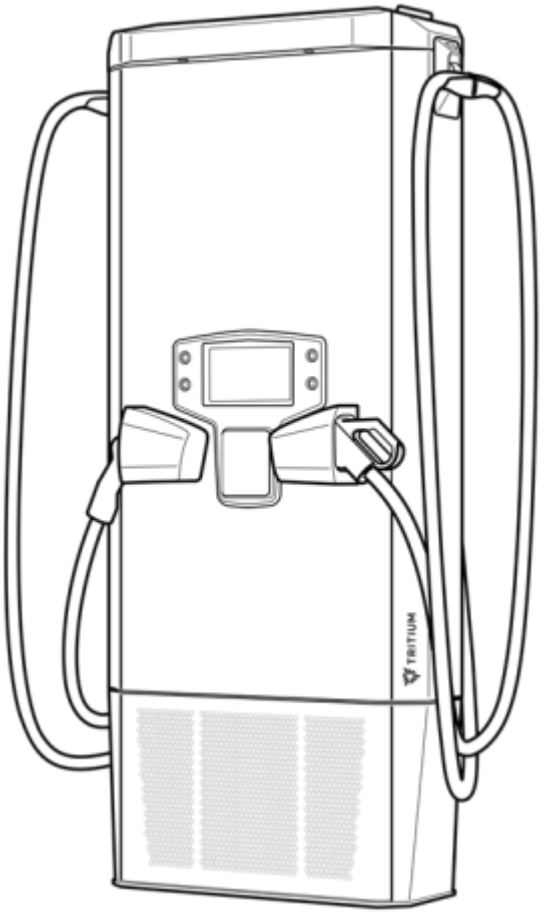
RTM Installation Manual



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Revision record

Rev	Date	TC #	Change	Author
12	11/04/2023	4390	Conversion from InDesign document to Word and latest template. General changes made throughout the document.	S Grewal, S George, TUV SUD, A Prewecki
13	12/05/2023	4733	Various edits and re-structure of document to improve the flow.	S Grewal, A Prewecki, S George. X Casley
14	31/05/2023	4705	Update to removed CCR/RFID clear protective strip.	B Barron, A Prewecki
15	24/07/2023	4910	Updates for Singaporean requirements	S George, A Prewecki
16	25/10/2023	5259	Added FCC - 47 CFR 15.105 statement as per BP finding and minor edits to the EMC Statement for World Wide.	S George R Weir
17	31/10/2023	5475	Updated wording in RF Site Survey section.	A Prewecki, G Smith
18	10/11/2023	5533	Link to newly created doc: CHK.2834v1_Radio Frequency (RF) Site Survey Requirements and Checklist	A Prewecki, G Smith
19	23/01/2024	5485	Update for RCD's for Singaporean Certification and World Wide considerations	S George

Rev	Date	TC #	Change	Author
20	24/01/2024	5649	Update to Section 4.0.7 Foundation Requirements.	G Smith, S Sommerschuh
21	23/02/2024	5674	Updated section 1.3 for FCC/ISED certification statements	R Weir
22	10/05/2024	5857	Update for UAE legislation	S George
			Added French warning statement to Section 1.3.2	R Weir
23	21/06/2024	5927	Update ferrites section and high-power input wiring section.	J Wu, G Smith
24	17/09/2024	6088	Update copyright information	S Caddaye
25	24/02/2025	6007	Review document & update copyright information	S Caddaye
26	20/05/2025	6470	Update RF site survey section to include MyTritium link.	J Wu

This document is based on TEM114v15

Contents

Contents

1 RTM - INS.046 RTM Installation Manual

1.1 Purpose

This manual contains important instructions for the RTM - 50 kW and 75 kW DC Electric Vehicle Fast Charger.

Two variants of the charger exist:

- Configuration 1
- Configuration 2

Each variant requires different installation steps, and each can be a further variant to suit North America (UL) or Worldwide (CE).

1.2 Important safety instructions

Read the installation and operating instructions before installing and commissioning the equipment.

These instructions must be followed during installation.

CAUTION - RISK OF ELECTRIC SHOCK

- The RTM must be serviced only by trained and **qualified electrical personnel** when **upstream power is switched off**.
- Read all instructions in this manual before servicing the charger.
- Ensure that all local and regional regulations are observed.

1.2.1 Identifying symbols

Symbol	Definition
	**CAUTION**
	**CAUTION - RISK OF ELECTRIC SHOCK**
	**IMPORTANT**
	**READ THE MANUAL**

Symbol	Definition
	Equipment Grounding Conductor Symbol
	Phase Symbol
	Alternating Current Supply Symbol
	DC Current

Wiring

Tritium recommends the use of copper cables. Take care to observe local regulations regarding wiring different circuits in the same conduit, including the ethernet link if used. In general, all conductors occupying the same conduit must have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the conduit. Liaise with the local authorities to ensure local regulations are met.

1.3 Electromagnetic compatibility

1.3.1 USA

The RTM75 has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by Tritium could void the user's authority to operate the equipment.

1.3.2 Canada

The RTM75 contains licence-exempt transmitters/receivers that comply with Innovation, Science and Economic Development Canada’s licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L’émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d’Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes:

1. L’appareil ne doit pas produire de brouillage;
2. L’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.

Changes or modifications not expressly approved by Tritium could void the user's authority to operate the equipment.

1.3.3 Other regions

The RTM75 has been tested to and complies with IEC 61851-21-2 - EMC requirements for off board electric vehicle charging systems.

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

1.3.4 Radio frequency exposure

- The RTM75 complies with the general population/uncontrolled exposure limits of FCC Part 1.1310.
- The RTM75 complies with the general public/uncontrolled environment limits of RSS-102.
- The RTM75 complies with the applicable exposure limits of EN 62311.
- The RTM75 complies with the general public exposure limits of ARPANSA RPS S-1.

Transmitter	Minimum separation distance
EG25-G radio modem LTE-FDD: B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B25, B26, B28 LTE-TDD: B38, B39, B40, B41 WCDMA: B1, B2, B4, B5, B6, B8, B19 GSM: B2, B3, B5, B8	20 cm from antenna
Payter credit card reader 13.56 MHz RFID	0 cm from contact surface
TRI153-28 13.56 MHz RFID	0 cm from contact surface
Ingenico credit card reader 13.56 MHz RFID	0 cm from contact surface

2 Save these instructions

This manual contains important instructions for RTM50 and RTM75 that shall be followed during installation, operation, and maintenance of the unit.

CAUTION

Installation MUST NOT be made in Hazardous Areas as defined by local legislation/standards.

These include: (but are not limited to)

USA - UL 2202: 2012

Installation shall not be made in a commercial garage (repair facility), closer than 6m (20ft) to an outdoor combustion fuel dispensing device or Hazardous Areas as defined by local legislation.

UK – RC59 Ver.2: 2023 – Fire Safety When Charging Electric Vehicles

Where hazardous installations, such as ignitable liquids storage, are present, EV charging points should be separated from the edge of Hazardous Areas (Zone 1 or 2, ATEX) by a minimum of 10 metres. This minimum separation distance shall be extended for vehicles >5 metres long, to be equivalent to the full length of the vehicle, plus 5 metres.

Singapore – TR25-1: 2022

EVCS shall be installed outside any Hazardous Zones where flammable/combustible gas may be present. Where necessary or in doubt, the fire agency shall be consulted.

2.1 Charger access

The following equipment applies to locations with non-restricted access as defined in:

- IEC 61851-1: 2017
- IEC 61439-7: 2022
- TR25-1: 2022

2.1.1 Nominal voltage range and frequency

400-480 VAC (+/- 10%), 3-Phase - No Neutral, 50/60 Hz

2.1.2 Nominal Current at nominal voltage level

Nominal Line Voltage		
Configured Power	**50 kW**	**75 kW**
Worldwide (CE)	76 A	114 A
North America (UL)	63 A	95 A
Low Line Voltage		
Configured Power	50 kW	75 kW
Worldwide (CE)	84 A	120 A
North America (UL)	70 A	105 A

2.1.3 Regional specific installation requirements

Liaise with local authorities to ensure that any national, regional, and local regulations are obeyed in the country of installation.

These include (but are not limited to):

- ANSI/NFPA 70 – National Electrical Code (North America)
- LA DBS – LAMC: Los Angeles Municipal Code
- BS 7671 – IET Wiring Regulations

2.1.4 Recommended over-current protection device required (OCPD) in site distribution board

The RTM charger must be connected to a circuit provided with appropriate over-current protection in accordance with the national, regional, and local regulations in the country of installation.

2.1.5 Bonding / grounding instructions

This charger must be connected to a grounded, metal, permanent wiring system. An equipment-grounding conductor must be run with circuit conductors and connected to the equipment-grounding terminal or lead on the electric vehicle charger.

Connections to the RTM charger must comply with all local codes and ordinances.

Observe all pertinent national, regional, and local safety laws and regulations when installing and commissioning the RTM charger.

2.1.6 Tightening torque

<table>
<tr><th>Wire</th><th>Configuration 1(UL/CE)</th><th>Configuration 2(UL/CE)</th></tr>
<tr><td>L1</td><td rowspan="4">20 Nm</td><td rowspan="3">6Nm</td></tr>
<tr><td>L2</td></tr>
<tr><td>L3</td></tr>
<tr><td>Earth</td><td>20Nm</td></tr>
</table>

2.1.7 Weather rating

IP65 Electronics Enclosure

2.1.8 Usage limitations

Cord extension sets or second cable assemblies must not be used in addition to the cable assembly for the connection of the vehicle to the charger.

Adaptors must not be used to connect a vehicle connector to a vehicle inlet.

CAUTION

This product can expose workers to chemicals including ethylene glycol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to:

- https://www.cdc.gov/niosh/topics/ethylene-glycol/default.html
- https://www.p65warnings.ca.gov/

3 Moving and storage instructions

Read these instructions carefully to become familiar with the RTM charger packaging and handling procedures prior to unpacking and installation.

In all cases, the RTM charger must be transported to the installation site in its original packaging and only unpacked at the installation site.

Installation, commissioning, and servicing of the RTM charger should only be carried out by qualified personnel.

3.0.1 Materials

The RTM charger is transported in a reinforced cardboard crate. Please respect the environment and recycle/reuse the materials.

3.0.2 Storage

Store in the original packaging, in a horizontal position.

Store in a dry location, protected from the weather (warehouse conditions).

3.0.3 Storage temperature

-35°C to 70°C (-31° to 158°F)

3.0.4 Handling

Only lift the RTM charger packaging in its horizontal orientation using a forklift, pallet jack, or with lifting straps and forklift or crane. Check the weight on the delivery documents and ensure the lifting apparatus used is compatible.

3.0.5 Receipt

Check that the crate packaging is in good condition and that the RTM charger is not damaged.

If any problems are noted, make a formal complaint to the carrier and notify your supplier.

3.0.6 Shipping/storage dimensions

Packed crate weight

Up to 375kg (826lbs)

Crate size

In mm: (Metric)

1190 (W) x 2135 (L) x 685 (H)

In inches: (Imperial)

46.85 (W) x 84.05 (L) x 26.96 (H)

RTM weight

Up to 300kg (661lbs)

4 Site configuration

4.0.1 Structural/geographic site survey

A qualified engineer must survey the installation site to determine the correct ground preparation for the size and weight of the RTM charger, in accordance with local regulations.

The RTM charger is best installed following the recommended site configuration requirements.

Additional considerations need to be observed when placing the charger in an outdoor environment. To ensure charger functionality, it is recommended the charger be installed in a shaded environment. However, where the local environment reaches temperatures over 50ºC (122ºF), the charger shall be installed in a shaded environment as this may impact the warranty.

4.0.2 Grid Quality Survey

It is highly recommended that a grid quality survey be performed before installation.

