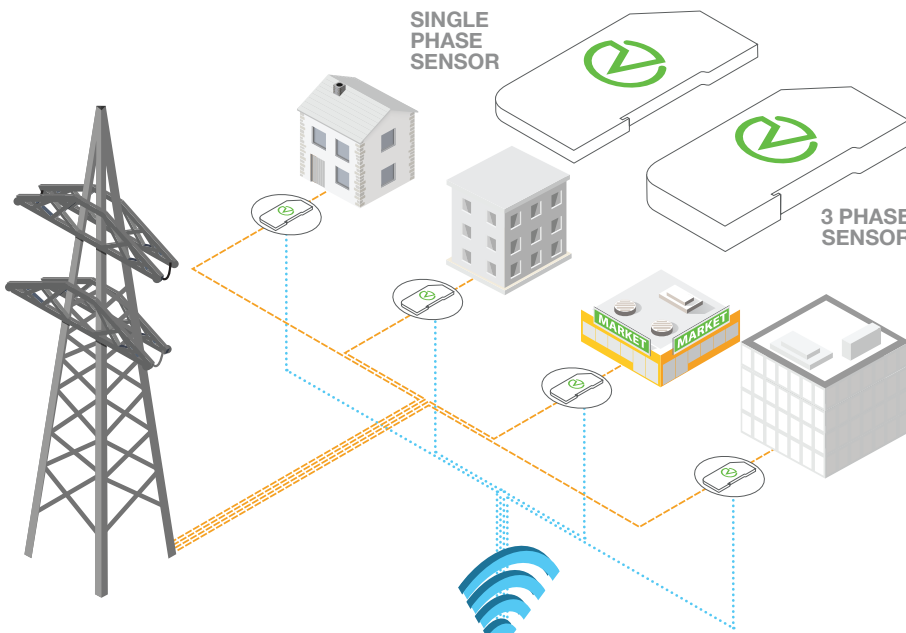


Energy monitoring

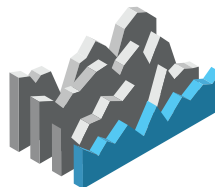
MONITORING



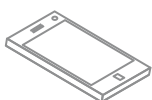
STORAGE



ANALYSIS



MOBILE APP



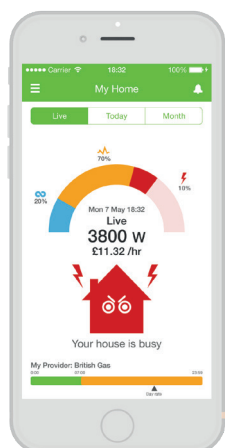
CUSTOM DASHBOARD



INTEGRATED API



MEASUREMENT AND COMMUNICATION OF DATA



A simple installation

The Voltaware single phase and three phase sensors are quick and easy to install with minimum disruption to your supply. Clamp or clamps are placed around the mains cable and voltage detectors are magnetically located on the appropriate fuses. The transmitter is small enough to fit unobtrusively inside most fuseboxes. The transmitter connects securely your local WiFi network or via GSM and immediately starts sending live data to our servers. You can be connected in 5 minutes.

