

Single Phase Electric Vehicle Charger Protection Units

SP-EVCP-T(C), SP-EVCP-R(C), SP-EVCP-M(C), SP-EVCP-B(C), SP-EVCP-RB(C)

Installation Manual

May 2021



Contents

Product Description	3
Warning Notice	3
Safety Advice	3
Introduction	4
Dimensions & Mounting the unit	5
Electrical Connections	9
Operating Instructions	16
Status Indicator	17
Specifications	18
Warranty	18
Declaration of Conformity	19

PRODUCT ADVISORY NOTICE

This product must be installed by a competent person in accordance with the IET Wiring Regulations, BS7671 (18th Edition or later) and current Building Regulations. Ensure the electrical supply is disconnected before installation or removing the cover of the Units.

Single-phase EV charger protection unit

Environment

matt:e no longer use plastic bags as part of product packaging. Wherever possible we utilise reusable biodegradable packaging for transportation. We ask that you support our efforts to reduce un-necessary waste and recycle all packaging appropriately. Thank you.

Product Description

The **matt:e** Single Phase Electric Vehicle Charger Protection units are designed for use in domestic dwelling applications where single phase PME supplies are feeding Electric Vehicle Chargers. They should NOT be used on premises with 3 phase supplies.

This manual covers the SP-EVCP-T(C), SP-EVCP-R(C), SP-EVCP-M(C), SP-EVCP-B(C), SP-EVCP-RB(C) models manufactured after February 2021.

The units are not intended for any purpose other than that defined within this document.

Warnings

Please read and observe the following notices carefully. These warnings must be observed when installing and operating the Electric Vehicle Charger Protection units.

All relevant supplies must be isolated or disconnected before commencing any work. This product must be installed by a competent person in accordance with the IET Wiring Regulations, BS7671 (18th Edition or later) and any relevant Building Regulations and/or Installation Regulations.



Once installed, the unit has a Live Mains Supply (230v or higher) within the enclosure. The cover must not be removed until the supply to the unit has been isolated or disconnected.

Safety Advice

The unit must be installed in a dry ventilated location; it must never be covered or have restricted ventilation.

The SP-EVCP units are rated for a maximum 32A.

The SP-EVCP-R & IP-EVCP-R models are rated to be connected directly to the supply meter tails via suitable connectors. All other models must be connected via the Consumer Distribution Board or 'Garage Board' and suitable protective device.

For any information not contained within this document, please contact our technical support team on 01543 227290 or info@matt-e.co.uk.

Introduction

The **matt:e** range of Single Phase Electric Vehicle Charger Protection units are designed to protect Electric Vehicle Charging equipment when installed onto single-phase PME infrastructures .

All units incorporate an electronic detection circuit and 3 pole contactor. The T version has three terminals on the incoming side of the unit. The M version has a 2 pole MCB and a single terminal on the incoming side of the unit. The R and RB versions have a 2 pole Type A RCBO and a single terminal on the incoming side of the unit.

The B version has a 2 pole Type B RCCB, single pole MCB and a single terminal on the incoming side of the unit.

The SP-EVCP-R(C), SP-EVCP-RB(C), IP-EVCP-R(C) versions are rated to be connected directly to the supply meter tails via suitable connectors. All other versions must be connected via the Consumer Distribution Board or 'Garage Board' and suitable protective device

The Current Curtailment versions are supplied with a split core CT for installing on the main incoming supply cable to the property. See page 9 for connection details.

On detection of fault conditions, the electronic circuit disconnects the EV charger from the incoming supply including CPC by de-energising the contactor. The isolation contactor is certified to BS EN 60947-4-1 and complies with the requirements of BS: 7671 18th Edition.

The **matt:e** SP-EVCP technology does not require earth rods or measuring electrodes to function correctly.

The units are designed to be installed indoors between the service providers meter / distribution board and the Electric Vehicle Charger. The unit must be mounted securely to a solid surface with the lid hinges at the top.

The installation location should be clean, dry and well ventilated.

SP-EVCP enclosures have gland hole knockouts ready to accept a range of cable glands.

Drilling or cutting of the enclosure to make additional cable entry points may damage the internal components and compromise their function. Such action will invalidate the warranty.

Please refer to the diagrams on the following pages for the dimensions and mounting arrangements of the units.

