



Chargemaster Charge Point Installation Guide

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1.0 Introduction

Chargemaster Ltd supply electric vehicle charging infrastructure to clients wishing to invest in advanced transportation. Chargemaster provides a range of solutions that are designed to fulfil all client's requirements. This document provides guidelines for the civil engineering works and electrical installations.

The dual socket approach allows two vehicles to be charged simultaneously, with dedicated access doors for each charging point to increase security. This reduces the number of charging points required.

Our modular approach also allows for a single socket Charge Point design. This design is chosen only in situations where a single car parking space is allocated to Electric Vehicle service.

Chargemaster also has a wall mounted design which is best suited for car parks and other areas where this type of mounting is appropriate and means that costly civil works are avoided.

Our Charge Point range can be surface mounted (Fig 1.1 to 1.4) or be wall mounted solutions as in Fig 1.5 to 1.8.

For GPRS/LAN products, all user information is displayed using the incorporated LCD screen.



Fig 1.1 – Surface mount GPRS post Fig 1.2 – Side view Fig 1.3 – Key operated post Fig 1.4 – Plastic post



Fig 1.5 – Wallmount with GPRS



Fig 1.6 – Combicharge Wallmount with GPRS



Fig 1.7 – Key operated Wallmount with Type2 sockets **Fig 1.8 – Key operated Wallmount with cable being plugged in**

Monitoring

Every GPRS or LAN enabled Chargemaster Charge Point is monitored remotely on a 24/7 basis by our central servers and Chargevision software. Monitoring is not provided for the key-switch operated units.

Unit Construction

All units are constructed using industry standard components, and meet all existing British and European standards for electrical installation and civil works requirements.

2.0 Site Survey

Chargemaster want to ensure that a Charge Point is fully operational and ready to use when it is powered up.

With this in mind it is important that the following process is adhered to prior to installation:

- Where possible, a Chargemaster representative / partner company undertakes a Site Survey prior to supply of the Charge Point.

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- If works are being undertaken by another installer it is still important that Chargemaster are able to advise on the application and installation of its Charge Point range.
- Following site survey and prior to Charge Point supply – it is vital that Chargemaster are provided with the following information where they / their partner businesses are not managing the installation:
 - Full location address.
 - Installer contact details.
 - Incoming Supply distribution board location and rating.
 - Mobile network coverage for intended location.
 - Any other prudent information.
- The mobile coverage must be checked at the exact location, orientation and height as the angled surface of the post being installed or the exact wall position for a wallmount taking account of where the front will be.
 - GPRS coverage should be checked by using a GPRS signal strength meter using an O2 SIM card and the exact location where the charge point is to be installed.
- Electrical provision:
 - A qualified electrician should be consulted to ensure that within the existing provision there is:
 - for single phase installations, a 63A supply available to connect to the Charge Point (Fastcharge requirement).
 - For three phase installations, a 230/400V, 3 phase supply at 63A.
 - The necessary civil works required to cater for the supply cable are covered in the next chapter.
- The Charge Point will only be supplied when this information is ascertained.

3.0 Civil Engineering Works

This section covers Charge Point installation for posts and wallmounts:

- Surface mount.
- Wall Mounted.

The following is general advice to be taken prior to any installation works being carried out. It is assumed that each contractor will have their own demonstrated Health and Safety process in place, including Risk and Method Statements, which covers at a minimum:

Ensure that the Civil Team have the following:

- Copy of Safe Dig Prints
- Copy of Site Survey
- Calibrated CAT & Genny
- Copy of Client Installation Manual

Personnel:

- All installation and service personnel will be required to attend an on-site briefing to cover topics including, but not limited to:
 - Definition of scope of works.
 - Existing services.
 - Use of correct personal protective equipment (PPE) and personal safety.
 - Emergency telephone numbers.
 - Identifications of working near electricity – alerting hazards.
- All staff is required by law to sign a document identifying their participation in this induction, and their understanding of their roles and responsibilities.
- All operatives and service personnel will be adequately trained and qualified for their specific task.

Standards that will apply to the installation of a charging post include:

- IEC 61851 – Electric vehicle charging station.
- IEC 60950 – Low Voltage Directive.
- BS7671 – IET Wiring Regulations – 18th Edition.
- BS6164:2001 Code of practice for tunnelling in the construction industry (where a supply feed is required to be drawn).
- BS7375 – Code of practice for the distribution of electricity on building sites.
- BS6423 – Maintenance of electrical switchgear up to 1kV.
- IET Code of Practice for Electric Vehicle Charging Equipment Installation, 3rd Edition.
- HS(G)141 – Health and Safety guidelines for electrical safety on construction sites.
- Health and safety guidelines concerned with the COSHH of materials, including but not limited to:
 - Building materials – concrete, cement, shuttering timber.
 - Installation materials – wire, charging post base, charging post.
 - Materials used in construction tooling – Electrical generators, fuel.
 - Control and use of PPE in the installation process.
- Manual handling requirements associated with the materials or plant used in the installation process.
- Any additional Health and Safety rules presented by the civil engineering contractors.
- Method statement and Risk Assessments
- Permit and Open Notice Numbers

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Fig 3.1 – Floor mounted post on concrete plinth with earth pit for TT earth rod



Fig 3.2 – Floor mounted post on concrete plinth in tarmac parking bay with bay marking



Fig 3.3 – Floor mounted post on concrete plinth



Fig 3.4 – Floor mounted post concrete plinth on soft ground - plinth dimensions are 0.6mx0.6mx0.6m

3.1 Surface Mounting - ground works for cabling



Fig 3.5 – Post Foundations being dug

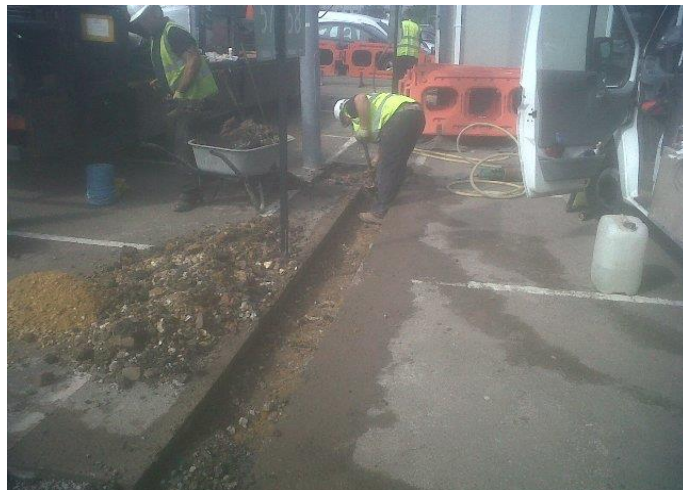


Fig 3.6 – Excavate Trench to 0.3m width by 0.45m depth



**Fig 3.7 – Check Trench Depth and consolidate Base
Warning Tape**



**Fig 3.8 – Install 63mm Minimum PVC Duct- Provide
100mm above Duct Run**



Fig 3.9 – Reinstatement Road Surface with Existing Material Type



Fig 3.10 – SWA cable being fed through

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Fig 3.11 – Install of post and guardrail onto concrete plinth within a block paving site

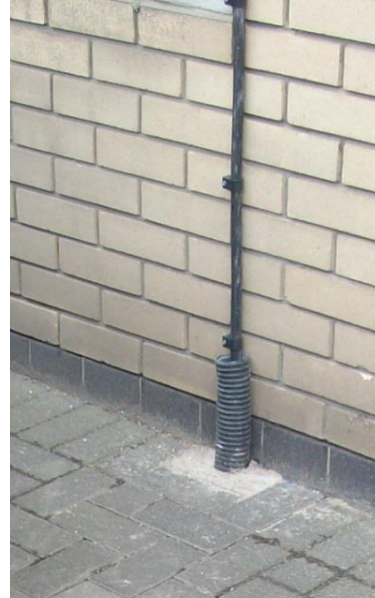


Fig 3.12 – Supply cable cleated to wall and routed under block paving to the post

3.2 Surface Mounting Floor Post Installation Considerations

The larger floor Post is designed for surface mounting and has an integrated base plate as supplied (see Fig 3.15 – 3.18). The fixings are bolted through the slots shown in Fig 3.15 and 3.16. These fixings are protected by 4 separate cover plates that are clipped into position after the post is bolted to the plinth (see Fig 3.16 – 3.18). A fillet of clear silicone should then be applied along the edges of each cover plate to avoid water ingress affecting the bolt head.