A poor-quality grid can cause the charger functionality to be diminished and in a worst case, damage the charger which will void warranty. Some regional standards/recommendations may include:

Generic – IEEE 519: 2022 (Applicable where there is no regional specific standard)

Standard for Harmonic Control in Electric Power Systems

UK – ENA G5-5: 2020

Harmonic voltage distortion and the connection of harmonic sources and/or resonant plant to transmission systems and distribution networks in the United Kingdom

Europe - EN 50160: 2022

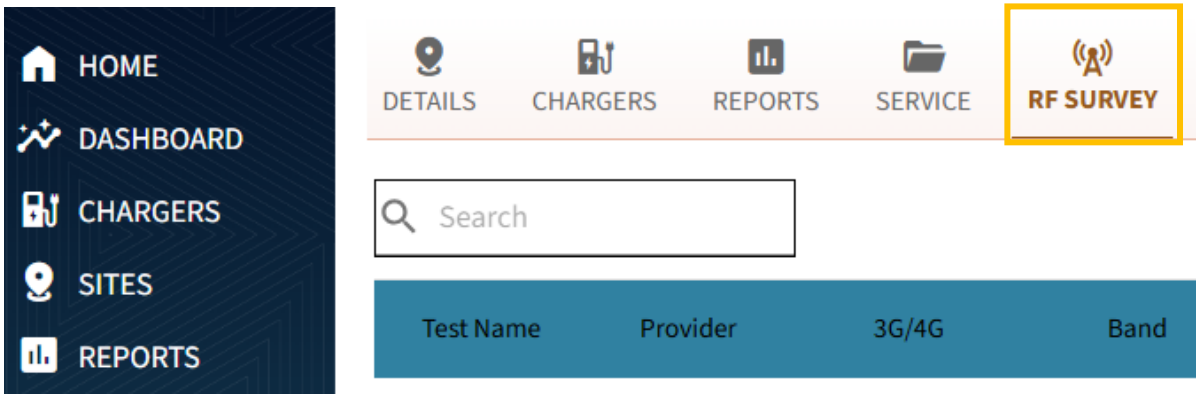
Voltage Characteristics of Electricity Supplied by Public Electricity Networks

4.0.3 RF site survey

It is a requirement for a qualified Radio/RF/EMC engineer to perform an RF survey of the site across the full 3G and 4G/4.5G frequency spectrum prior to installation.

This will help determine if there is sufficient signal strength for the applicable regional bands and identify any potential interfering signals at the site.

For guidance on how to obtain and apply the Site Survey results to Tritium chargers, go to , go to *MyTritium (SITES > select a site > RF Survey).*



4.0.4 RCD considerations

In some regions an RCD is required on the AC Input from the grid.

If an RCD is required, Tritium has 2 RTM configurations:

	Standard RTM Configuration:	RTM Low Leakage Configuration:
RCD Type:	Type B / B+	Type B / B+
RCD Trip Limit:	100 mA	30 mA
RCD Time Delay:	Instantaneous to 100ms MAX	Instantaneous to 100ms MAX
RCD Rated Current:	160A	160A

Tritium recommends Type B / B+ with adjustable time selection to enable reduction of nuisance tripping caused by Grid Transient Events.

The Low Leakage Configuration operates in three phase networks with TT or TN-S only and is available as an orderable installation kit from Tritium.

The Low Leakage Configuration shall be installed in an IP65 rated enclosure or distribution board.

Observe all pertinent national, regional, and local safety laws and regulations when installing, commissioning, and repairing.

Note: If using a Type A RCD due to mandatory regional legislation/standards, it should be noted there is potential for DC residual currents that could potentially ‘blind’ a Type A RCD, rendering it incapable of responding to a situation in which there is a genuine electric shock risk.

A Type B / B+ RCD on the other hand provides a more comprehensive detection capability for various residual fault currents, including smooth DC currents.

RCD model to enable Low Leakage configuration when used:

Manufacturer:	Charger Model:	Model:	RCD Rated Current:
Siemens	RTM 75 (75kW)	3VA9114-0RL21	160A AC

4.0.5 Ground fixing

The RTM charger is to be fixed to the ground through the baseplate fixing holes with 4x M16 fasteners. Fasteners are not supplied, because the type required depends on the foundation used and must be chosen by the installer accordingly.

The fasteners should fix the RTM charger securely to the foundation through the baseplate in accordance with the dimensions and fixing points shown in the Baseplate dimensions section.

Note: Keep the plastic inserts from the bolts for use in the baseplate holes.

4.0.6 Conduit requirement

Up to Ø110mm (4”) OD conduit maximum. Ø50 (2”) and Ø25mm (1”) conduit standard.

4.0.7 Foundation requirements

The foundation must be flat, even, and have the appropriate density for the weight of the charger.
Check the flatness and level of the foundation and level of the RTM charger baseplate prior to fixing.

IMPORTANT

The charger base plate is not designed to sit on stand-offs. Using stand-offs reduces the contact surface for the load distribution and can create local stress concentration that has not been considered in the product design.
Ensure the foundation provides a flat and level surface large enough to suit the charger footprint.

In situations where sites provide inadequate installation conditions, a Civil Engineering service provider should be engaged to propose an adequate solution for creating a flat mounting surface that supports the weight of the charger.

4.0.8 Communications

Wired ethernet or 3G/4G network capability.

4.0.9 Power supply

The RTM charger is designed to accommodate input wiring from either an underground or above ground foundation.

4.0.10 High power input wiring

High power input wiring can be provided to the charger in three different scenarios:

1. A single multi-conductor cable Ø27-38mm (1-1 1/4”) to suit the supplied M50 cable gland. The cable needs to be a continuous cable with no joins. If a joint is required, it must be done by means of a IP65 rated junction box.
2. Running the wiring in a 50mm (2”) conduit and installing using the provided M50 conduit adaptor and seal.
3. Individual wires can be used with the provided alternate gland plate and 4x M32 cable glands. Each individual cable must be Ø13-18mm (1/2”). The cable needs to be a continuous cable with no joins. If a joint is required, it must be done by means of a IP65 rated junction box.

4.0.11 Auxiliary field wiring

The auxiliary field wire must be a single multi-conductor cable Ø10-14mm, to use the supplied M25 cable gland.
If the auxiliary wire is smaller than Ø10 (25/64”), the 25mm conduit installation must be used.

CAUTION

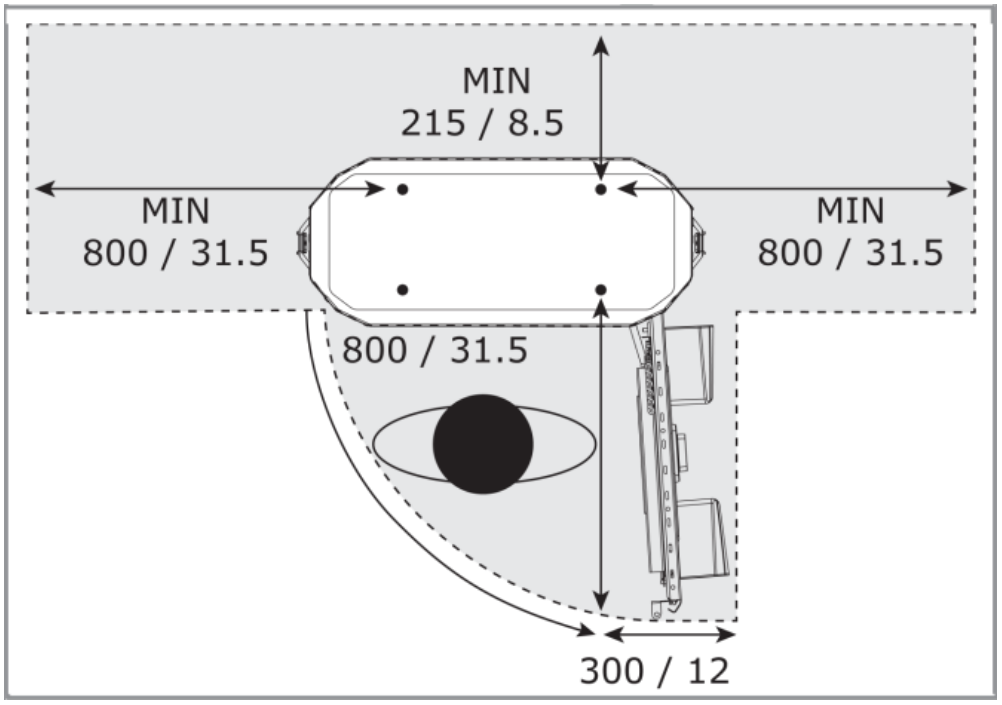
It is critical to product safety and warranty that IP65 is achieved for all input wiring.
To continue to achieve the IP65 rating the power cabling must be fitted correctly into the conduit and the conduit sufficiently sealed so that no water or debris can enter.

4.1 Servicing distance

CAUTION

Additional space is required around the RTM charger for servicing, as shown in the following image. Measurements are from the RTM foundation points.

Note: The grey areas shown in the image must be kept clear of all obstructions. This allows the charger to be serviced and provides clearance when the front door of the charger is opened.