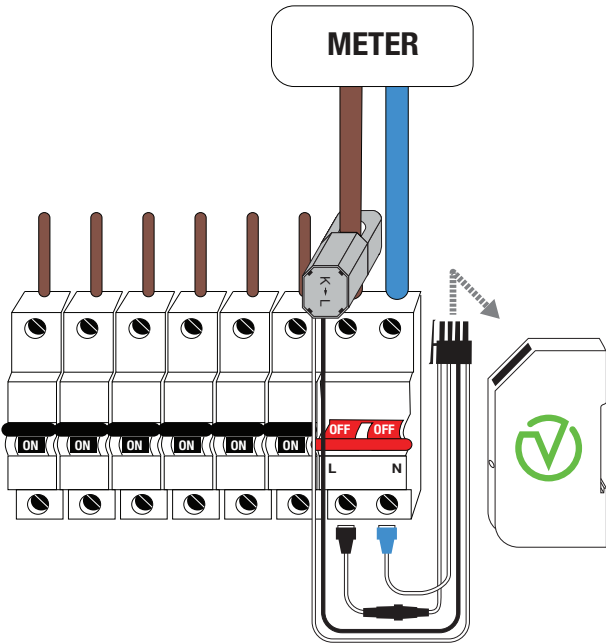
Data analysis

Total consumption and cost data is available immediately; live, daily, or monthly. Our machine learning algorithm takes about a week before it begins to identify appliances by their electrical signatures. We use artificial intelligence to model consumer behaviour and this allows us to deliver periodic detailed breakdowns of cost and consumption.

Data where you need it

Voltaware electricity monitoring data is available to you anywhere via our free iOS and Android app available at Google Play and the App Store but for larger installations we can develop custom dashboards. Or you can integrate our data into your own systems using our API.

Single Phase sensor



ELECTRICAL CHARACTERISTICS

Operating voltage:	85 - 250 V ac
Operating frequency:	50 - 60 Hz
Power consumption (typical):	1 W
Wireless connectivity:	IEEE 802.11n/g/b 2.4 GHz
Supported current transformers:	30/60/100 A
Maximal power measured:	7.5/15/25 kW

MEASURED QUANTITIES

Voltage
Current
Active Power
Apparent power
Current harmonics
Voltage Harmonics
Phase
Energy*
Event Based**

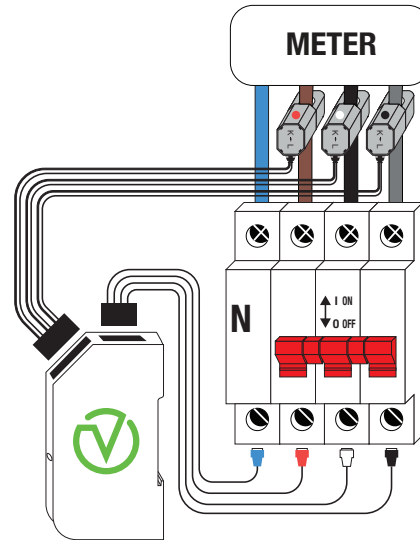
*Incremental metered value of total consumption in watt-hours and backed up locally in the sensor.

**Sensor transmits a data packet every time there is a step in current (event based) or every 2 min 40 s.

MECHANICAL CHARACTERISTICS

Case dimensions:	83 × 56 × 7 mm
Mounting:	Top hat rail EN 50022 – 35 × 15

Three-phase sensor



ELECTRICAL CHARACTERISTICS

Operating voltage:	85 - 250 V ac / phase (147-433 V ac 3-phase systems with neutral)
Operating frequency:	50 - 60 Hz
Power consumption (typical):	1 W
Wireless connectivity:	IEEE 802.11n/g/b 2.4 GHz
Supported current transformers:	100 A / phase
Maximal power measured:	25 kW / phase

MEASURED QUANTITIES

Voltage
Current
Active Power
Apparent power
Reactive power
Current harmonics
Voltage Harmonics
Frequency
Phase
Energy*
Event Based**

MECHANICAL CHARACTERISTICS

Case dimensions:	87 × 56 × 16 mm
Mounting:	Top hat rail EN 50022 – 35 × 15

Single Phase Energy Monitor

Installation guide



single
phase



Warning!