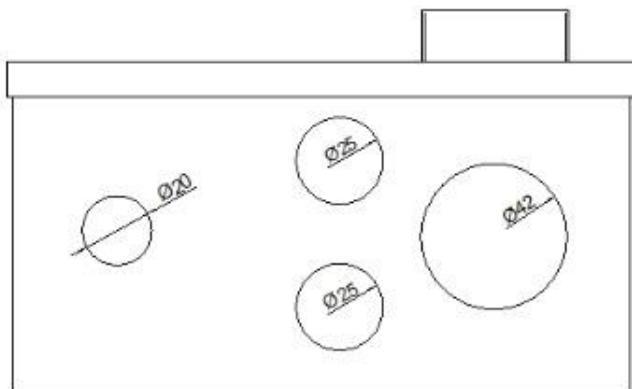
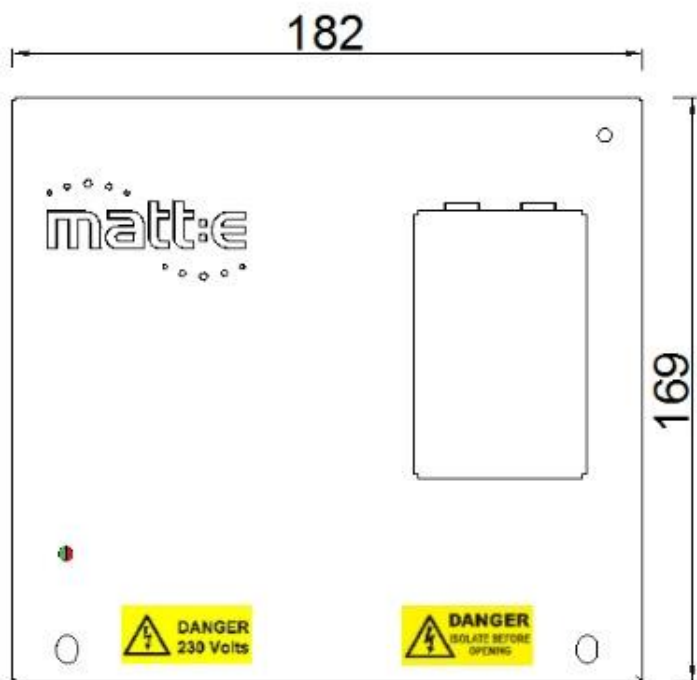
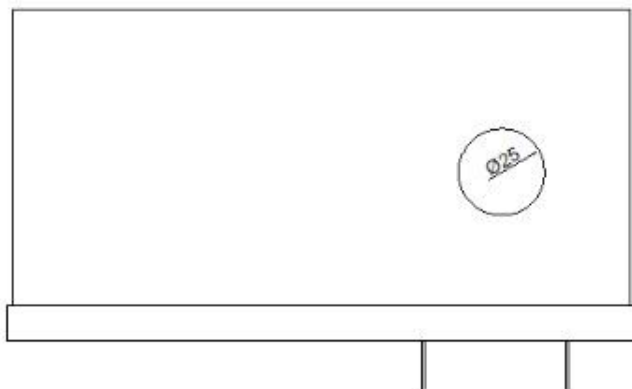
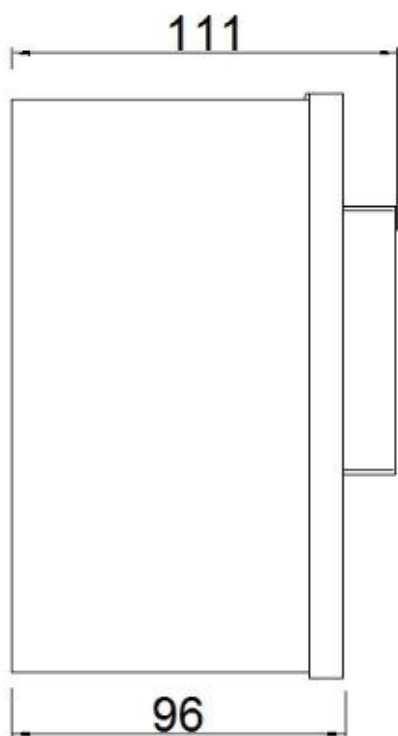
Single-phase EV charger protection unit

Dimensions

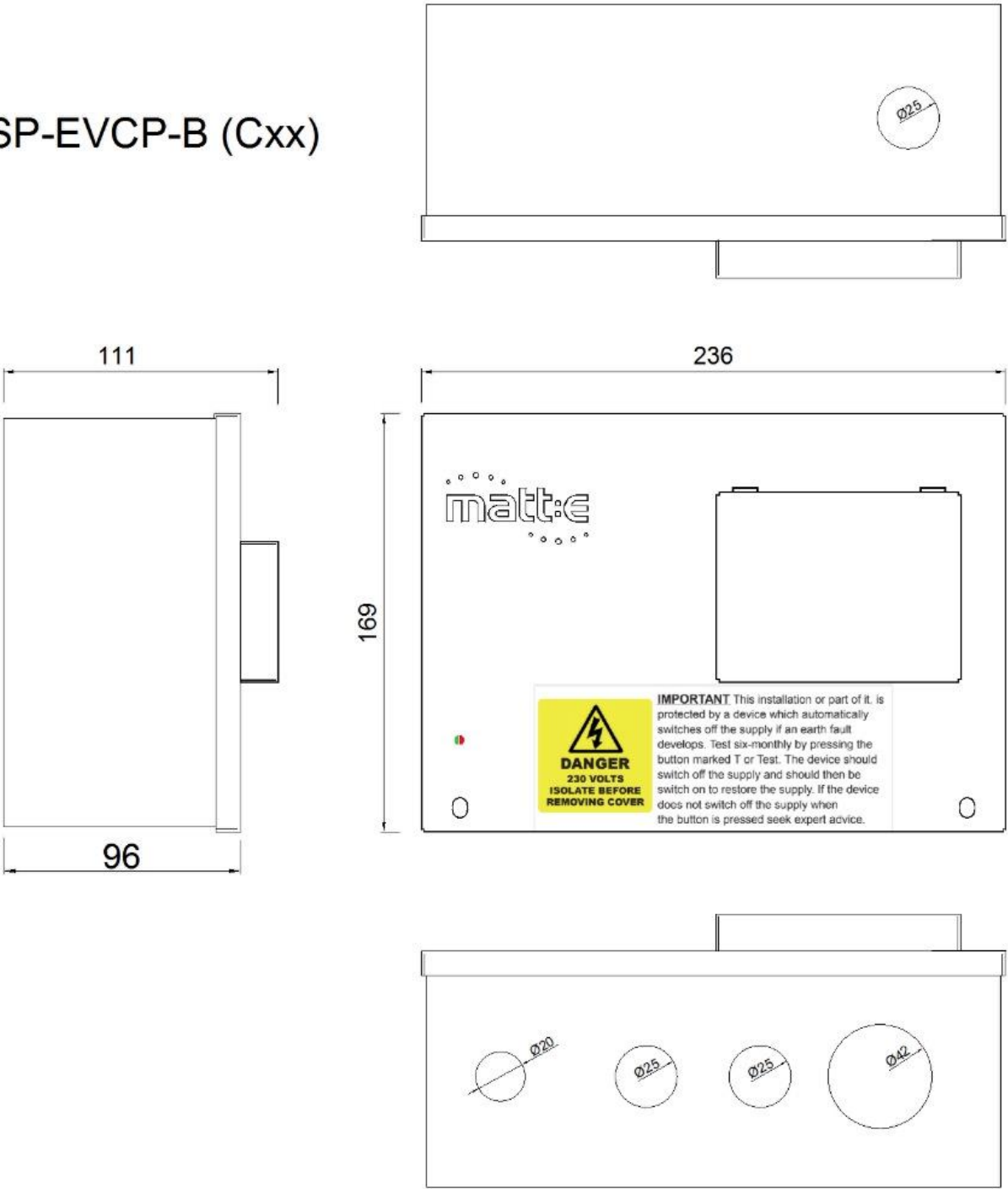
SP-EVCP-R (Cxx)

SP-EVCP-M (Cxx)