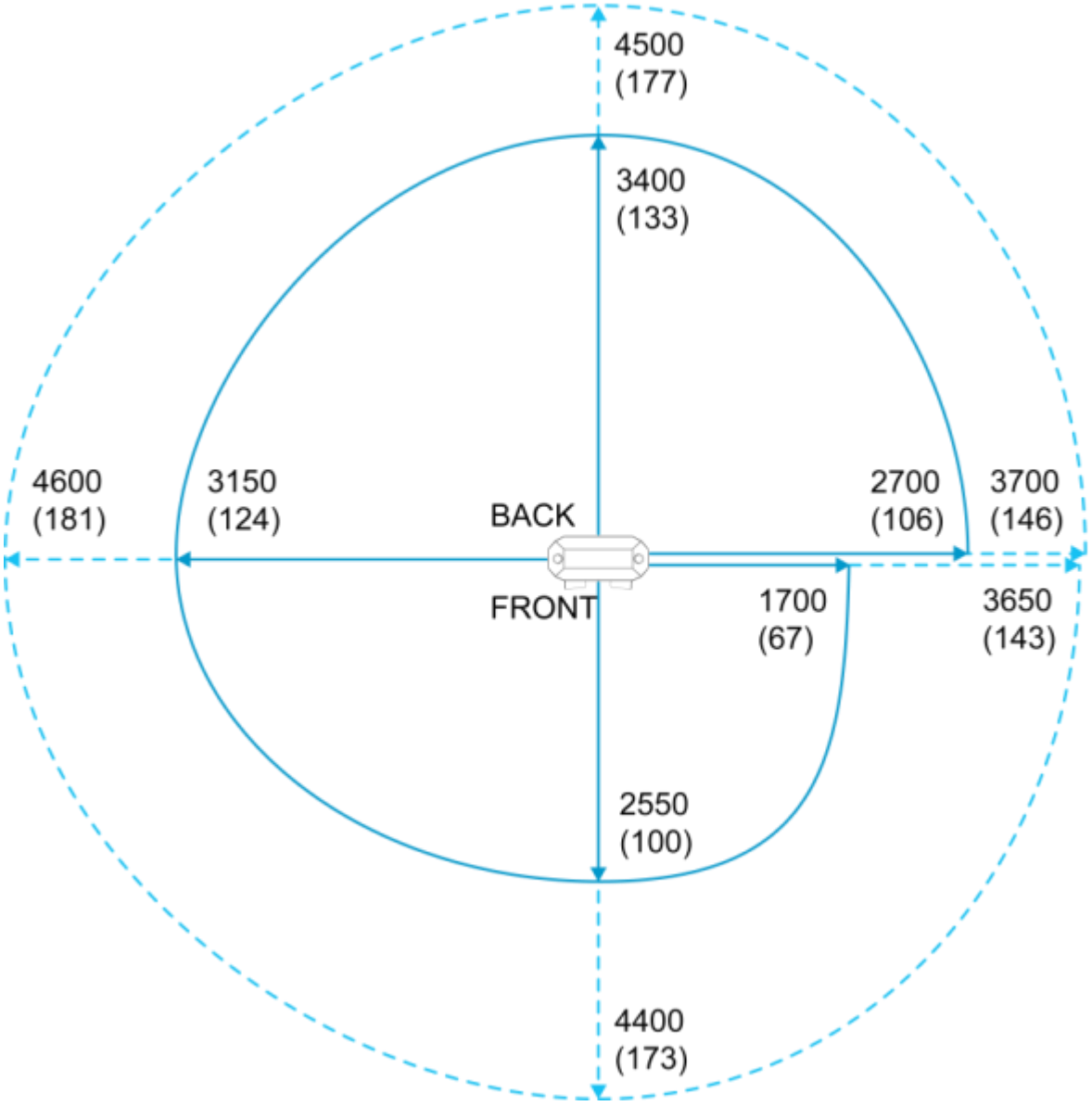


Front of charger

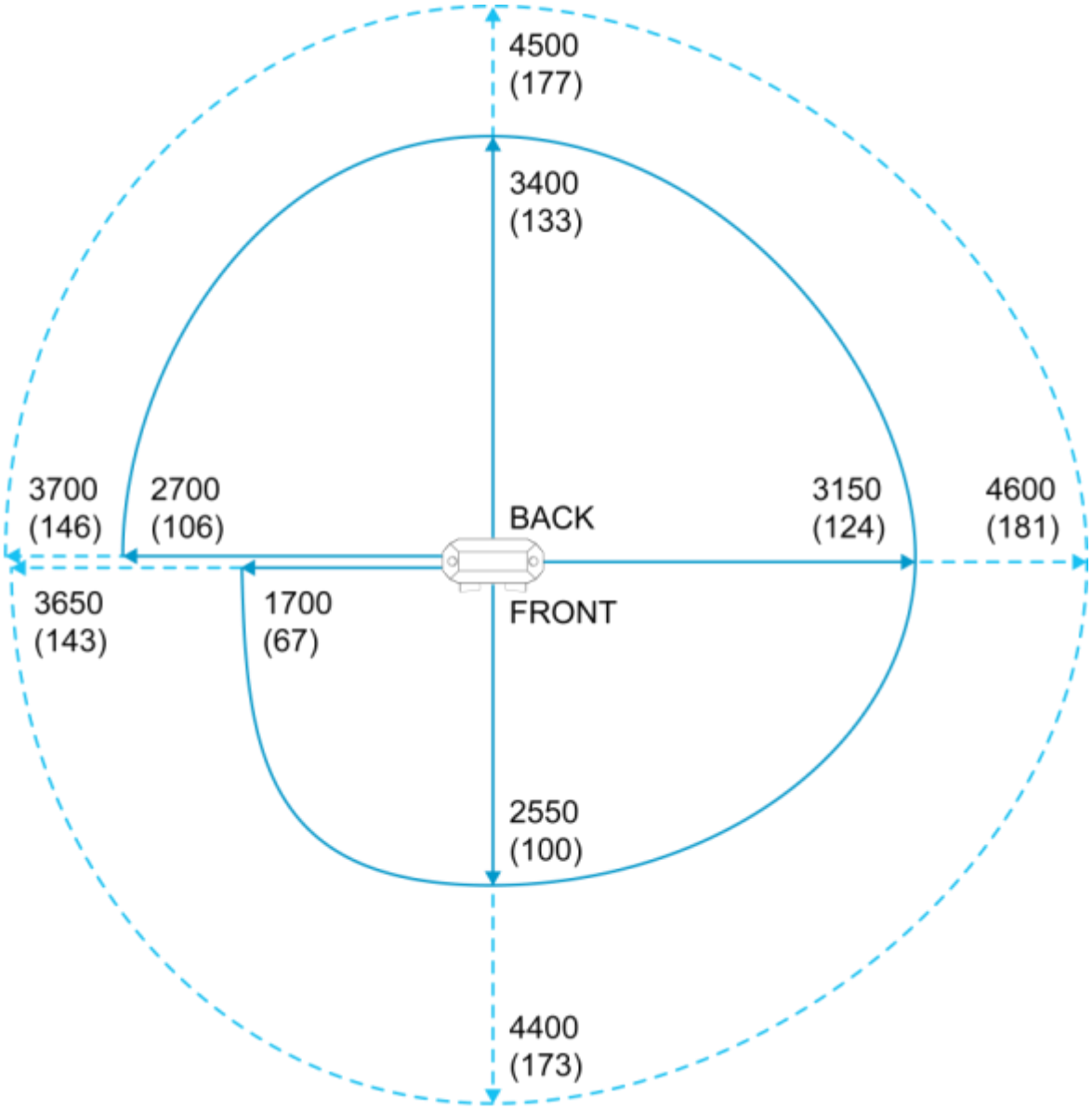
Notes	
	Keep clear area
Do not scale drawing. Dimensions in mm / inches.	

4.2 Cable reach

4.2.1 Right side cable reach

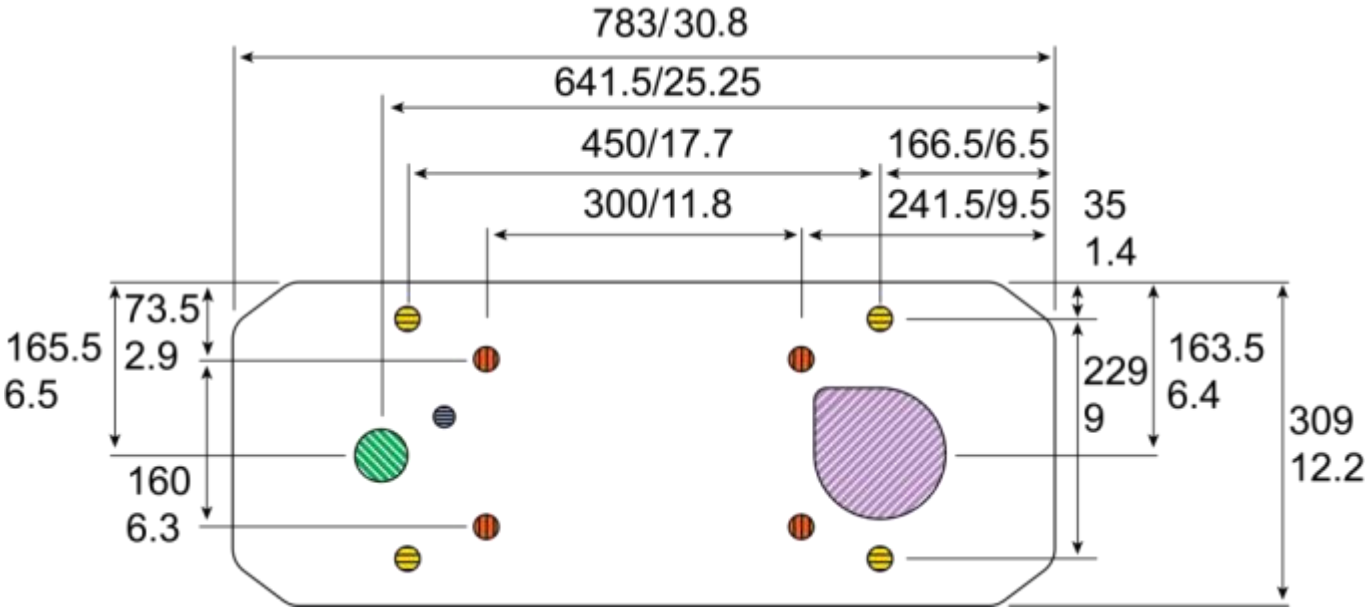


4.2.2 Left side cable reach



Notes	
——	3.6m Cable without management
- - - -	6m Cable with management

4.3 Baseplate dimensions



Front of charger

Key	
	125mm Wiring in hole
	50mm Grounding conductor hole
	20mm Grounding conductor hole (retrofit over Veefil-RT installation)
	Fixing point holes (retrofit over Veefil-RT installation)
	Fixing point holes new installation
Note:	Do not scale drawing. Dimensions in mm / inches. Tritium can supply a mounting stencil at customer request that features measurements in mm and inches.

IMPORTANT

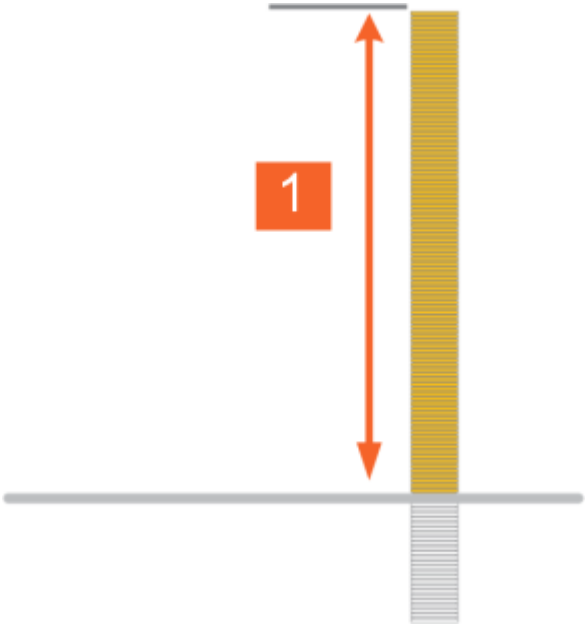
- Fixing point holes (shown in red) are only to be used when retrofitting over an existing Veefil-RT 50kW installation.
- If installing on an existing Veefil-RT foundation refer to the retrofit installation section.
- A lower wind load rating will apply in retrofit installation.

5 Site preparation

5.1 Underground wiring

Power supply preparation

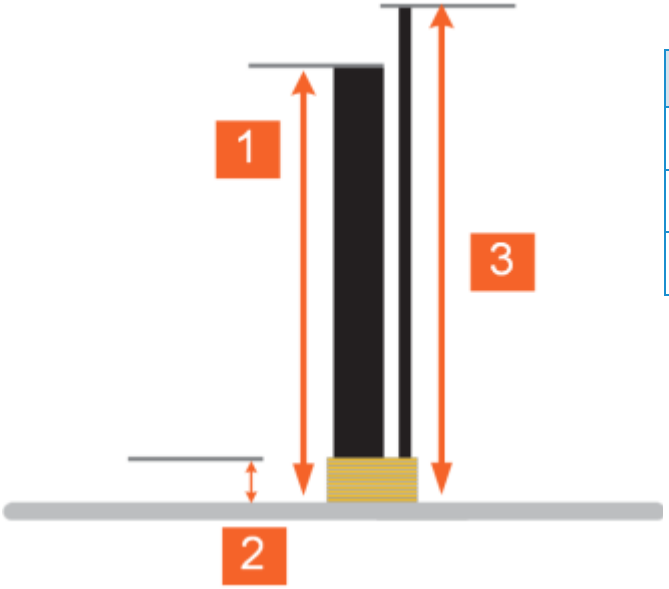
When preparing the foundation, allow approximately 1 metre (40”) of conduit and wiring from the foundation surface:



Key #	Description
1	1 meter (40")

Large conduit installation

If the conduit used is greater than Ø50mm (2”), cut the conduit 20mm (1”) from the foundation surface. Cut the wiring as shown below:

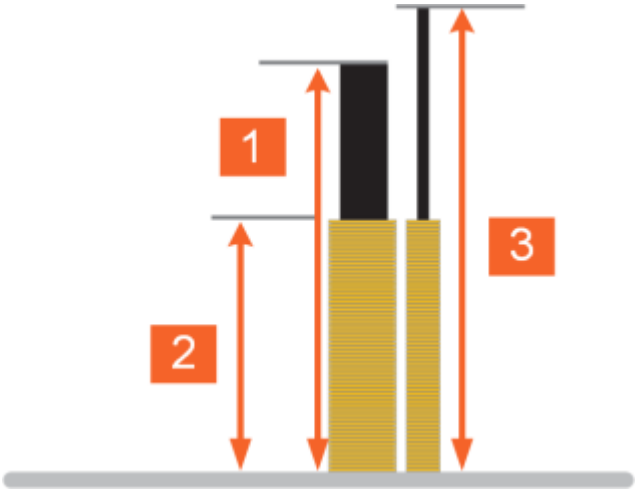


Key #	Description
1	HP Input Ground Ethernet 900mm (35.5")
2	Cut conduit 20mm (2") from foundation
3	AUX Field Wiring 1000mm (40")

Note: Use expanding foam to fill in or around the conduit, to avoid it filling with water and debris.

