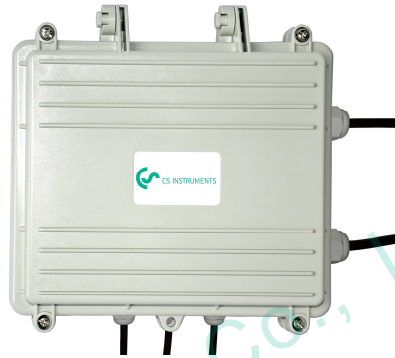


CS 110 Power Meter



CS 110 hat rail power meter



CS 110-P connectable to DS 350-P



Features

- Measures active and reactive power, frequency, voltage, currents power factor
- Accumulates active energy [kWh]
- 3 phase-3 wire measurement as well as 3 phase-4 wire
- Modbus/RTU output to DS 350/330
- 24 VDC supply
- Wall mountable, hat rail and portable unit available

The CS Power Meters are designed for easy installation and high accuracy. It 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. Through 3 clamp sensors the current is sensed. Hat rail, wall mountable and portable versions are available.

General information

Important information



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.

Danger!



HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Follow safe electrical work practices and local codes
- This equipment must only be installed and serviced by qualified electrical personnel.
- Read, understand and follow the instructions before installing this product.
- Turn off all power supplying equipment before working on or inside the equipment.
- Use a properly rated voltage sensing device to confirm power is off. **DO NOT DEPEND ON THIS PRODUCT FOR VOLTAGE INDICATION**
- Only install this product on insulated conductors. **Failure to follow these instructions will result in death or serious injury.**

Caution



RISK OF EQUIPMENT DAMAGE

CS 110 rated for use at 45-65 Hz. Do not connect this product to circuits with high harmonic energy, such as Variable Speed Drives (a.k.a. Variable Frequency Drives, Adjustable Frequency Drives) or similar sources, as these may permanently damage the product.

Failure to follow these instructions can result in overheating and permanent equipment damage.

Installation

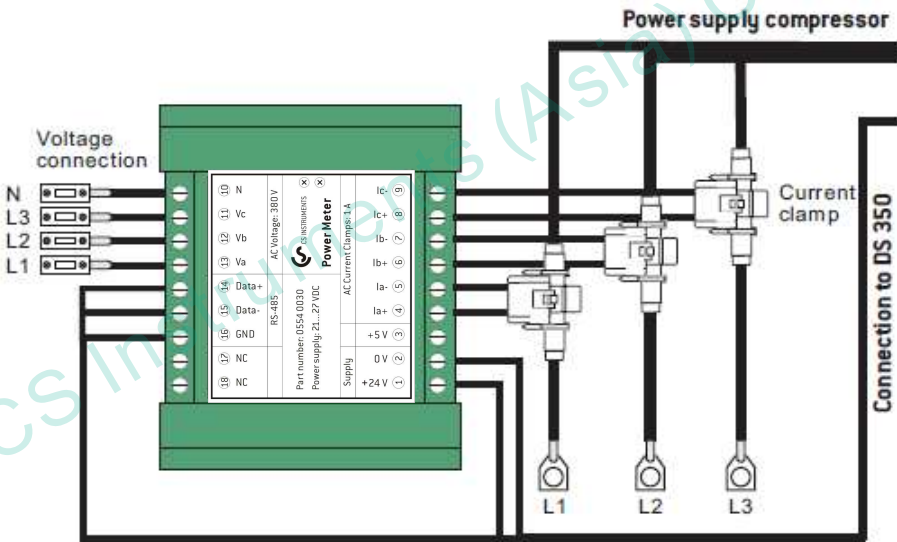
Installation and operation



The measuring device must only be installed, connected, commissioned and maintained by qualified and authorized specialists (e.g. electrical technicians) in full compliance with the instructions in this manual, the applicable norms, legal regulations and certificates (depending on the application).

The measuring device may only be modified or repaired if such work is permitted in this instruction manual.

In order to achieve and maintain the accuracy stipulated in the technical data, the sensor must be installed according to the instructions in this manual.