To secure the post in place, the installer will need to provide four 100mm Spax concrete screws or M12 x 150mm expanding concrete anchor bolts or similar fixings.

- 1) It is vital that the concrete surface on which the floor post is located is horizontal in both directions as any deviation from horizontal in either axis will affect the vertical alignment of the charge point.**
- 2) The concrete plinth must be level with the ground unless the client specifies they want it above ground. If so, it is recommended that the plinth is a minimum of 100mm above ground and the edges are clearly marked with yellow paint to avoid a trip hazard.**
- 3) As recommended in Fig 3.1, a 0.6m³ base will allow the post and guardrail to be mounted. If just a post is being installed, the minimum plinth would be 450mm poured concrete.**
- 4) A duct must be provided through the concrete base for the incoming cable, which should be filled with expanding foam once the install has been completed; see also section 5.1 on installation.**
- 5) A pipe should be provided through the base for an earth rod if required; alternatively an earth rod pit must be sited alongside the post base.**
- 6) The concrete must be allowed to set fully before the post is installed. Fibres can be used in the concrete mix to bind it. The post can be sealed to the plinth by a fillet of clear silicone around the outside of the post base.**

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- 7) The key-switch or user interface screen/RFID reader should face the 'Pedestrian Side'. The 'Pedestrian Side' is taken to be a clearly defined walkway or minimum 1.2 metre access area.
- 8) If the post is mounted on or near a path, health and safety must be considered regarding the charging cables being connected between the post and the vehicle, which will drag along the ground and present a potential trip hazard. There should be no public access on the cable/road side of the post.
- 9) Cables need to be sized in accordance with BS7671 and the install and earthing in accordance with BS7671 and the IET Code of Practice for Electric Vehicle Charging Equipment Installation, particularly sections 7 and 8. Refer to section 4.3 regarding the wattage to be used in any cable gauge calculation.
- 10) The above images show the installation of ground fed cables. Also refer to section 5.1. in this document. The distance and routing of the cables from the Distribution Board and/or feeder pillar must be taken into account in the cable calculations and the breakers required in the Distribution Board.
- 11) If SWA cables are being installed on the surface of buildings, then cleating requirements must be met and account taken of information provided in any building survey or any asbestos survey.
- 12) The armoured cable should enter the post from underneath and be secured in accordance with BS 7671. Terminations are then to the connector blocks within the post, which can be accessed by removing the door.
- 13) Any block paving or tarmac removed during the installation must be reinstated to avoid any shrinkage.



Fig 3.13 – Fixing holes on base plate of metal post



Fig 3.14 – Metal post base cover



Fig 3.15 – Plastic post base plate



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Fig 3.16 – Plastic post base showing fixing slot and cover

Fig 3.17 – Plastic post base with cover in position

Fig 3.18 – Plastic post base cover fitted

3.3 Wallmount

The wallmount is supplied with a wall mounting bracket. The bracket is secured to the wall using the 3 off fixing points that will take M8 bolts or screws. It is recommended that for solid walls, M8x50mm rawlbolts are used. The recommended height of the wallmount socket outlet is 0.75m-1.2m above the floor. The wallmount is located on the wall bracket top formed sections and held in place by the bottom M4 hex head securing bolts (refer to Fig 3.19 and 3.20).

- 1) It is vital that the bracket is correctly installed as the charge point mounts directly to the bracket. Any deviation from the vertical or horizontal axis will affect the alignment of the wallmount charge point.
- 2) Electrical connection to the wallmount is via the M25 hole on the bottom of the oval (refer to Figs 3.21 and 3.22). This aperture will accept an armoured cable gland or flexible conduit, if being wired to an isolation switch or adaptable box.
- 3) To install the electrical supply, remove the 8 off M6 fixings holding the fascia to the base and carefully separate the two, taking care not to strain any connecting cables. Insert the conduit fitting or armoured cable gland into the mounting hole and secure the nut on the inside.
- 4) For an armoured cable, leave sufficient insulation on the inside and form a gentle bend radius on each conductor and secure the live, neutral and earth wires to the respective 35mm² connector blocks as defined in sections 4 and 5. The connector manufacturer recommends a torque setting of 2.8-3Nm.

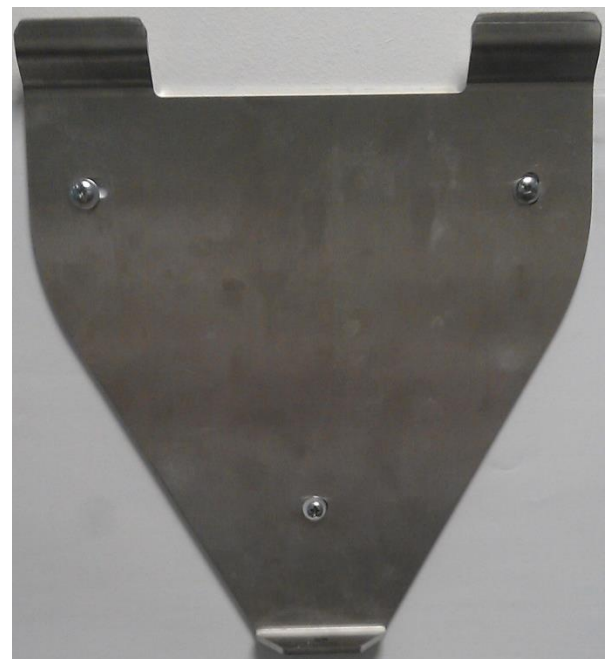
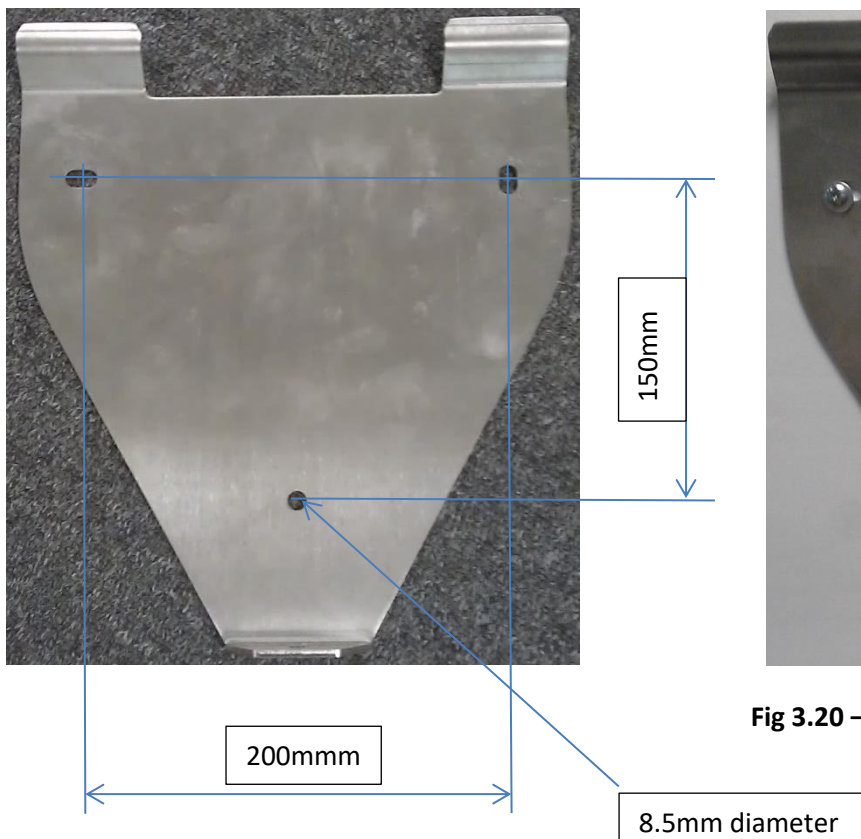