50 & 25mm conduit installation

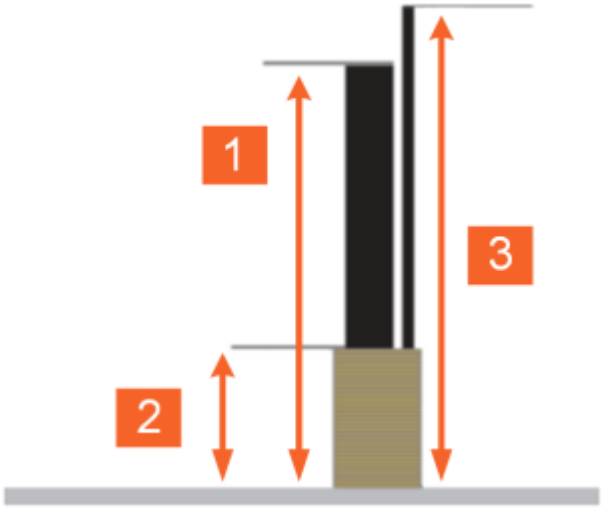
If using conduit fittings, cut the conduit 390mm (15.5”) from the foundation surface. Cut the wiring as shown below.
Note: This installation is not suited to route ethernet wiring:



Key #	Description
1	HP Input Grounding 900mm (35.5")
2	Cut conduit 390mm (15.5") from foundation
3	Field Wiring 1000mm (40")

Cable gland installation

If the installation is using a 50mm (2") cable gland, cut the conduit 200mm (8") from the foundation surface. Cut the wiring as shown below:



Key #	Description
1	HP Input Ground Ethernet 900mm (35.5")
2	Cut conduit 200mm (8") from foundation
3	AUX Field Wiring 1000mm (40")

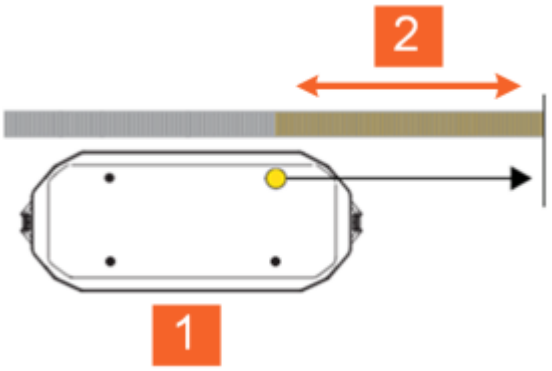
Note: Use expanding foam to fill in or around the conduit, to avoid it filling with water and debris.

5.2 Above ground wiring

Power supply preparation

Use 50mm flexible conduit for providing power above ground.

Leave a minimum of 1500mm (59”) of conduit and wiring from the right rear foundation hole. Prior to installation, the conduit and wiring will require trimming:

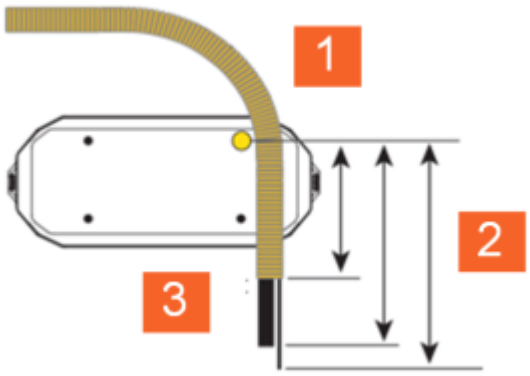


Key #	Description
1	Minimum 1500mm (59")
2	Charger front

Full conduit installation

Cut the conduit 470mm (18.5”) from the right rear foundation hole. Cut the wiring as shown below:

Note: This installation is not suited to route ethernet wiring:

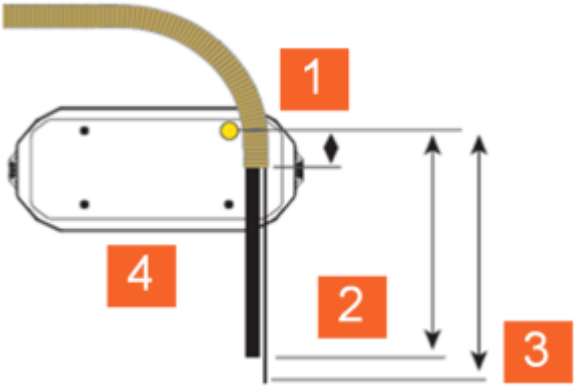


Key #	Description
1	Cut conduit 470mm (18.5") from foundation hole
2	HP Input Grounding 1000mm (40”) AUX Field wiring 1100mm (40”)
3	Charger front

Cable gland installation

Cut the conduit 100mm (4”) from the right rear foundation hole. Cut the wiring as shown below.

Note: Use expanding foam to fill in the conduit to avoid it filling with water and debris.

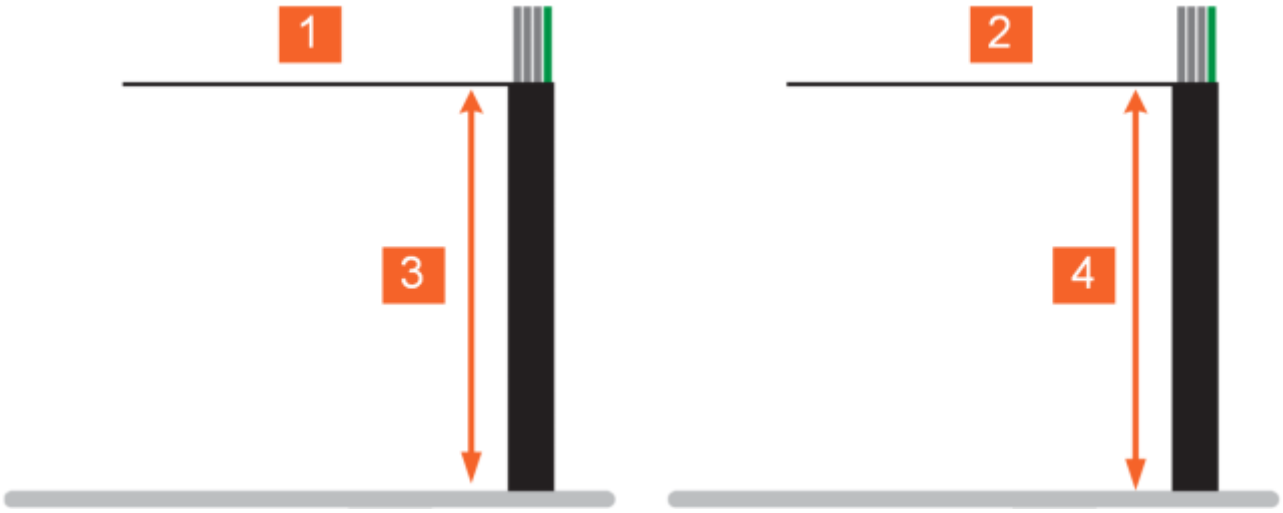


Key #	Description
1	Cut conduit 100mm (4") from foundation hole
2	HP Input Grounding Ethernet 1000mm (40")
3	AUX field wiring 1100mm (40.3")
4	Charger front

5.3 High power input wiring

Prior to installation of the RTM, cut the wiring sheath as per the diagrams shown for both underground and above ground wiring:

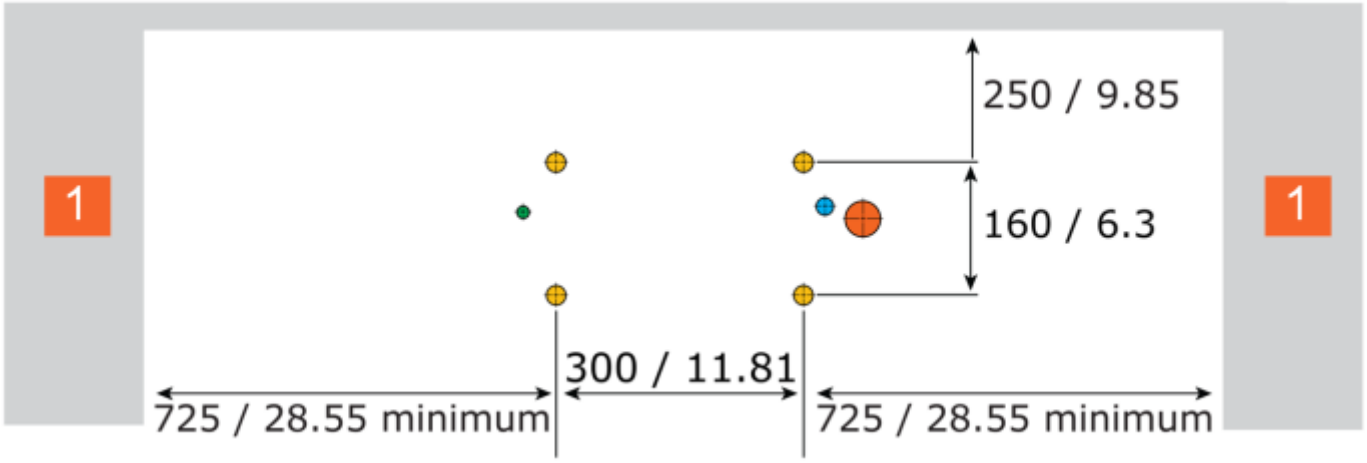
Note: Drawing is not to scale. Measure and cut on site:



Key #	Description
1	Underground installation
2	Cut the wiring sheath 400mm (15.75") from foundation
3	Above ground installation
4	Cut the wiring sheath 480mm (19") from foundation

5.4 Veefil-RT retrofit

- If retrofitting the RTM onto a Veefil-RT site, you must change the foundation to suit the RTM charger and ensure the radiator is not damaged during installation.
- These instructions assume the Veefil-RT has been removed from the site, and the foundation has a protruding threaded rod to mount the RTM charger.
- If a different mounting system has been used, all minimum requirements must still be met, and the radiator shifted to gain access to the rear fixing points.
- If the dimension from the wall to the rear fixing points is smaller than 250mm (9.85”), the RTM should not be retrofitted onto the Veefil-RT foundation and the RTM installation instructions should be followed:

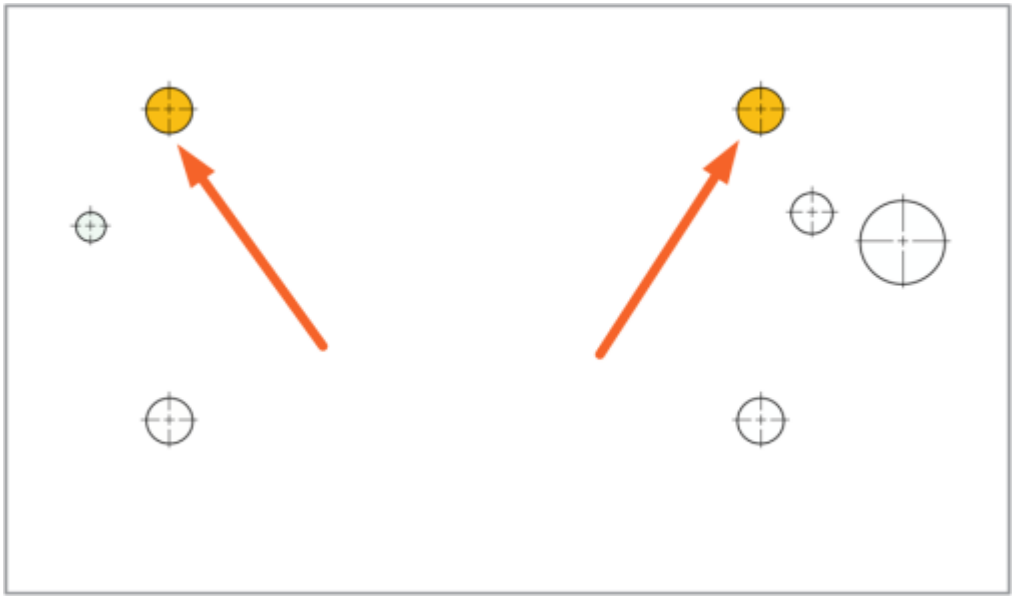
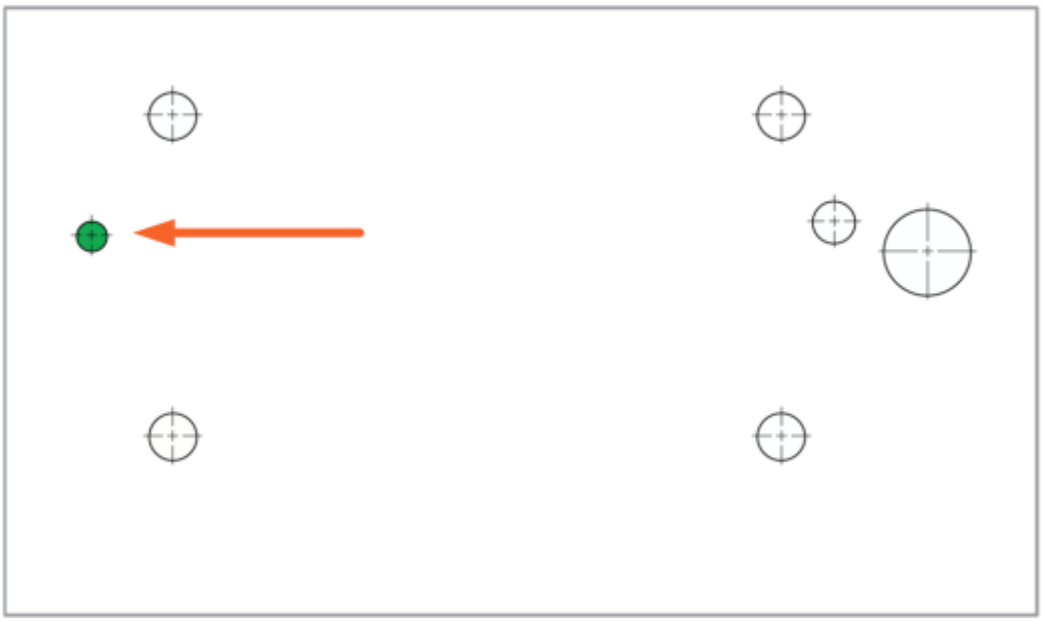


Veefil-RT Front

Key #	Description
1	Wall
	Power in conduit / cable
	Veefil-RT foundation fixing points
	Ethernet cable
	Grounding conductor
Note	All dimensions shown in mm/inches. Do not scale.

5.4.1 Adjustment of threaded rods

When using the existing threaded rods from a Veefil-RT for mounting to the foundation, additional clearance must be provided to the internal components in the bottom of the Veefil-RTM. The mounting rods shall be cut as follows:

Step	Action
1	Cut the rear threaded rods down to 30mm (1.2”) from the foundation surface. Alternatively, cut off all of the threaded rods at foundation level and fix to the foundation through the RTM fixing point holes:  **Veefil-RT front**
2	Cut the grounding rod down to 40mm (1.6") from the foundation surface:  **Veefil-RT front**

5.5 Local earth

This is a secondary point for connecting local earth to the chassis.

Attach the earth stake to the stud on the chassis. Follow local regulations regarding lightning protection and local earth bonding.

If retrofitting over a Veefil-RT site, the earth stake must be cut down to a maximum of 40mm (1.6") from the foundation surface to ensure it doesn't interfere with the radiator:

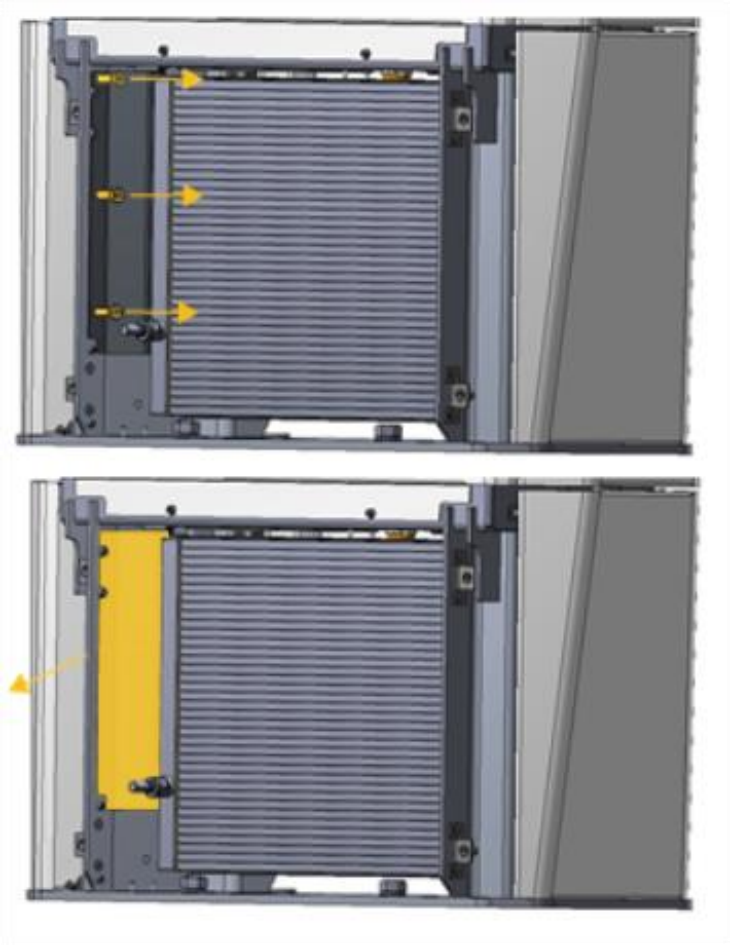
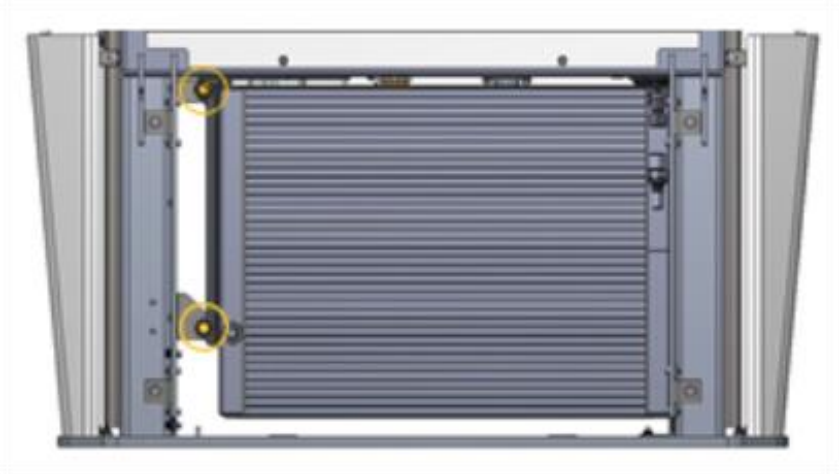
Note: This does not remove the need to attach the Protective Earth Conductor at the charger input terminals.

6 Veefil-RT retrofit procedure

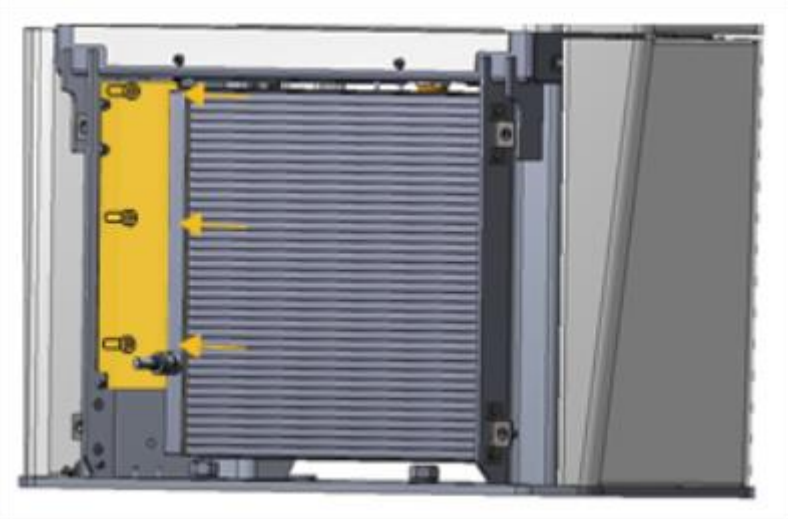
Installing an RTM over a Veefil-RT site requires temporarily moving the RTM radiator so that the fixing bolts at the bottom-rear of the charger can be accessed. Once the RTM is installed, return the radiator to its original position and secure.

The following steps take place when the RTM charger has been unpacked and the radiator panels removed, prior to installation:

Step	Action
1	Remove the plastic flanges from the RTM baseplate holes and put them into the RT holes on the baseplate, front and rear:  **RTM front**  **RTM rear**
2	Remove the M6 flange bolt on the front- left base fixing point of the radiator: 

Step	Action
3	A baffle plate is bolted onto the rear of the unit. Remove the 3x M5 bolts and the baffle: 
4	Remove the 2x M6 flange bolts from the rear of the radiator: **Note:** The radiator should still be connected to the unit at the front-left, upper fixing point. DO NOT remove: 

Step	Action
5	Move the radiator base towards the front of the charger to gain access to the rear Veefil-RT fixing points. The RTM unit is now ready to mount onto the foundation following the standard procedure:  After securing the charger to the foundation, remount the RTM radiator.
6	Return the radiator to the original position and fix it into place with the M6 flange bolts at the front and rear:  

Step	Action
7	Mount the baffle back into position and fasten with the 3x M5 bolts: 
8	Follow the Site Preparation - Local Earth section. The grounding rod requires trimming and a longer wire may be required to reach the grounding stud.

7 Requirements and equipment

These instructions provide a systematic guide for installing and commissioning the RTM charger.

The RTM charger must be installed and serviced by qualified electrical personnel.

Observe all pertinent national, regional, and local safety regulations when installing and commissioning the RTM charger.

The RTM charger has an IP65 electronics enclosure rating. However, because it must be opened for installation, this is best done in dry weather or under cover to avoid moisture or debris ingress.

The RTM charger must be properly installed and assembled according to these instructions before use. Prior to installation, contact your supplier to organise commissioning information:

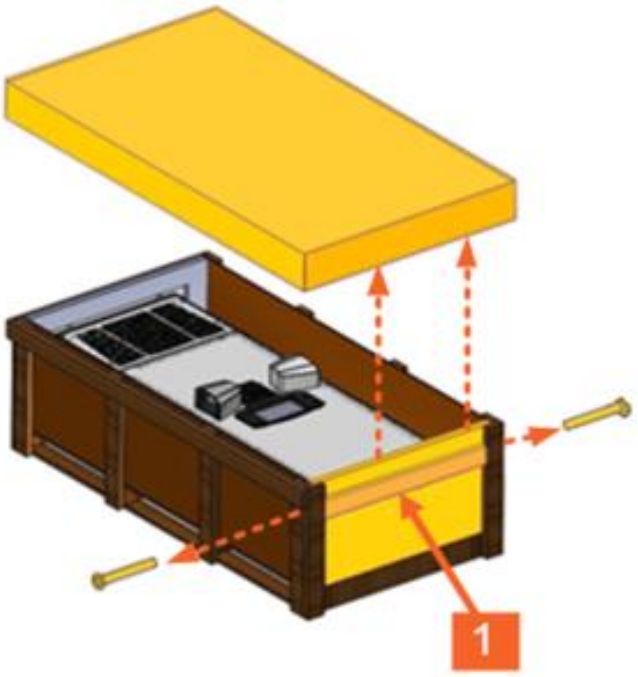
CAUTION

Do not work under suspended loads. Two people may be required, because the charger could swing.