1. Connection to DS 350/330

Connect the power supply and the RS-485 signals of the Modbus between DS 350/330 and CS 110. See wiring section. For the portable version of CS 110 just connect the connection cable to DS 350-P.

For the power supply connection DS 350/330 offers up to 4 available terminals, only one of them has to be used.

For RS-485 (Modbus) connection DS 350/330 offers up to 2 available terminals, only one of them has to be used.

DS 350/330			CS 110	
Terminal	Pin	Signal	Signal	Pin
G	8	+Vb	+24V	1
	7	-Vb	0V	2
I	5	+Vb	+24V	1
	4	-Vb	0V	2
E	9	+Vb	+24V	1
	8	-Vb	0V	2
F	9	+Vb	+24V	1
	8	-Vb	0V	2
D	1	Data+	Data+	14
	2	Data-	Data-	15
	3	Shield	GND	16
	4	Data+	Data+	14
	5	Data-	Data-	15

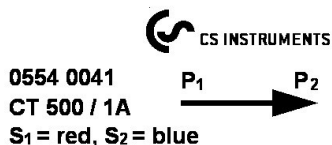
⑮	⑰	⑯	⑮	⑭	⑬	⑫	⑪	⑩
NC	NC	GND	Data-	Data+	Va	Vb	Vc	N
RS-485					AC Voltage: 380 V			
Part number: 0554 0030					 CS INSTRUMENTS (X) Power Meter (X)			
Power supply: 21...27 VDC								
Supply			AC Current Clamps: 1 A					
+24 V	0 V	+5 V	Ia+	Ia-	Ib+	Ib-	Ic+	Ic-
①	②	③	④	⑤	⑥	⑦	⑧	⑨

Above is the terminal arrangement of CS 110. Please connect the wiring to DS 350/330 as described in the table on the left. The terminal description of DS 350/330 can be found in the related instruction manual.

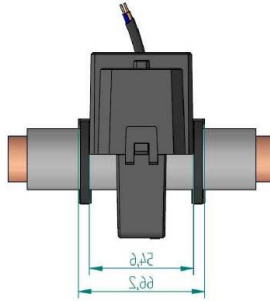
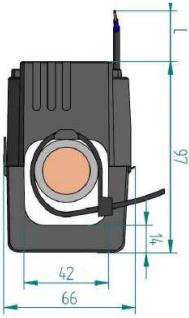
2. Connect the current clamps (CT)

Snap the CT onto the conductor. Observe the right orientation (current flow arrow on CT points to the consumer load side) on the CT. Connect the red color wire to the (I+) terminal and the blue color one to the (I-) terminal.

CT		CS 110	
Conductor	Color	Signal	Pin
L1	Red	Ia+	4
	Blue	Ia-	5
L2	Red	Ib+	6
	Blue	Ib-	7
L3	Red	Ic+	8
	Blue	Ic-	9



Above is the label printed on the CT. Please ensure that the arrow points to the consumer (motor, compressor)!



Place the CTs around the isolated conductor. If the conductor is too small, use a fastener to fix the CT as indicated in the picture.

3. Connect the Voltage leads

Connect the voltage leads (L1, L2, L3, N) to the 3 phase conductors. Connect N if a 4-wire connection is required. **(default is 3 wire / 3 phase)**