- Voltages dangerous to human health are involved in the installation of the Voltaware Energy Monitor. Follow all warnings provided in this pamphlet to ensure your own safety.
- A qualified electrician must install the Voltaware Energy Monitor. Voltaware will not be held responsible for failure to follow these guidelines.
- Do not install the Energy Monitor if the mains supply voltage is outside of the nominal operating voltage range.
- You should never, under any circumstances, install or allow your Voltaware Energy Monitor to be installed with the mains electricity switched on. There is a risk of explosion, fire and electric shock if this is ignored.
- Installation must comply with electrical standards and approved codes of practice for the country or region where the installation is taking place.
- The incoming cables feeding the main switch (marked 'X' in Fig. 3) always remain connected to the mains even when the switch is turned OFF. This means that the 'source' terminals (see terminals on the upper side) are always live. Do not attempt to connect the line and neutral magnetic connectors to these inputs. Connect the connectors on the load side of the main circuit breaker (see terminals on the lower side). These outputs are always inactive when the main switch is off.
- Do not tamper with the installation of the Energy Monitor while the mains electricity is switched on.
- Do not dispose of in fire.
- Do not allow the Energy Monitor to come into contact with water.
- Do not leave the Energy Monitor in direct sunlight or near sources of heat.
- Do not install the Energy Monitor if you see any apparent damage on the transceiver, cable or its parts.

EU Declaration of Conformity (DoC)

Company name Voltaware Services Limited
Postal address 282 Earls Court Road
Postcode and City London, UK, SW5 9AS
Telephone +44 (0) 20 74601521
E-Mail address support@voltaware.com

We declare that the DoC is issued under our sole responsibility and belongs to the following product:

Apparatus model: VOLTA1P
Product Type: Energy Monitor
Code no. 1PEU001
Hardware Revision 1.5

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Directive 2014/53/EU

The following harmonised standards and technical specifications have been applied:

Health & Safety (Directive 2014/53/EU Art. 3.1(a))

EN 60950-1 2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013
EN 61010-1 2010 (3rd Edition)
EN 62311 2008

EMC (Directive 2014/53/EU Art. 3.1(b))

EN 301 489-1 V2.1.1
EN 301 489-17 V3.1.1
EN 61326-1 2013

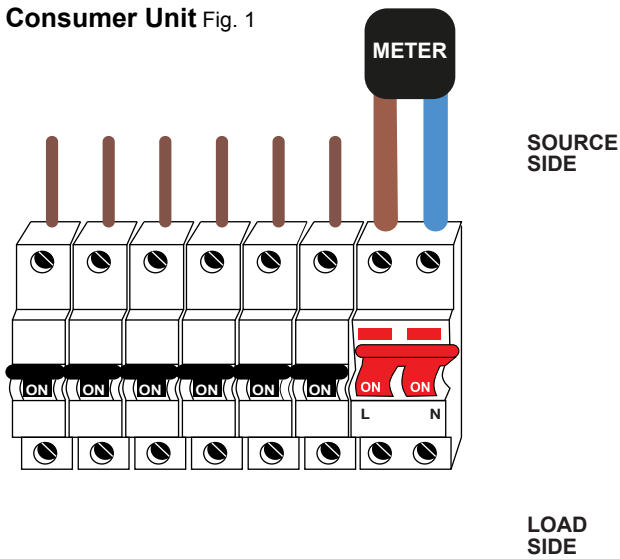
Radio Spectrum (Directive 2014/53/EU Art. 3.2)