Equipment supplied with RTM	Equipment required (not supplied)
• 5mm pin hex tool • 1x 50mm conduit fitting and seal • 1x 25mm conduit fitting and seal • Alternative gland plate with 4x M32 cable glands • External ethernet connector • Class A ferrite (Blue) • Class B ferrite (Black) • Conduit clamp • 2x M5x12mm screws • 2x M5 flange nuts • Warranty documentation • Baseplate template	• Lifting apparatus. See *Moving and storage instructions* for weights. Ensure lifting apparatus is sufficiently rated. • 110mm (4”) OD conduit • 4x M8 lugs and crimping tool (EU) • 1x M8 lug and 3x M10 lugs and crimping tool (USA) • Bootlace ferrules 20AWG 0.5mm². Quantity dependent on field wiring requirements. Refer to the *Auxiliary field wiring* section. • 4x site specific fasteners. Fasteners are not supplied, because the type required depends on the foundation used and must be chosen by the installer accordingly. • Socket set and ratchet • Torque wrench

8 Unpacking

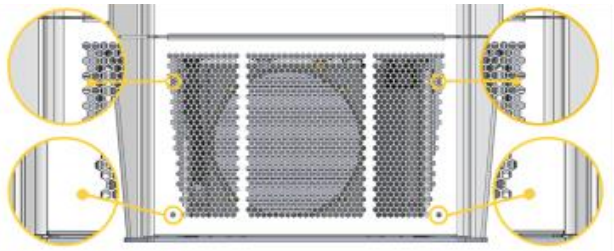
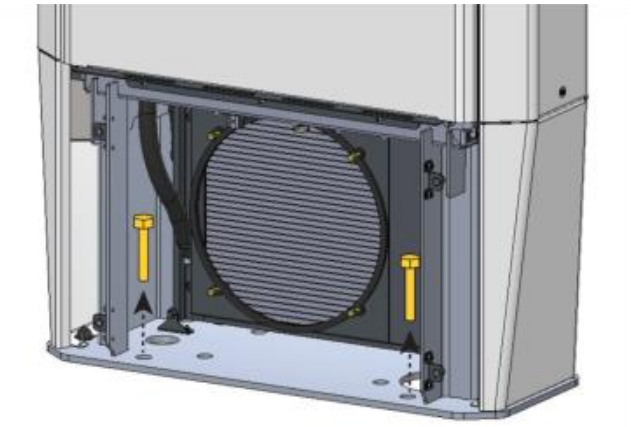
Colour	Document Key
	Items shown in orange are parts that require action for that step.

Step	Action	
1	Open the crate: a. Move the crate as close to the prepared installation site as possible. b. Ensure there is enough room to manoeuvre the lifting apparatus. c. Remove the exterior packaging, straps, and cardboard lid. d. The crate end is secured with a batten screw each side. Remove the batten screws and slide out the crate end.	 **Key #** / **Description** 1 — Crate end with horizontal batten

Step	Action
2	**CAUTION** Do not work under suspended loads. Two people may be required, because the charger could swing. a. Securely attach the lifting straps at the top of RTM to the lifting apparatus and gently raise to a standing position on the shipping baseplate. **Notes:** • Lifting may require two people as the charger could swing when suspended. • The RTM charger is 2030mm (80") tall on the shipping baseplate. b. When the charger is upright, remove all wrapping. c. Ensure the connection to the lifting apparatus is secure at all times: **CAUTION** Make sure the cable plugs are not sitting in the holsters to protect them from damage during installation.  d. Place charging cables out of the way during installation to avoid damage.

Key #	Description
1	Lifting straps
2	Shipping baseplate

8.1 Installation

Step	Action	Image/Comment
1	Remove the radiator panels. Fixing points for the front and rear radiator panels are located behind 4x hex holes as shown: a. Use the 5mm pin hex tool to unscrew the 4x security screws, which will disengage the radiator panels. b. Pull the radiator panels forward to remove, and store safely.	
2	Remove the shipping bolts. Unscrew the 4x bolts from the shipping baseplate, located at the front and rear of the radiator.	
3	**CAUTION** Do not work under suspended loads. Two people may be required, because the charger could swing. a. Using the lifting device, guide the charger to the install location. Seek assistance from a second person to help with guiding the charger. b. Use ropes or guide cables (if needed) to avoid manoeuvering the charger by hand and so you maintain a safe distance away from the charger.	

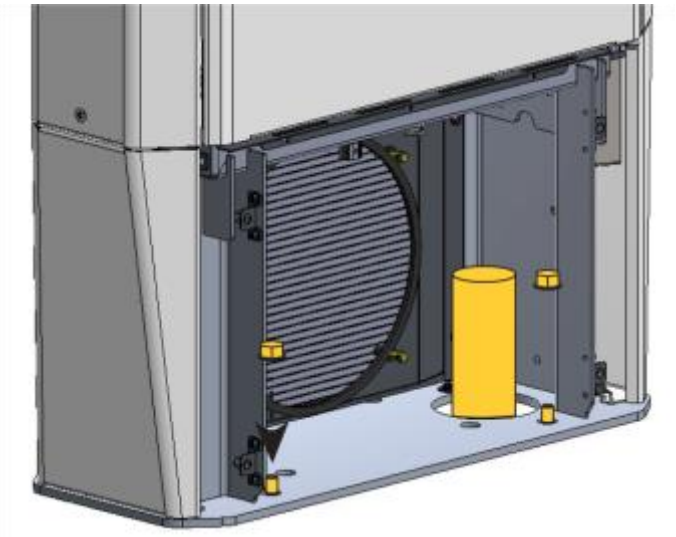
4

Secure the unit to the foundation:

a. Lift the RTM charger and place over the prepared foundation.
b. Maintain supporting the charger with the slings until it is fastened to the ground. Check the stability and ensure proper positioning.
c. When the charger is firmly secured, detach the slings from the lifting device and remove.
d. Review the sections *Underground wiring* and *Above ground wiring* in Site Preparation to ensure the correct wiring and conduit preparation:

IF...	THEN...
wiring is provided from underground,	feed it through the power-in hole and secure the RTM charger to the foundation fixing points (fasteners not supplied).
the power is provided above ground,	secure the RTM charger to the foundation and proceed with the installation instructions.

Note: Use the plastic inserts in the holes of the baseplate.



5

CAUTION

Opening the charger with the cable plugs sitting in the holsters will damage the plugs.

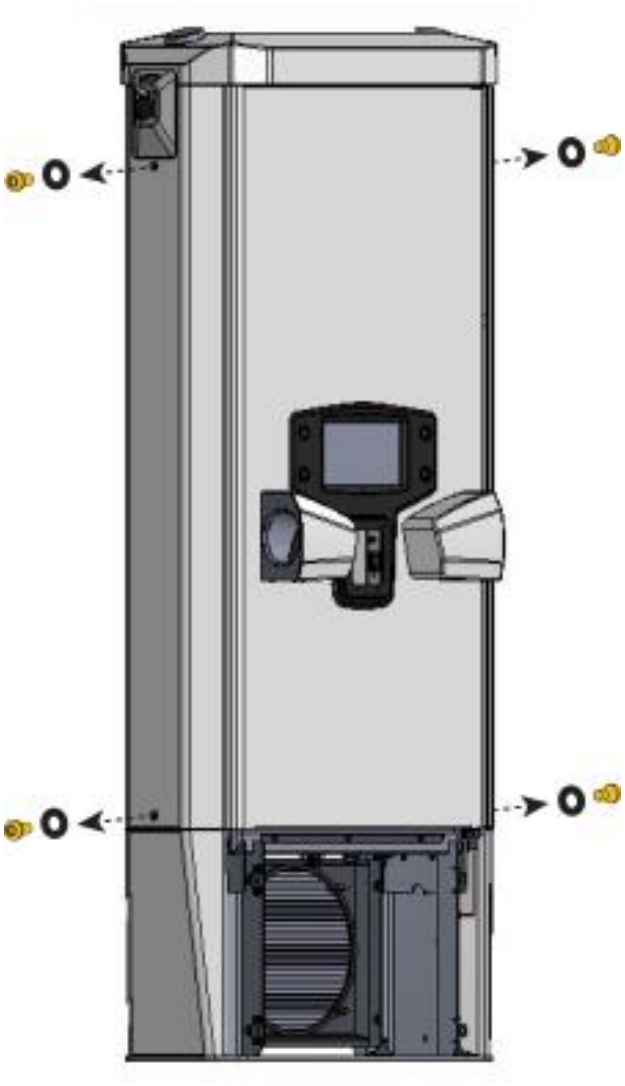
a. Check the cable plugs have been removed from the holsters.

b. Remove the side panel security screws.

IF...	THEN...
the RTM has cable management,	do this for both side panels.
there is no cable management,	open the left side panel only.

c. Use the 5mm pin hex tool to unscrew the 2x security screws on each side panel.

d. Remove the security screws and washers.

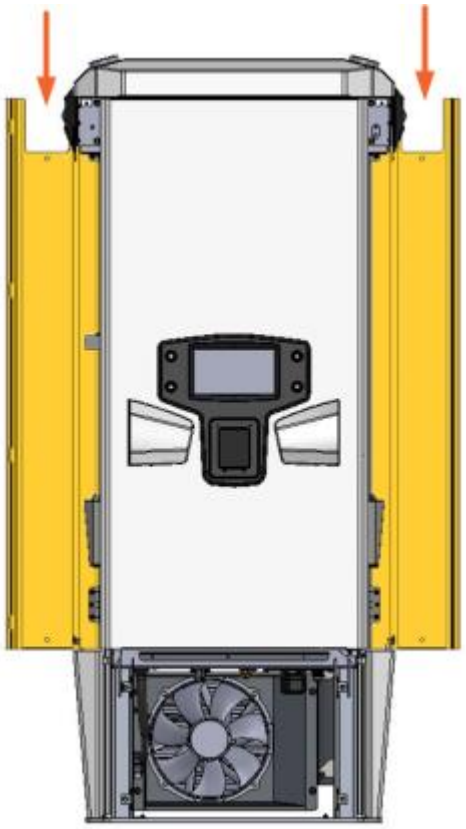


6

a. Open the hinged side panels:

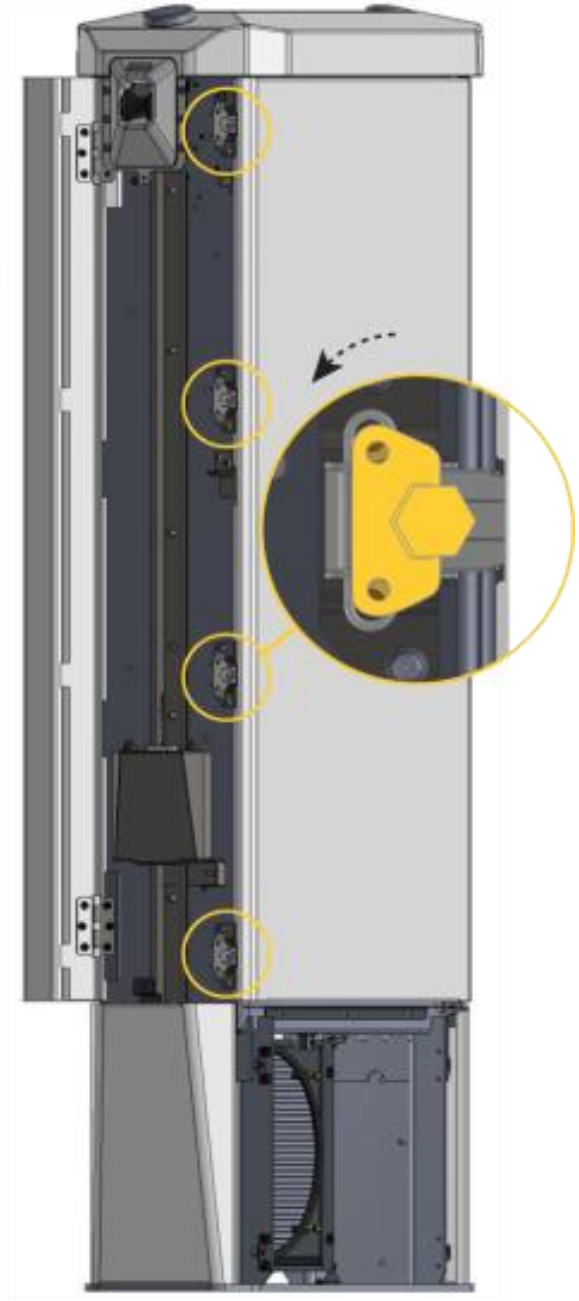
IF...	THEN...
the RTM has cable management	do this for both side panels.
there is no cable management	open the left side panel only.

b. Unhook the cable cord from the cut-out in the top of the side panel when opening.