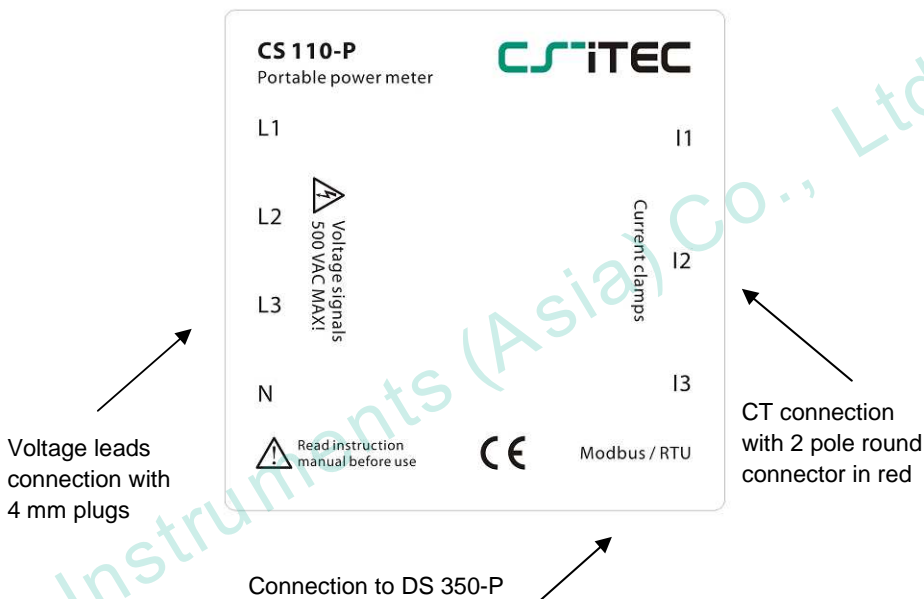
Danger!



CT		CS 110	
Conductor	Signal	Pin	
L1	Va	13	
L2	Vb	12	
L3	Vc	11	
N	N	10	

Connection of CS 110-P

The portable power meter CS 100-P is connected to the portable data logger DS 350-P. It comes with the required cables, leads and clips. The CTs are equipped with a connector (red color). See below the connection.



Configuration of DS 350/330, DS 350-P

CS Instruments provides a configuration software CSC-350 which can be downloaded from the web page: www.csinstrument.com.

Ex factory a standard setting is prepared and the user need this software only if a setting change is required.

The portable version CS 110-P can be connected to DS 350-P and will be detected automatically. user can select which type he is using at the user interface of DS 350-P.

Technical data CS 110

Nominal voltage [L-N / L-L]	277 / 480 VAC
Clamp sensor input range	0 ... 1 A
Available clamp sensors	200 A, 500 A, 1000 A
Power range	Up to 690 KW (depending on current clamp)
Frequency range	45 ... 65 Hz
Accuracy	Voltage: 0.2% Current: 0.5% Clamp sensor: class 1 Energy: class 0.5
Operating temperature	-5 ... +55 °C
Output	Modbus/RTU
Output signal	4...20 mA, 3-wire Relay: NO, 32 V / 500 mA
Classification	IP65 (wall casing)
Dimensions	Hat rail version: 110x90x31 mm Wall version: 190x155x85 mm Portable: 177x177x60 mm
Installation category	CAT II or CAT III

Warranty

CS 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 guaranteed by us.

Excluded from this warranty is damage caused by improper use and non-adherence to the instruction manual.

The warranty is also cancelled once the measuring instrument has been opened provided this is not described in the instruction manual for maintenance purposes. This is also the case if the serial number has been changed, damaged or removed.

If in addition to the warranty service necessary repairs, adjustments or similar are carried out, the warranty services are free of charge but there is a charge for other services such as transport and packing costs. Other claims, especially those for damage occurring outside the instrument are not included unless responsibility is legally binding.

Order information

Order no.	Description
0554 0030	Power meter CS 110, hat rail, 24VDC, Modbus/RTU
0554 0033	Power meter CS 110-W, 24VDC, Modbus/RTU, wall mountable
0554 0034	Portable power meter CS 110-P, Modbus/RTU, including 4 test leads, 4 test clips, 5 m cable with connector to DS 350-P
0554 0040	Current clamp sensor, 1.8 m cable, 200/1A
0554 0041	Current clamp sensor, 1.8 m cable, 500/1A
0554 0042	Current clamp sensor, 1.8 m cable, 1000/1A
0554 0061	Current clamp sensor, 1.8 m cable, 200/1A, connector to CS 100-P
0554 0062	Current clamp sensor, 1.8 m cable, 500/1A, connector to CS 100-P
0554 0063	Current clamp sensor, 1.8 m cable, 1000/1A, connector to CS 100-P
0554 0035	Transport case DS 350-P for sensors and cables

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