Fig 3.20 – Wallmount bracket mounted on stud wall

Fig 3.19 – Wallmount stainless steel bracket fixing positions

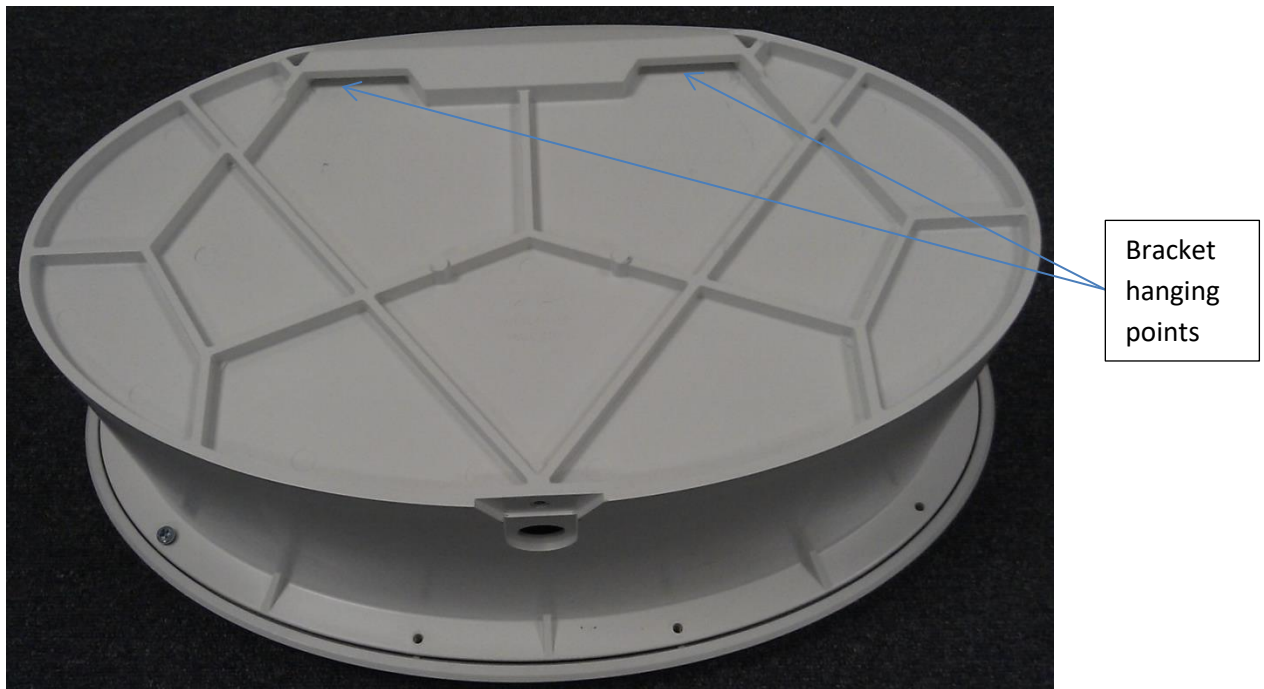


Fig 3.21 – Wallmount rear surface showing hanging points for mounting onto the bracket

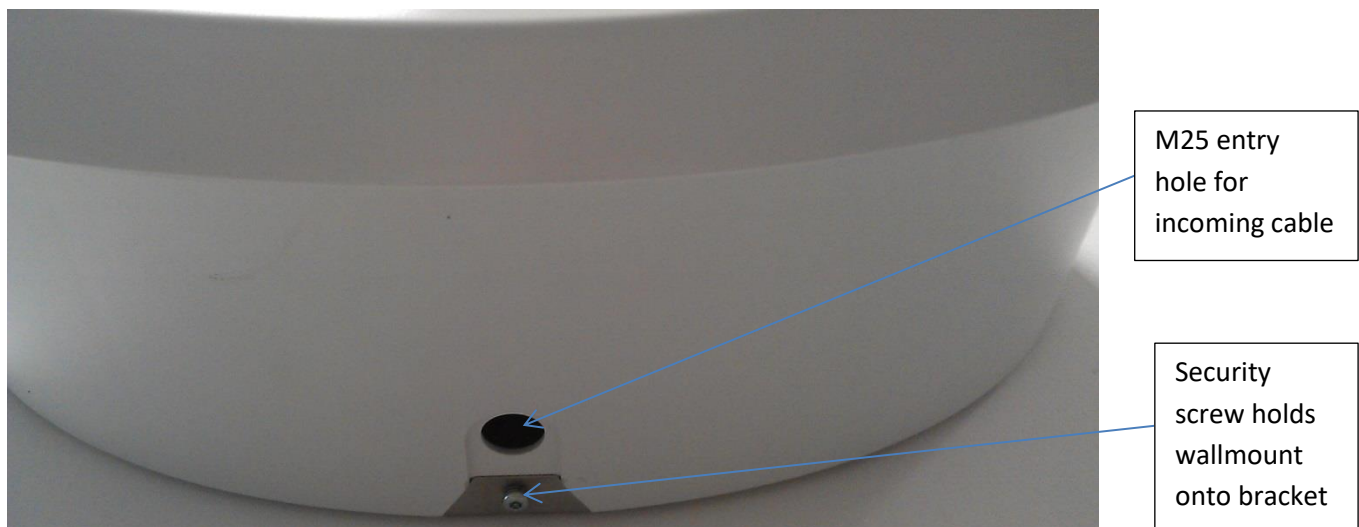
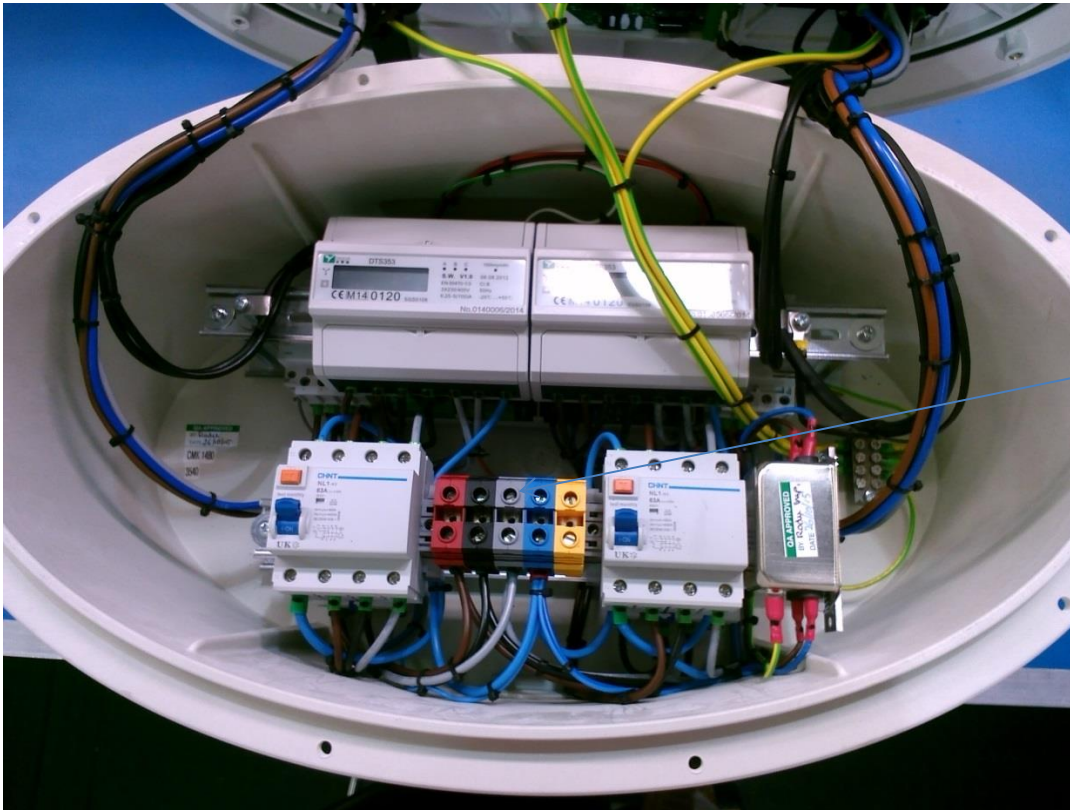


Fig 3.22 – Wallmount located on wall, showing conduit/cable entry point and security screw for bracket

There is only one access hole at the bottom of the wallmount. Under no circumstances should any additional holes be drilled as this will compromise the IP rating and warranty. When dressing the incoming cable, it is recommended that a drip loop is formed, to avoid any problems of water ingress at the entry hole. See Fig. 3.27.