7

Open the door:

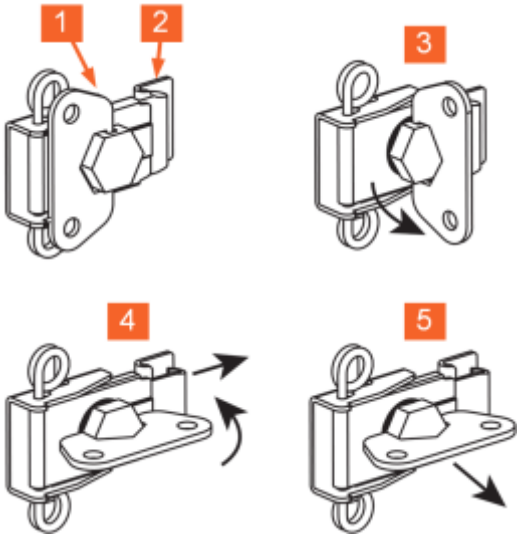


a. The front door has 4x latches that seal the door to the enclosure. If a lock is fitted, unlock to unlatch.

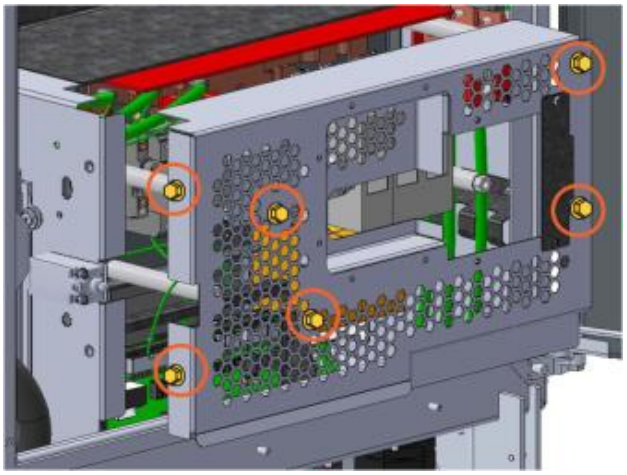
b. Starting with the two latches in the centre, follow the instructions shown for opening the latches.

c. Once all latches are disengaged, open the hinged door.

Note: Compressing the door seal assists in disengaging the latch from the hook.



Key #	Description
1	Latch
2	Hook
3	Flip the latch handle up
4	Turn the latch handle anti clockwise to slide the latch away from the hook
5	Pull the latch handle away from the latch to disengage from the hook.

8	Remove the 6x M8 hex bolts and remove the escutcheon.	

9 Wiring in

CAUTION

It is critical to product safety and warranty that IP65 is achieved for all input wiring.

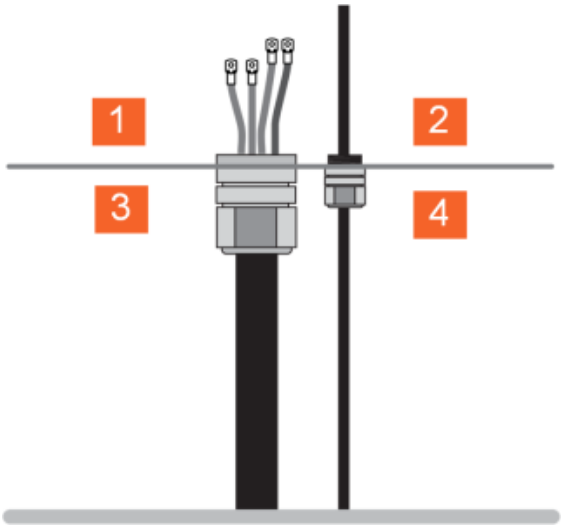
To continue to achieve the IP65 rating the power cabling must be fitted correctly into the conduit and the conduit sufficiently sealed so that no water or debris can enter.

CAUTION

If using an auxiliary field wire, the wire must be a single multi-conductor cable Ø10-14mm to suit the M25 cable gland.

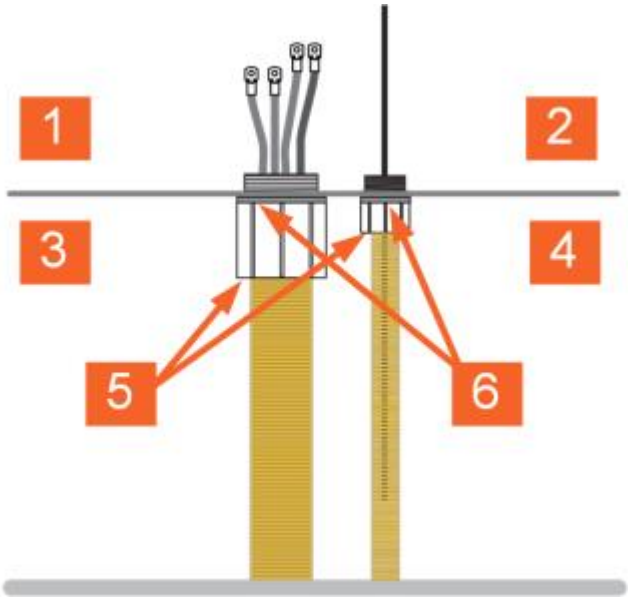
If the auxiliary wire is smaller than Ø10, the conduit installation must be used.

9.1 Underground with gland installation

Step	Action
1	Prepare conduit and wiring as per section: Site preparation - Underground wiring - Cable gland.
2	Loosen the M50 cable gland and feed the HP input wiring and grounding wire through. Ensure the wiring sheath is sitting above the gland plate.
3	Tighten the cable gland and pull on the wiring to ensure it will not slip.
4	Loosen the M25 cable gland and feed the auxiliary field wire through. Ensure 470mm (18.5") of internal auxiliary wire is above the gland plate.
5	Tighten the cable gland and pull on the wire to ensure it will not slip.
6	

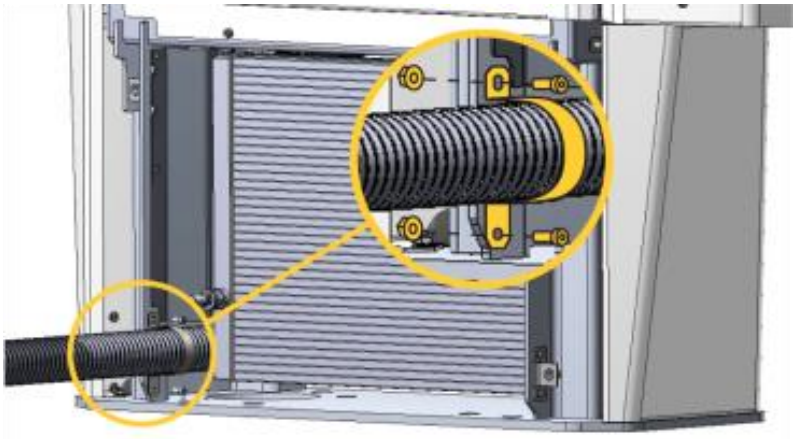
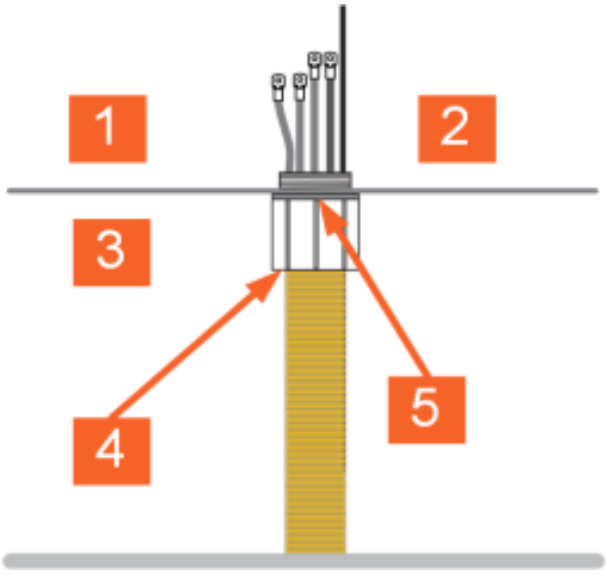
Key #	Description
1	HP input + grounding
2	470mm (18.5") auxiliary field wire
3	M50 cable gland
4	M25 cable gland

9.2 Underground with conduit installation

Step	Action
1	Prepare conduit and wiring as per section: Site preparation - Underground wiring - Conduit.
2	Remove the M50 cable gland from the input plate, retaining the lock nut for reuse.
3	Fit the provided 50mm conduit fitting, seal over the input wiring, and glue to the 50mm conduit with an appropriate sealant to ensure IP65.
4	Feed the wiring and conduit fitting through the 50mm gland plate hole and secure the conduit fitting to the gland plate with the retained lock nut. If using auxiliary wiring in the conduit, repeat these steps with the fitted M25 gland and 25mm conduit fitting and seal.
5	Ensure 470mm (18.5") of internal auxiliary wire is above the gland plate. If in doubt about IP65 rating, use an appropriate outdoor rated sealant.
6	
7	When the cable gland has been tightened, pull on the cable to ensure it doesn't slip.

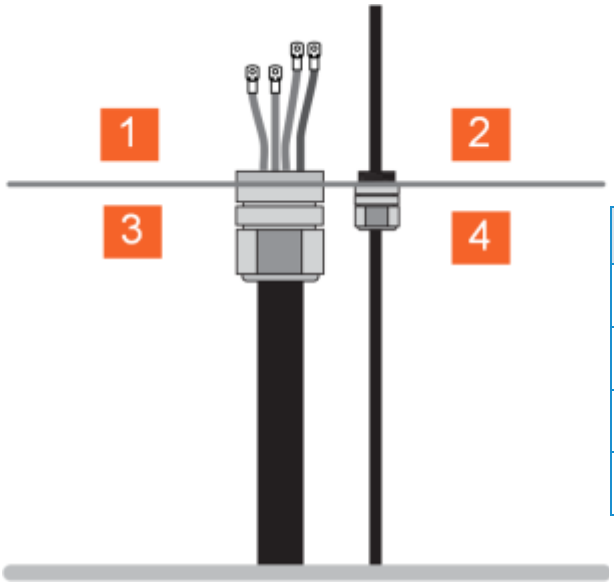
Key #	Description
1	HP input + grounding
2	470mm (18.5") auxiliary field wire
3	M50 conduit
4	M25 conduit
5	Sealant area
6	Provided seals

9.3 Above ground with conduit

Step	Action
1	When providing wiring above ground, all HP input, grounding, and auxiliary field wires are routed inside a flexible 50mm conduit. Prepare conduit and wiring as per section: Site preparation - Above ground - Full conduit installation.
2	Ensure the correct length of conduit from the rear installation point. Fasten the 50mm conduit to the rear-left side of the chassis using the supplied conduit clamp and M5 fasteners: 
3	Remove the M50 cable gland from the input plate, retaining the lock nut for reuse.
4	Fit the provided 50mm conduit fitting and seal over the wiring and glue to the 50mm conduit with an appropriate sealant to ensure IP65.
5	Feed the wiring and conduit fitting through the 50mm gland plate hole and secure the conduit fitting to the gland plate with the retained lock nut.
6	Do not remove the M25 cable gland or gland blocker: 