EN 300 328 V2.1.1

Signed for and on behalf of Voltaware Services Limited
London, 13/04/2018

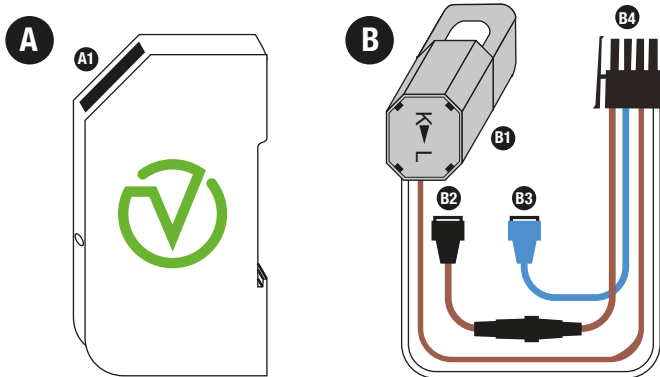
Rishabh Jaipuria
COO

Consumer Unit Fig. 1



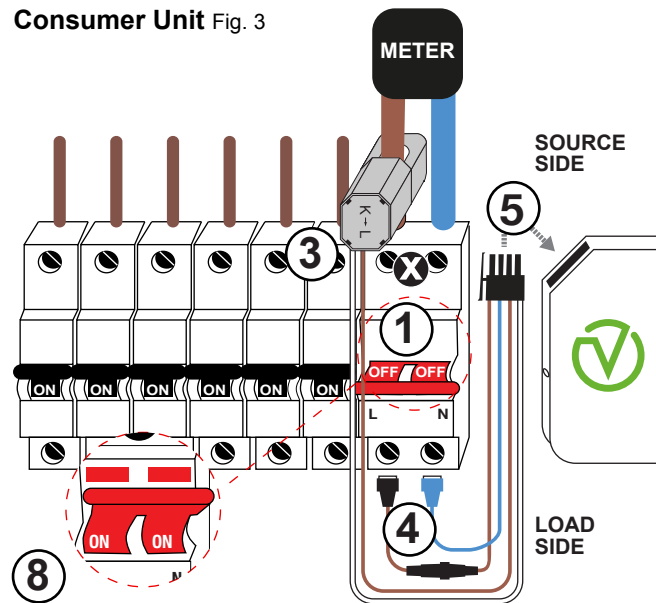
Consumer units can vary considerably. There will be differences between the consumer unit you are working on and the example presented in this guide.

Energy Monitor Components Fig. 2



- A Transceiver
- A1 4-pin Female Connector
- B Cable Assembly
- B1 Current Clamp
- B2 Line voltage magnetic probe
- B3 Neutral voltage magnetic probe
- B4 4-pin Male Connector

Consumer Unit Fig. 3



Before installation, please make sure you have read the installation guide and understood the instructions. Numbers correspond to steps in the *Installation Step-by-Step Guide*.

Please note

The Transceiver (A in Fig. 2) will be powered through the magnetic connectors (B2 and B3 in Fig. 2) connected respectively to the Line output and to the Neutral output of the main switch (see terminals with screws on load side).

Electrical Characteristics

Operating voltage	85 - 250 Vac
Operating frequency	50 - 60 Hz
Power consumption	Max 1.5 W
Operating Temperature	-20°C to +60°C

Requirements

WiFi connection supporting IEEE 802.11b/g/n and Open, WPA/WPA2 or WPA2 security.

Support

Additional support is available on at www.voltaware.com. To speak to a member of our technical team contact support@voltaware.com

Installation Step-by-Step Guide

- 1 Completely switch off the power.
- 2 Remove the cover from the consumer unit to gain full access to the electrical system.
- 3 Open the Current Clamp (B1 in Fig. 2) and install it around the Line cable (usually brown, black or grey). Make sure that the arrow on the back of the body of the clamp (between the letters "K" and "L") points in the direction of energy flow (source to load). The clamp must be completely closed for its correct operation.
- 4 Identify Line and Neutral outputs on the load of the main circuit breaker. Connect the blue magnetic connector on the screw of the Neutral terminal, then also the black magnetic connector (with a fuse on the wire) on the screw of the Line terminal. It is important that the magnetic connectors (B2 and B3 in Fig. 2) are connected the correct way around. Note: If hard-wired installation is required, the magnetic connectors can be removed (cut off). Please follow relevant electrical wiring guidelines when connecting the wires to the installation.
- 5 Insert the 4-pin male connector into the 4-pin female connector on the Energy Monitor (A1 in Fig. 2).
- 6 We suggest to clip the Energy Monitor directly on the DIN rail if available.
- 7 Visually check that the installation of the Energy Monitor has been done correctly.
- 8 Switch the mains back on. If the Energy Monitor is correctly powered it will emit a blue light, which indicates that it is ready to be configured and connected to the WiFi network.
- 9 After completing the procedure of connecting to the desired WiFi network (steps 10 to 16), refit the cover on the electrical panel.