3.3.1 Three Phase Wallmount Connection:

Once the charge point has been firmly attached to the wall or vertical surface, the final wiring can be completed.



Terminate the incoming cable wires here.

Fig 3.23 – Wallmount Connector blocks for incoming cable

- Ensure the supply is disconnected or isolated at the primary or secondary isolation unit.
- Bring the incoming supply cable through the bottom hole, allow for the bend radius and then connected into the top of the connector blocks, as shown in Fig 3.22 as follows:
 - The incoming L1 is connected to the red screw terminal block marked 'L1' as Fig 3.23.
 - The incoming L2 is connected to the black screw terminal block marked 'L2' as Fig 3.23.
 - The incoming L3 is connected to the grey screw terminal block marked 'L3' as Fig 3.23.
 - The incoming Neutral is connected to the blue screw terminal block marked 'N' as Fig 3.23.
 - The incoming Earth cable is connected to the yellow screw terminal block marked 'PE' as Fig 3.23.

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3.4 Bay Markings

Here we have provided examples of the intended layout and orientation of the unit relative to two parking space coverage.

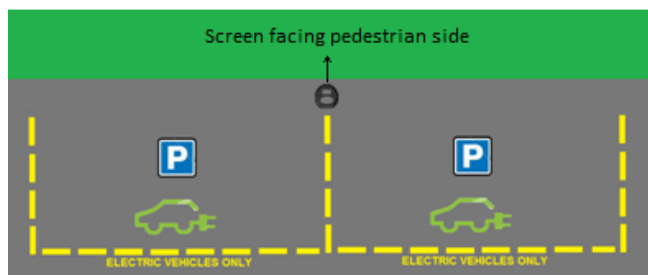


Fig 3.24 – Horizontal Parking Layout

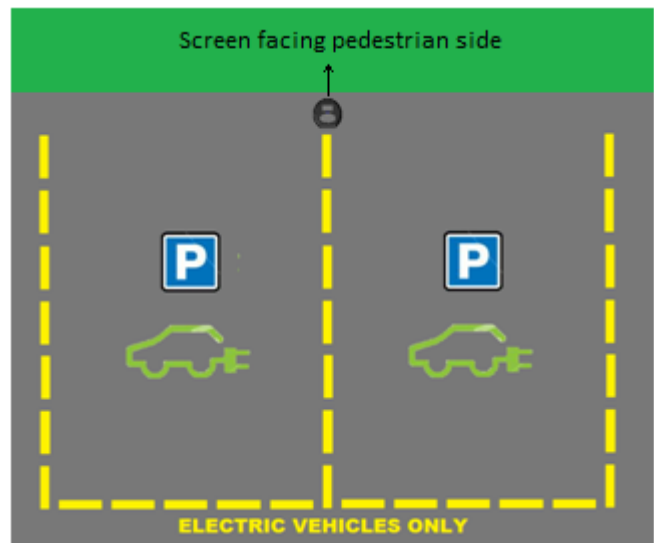


Fig 3.25 – Vertical Parking Layout

Installations for a Monochrome bay can be seen below:

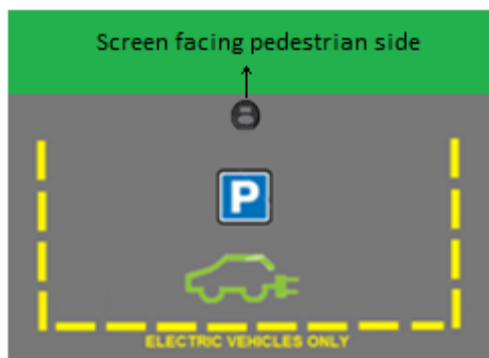


Fig 3.26 – Single Horizontal Parking Layout



Fig 3.27 – Single Vertical Parking Layout

- Alternative layouts and logos are available upon request.
- Lines will be marked using standard thermoplastic paint.
- Additional signage can be supplied upon request for attachment to a standard 75mm pole.



Incoming cable incorporating drip loop route into base of wallmount

Fig 3.28 – Vertical Parking Layout



Fig 3.29 – Specific Polar signage

3.5 Signage



Fig 3.30 – Waitrose Signage

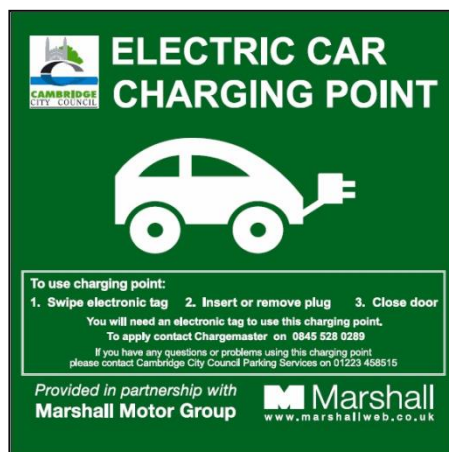


Fig 3.31 – Cambridge Signage



Fig 3.32 – Best Buy Signage

The above images are examples of typical signage for electric vehicle charging points.

3.6 Guards

All Chargemaster products can be supplied with an external guard. These are typically used in installations where the charge point is installed close to an area of high volume moving traffic.

Chargemaster Charge Point guards are 550mm in height and 492mm top diameter, made from nominal 50mm tubing. They are attached to the ground via eight M10 expanding concrete bolts (M11 clearance holes in feet) and manufactured in steel, finished in black (RAL9005) or white (RAL9010) to match the posts. The maximum diameter onto the concrete base across the outside of the feet is 545mm. Fixing details are:

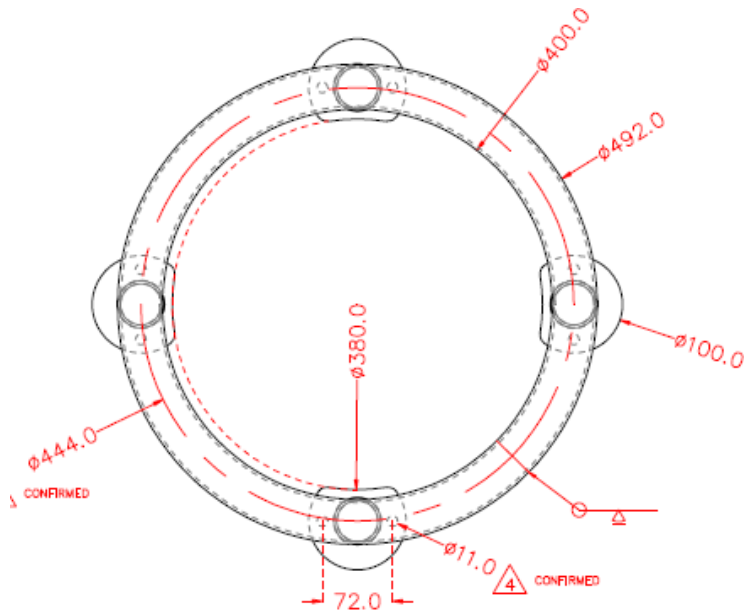


Fig 3.33 – Plan view of guard rail

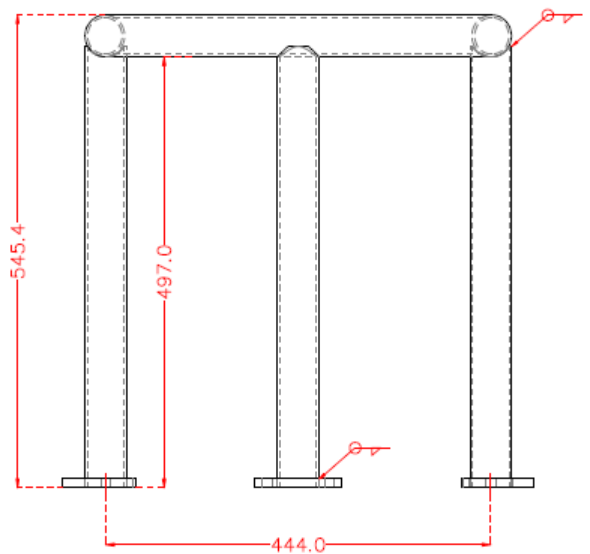
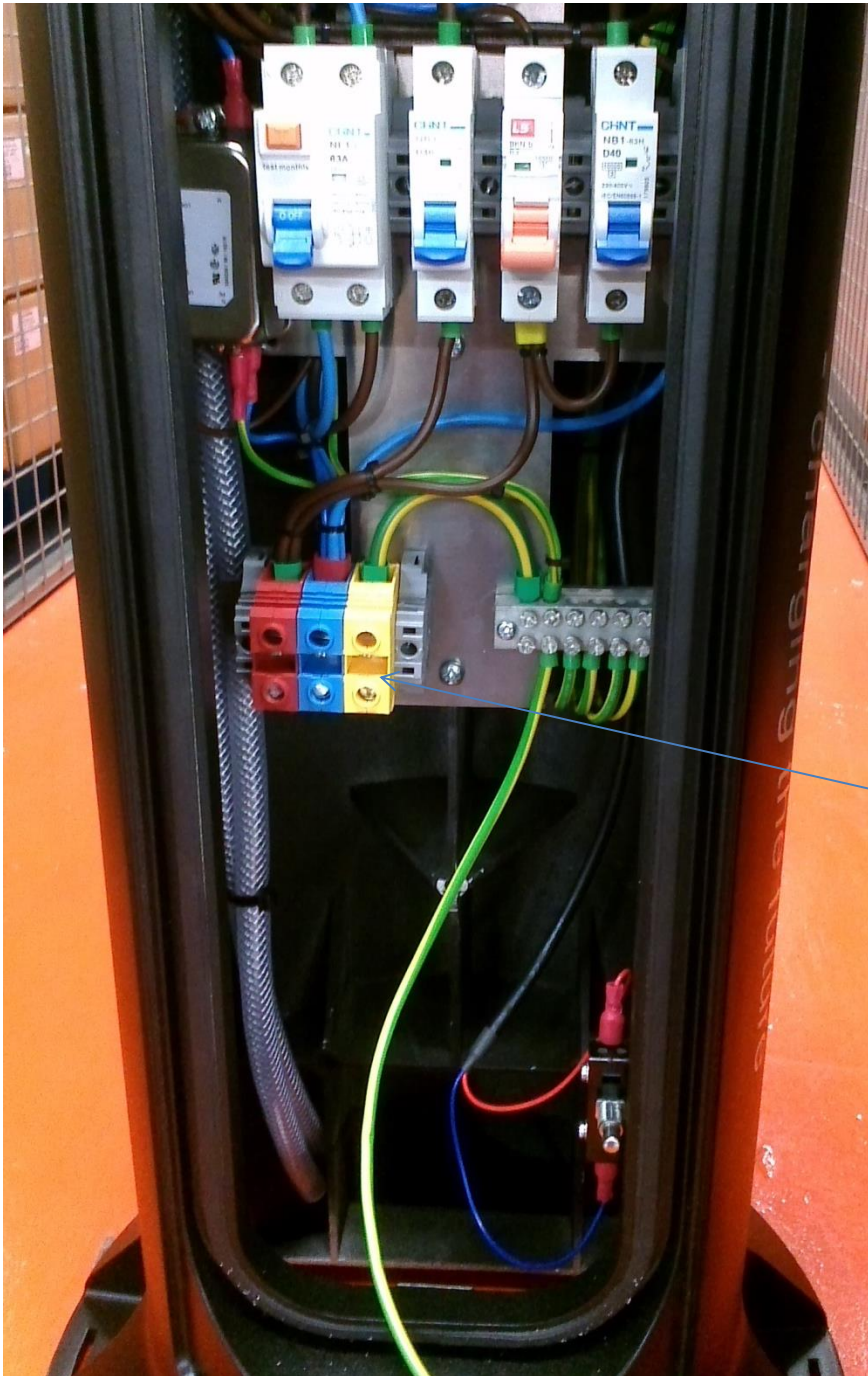


Fig 3.34 – Front elevation of guard rail

4.0 Electrical Works



Incoming cable termination point. These connection blocks will accept cable up to 35mm². The manufacturer's recommended torque setting is 2.8-3Nm and a wire strip length of 17mm. Connect the live to the RED terminal block, the Neutral to the BLUE terminal block and the green/yellow earth to the YELLOW terminal block.

Fig 4.1 – connection blocks for incoming supply cable

The provision of any backboard, and strain relief on the incoming armoured cable is the responsibility of the installer to meet all requirements of BS7671 for the incoming cable.

4.1 Connecting a Chargemaster charge point to a dedicated mains supply

There are some basic requirements that need to be fulfilled prior to installing a Chargemaster charge point.

- All Charge Points require an earth connection conforming to the requirements of IEC 60950.

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4.1.1 Single Phase:

- Each Charge point requires a dedicated 240v single phase connection continuously supplying 32A per connector.
- Chargemaster recommend that a feed of 7.36kW per socket is provided where a single phase supply is utilised. This is to guard against having to upgrade the power supply in the future.
- Alternatively, a three-phase supply can be provided where two phases are capped.
- A Fastcharge post with two 32A sockets would need to be supplied from a single phase 63A distribution board, or 2 X 32A supplies if from a Three-phase distribution board.

4.1.2 Three Phase:

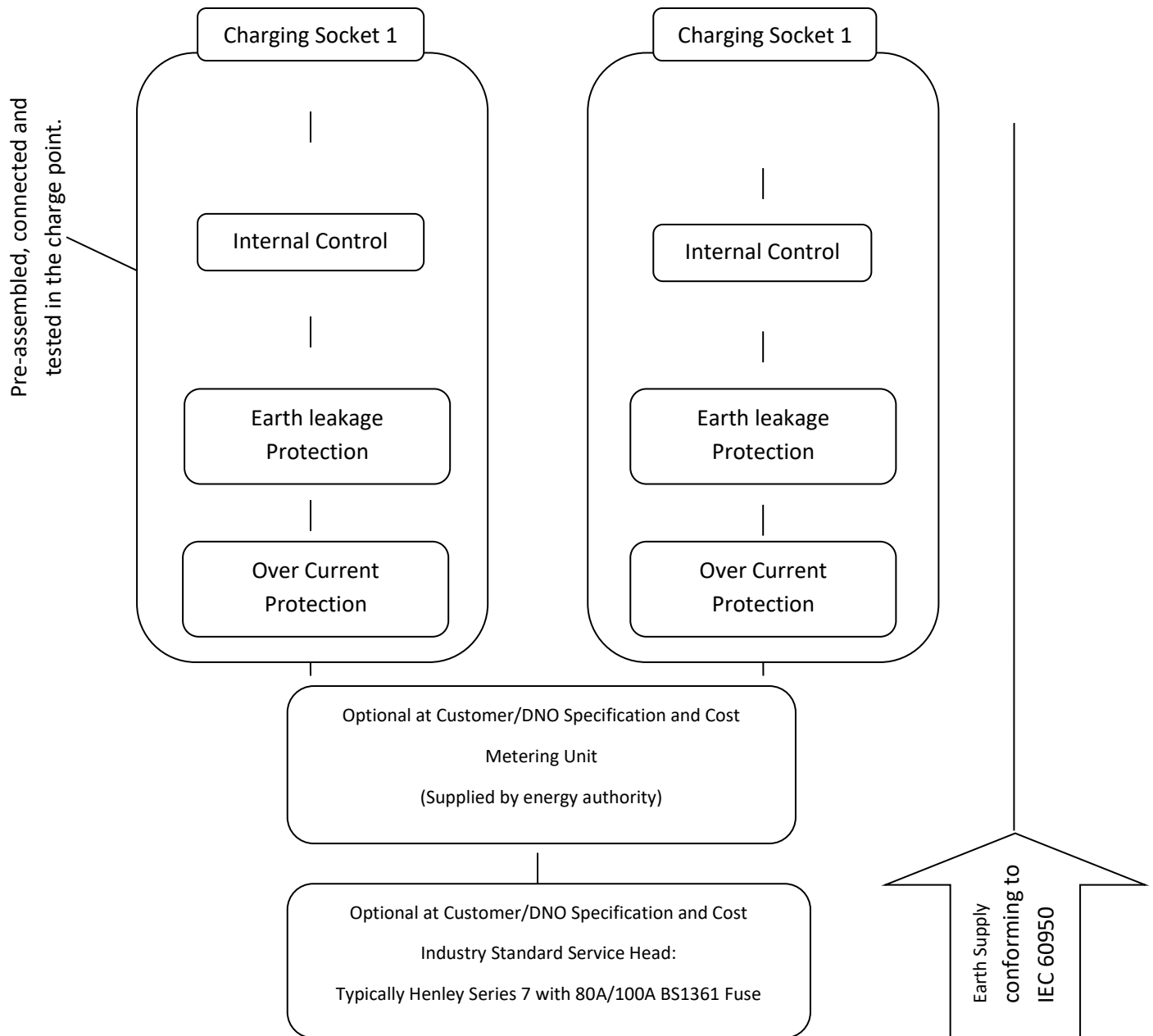
- Each Charge point socket can charge up to 22kW/hr and will require a 3 phase 63A supply.