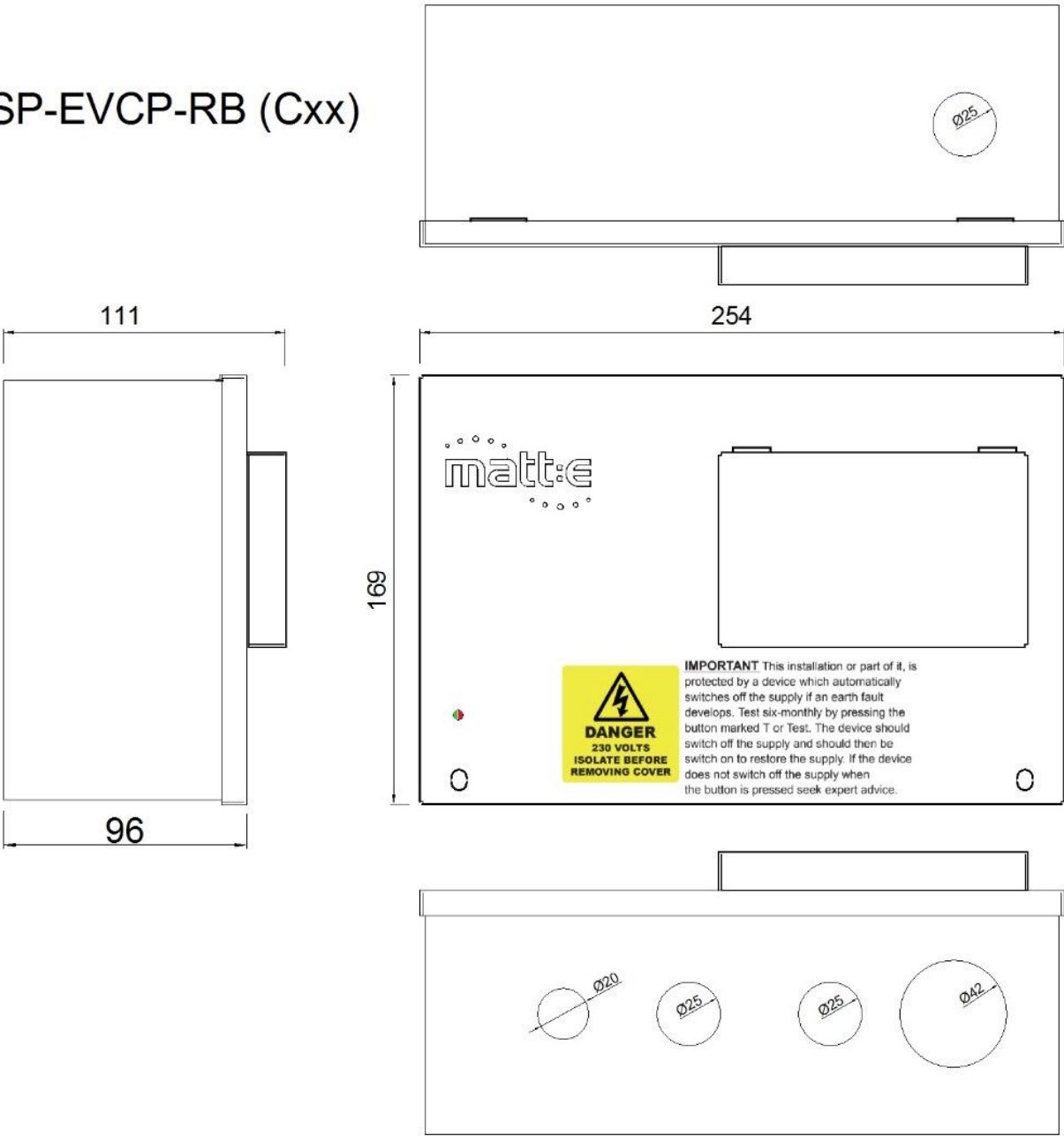
SP-EVCP-T (Cxx)
(without MCB flap)

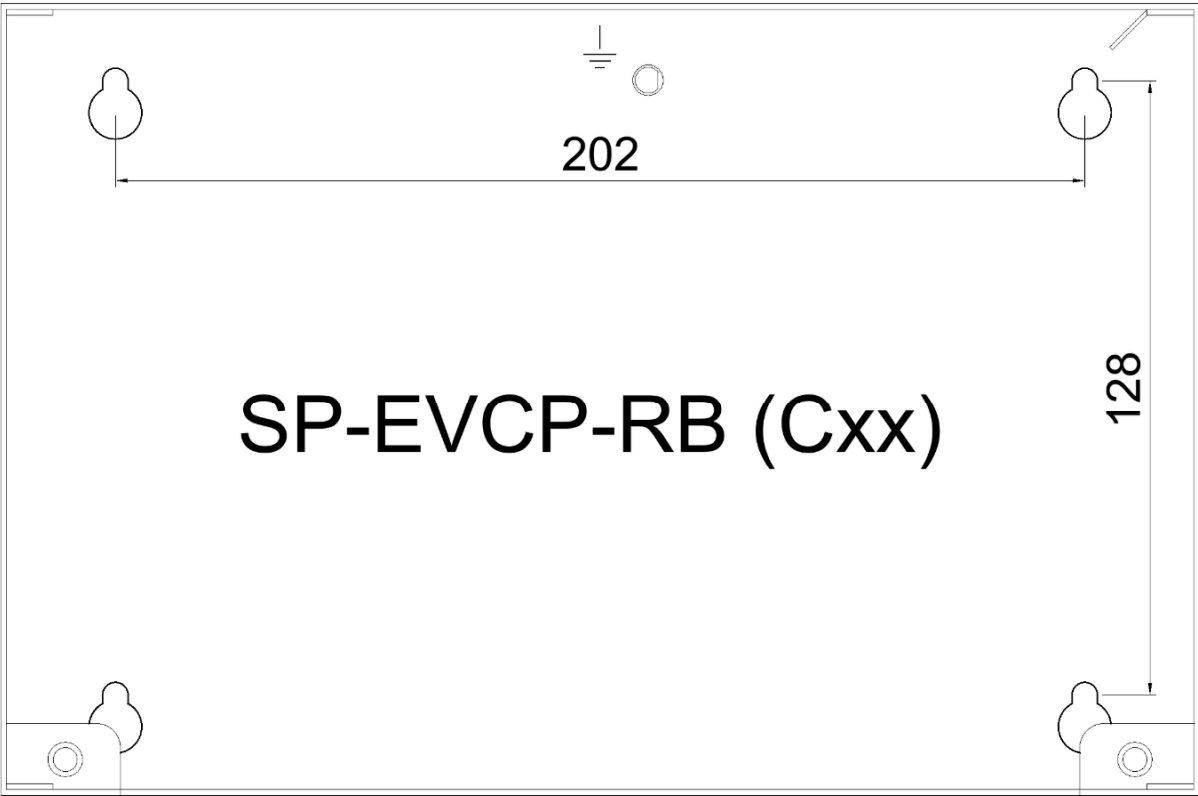


SP-EVCP-B (Cxx)