Connecting to the local network

Follow the steps below to connect your Energy Monitor to your WiFi network.

- 10 Make sure your router security is set to WPA2 or WPA/WPA2. Please consult your WiFi router manual for more information.
- 11 On your PC or connected mobile device, do a WiFi scan for the network: VOLTA_XXXX (where 'XXXX' represents the Device ID). The Device ID is shown inside the box and on the label of the Energy Monitor.
- 12 Select this network and connect using the password: byttwm2015
- 13 Open an internet browser and enter the IP address 192.168.10.1 in the address bar. Press Enter. Please note Mobile Data must be disabled.
- 14 The Voltaware 'Provisioning' web page will appear.
- 15 Select the local WiFi network and enter the WiFi password.
- 16 Once the previous steps have been successfully completed, the Energy Monitor will start working and its LED light will turn green.

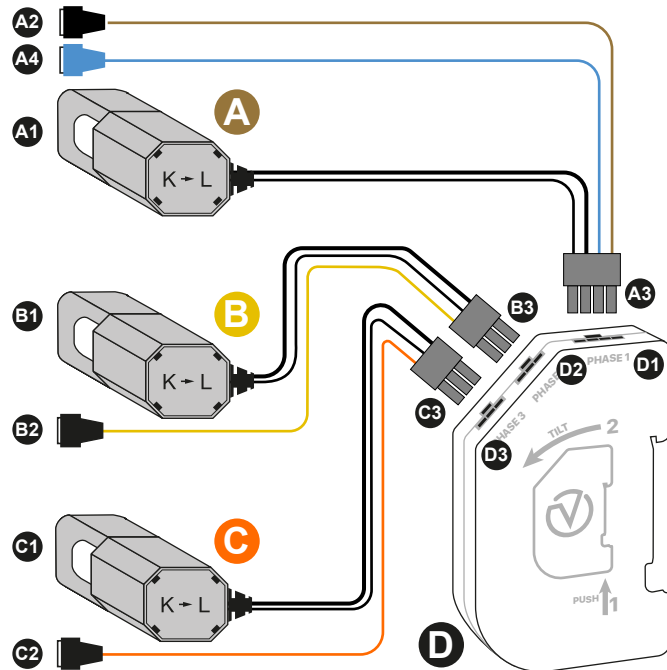
3 Phase Sensor Installation guide

Please visit www.voltaware.com for further support



3 phase

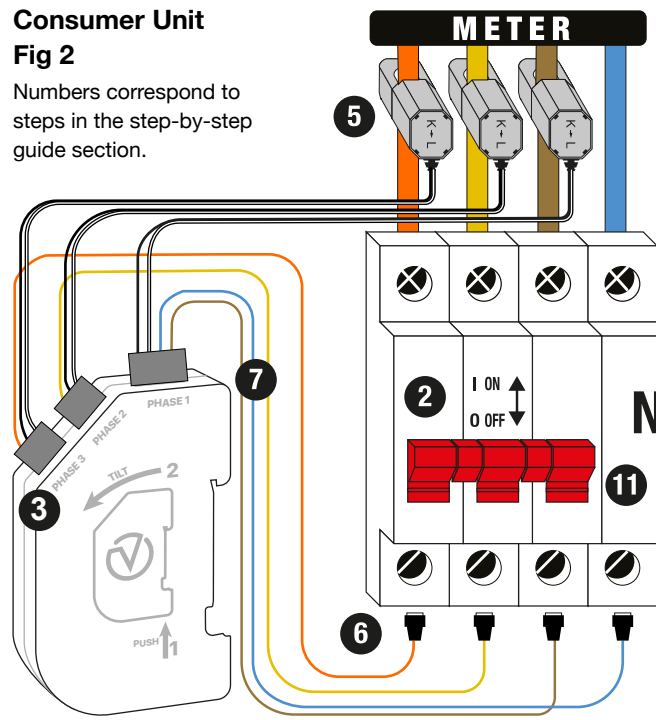
Sensor Components Fig. 1



Consumer Unit

Fig 2

Numbers correspond to steps in the step-by-step guide section.