4.2 Important Notes

- All other items are located on a bespoke Chargemaster DIN rail. The DIN rail and control hardware arrives on site already installed in the charge point.
- All components are fully tested prior to installation.
- Supply cabling is typically Steel Wire Armoured (SWA) double insulated cable which is terminated in the base of the charging post or to the Chargemaster screw terminal blocks at the bottom of the DIN rail.
- All connections must conform to IEC 60950, BS7671 and the IET Code of Practice for Electric Vehicle charging equipment installation.
- The cable gauge will be governed by complying with the requirements of BS7671 and allowable voltage drop. A 4.5% voltage drop should be considered. Cable gauge calculations must be made for each install, taking the cable run into account and if a single cable is being used, the calculations should use 14.7kW for single phase and 44kW for a 3 phase connection. Current drawn will be 32A/outlet. Account must be taken of the total length of the cable between the Distribution Board and the chargepoint and how the cable is laid with respect to ducting and proximity to other cables.
- The chargepoints can be down-rated to 16A per socket such that the total supply from a single phase supply would be 32A/phase. Chargepoints should be ordered for this configuration.
- The chargepoints can also be ordered as 'split load', such that each socket can be fed from a different phase of the distribution board. The internal wiring is arranged accordingly and two sets of connector blocks on the DIN rail are provided into which the two separate supply cables can be terminated. Chargepoints should be ordered as such if this configuration is required.
- Appropriate label for 400 volts will be required to identify the use of the 2 phases and so that the user is aware of the health and safety requirements.

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Fig 4.2 Diagram showing Installation to a dedicated electricity supply

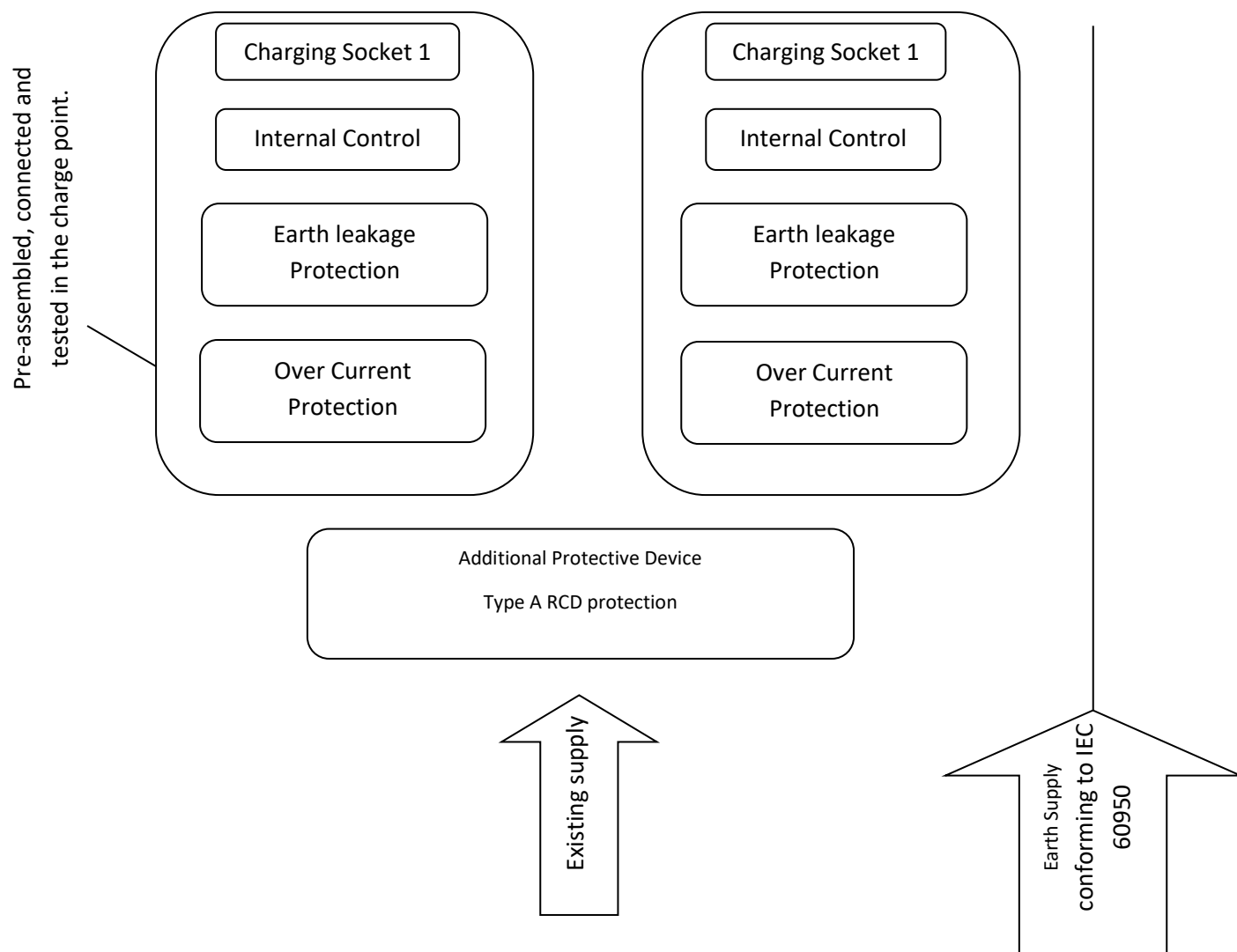


4.3 Connecting a Chargemaster charge point to an existing mains supply

To accomplish this type of application, several conditions require attention:

- 1) Within the charge point, each 32A rated socket is protected by one of the following:**
 - A BS EN60898 circuit breaker.
 - A 32A protective device, conforming to, but not limited to: BS88-2.2; BS8-6.
 - A 32A device conforming to BS1361, BS3036.
 - BS61008 Type A RCD
- 2) The protective devices are located on the DIN rail on the spine of the Chargemaster Post or on the internal DIN rail of the Wallmount.**
- 3) At the supply end, the installer may use:**
 - A 63A or 2 x 32A protective devices, conforming to, but not limited to: BS88-2.2; BS8-6.
 - Alternatively a BSEN60898 circuit breaker.
 - Alternatively a BSEN61009-1 delayed RCBO.
- 4) The charge point includes an IEC/EN 61008-1 Type B, 30mA high immunity Earth Leakage protection device, however if additional RCB is required for an installation. Refer to the IET code of practice for further recommendations on the commercial and industrial charge point installations.**
- 5) The cabling used in the installation must be verified against the requirements of BS7671 and may be 6mm² 10mm², 16mm², 25mm² or 35mm² XPLE/SWA/PVC armoured cable; the gauge is dependent upon wire run length and single or three phase for the installation. The correct voltage and power ratings must be used for the calculations, which should be 230V, 14.7kW for single phase installs and 400V, 44kW for 3 phase installs.**
- 6) The earthing requirements of IEC 60950 must be met and the IET code of practice. For TT installations, refer to section 5.1.2.**
- 7) The chargepoint provides connector blocks that accept up to 35mm² cables.**

Fig 4.3 Diagram showing Installation to an existing electricity supply



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5.0 Installation and Commissioning

5.1 Installation

Once the civil and electrical supply work has been completed, the Chargemaster charge point can be installed.