SP-EVCP-RB (Cxx)



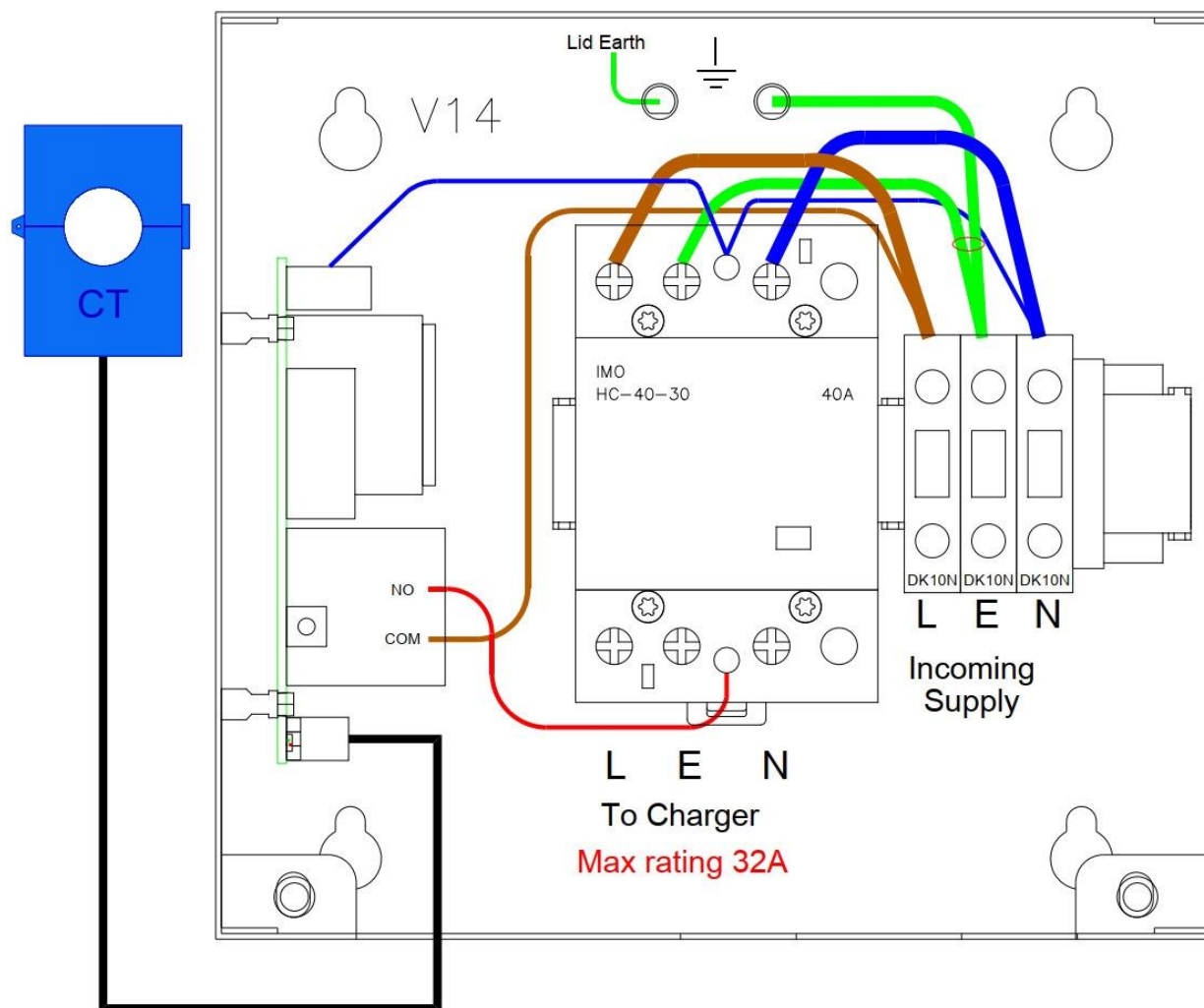


Single-phase EV charger protection unit

Electrical Connections

The user wiring connections are indicated in the diagrams below.

SP-EVCP-T (Cxx)



