 60629
Dimensions	177 mm x 60 mm x 203 mm (L X W X H)
Weight	822 g

4.2 Electrical Data

Power supply	24 VDC

4.3 Input-Signals

Rogowski Coil	0 mV ... 333 mV

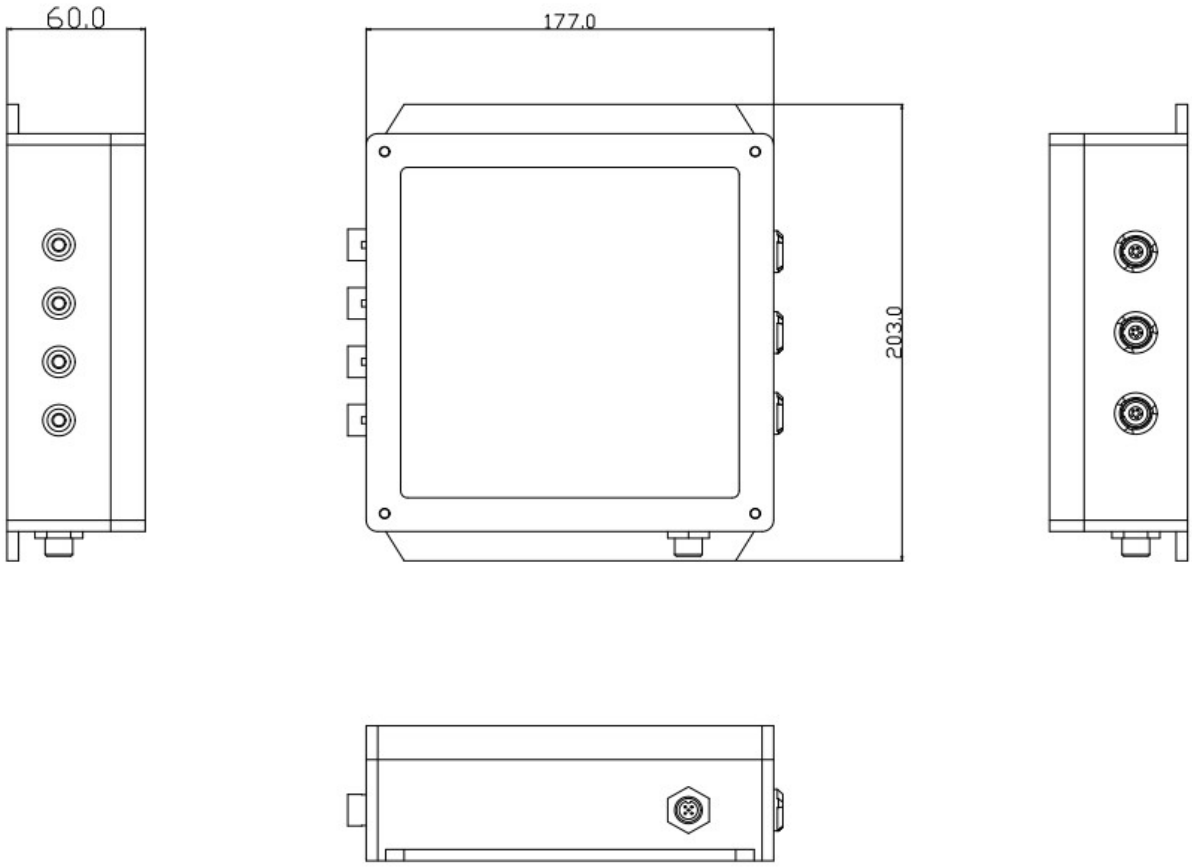
4.4 Output-Signals

Modbus output	See chapter 8.1

4.5 Accuracy

Accuracy	Voltage:	0.2 % (100...500 V)
	Current:	0.5 % (1%...120% of rang.)
	Power factor:	0.005 from 10 ... 120 %
	Frequency:	0.01 % from 45 ... 65 Hz
	Active/Apparent Power:	IEC62053-22 Class 0.5
	Reactive Power:	IEC62053-21 Class 2
	Active Energy:	IEC62053-22 Class 0.5s
	Reactive Energy:	IEC62053-21 Class 2

5. Dimensional drawing (in mm)



6. Installation

Please make sure that all components listed below are included in your package.