Due to its modular design this can be accomplished with a single competent electrical engineer. The sizing of the incoming supply, location of the distribution board, length of cable run, gauge of incoming feed cable required should all have been calculated at site survey time. The supply rating for the post/wallmount should be:

- For a Fastcharge 7kW per socket chargepoint: 63A or 2 X 32A
- For a 3 phase fastcharge 22kW per socket chargepoint: 63A or 2 X 32A

It is important to note that a communicating charge point will power up but **will not be fully operational** until it has been commissioned by a member of the Chargemaster technical team.

5.1.1 Prior to installation:

There are several steps to be completed prior to the installation:

- Prior GPRS survey satisfactorily completed.
- Correct positioning of the charge point in accordance with customer agreement. This must also conform to the IET code of practice.
- Measurement and visual inspection of the concrete floor onto which the post is to be mounted.
- Checking the electrical supply characteristics – at the supply and base ends.
- Earthing requirements for the EV charging installation as per IET code of practice
- Polarity of the supply.
- Correct operation of the supplied residual current devices (RCD).

5.1.2 Installation Process

Once these checks have been completed, the installation can be commenced as follows:

- Installing the charge point onto the concrete plinth using four M12 bolts/fixing, to be supplied by the installer, through the fixing slots (see Fig 3.16).
- Installation of the four fixing cover plates that protect the fixing bolts.
- Incoming supply cable terminated in accordance with IET wiring regulations and wired to the screw terminal blocks provided.
- Please note the information provided on the charge point packaging. Once removed from the packaging and installed at the outside location, the unit must be powered and not left unpowered, as this would invalidate the warranty.
- For posts, it is recommended that the access duct for the incoming cable is filled after installation with expanding foam. The post base should also be sealed to the concrete with a fillet of clear silicone.

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- Earthing of the chargepoint must be in accordance with IET Code of Practice for Electric Vehicle Charging Equipment Installation.
 - If TT and an earth rod is used, this **must have an Ra reading of less than 100ohms**.

5.1.3 Single Phase Post Wiring

Once the Post has been bolted to the concrete plinth, the final wiring can be completed:

- Ensure the supply is disconnected or isolated at the primary or secondary isolation unit.
- Terminate the incoming SWA cable directly into the coloured 35mm² screw terminal blocks. Refer to Fig 4.1 for details.

5.1.4 Single Phase Wallmount Wiring

For a wallmount, the final wiring is completed before the unit is hung on the mounting bracket:

- Ensure the supply is disconnected or isolated at the primary or secondary isolation unit.
- The incoming SWA cable screw gland should be mounted through the M25 access hole on the underside of the wallmount and secured with a nut. The screw terminal blocks are located such that the wires can be dressed and easily terminated into the three coloured 35mm² screw terminal blocks.
- Alternatively, if an external isolation switch is being used or adaptable box is being used to terminate the incoming SWA cable into externally to the wallmount, wire tails can be brought into the unit through conduit, which can be mounted in the M25 hole on the underside of the unit. The cable gauge must be capable of supply 63A continuously.

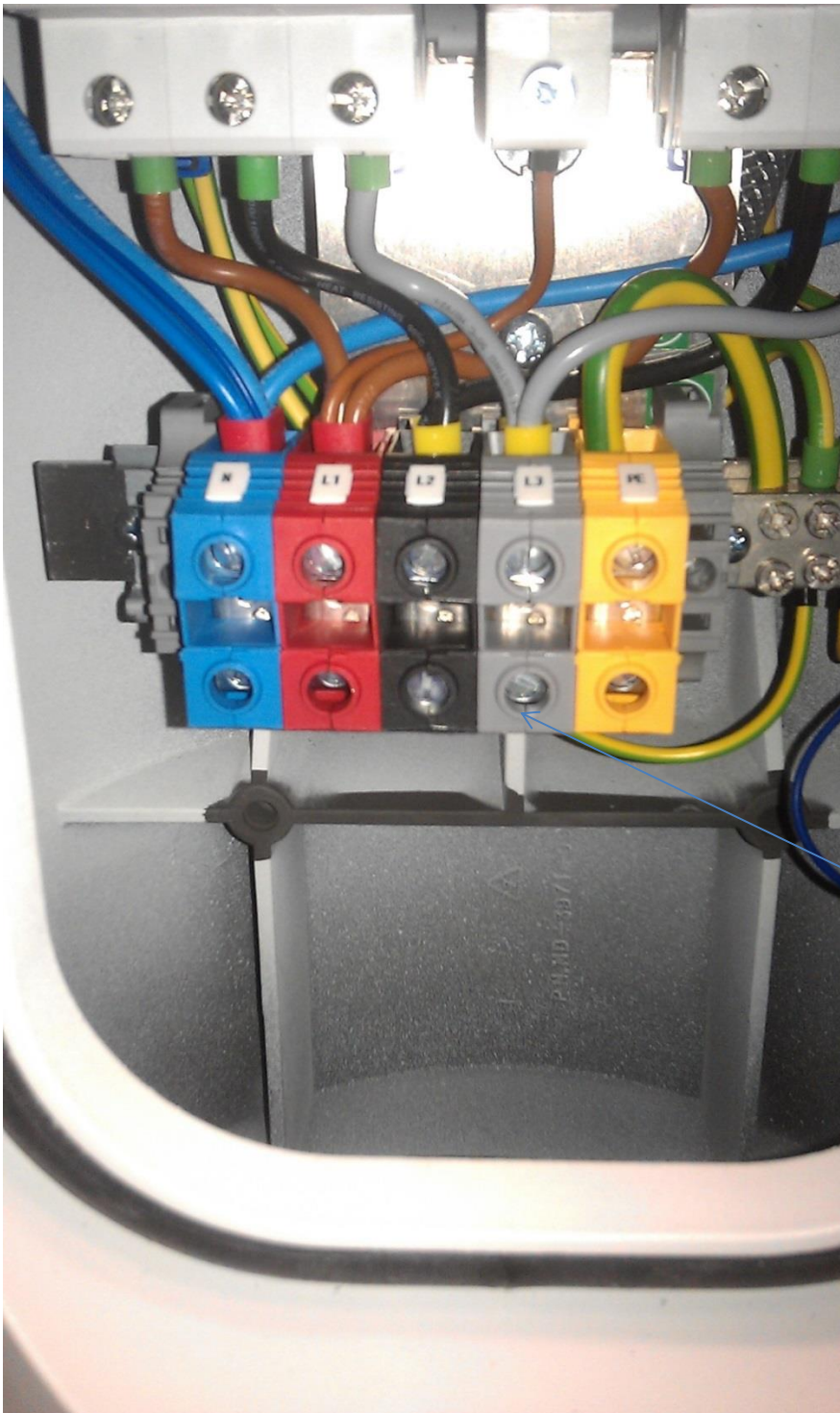
5.1.5 Three Phase Post Wiring

Once the charge post has been firmly attached to the plinth, the final wiring can be completed:

- Ensure the supply is disconnected or isolated at the primary or secondary isolation unit.
- The incoming cable is then connected as follows:
 - The incoming L1 is connected to the red screw terminal block marked 'L1' at the base of the DIN Rail.
 - The incoming L2 is connected to the black screw terminal block marked 'L2' at the base of the DIN Rail.
 - The incoming L3 is connected to the grey screw terminal block marked 'L3' at the base of the DIN Rail.
 - The incoming Neutral is connected to the blue screw terminal block marked 'N' at the base of the DIN Rail.

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- The incoming Earth cable is connected to the yellow screw terminal block marked 'PE' at the base of the DIN rail.