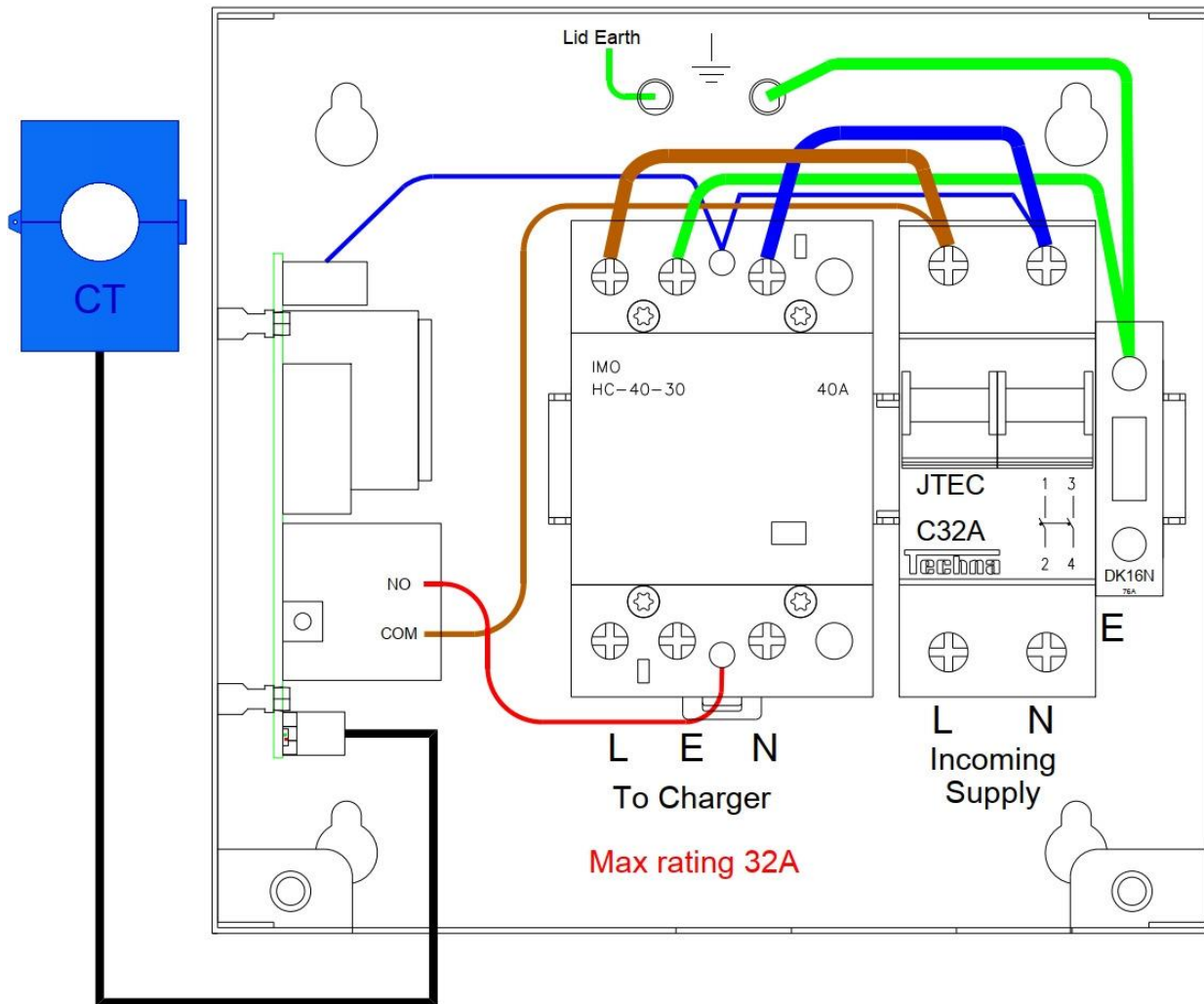
Connect the supply cable from the distribution board directly to the 'Incoming Supply' terminals. Connect the outgoing cable to the contactor L, E & N terminals. If required, connect the CT to the 3 pin connector on the PCB. Check ALL power and earth connections before switching on.



THIS PRODUCT IS DESIGNED FOR AN ISOLATED EARTHING ARRANGEMENT.

CHECK BEFORE USING SWA CABLE

SP-EVCP-M (Cxx)



Connect the supply cable from the distribution board directly to the MCB 'Incoming Supply' terminals. Connect the outgoing cable to the contactor L, E & N terminals. If required, connect the CT to the 3 pin connector on the PCB. Check ALL power and earth connections before switching on.



THIS PRODUCT IS DESIGNED FOR AN ISOLATED EARTHING ARRANGEMENT.

CHECK BEFORE USING SWA CABLE

The diagram illustrates the internal wiring of the CT1000-3000 unit. Key components and connections include:

- Incoming Supply:** Labeled 'Incoming Supply' at the bottom right, with terminals L, N, and E.
- Charger Connection:** Labeled 'To Charger' at the bottom center, with terminals L, E, and N.
- CT Sensor:** A blue square component labeled 'CT' on the left, connected to the 'COM' terminal of a switch and the 'L' terminal of the charger connection.
- Internal Components:**
 - C1:** A large central component labeled 'IMO HC-40-30 40A'.
 - 2C32-030:** A component labeled 'Rtec X3' with a schematic diagram.
 - DK16N 75A:** A component labeled 'TEST'.
- Wiring:** Colored lines (red, blue, green, orange) show the connections between the incoming supply, charger, CT sensor, and internal components. A red line connects the 'COM' terminal to the 'L' terminal of the charger. A blue line connects the 'L' terminal of the incoming supply to the 'L' terminal of the charger. A green line connects the 'N' terminal of the incoming supply to the 'N' terminal of the charger. An orange line connects the 'E' terminal of the incoming supply to the 'E' terminal of the charger.
- Max rating 32A:** A red label at the bottom center indicating the maximum rating.

Connect the supply cable from the distribution board (or meter tails) directly to the RCBO 'Incoming Supply' terminals. Connect the outgoing cable to the contactor L, E & N terminals. If required, connect the CT to the 3 pin connector on the PCB. Check ALL power and earth connections before switching on.



CHECK BEFORE USING SWA CABLE

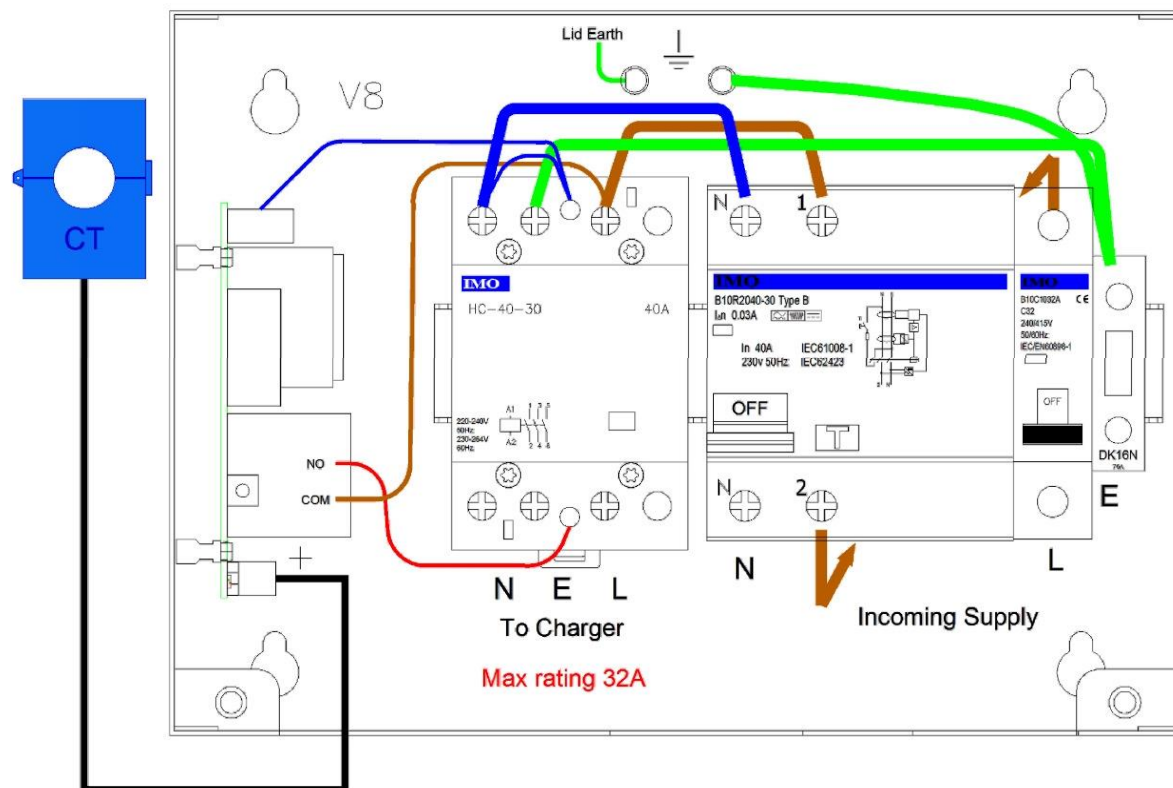
The diagram shows the internal wiring of a 32A 3-phase 4-wire EVSE. A blue CT (Current Transformer) sensor is connected to the main power lines. The wiring includes connections for the incoming supply (N, L, E) and the output to the charger (N, E, L). A voltage sensor (V 14) is connected to the main power lines. The diagram also shows the internal components of the EVSE, including the main power switch, the CT sensor, and the output terminals.



