

EV CONNECTION CENTRES

SP-M1b3t-R-SPD IP-M1b3t-R-SPD

Installation, Operation and Maintenance Manual



Single-phase EV connection and protection

M1b3t PEN fault protection
Type A RCBO | Type 2 SPD

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PRODUCT ADVISORY NOTICE

This equipment must be installed, inspected and tested by a competent person in accordance with BS 7671, applicable Building Regulations, the EV charge point manufacturer's instructions and all site-specific requirements.

ISOLATE BEFORE ACCESS

Disconnect and securely isolate every relevant supply before removing the enclosure cover, carrying out tests requiring access, maintenance or modification. Prove dead using an approved method.

Product description and scope

The matt:e SP-M1b3t-R-SPD and IP-M1b3t-R-SPD are dedicated single-phase connection centres for one 7.4 kW EV charge point. Each unit incorporates IET:01:2024 M1b3t PEN fault protection, a 40 A / 30 mA Type A RCBO and a Type 2 surge protective device.

The integral PEN protection permits connection to a PME earthing facility without a separate earth electrode, subject to the electrical installation being designed, installed, verified and maintained in accordance with the applicable requirements.

Model	Intended location	Enclosure
SP-M1b3t-R-SPD	Indoor, clean and dry	IP41 steel enclosure
IP-M1b3t-R-SPD	Outdoor	IP65 thermoplastic/polycarbonate enclosure

Warnings and safety advice

- Do not use the unit for any purpose other than the application described in this manual.
- The enclosure contains hazardous mains voltage when energised. Keep the cover secured during normal service.
- Confirm that the prospective fault current and upstream protective arrangements are compatible with the 6 kA RCBO rating and the complete installation design.
- Do not megger, flash-test or carry out insulation resistance testing through connected electronic devices or EV charging equipment. Isolate sensitive equipment in accordance with its instructions.
- The IP rating depends on correct mounting, suitable cable glands, intact seals, closed covers and all unused entries being sealed.

Function and operating principles

The unit continuously assesses the single-phase supply and protective conductor conditions before connecting the EV charge point and while it remains energised.

Function	Declared behaviour
Voltage supervision	Permitted operating window: 184 V to 262.2 V AC.
Protective conductor supervision	Trips when protective conductor current reaches the IET:01 M1b3t threshold of 21 mA.
Fault isolation	Disconnects line, neutral and protective conductor from the load.
Start-up	Monitors the supply for approximately 20 seconds before energising.
Detected fault reset	Manual reset only, and only when safe conditions are present.
Complete power failure	Automatically reconnects after power returns and remains within limits for 20 seconds.

IMPORTANT RESET DISTINCTION

A complete loss of power may be followed by automatic reconnection. A detected PEN, voltage, CPC-current, overload, short-circuit or residual-current fault requires investigation and manual reset.

Protective devices

- The Type A RCBO provides overload, short-circuit and 30 mA residual-current protection for the EV circuit.
- The Type 2 SPD limits transient overvoltages. Its status window must show green in normal service; red indicates replacement is required.

Dimensions and mounting

Model	Overall dimensions	Protection / material
SP-M1b3t-R-SPD	302.2 W x 234.84 H x 124.42 D mm	IP41; Mild steel enclosure
IP-M1b3t-R-SPD	270 L x 250 W x 160 H mm	IP65, IK08; thermoplastic/polycarbonate, RAL 7035

Mounting requirements

- Mount upright on a sound, flat, non-combustible surface using fixings suitable for the substrate and the completed assembly weight.
- Provide sufficient clearance to open the cover fully, operate devices, route cables without tight bends and carry out future inspection.
- Keep away from heat sources, flammable materials, corrosive atmospheres, excessive vibration and locations liable to flooding or impact.
- For the SP model, select a clean, dry indoor location and maintain the IP41 rating.
- For the IP model, use correctly rated glands, seal unused entries and preserve the cover gasket. Avoid positions where water can collect around cable entries.

DO NOT DRILL THROUGH ASSEMBLED EQUIPMENT

Before making any additional entries, remove swarf and protect internal components. Do not damage conductors, insulation, seals or the enclosure structure.