Qty	Description	Item No.
1	Power meter S 110-P	P554 0134
3	Rogowski coils	S551 0160 or S554 0161 or S554 0162
4	Test leads	No P/N
4	Test clips	No P/N
1	5 m cable with connector to S 551.	A553 0111
1	Instruction manual	No P/N

6.1 Installation Requirements

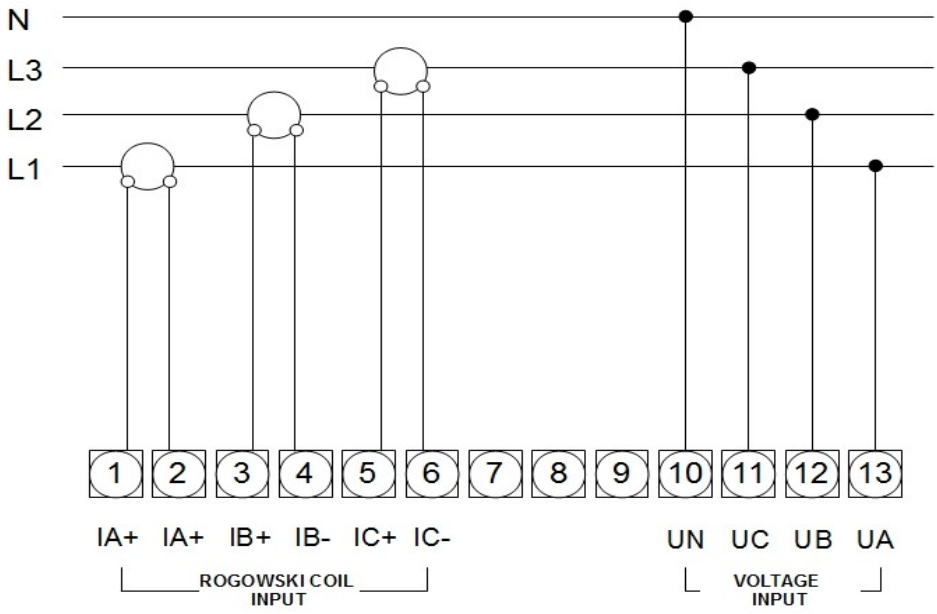
ATTENTION!

Wrong measurement is possible, if the device is not installed correctly.

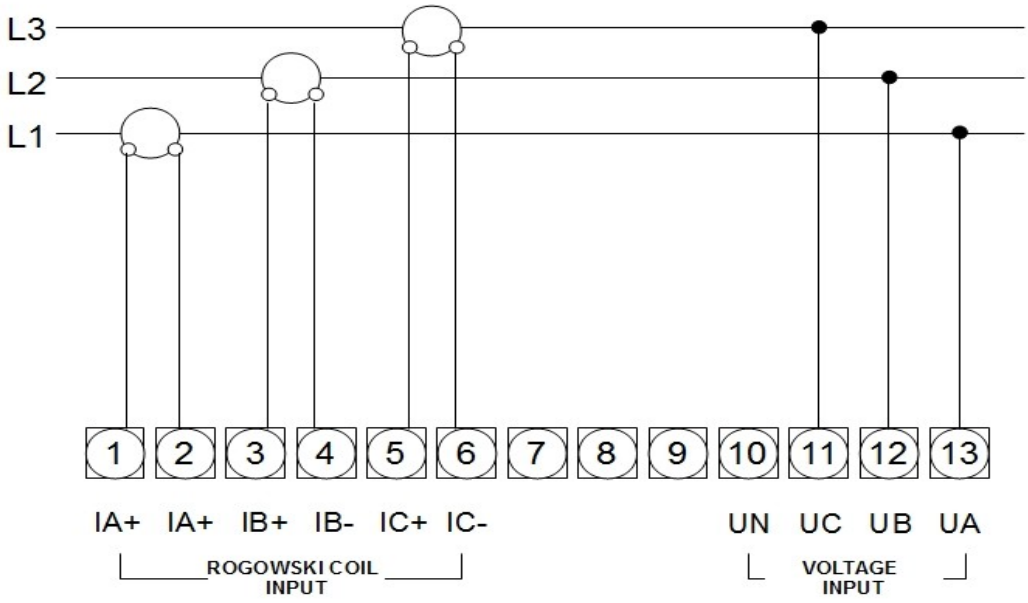
- The device is for indoor use only! At an outdoor installation, the device must be protected from solar radiation and rain.
- It is strongly recommend not to install S 110-P in wet environment.