Electrical hazard

CHECK BEFORE USING SYVA CABLE

SP-EVCP-B(Cxx)



Connect the supply cable from the distribution board (or meter tails) directly to the MCB/RCCD 'Incoming Supply' terminals. Connect the outgoing cable to the contactor L, E & N terminals.

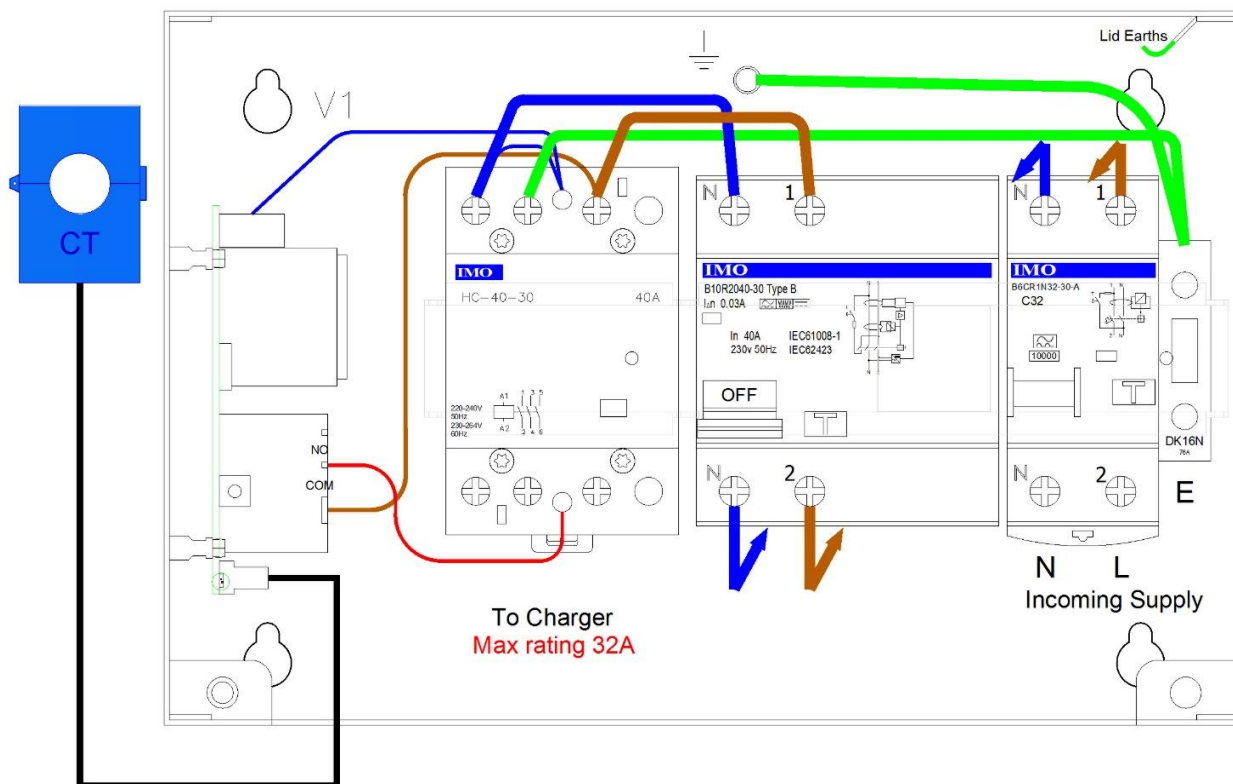
If required, connect the CT to the 3 pin connector on the PCB
Check ALL power and earth connections before switching on.



THIS PRODUCT IS DESIGNED FOR AN ISOLATED EARTHING ARRANGEMENT.

CHECK BEFORE USING SWA CABLE

SP-EVCP-RB (Cxx)



Connect the supply cable from the distribution board (or meter tails) directly to the RCBO 'Incoming Supply' terminals. Connect the outgoing cable to the contactor L, E & N terminals.