Always verify fixing positions against the actual enclosure supplied before drilling. Do not scale dimensions from this manual.

Electrical connections

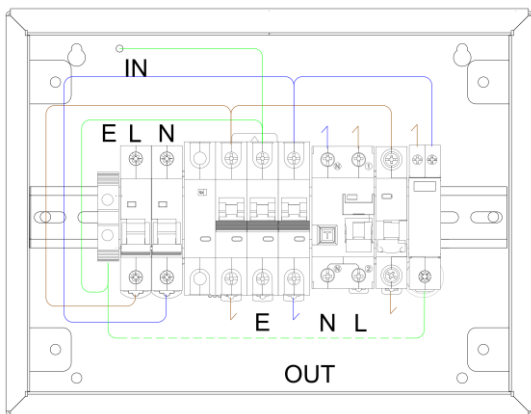
The unit is installed between the supplying distribution board and one single-phase EV charge point. Use only the designated incoming and outgoing terminals identified inside the enclosure.

SUPPLY	CONNECTION CENTRE	LOAD
Distribution board 230 V 1P+N+PE	M1b3t + Type A RCBO + Type 2 SPD	One 7.4 kW EV charge point

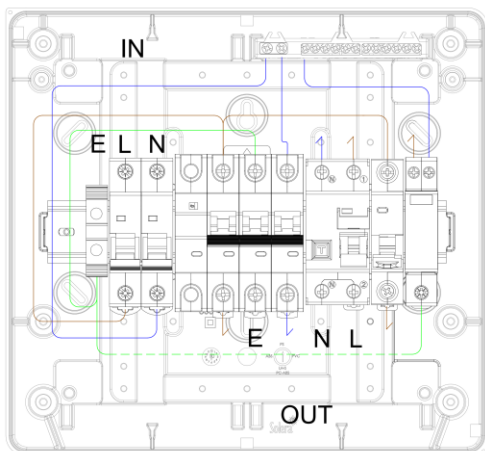
Connection requirements

- Connect supply line (L), neutral (N) to the double pole isolator and protective conductor (PE/CPC) to the terminal block marked SUPPLY.
- Connect the EV charge point line, neutral and protective conductor to the RCBO and the E terminal on the 3P device marked LOAD.
- Maintain conductor identification and polarity throughout. The protective conductor must pass through the designated M1b3t protective path; do not bypass, parallel or bond around it.
- Select conductor type and cross-sectional area for the 40 A design current, installation method, voltage drop, ambient temperature, grouping and fault protection requirements.
- Use ferrules where required. Ensure every conductor is fully inserted, undamaged and free from stray strands.

SP-M1b3t-R-SPD connections



IP-M1b3t-R-SPD connections



TERMINAL TORQUE

Tighten each terminal to the value marked on the installed component or stated in its current manufacturer data. Record the applied values during commissioning. Do not use a generic torque where component values differ.

Terminal Capacities	<u>Min</u>	<u>Max</u>	<u>Torque</u>
Supply Isolator, and RCBO cable size & tightening torque	2.5 mm ²	25.0mm ²	3Nm
Supply Earth Terminals cable size & tightening torque	0.5 mm ²	16.0mm ²	2.5Nm

Installation procedure

- Confirm the correct model, rating, enclosure condition and installation location. Check the unit for transit damage and verify all devices are secure.
- Review the circuit design, upstream protective device, prospective fault current, cable sizing, discrimination requirements, earthing arrangement and EV charge point instructions.
- Isolate every relevant supply, lock off where practicable, display warning notices and prove dead using an approved method.
- Mount the enclosure securely and upright. Fit suitably rated glands or entry systems without compromising conductors, seals or internal devices.
- Route the incoming and outgoing cables separately where practicable. Prevent strain at terminals and maintain the minimum bending radius.
- Terminate incoming L, N and PE/CPC, then outgoing L, N and PE/CPC, strictly to the internal terminal identification. Do not bypass the protective conductor switching path.
- Tighten all connections using a calibrated torque tool to the device-marked values. Check factory connections visually; do not disturb them unnecessarily.
- Remove all swarf and debris. Confirm barriers, blanks, gland seals and covers are correctly installed before energisation.