6.2 Voltage and current connection

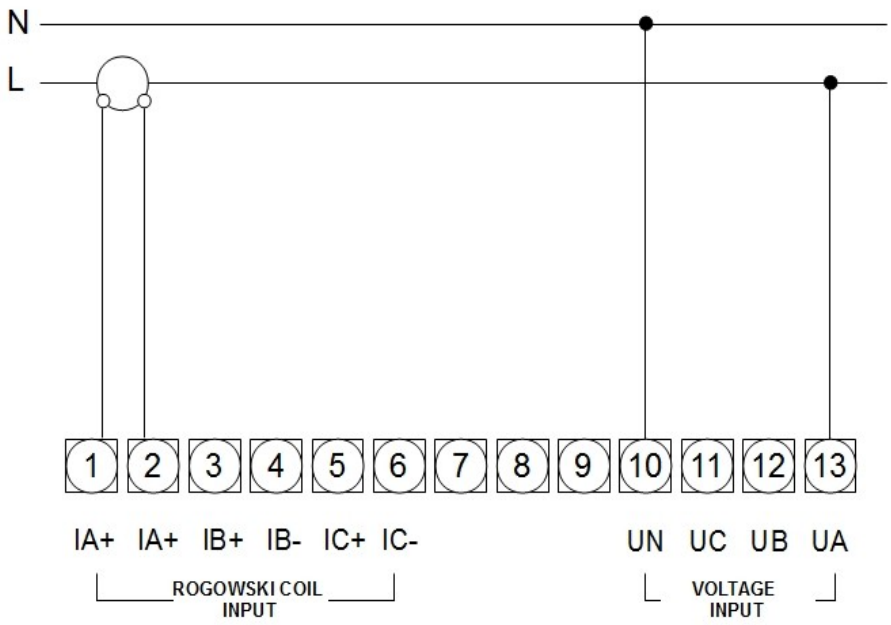
6.2.1 3-phase / 4-wire connection



6.2.2 3-phase / 3-wire connection



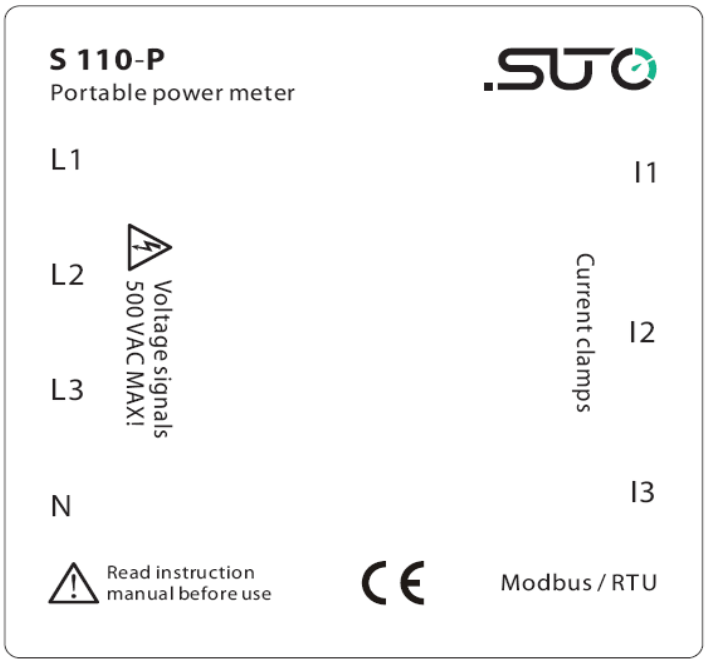
6.2.3 1-phase / 2-wire connection



6.3 Electrical connection

The portable power meter S 110-P is connected to the portable data logger S 551. For the electrical installation please observe the following instructions.