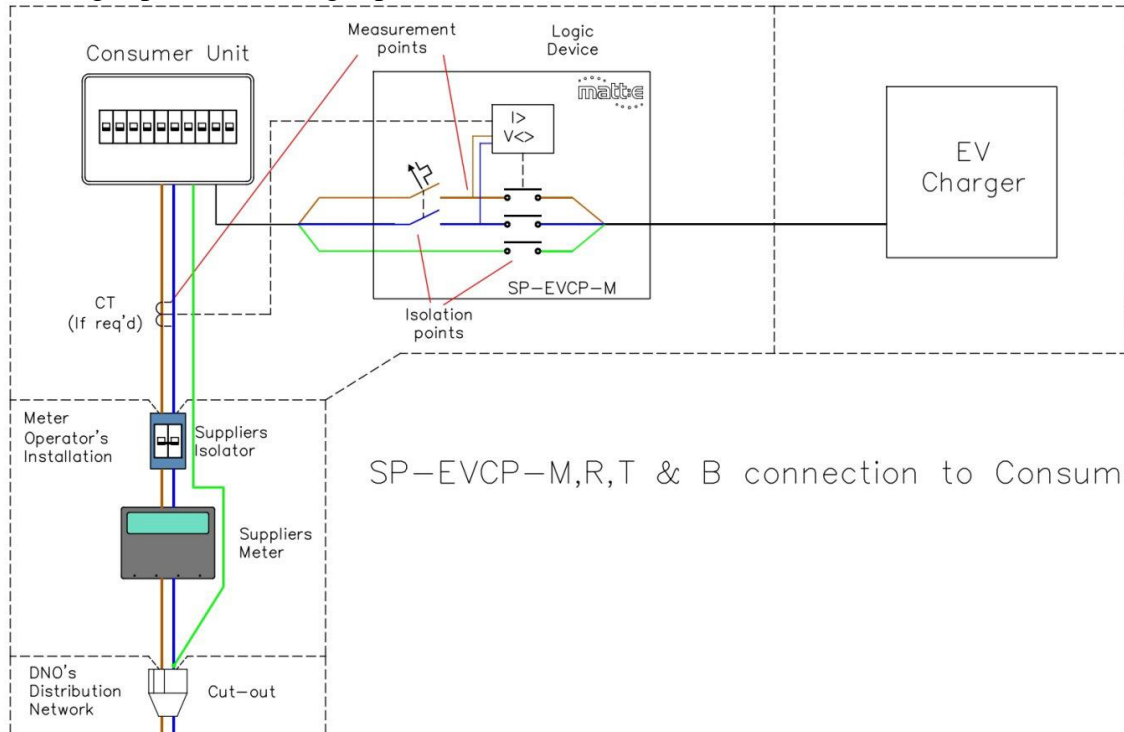
If required, connect the CT to the 3 pin connector on the PCB
Check ALL power and earth connections before switching on.



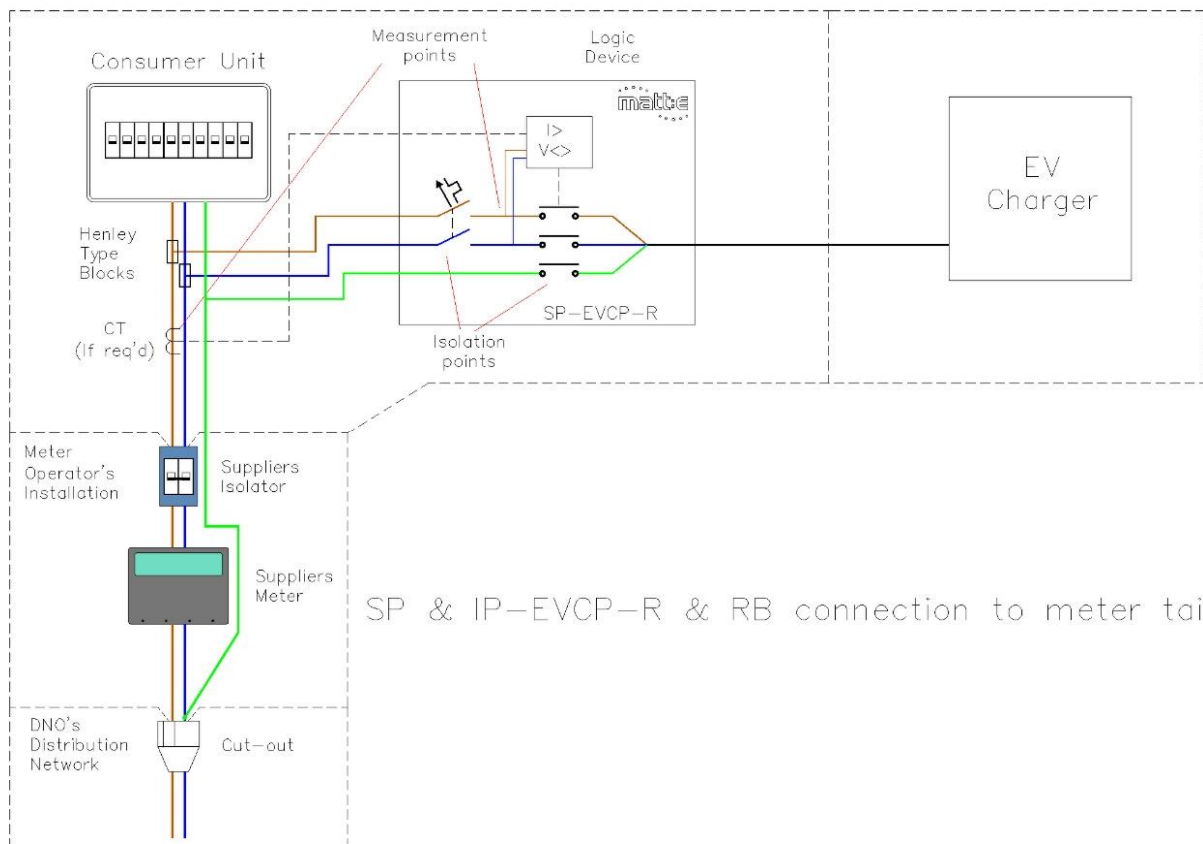
THIS PRODUCT IS DESIGNED FOR AN ISOLATED EARTHING ARRANGEMENT.

CHECK BEFORE USING SWA CABLE

Single-phase EV charger protection unit



SP-EVCP-M,R,T & B connection to Consumer Unit



SP & IP-EVCP-R & RB connection to meter tails

Single-phase EV charger protection unit

Operating Instructions

With the supply switched on the electronic control circuit in unit will continuously monitor the incoming supply voltage.

If the incoming supply is within limits, approximately 5 seconds after switching on the contactor will energise and connect the load to the incoming supply and the CPC. The 5 second delay is to establish the incoming supply is stable before applying power to the load.

In the event the SP-EVCP unit detects a fault condition on the monitored supply for a period of 4 seconds, the electronic control circuit will de-energise the contactor coil which will open the contactor disconnecting Line, Neutral and CPC from the load.

The contactor will remain de-energised until the monitored supply has returned to the correct level and remained stable for a period of 3 minutes.