Sensor components Fig 1

- A Phase 1 Cable
 - A1 Phase 1 Current Clamp
 - A2 Phase 1 Line voltage magnetic probe
 - A3 Phase 1 Male connector
 - A4 Phase 1 Neutral voltage magnetic probe
- If you are installing on single phase you will only need to fit the Phase 1 Clamp and Cable
- B Phase 2 Cable
 - B1 Phase 2 Current Clamp
 - B2 Phase 2 Line voltage magnetic probe
 - B3 Phase 2 Male connector
 - C Phase 3 Cable
 - C1 Phase 3 Current Clamp
 - C2 Phase 3 Line voltage magnetic probe
 - C3 Phase 3 Male connector
 - D Transceiver
 - D1 Phase 1: 4-pin Female Connector
 - D2 Phase 2: 3-pin Female Connector
 - D3 Phase 3: 3-pin Female Connector

Before you start

Warning!

Voltages dangerous to human health are involved in the installation of the Voltaware sensor.

A qualified electrician must install the Voltaware sensor. Voltaware will not be held responsible for failure to follow these guidelines.

Installation must comply with electrical standards and approved codes of practice for the country or region where the installation is taking place.

Do not install the sensor in any supply voltage outside the rated voltages: 110 - 240 V AC.

You should never, under any circumstances, install or allow your Voltaware sensor to be installed with the mains electricity switched on. There is a risk of explosion, fire and electrocution if this is ignored. Voltaware will not be held responsible for failure to follow these guidelines.

Do not tamper with the installation of the sensor while the mains electricity is switched on.

Never attempt to disassemble and reassemble the sensor. Doing so will void your sensor's warranty.

Do not dispose of in fire.

Do not allow the sensor to get wet/ handle near water.

Do not leave the sensor in a moist environment or in direct sunlight.

Do not allow children to play with the sensor or let them anywhere near the consumer unit.

Caution!

Do not install the sensor in any supply voltage outside the rated voltages: 110 - 240 V AC.

Installation step-by-step guide:

Please refer to Figure 2 for steps 2 to 9. Consumer units can vary considerably, please note there may be differences between the consumer unit you are working on and the example presented in this guide.

IMPORTANT

Before installation, please make sure you have read through the entire installation guide and understood the instructions.

Warning!

The four bolts directly beneath the line and neutral cables on the consumer unit are often upstream of the mains power switch (bolts marked 'x' on Figure 2). This means they are not switched off when you switch off the mains. **DO NOT ATTEMPT TO INSTALL THE LINE AND NEUTRAL VOLTAGE MAGNETIC PROBES ON THESE BOLTS.** Always install the magnetic probes downstream of the mains; which is inactive after the main circuit breaker is switched off.

Please note:

The line and neutral magnetic probes of the device connect to the line and neutral bolts respectively. These cables are also used to power the sensor. If you are installing on single phase you will only need to fit the Phase 1 Clamp and Cable.

- 1 Turn on your torch. Voltaware recommends you free your hands by placing the torch where it can illuminate the consumer unit.
- 2 Switch off the electricity mains completely on the consumer unit.
- 3 Remove the cover from the consumer unit to have full access to the wiring.
- 4 Take the cable with two magnetic voltage probes and current clamp (4-pin connector). Release the latch on the current clamp and visually check that the magnetic core of the clamp is not damaged*. Make sure there is not any debris on the opposing faces of the core as this could affect the current readings. Identify the mains phase where the clamp will be installed. Attach the current clamp around the line cable – this can be upstream or downstream of the main power switch, as the clamp is not electrically connected to the mains. Please observe the direction marked K→L – the arrow must follow the direction of the mains supply (from source towards the load). Installation of the clamp must not require actions other than closing and locking the clamp around the cable. *If the clamp is damaged the sensor is not fit for installation.
- 5 Visually identify three line and one neutral bolts downstream of the main switch, on the part that is not powered. Connect the blue neutral magnetic voltage probe to the identified neutral bolt.