Voltage leads connection with 4 mm plugs

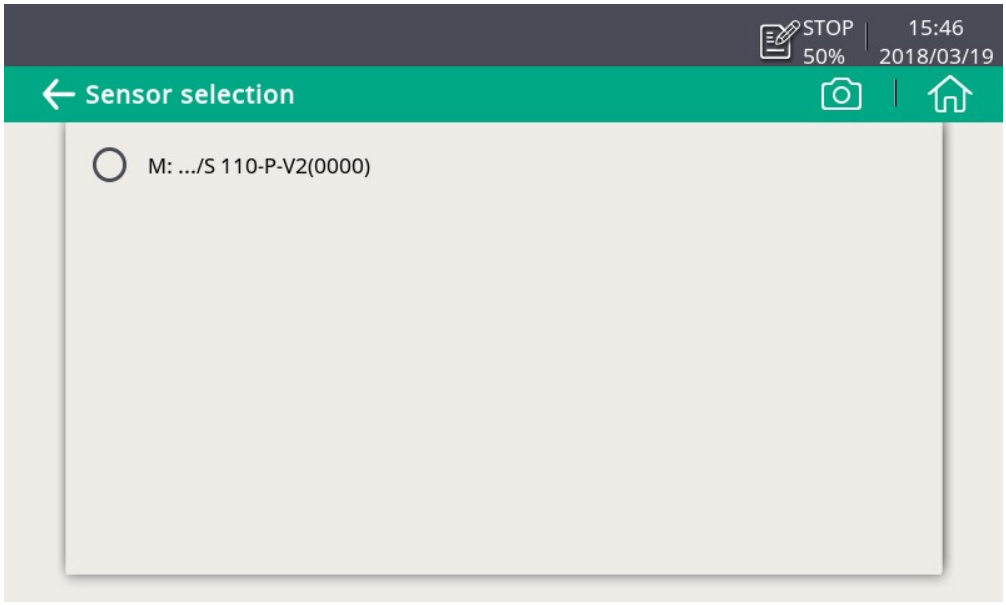


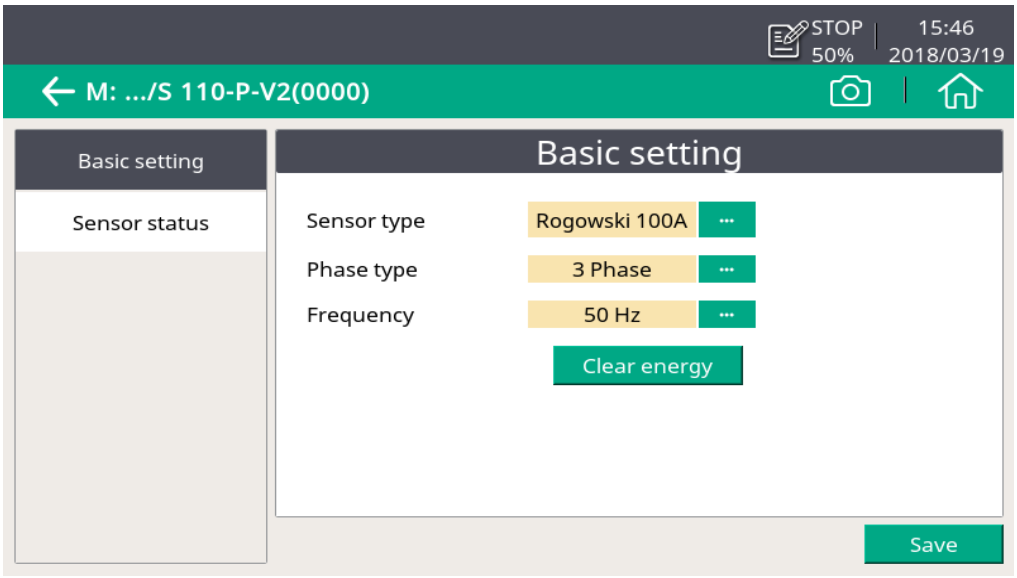
Coil connection with 2 pole round connector in yellow.

Connection to S 551 via Modbus / RTU.