The current monitoring versions are supplied with a split core CT to allow the unit to monitor whole house load. The CT should be clamped around the incoming supply cable directly after the service providers' meter. It is designed to measure the FULL load current to the house. Connection diagrams are shown from page 9.

The current monitor versions of the SP-EVCP-(C) have a current curtailment function designed to prevent the domestic load exceeding the deemed Domestic Load Level. There are 3 versions, 60A, 80A & 100A. All versions function in the same way.

The total current of the incoming mains supply is measured by the CT.

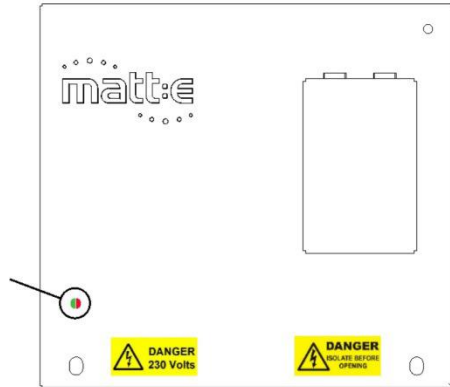
Normal operational state – If the measured current demand exceeds the Domestic Load Level for 4 seconds the supply to the EV charger is disconnected by de-energising contactor C1. The new value of the current demand is noted by the processor 1 second after C1 has been de-energised.

Once the measured current demand has reduced to a value where the current required by the car charger will not cause the current demand to exceed the deemed Domestic Load Level for a period of 3 minutes the EV charger supply is reinstated by energising C1.

Single-phase EV charger protection unit

LED Status Indicator

A dual colour (Red / Green) LED gives a visual indication of the real time status of the unit.



LED flash codes

Version info	Software Ver. 1.2	1 red flash (major) followed by 2 green flashes (minor), this appears once at power on during the first 5 secs of operation
Normal operation	No errors	Green flashes continuously @ 1Hz
Tripped	Over current	Alternating green and red flashes @ 1Hz – recovers when current in range
Tripped	Under voltage	1 red flash over 4 sec period – recovers when voltage in range
Tripped	Over voltage	2 red flashes over 4 sec period – recovers when voltage in range
Tripped	DC Detected	3 red flashes over 4 sec period – power cycle / engineer attention
Tripped	CT not found	4 red flashes over 4 sec period – power cycle / engineer attention
Tripped	Internal error	Solid red – power cycle required – power cycle / engineer attention
Normal operation	Voltage error state commencing	Red flashes continuously @ 2Hz
Normal operation	Voltage error state recovering	Green flashes continuously @ 2Hz

Single-phase EV charger protection unit



Specifications

Description	Electric Vehicle Charger Protection Unit
Input (Volts)	Nominal input voltage 230v, 50Hz
Max Load	32A - All units
Dimensions	SP - 182mm x 169mm x 96 (111)mm
Weight	Approximately 2.5 kg
Operating Temp	-5°C to 40°C
Storage Temp	-5°C to 40°C
Enclosure	SP - Mild Steel Zintec Powder Coated
Power Consumption	13VA
Ingress Protection	SP-EVCP = IP2X
Document Revision	V1.6 Feb 2021

Terminal Capacities	Min	Max	Torque
Incoming Terminals cable size & tightening torque	0.5 mm ²	16.0mm ²	1.3Nm
Incoming RCBO cable size & tightening torque	2.5 mm ²	25.0mm ²	2Nm
Outgoing Contactor cable size & tightening torque	2.5 mm ²	10.0mm ²	2.3Nm

WARNING: This equipment is compliant with Class A of EN55032. In a residential environment this equipment may cause radio interference.

Warranty

The SP-EVCP units are guaranteed for a period of 3 years from the date of manufacture.

This warranty is limited to the replacement of faulty components only.

t: 01543 227290 e: info@matt-e.co.uk w: www.matt-e.co.uk

matt:e Ltd, Unit 5, Common Barn Farm, Tamworth Road, Lichfield WS14 9PX

Single-phase EV charger protection unit

EU Declaration of Conformity (DoC)

Ref : SP-EVCP-01-2020

We

Company name: matt:e Ltd
 Postal address: Unit 5 Common Barn Farm Tamworth Road
 City: Lichfield
 Postcode: WS14 9PX
 Telephone number: 01543-227290
 E-Mail address: Info@matt-e.co.uk

Declare that this DoC is issued under the sole responsibility of the manufacturer.

Apparatus model/Product: SP-EVCP
 Type: Single Phase Electric Vehicle Charger Protection

Object of the declaration

Electric Vehicle Charger	SP-EVCP-T(C) SP-EVCP-M(C) SP-EVCP-R(C) SP-EVCP-B(C) SP-EVCP-RB(C)
Protection units	IP-EVCP-T(C) IP-EVCP-M(C) IP-EVCP-R(C) IP-EVCP-RB(C)

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

Low Voltage Directive (2014/35/EU)

The following harmonised standards and technical specifications have been applied:

Emissions
 EN60255-1 2010 Emissions standard for Measuring Relays and Protection Equipment
 EN60255-26 2013
 EN55011 2016 + A1:2017 Emissions Standard for ISM Equipment
 EN55032 2012 Emissions Standard for Multimedia Equipment

Immunity
 EN60255-1 2010 Emissions standard for Measuring Relays and Protection Equipment
 EN60255-26 2013
 EN61000-4-2 2009 ESD Requirements
 EN61000-4-3 2006 + A1 + A2 Radiated Susceptibility
 EN61000-4-4 2012 Electrical Fast Transient Burst Requirement
 EN61000-4-5 2006 Surges Requirements
 EN61000-4-6 2009 Conducted Susceptibility
 EN61000-4-11 2004 Voltage Dips and Interruptions
 Following the provisions of EU EMC Directive 2014/30/EU

EN61439-1 2:2012 3:2012 Low-voltage switchgear and controlgear assemblies.
 EN60947-4-1 Low-voltage switchgear and control gear
 EN61009-1 Residual current operated circuit-breakers with integral overcurrent
 EN61008-1 Residual current operated circuit-breakers without integral overcurrent
 EN 60898-1:2019 Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations –
 Part 1: Circuit-breakers for a.c. operation

Signed for and on behalf of: matt:e Ltd

Place of issue

Lichfield, England

Date

17 Jan 2021



J Charlton, Director