SWA AND PARALLEL EARTH PATHS

Where armoured cable, metallic containment or other conductive paths are used, ensure the design does not unintentionally bypass the unit's controlled protective-conductor disconnection. Obtain project-specific design approval where necessary.

Commissioning

Commissioning must be completed by a competent person before the EV charge point is placed into service. Complete all tests required by BS 7671 and the EV equipment manufacturer, taking account of electronic devices within the circuit.

Pre-energisation checks

- Correct product and ratings; enclosure secure and undamaged.
- Correct supply, polarity and earthing arrangement confirmed.
- Incoming and outgoing conductors correctly identified, fully inserted and torqued.
- No unintended parallel CPC path around the M1b3t device.
- IP seals, glands, blanks, barriers and covers correctly fitted.
- RCBO and SPD are secure; SPD status window is green.

Functional commissioning

- Close the upstream supply. Keep clear of live parts and refit all covers before normal energisation.
- Allow approximately 20 seconds for the M1b3t supply checks. Confirm the load then energises when conditions are within limits.
- Operate the RCBO test button. Confirm disconnection and reset.
- Operate the M1b3t Test/Normal switch as described on page 10. Confirm the load is isolated and manual reset operates correctly.
- Complete EV charge point commissioning.

Operating and reset instructions

Normal start-up

When the supply is applied, the M1b3t device monitors voltage and protective conductor current for approximately 20 seconds. If conditions remain acceptable, the unit connects the EV charge point.

If the unit disconnects

- Do not repeatedly reset the unit. Treat an unexplained operation as a potentially hazardous electrical fault.
- Check the RCBO position, M1b3t control position and SPD status indication without removing the cover while energised.
- Isolate the supply and arrange investigation by a competent person. Check supply voltage, polarity, CPC current, insulation, connected equipment and circuit condition as applicable.
- After the cause has been identified and corrected, return the test switch to Normal and reset the RCBO/M1b3t mechanism to ON. The device will reconnect only if safe conditions are present.

Power interruption

Following a complete power failure below 30 V, the unit may automatically reconnect after the restored supply remains within its permitted parameters for 20 continuous seconds. Connected equipment must therefore always be treated as capable of re-energising automatically.

NO AUTOMATIC RESET AFTER A DETECTED FAULT

A voltage, PEN/CPC-current, residual-current, overload or short-circuit trip requires manual reset after the cause has been investigated and made safe.

Testing and maintenance

Six-monthly M1b3t functional test

- Ensure it is safe for the EV charge point supply to be interrupted. Stop any active charging session.
- With the unit energised and operating normally, slide the internal/manual control labelled Test/Normal to Test.
- Confirm that the unit isolates the load. If it does not, switch off the supply and contact matt:e technical support.
- Return the switch to Normal. Reset the protective device manually and confirm normal start-up.

Leaving the switch in Test does not prevent fault isolation, but it prevents automatic reset following a complete power failure.

Routine inspection

- Test the RCBO using its test button, matt:e recommends this is carried out every 6 months.
- Inspect for damage, overheating, moisture, contamination, loose glands, failed seals, corrosion and unauthorised alterations.
- Check the SPD indication: green = operational; red = replace the affected cartridge/device before returning the unit to normal service.
- Before carrying out any internal inspection or torque check, safely isolate the unit and verify that no voltage is present using an approved test method. Use only replacement parts approved by matt:e or components that meet the declared technical specification.

NO USER-SERVICEABLE ELECTRONICS

Do not modify, bypass or repair the M1b3t protection device. Contact matt:e if the functional test fails or abnormal operation persists.

Troubleshooting

Observation	Possible cause	Action
No output after energising	Normal 20 s start-up delay; supply out of range; test switch not at Normal; RCBO open.	Wait 20 s, check controls and arrange competent-person testing.
Trips and will not reset	Unsafe voltage, CPC current, residual-current fault, overload, short circuit or connected-equipment fault.	Do not force reset. Isolate and investigate the circuit and load.
Reconnects after outage	Normal automatic reset following complete power failure and stable restoration.	Expected behaviour.
RCBO test fails	Loss of supply, incorrect condition or device fault.	Isolate immediately and replace/investigate before use.
SPD window red	SPD cartridge has reached end of life or disconnected after surge/thermal event.	Isolate and replace the approved cartridge/device; inspect installation.
Moisture or condensation	Entry sealing, gasket, location or environmental issue.	Isolate, dry and correct the cause; replace damaged parts before use.