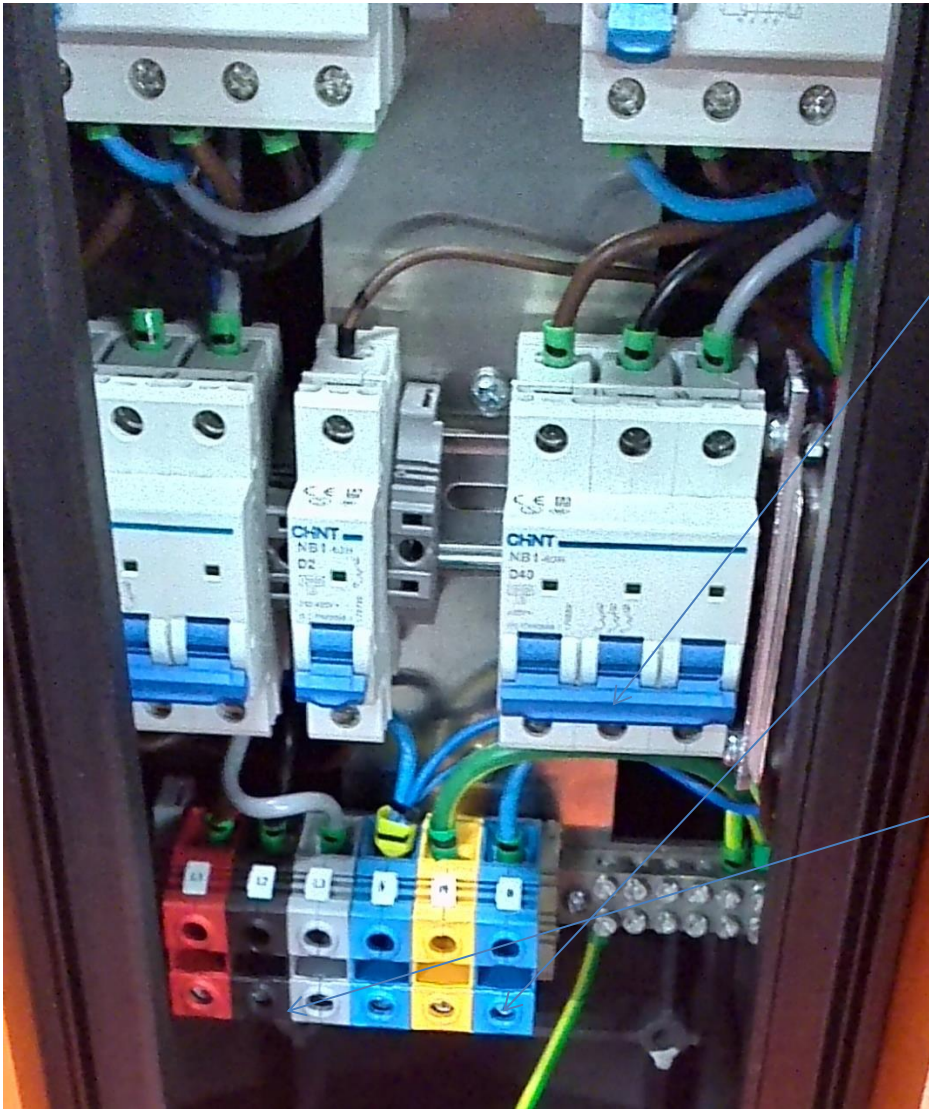


Terminate incoming cable into these connector blocks. Torque should be 2.8-3Nm.

Fig 5.1 – Incoming 3 phase cable connection screw terminal blocks

5.1.5.1 Three Phase Post Wiring, Split Load

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Connect the supply for Socket 2 to the bottom of the right hand MCB as follows: L1 to the left screw contact, L2 to the middle and L3 to the right contact.

Connect the supply Neutral for Socket 2 to the bottom of the right most connector block.

Connect the supply for Socket 1 to the bottom of the connector blocks as follows: L1 to red, L2 to black; L3 to grey and Neutral to the left most blue terminal. Yellow is a common earth connector for both incoming supply cables.

Fig 5.2 – Incoming 3 phase cable connection screw terminal blocks, split load

5.1.6 Three Phase Wallmount Wiring

For a wallmount, the final wiring is completed before the unit is hung on the mounting bracket:

- Ensure the supply is disconnected or isolated at the primary or secondary isolation unit.
- The incoming SWA cable screw gland should be mounted through the M25 access hole on the underside of the wallmount and secured with a nut. The screw terminal blocks are located such that the wires can be dressed and easily terminated into the top of the five coloured 35mm² screw terminal blocks.
- Alternatively, if an external isolation switch is being used or adaptable box is being used to terminate the incoming SWA cable into externally to the wallmount, wire tails can be brought into the unit through conduit, which can be mounted in the M25 hole on the underside of the unit. The cable gauge must be capable of supply 63A/phase continuously. It is recommended that 16mm² cable is used.
- The incoming cable is then connected as follows:

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- The incoming L1 is connected to the top of the red screw terminal block marked 'L1' on the top DIN Rail.
- The incoming L2 is connected to the top of the black screw terminal block marked 'L2' on the top DIN Rail.
- The incoming L3 is connected to the top of the grey screw terminal block marked 'L3' on the top DIN Rail.
- The incoming Neutral is connected to the top of the blue screw terminal block marked 'N' on the top DIN Rail.
- The incoming Earth cable is connected to the top of the yellow screw terminal block marked 'PE' on the top DIN rail.

5.2 Ethernet Connection to a Charge Point

In places where GPRS signals are poor, a charge point can be configured to connect to a router using an Ethernet cable to provide its communication. This should be done at the time the charge point is ordered to ensure it has been built, set-up and tested in the factory for Ethernet use.

The installer should consider the following aspects when an Ethernet connection is to be adopted.

5.2.1 Choosing a Cable Type

5.2.1.1 Cat5e

Cat5e is the most cost effective option for connecting a charge point over Ethernet and will be suitable in most cases. The cable run should not exceed 76 metres, as the signal may suffer attenuation.

5.2.1.2 Cat6

If the cable run between the charge point and router does exceed 76m, then Cat6 cable should be used and will allow for faster transmission of data.

5.2.2 Interference

In the event that the data cables and power cables have to be run together, the following points should be taken into consideration.

5.2.2.1 Spacing

Power cables can emit electro-magnetic interference that can interfere with data cables. It is therefore recommended that data cables are routed separately from power cables, or with at least a 300mm separation. Should the cables have to cross paths, this should be done at 90° angles from one another.

5.2.2.2 Shielded Cable

If it is not possible to run data and power cables separately, it is recommended that shielded Ethernet cable is used. This type of shielded Ethernet cable contains aluminium foil to suppress electro-magnetic interference.

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5.2.3 Connection to the Charge Point

The charge point will be built with an internal Cat5e cable terminated with an RJ45 plug. In a post, the RJ45 plug will be at the top of the door aperture and 1m of spare Ethernet cable should be allowed to reach the connection point. The incoming Ethernet cable from the router will need to be terminated with either an RJ45 socket or a plug. The Cat6 patch lead within the chargepoint is terminated in an RJ45 plug and a mating male/female 8 pin coupler is also provided to accept the incoming Ethernet RJ45 plug.

For connection to a wallmount chargepoint, **the Ethernet cable will have to be routed in the same conduit as the mains cable** and must therefore be a shielded cable. The terminating RJ45 plug will be located behind the fascia. Under no circumstances should an additional hole be cut in wallmount housing. If an armoured mains cable is being used, this will need to be terminated externally to the unit and conduit run into the bottom hole of the wallmount which will need to take the mains wires and the Ethernet cable. Refer to section 3.3 for details.

5.2.4 Router Configuration

There are no special router configuration changes required for charge points. Charge points operate on port 80 – the port used by your internet browser – which is open by default on standard routers.

5.3 Commissioning

- **All commissioning is to be carried out by trained Chargemaster staff only**
- **Please ensure that the 'switch on' date and precise location of the Charge Point have been agreed and documented with Chargemaster prior to installation**
- All commissioning tests will follow industry practice and Data Protection Legislation.
- Once assembled, all charge points will undergo an internal testing schedule including, but not limited to the following functions, which will depend on the charge point facilities provided by the product type:
 - Power up functions.
 - Communication protocol functions.
 - User interface function testing.
 - Status and Health indication function.
 - Earth leakage and over current protection testing.
 - Remote access through Management System – including testing of remote functions.
 - Connectivity with server:
 - To allow most recent Authorised User List to be updated,
 - To allow for unit to be added to the active list,
 - To check PPP and GPRS functions,
 - Note coverage must have been verified at site survey.
 - User interface testing in relation to server communications:
 - Authorised user access and door release functions,
 - Time stamp identification of charge point event.

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- Check the recorded response of the Management System to each charge point event.
- All subsequent updates to the charge point, charge point infrastructure and management system will be subject to testing.
- All testing reports will include, but will not be limited to:
 - Relevant testing carried out,
 - The results of the test being carried out,
 - Any deviation from the approved test strategy,
 - If testing failed in any way and the severity of the test failure.

Once fully installed and commissioned the Chargemaster charge point is ready to accept its first authorised user.