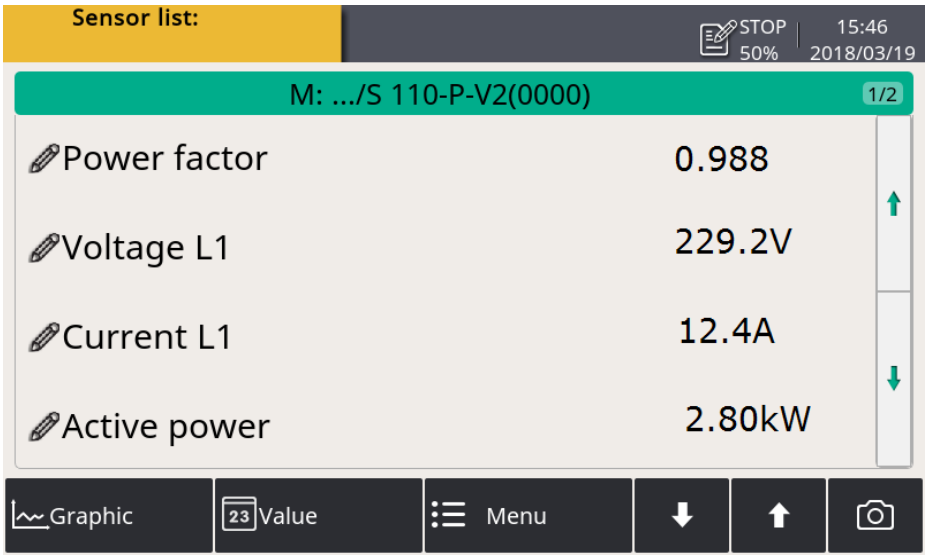
6.3.1 Connection to S 551

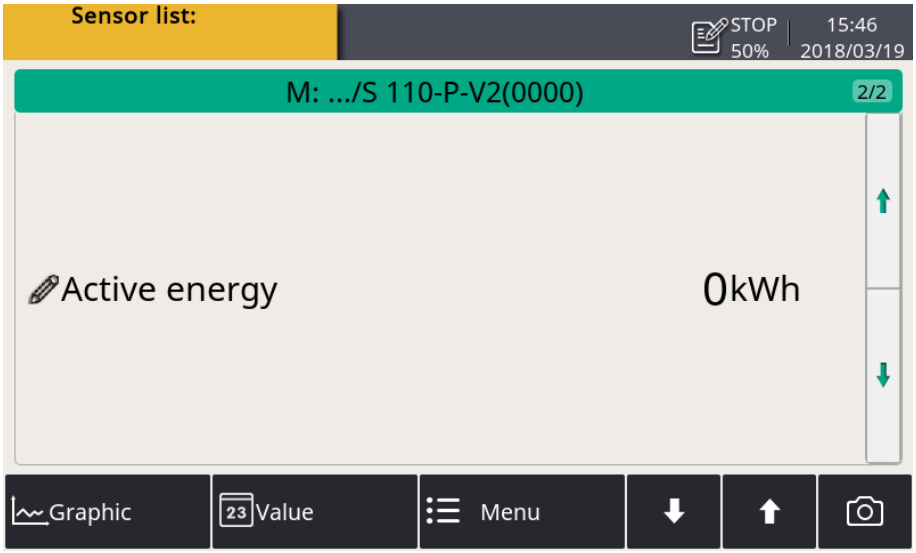
1. Connect the S 110-P with the S 551 via modbus port.
2. Power on S 551 and then the S 110-P will be detected automatically.
3. Press the “Menu” button on the interface of S 551 and select the sensor type of clamp current sensor. For this please have a look at the picture below.





4. By pressing the “Value” button the online view will be shown. Use the arrows to see all windows.



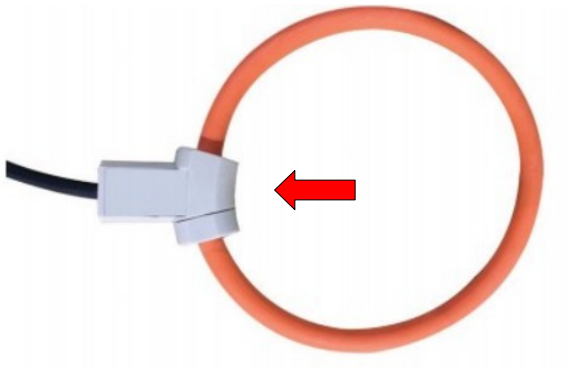


6.3.2 Connection to the Rogowski coils

Please observe the following steps to connect the coils.