TECHNICAL SUPPORT

Technical support: 01543 227290 | info@matt-e.co.uk | www.matt-e.co.uk

Specifications

Description	Declared specification
Supply / poles	230 V AC, 50 Hz; 1P + N + PE
Rated load	40 A; one 7.4 kW single-phase EV charge point
PEN protection	IET:01:2024 M1b3t
Fault isolation / reset	L, N and PE disconnected; manual reset after detected fault
Start-up / power restoration	Approx. 20 s monitoring; automatic reset after complete power failure and stable return
RCBO	40 A Type C; 30 mA Type A; BS EN 61009-1; 6 kA Icn
SPD	Type 2 / Class II, 1+NPE; In 20 kA; I _{max} 40 kA; U _p L-PE 1.5 kV / N-PE 1.3 kV
SP enclosure	IP41 indoor; 302.2 x 234.84 x 124.42 mm W x H x D
IP enclosure	IP65 / IK08; 270 x 250 x 160 mm; -5 C to +85 C enclosure range
M1b3t ambient range	-25 C to +40 C
Certification marking	UKCA, CE
Warranty	1 year parts warranty

Warranty

The SP-M1b3t-R-SPD and IP-M1b3t-R-SPD are covered by a standard one-year parts warranty from the date of manufacture. The warranty is limited to replacement of faulty components and excludes incorrect installation, misuse, unauthorised modification, environmental damage, external faults, surge damage and normal wear.

Retain the commissioning and maintenance records. Contact matt:e before returning equipment.



UK DECLARATION OF CONFORMITY

Electrical equipment for Great Britain

Document reference	MTE-DoC-SP-IP-M1b3t-R-SPD-01
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1. MANUFACTURER

Company: matt:e Ltd

Address: Unit 1 Langley Brook Business Park, Middleton, Tamworth, B78 2BP, United Kingdom

2. PRODUCT IDENTIFICATION

Product references: SP-M1b3t-R-SPD and IP-M1b3t-R-SPD

Description: Single-phase EV connection centres, 230 V AC, 50 Hz, rated 40 A, incorporating IET:01 M1b3t PEN fault protection, a 40 A / 30 mA Type A RCBO and a Type 2 surge protective device.

Enclosures: SP version - IP41; IP version - IP65.

3. DECLARATION

This declaration of conformity is issued under the sole responsibility of the manufacturer. The products identified above are declared to conform to the relevant requirements of the following United Kingdom legislation, when installed and used in accordance with the manufacturer's instructions.

Safety	The Electrical Equipment (Safety) Regulations 2016
EMC	The Electromagnetic Compatibility Regulations 2016

4. STANDARDS AND TECHNICAL SPECIFICATIONS APPLIED

Area	Standard / specification
Assembly	BS EN IEC 61439-1:2021 - Low-voltage switchgear and controlgear assemblies: General rules
Assembly	BS EN IEC 61439-7:2023 - Assemblies for specific applications, including electric vehicle charging stations
PEN protection	IET 01:2024, Category M1b3t - Open PEN detection devices for EV charging applications
Protective device	BS EN 60898-1:2019 and BS EN 63024:2018
RCBO	BS EN 61009-1 - Residual current operated circuit-breakers with integral overcurrent protection
SPD	IEC 61643-11 - Low-voltage surge protective devices connected to AC low-voltage power systems
EMC	BS EN IEC 55014-1:2021; BS EN IEC 61000-4-11:2020; BS EN 61000-4-8:2020; BS EN 61000-4-6:2014; BS EN 61000-4-4:2012; BS EN 61000-4-5:2014+A1:2017; BS EN 61000-4-3:2020; BS EN 61000-4-16:2016; BS EN 61000-4-2:2009; BS EN 61000-4-13:2020+A2:2016

5. AUTHORISED SIGNATORY

Signed for and on behalf of matt:e Ltd

Name: Richard Winter

Position: Director

Place of issue: Tamworth, England

Signature

Date: 4 September 2026