Then connect the line magnetic voltage probe to the bolt identified on the same phase where the current clamp has been installed. Plug the 4-pin connector of the cable into the transceiver at the position marked "PHASE 1".

- 6 Repeat steps 4 & 5 for phase 2 and phase 3 with the remaining cables. Please note these only provide connections for line voltage as the neutral is already supplied from the first cable.
- 7 Visually check over the installation to ensure the sensor has been installed correctly.
- 8 Please re-fit the consumer unit cover now.
- 9 On the consumer unit, switch the mains electricity back on. If the sensor is powered it will emit a light according to its operational state.

Connecting to the local network (wifi sensors only)

Follow the steps below to connect your sensor to your Wi-Fi network. The sensor will emit blue light if the WiFi is enabled.

- 10 On your PC or connected mobile device, do a Wi-Fi scan for the network: VOLTA_XXXX_ABC (where 'XXXX' represents the Sensor ID and ABC represents an internal number for Voltaware). You should have been provided with your Sensor ID by Voltaware.
- 11 Select this network and login with the password: byttwm2015
- 12 Open an internet browser and enter the IP address 192.168.10.1 in the search bar. Press enter;
- 13 The Voltaware 'Provisioning' web page will appear.
- 14 Select the local Wi-Fi network and enter the Wi-Fi password.
- 15 On successful completion of these steps, the sensor will proceed to connect to the selected Wi-Fi network.

Please note the sensor only supports WPA2 or mixed WPA/WPA2 security. Please consult your WiFi router manual for more information.

Additional Information

Electrical Characteristics:

Operating voltage:	110 – 240 V AC
Operating frequency:	50 – 60 Hz
Power consumption (typical):	1 W for WiFi, up to 4 W for 3G
Wireless connectivity:	IEEE 802.11n/g/b 2.4 GHz, 3G
Supported current transformers:	100 A
Maximal power measured:	25 kW per channel

Support

Additional support is available at www.voltaware.com or speak to a member of our technical team, contact enquiries@voltaware.com.

EU Declaration of Conformity (DoC)

Company name Voltaware Services Limited
Postal address 282 Earls Court Road
Postcode and City London, UK, SW5 9AS
Telephone +44 (0) 20 74601521
E-Mail address support@voltaware.com

I declare that the DoC is issued under our sole responsibility and belongs to the following product:

Connectivity	Apparatus model	Product Type	Code no.
WiFi Only	VOLTA3P-V2	Power Meter	3PW002
3G:	VOLTA3P-V2-3G	Power Meter	3P3G001
Hardware Revision 1.0			

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Directive 2014/53/EU

The following harmonised standards and technical specifications have been applied:

Title *Reference of the standard*

Health & Safety (Directive 2014/53/EU Art. 3.1(a))

EN 60950-1	2006/A1:2010/A12:2011/A1:2010+A2:2013
EN 61010-1	2010 (3rd Edition)
EN 62311	2008

EMC (Directive 2014/53/EU Art. 3.1(b))

EN 301 489-1	V2.1.1
EN 301 489-17	V3.1.1
EN 301 489-52	V1.1.0
EN 61326-1	2013

Radio Spectrum (Directive 2014/53/EU Art. 3.2)

EN 300 328	V2.1.1
EN 301 908-2	V11.1.2

Signed for and on behalf of Voltaware Services Limited
London, 11/12/2018

Rishabh Jaipuria
COO