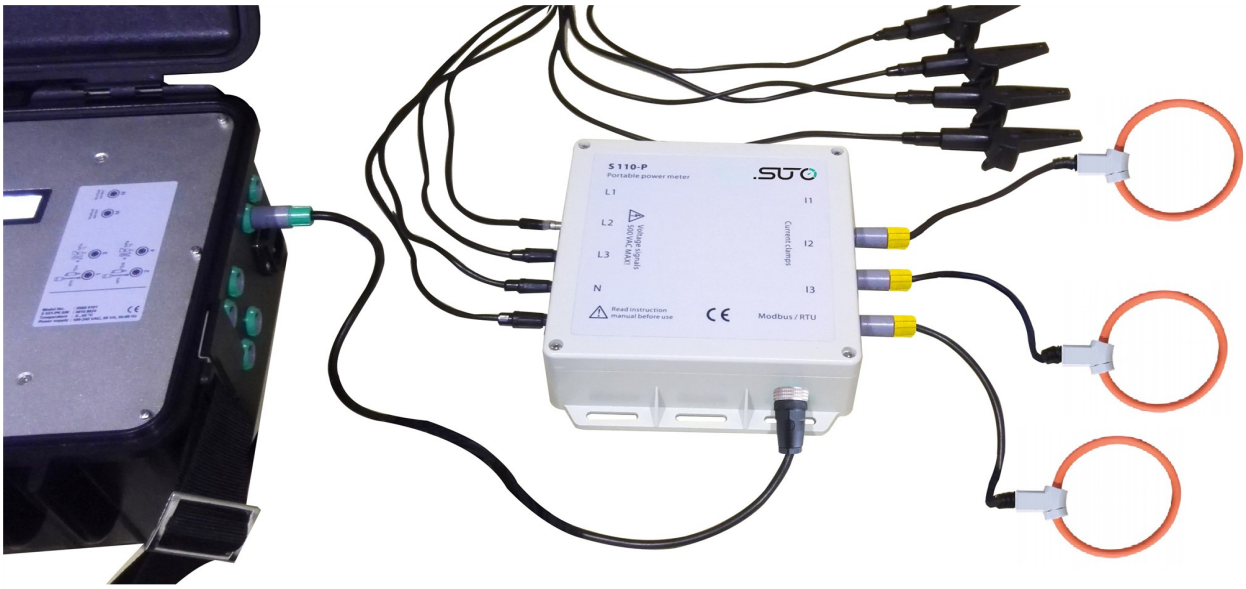
1. Place the coil's around the isolated conductor. If the conductor is too small, use a fastener to fix the coil as indicated in the picture below.
2. Take care of current orientation, There is an arrow on body to indicate direction.
3. Connect the black color wire to the IX+ terminal and the blue color to the IX- terminal.

Coils for S 110-P:



Arrow indication on the grey plastics for the current direction!

Typical connection for the S 110-P:



6.3.3 Connection to the Voltage leads

For S 110-P connect the voltage leads (L1, L2, L3 and N) to the 3 phase conductors. Connect N if a 4-wire connection is required.

7. Optional extra accessories

For the particular type the following extra accessories are available:

- Transport case S 551 for sensors and cables.

7.1 Extra accessories for S 110-P

- Rogowski coil, 1000 A, 100 mm diameter, 1.8 m cable, connector to S 110-P.
- Rogowski coil, 3000 A, 150 mm diameter, 1.8 m cable, connector to S 110-P.
- Rogowski coil, 100 A, 16 mm diameter, 1.8 m cable, connector to S 110-P.

8. Maintenance

To clean the power meter it is recommended to use moist cloth only.

ATTENTION!

Do not use isopropyl alcohol to clean the power meter!

9. Disposal or waste

Electronic devices are recyclable material and do not belong in the household waste.
The power meter, the accessories and its packings must be disposed according to your local statutory requirements. The dispose can also be carried by the manufacturer of the product, for this please contact the manufacturer.

10. Warranty

SUTO provides a warranty for this product of 24 months covering the material and workmanship under the stated operating conditions from the date of delivery. Please report any findings immediately and within the warranty time. If faults occurring during the warranty time SUTO will repair or replace the defective unit, without charge for labour and material costs but there is a charge for other service such as transport and packing costs.
Excluded from this warranty is:

- Damage caused by:
  - Improper use and non-adherence to the instruction manual.
  - Use of unsuitable accessories.

- External influences (e.g. damage caused by vibration, damage during transportation, excess heat or moisture).

The warranty is cancelled:

- If the user opens the measurement instrument without a direct request written in this instruction manual.
- If repairs or modifications are undertaken by third parties or unauthorised persons.
- If the serial number has been changed, damaged or removed.

Other claims, especially those for damage occurring outside the instrument are not included unless responsibility is legally binding.

Warranty repairs do not extend the period of warranty.

ATTENTION!

Batteries have a reduced warranty time of 12 month.

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S110-P-V2_im_en_2018-2