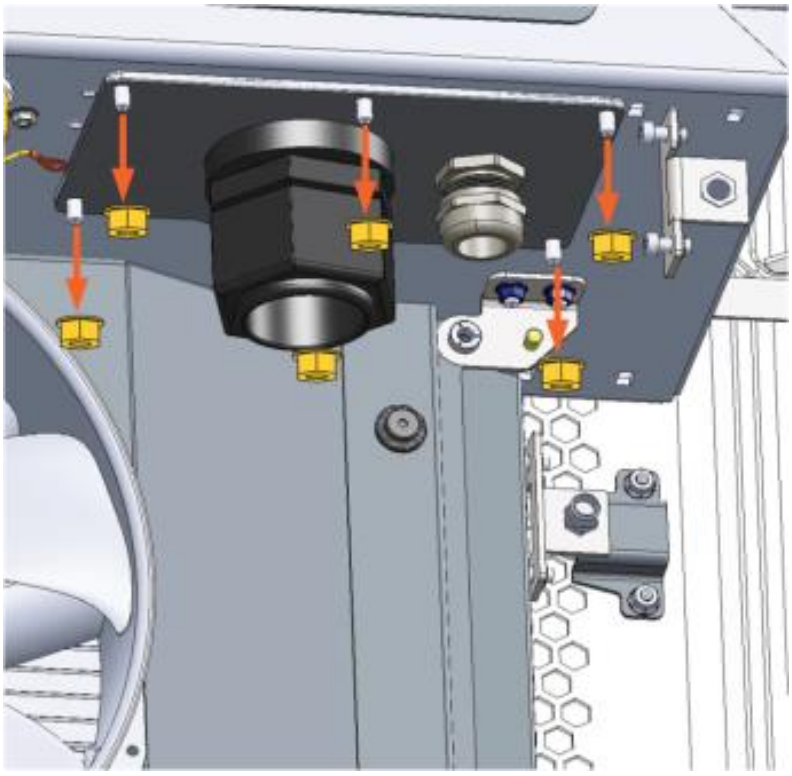
Key #	Description
1	HP input + grounding
2	470mm (18.5") auxiliary field wire
3	M50 conduit
4	Sealant area
5	Provided seal

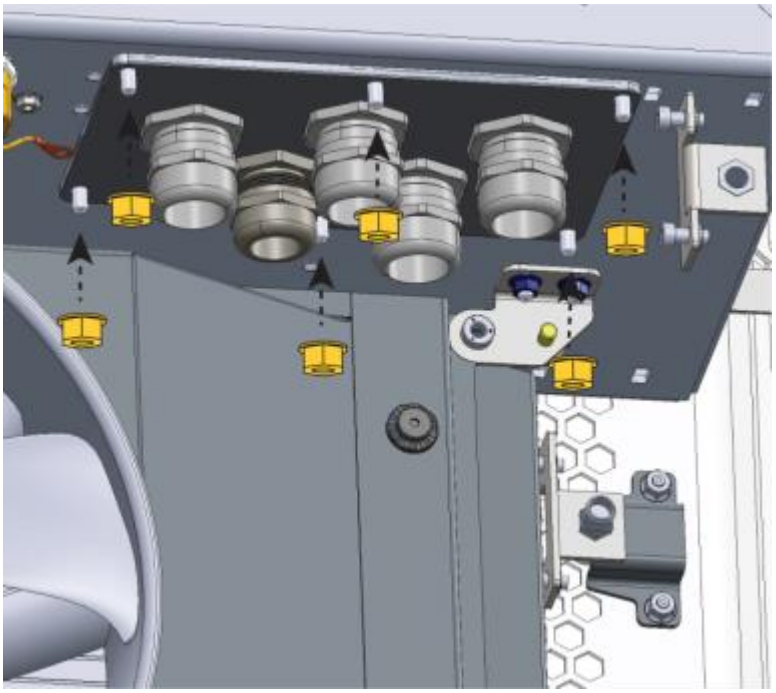
9.4 Above ground with cable glands

Step	Action
1	When providing wiring above ground, all HP input, grounding, and auxiliary field wires are routed inside a flexible 50mm conduit. Prepare conduit and wiring as per section: Site preparation - Above ground cable gland installation.
2	Loosen the M50 cable gland and feed the HP input wiring and grounding wire through. Ensure the wiring sheath is sitting above the gland plate. Tighten the cable gland and pull on the wiring to ensure it will not slip.
3	Loosen the M25 cable gland and feed the auxiliary field wire through ensuring there is 470mm (18.5") of internal wire from the gland plate.
4	 **Key #** / **Description** 1 — HP input + grounding 2 — 470mm (18.5") auxiliary field wire 3 — M50 cable gland 4 — M25 cable gland
5	If in doubt about IP65, use an appropriate outdoor rated sealant.
6	When the cable gland has been tightened, pull on the cable to ensure it doesn't slip.

9.5 Wiring in - alternative gland plate

The alternative gland plate is required when individual HP input wiring is used:

Step	Action
1	Prepare all wiring as per Site preparation - Cable gland installation or Site preparation - Above ground cable gland installation. **Note:** Each scenario has different wiring trim lengths.
2	The gland plate is fixed under the RTM chassis. Unscrew the 6x M5 nuts and remove the existing gland plate. Retain the nuts for reuse later: 
3	Assemble the 4x M32 and 1x M25 onto the alternative gland plate with the nuts on the gasket side. Torque to 2Nm: 

Step	Action
4	Install the alternative gland plate under the RTM chassis. Re-use the 6x M5 nuts retained earlier and torque to 6Nm:  If in doubt about IP65 rating, use an appropriate outdoor rated sealant.
5	When the cable gland has been tightened, pull on the cable to ensure it doesn't slip.

10 Cable termination

CAUTION

Wiring of the charger is to be done by qualified electrical personnel only.

CAUTION

It is critical to product safety and warranty that IP65 is achieved for all input wiring/cabling.

To continue to achieve the IP65 rating all wiring/cabling must be fitted correctly into the appropriate conduit (as required) and the conduit/wiring sufficiently sealed so no water or debris can enter.

CAUTION - RISK OF ELECTRIC SHOCK

If a cable with neutral is used (i.e., when performing a Veefil-RT 50kW replacement), ensure the appropriate regulations are followed to safely terminate the unused neutral cable.

Ensure that the lugs and connection points are clean and free of dirt before making the connections.

10.1 Cable sizing

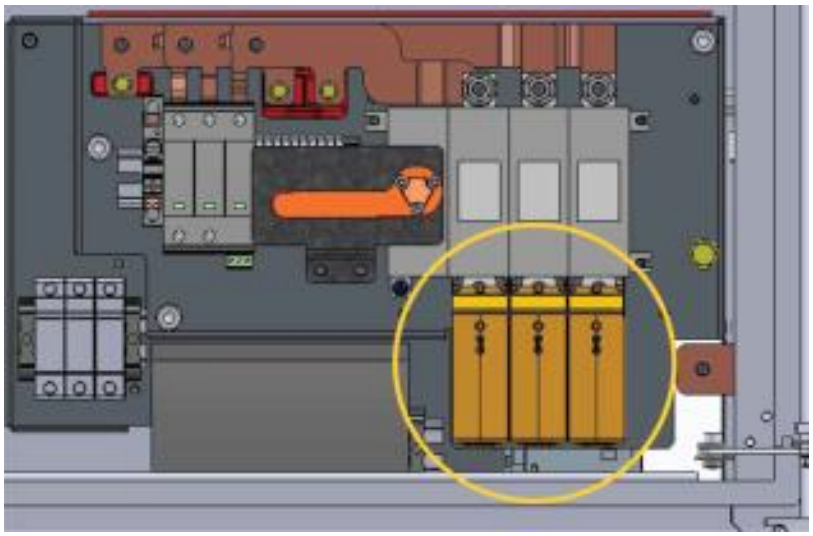
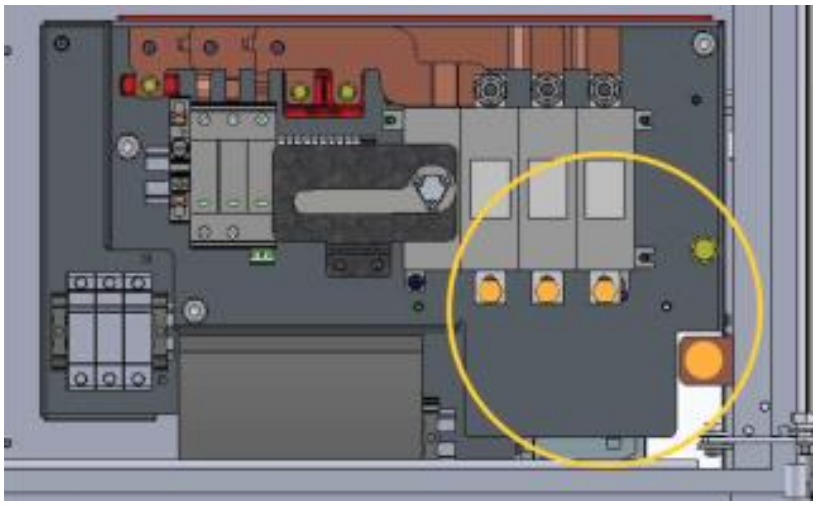
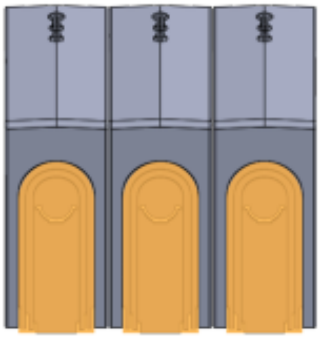
REFERENCE CALCULATION OF BURIED CABLE SIZE FOR AC SUPPLY (LENGTH OF AC CABLES AND SYSTEM EFFICIENCY SHOULD BE CONSIDERED WHEN SIZING CABLE)	Single cores in buried duct:		Single cores in buried duct:	
	25mm2 Cu for L1,2,3 16mm2 Cu for PE	50mm2 Cu for L1,2,3 25mm2 Cu for PE	6AWG Cu for L1,2,3 8AWG Cu for PE	3AWG Cu for L1,2,3 4AWG Cu for PE
	Multicore cable in buried duct:		Multicore cable in buried duct:	
	25mm2 Cu	50mm2 Cu	4AWG Cu	2AWG Cu
	Multicore cable direct buried:			
	25mm2 Cu	35mm2 Cu		
AC SUPPLY CABLE SIZE	Cable sizes must be calculated on a per site basis as length, burial/conduit method, insulation rating, soil type will all affect correct sizing.			

The above table provides minimum requirements for most regions, however there may be some variations in some regions. Liaise with the local authorities to ensure local regulations are met.

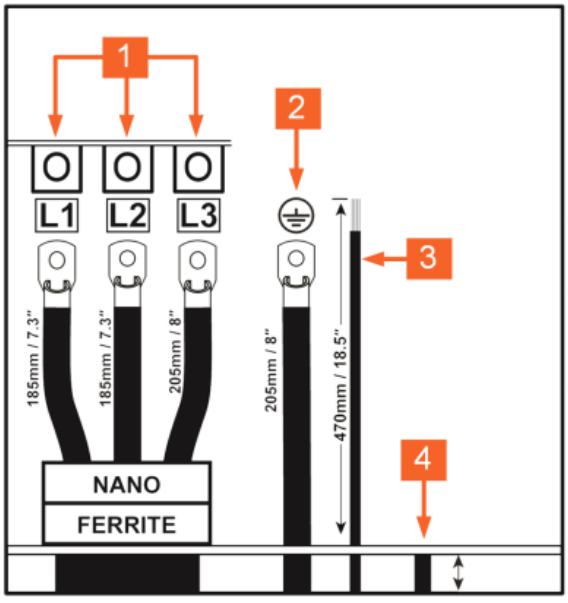
10.2 Configuration 1 (fused disconnect switch)

10.2.1 Termination preparation

Preparing the termination area requires different steps depending on the variant of the RTM being installed:

Step	Action
1	Pull the terminal covers away from the mounting to disengage and remove: 
2	Remove input fasteners by removing the 3x bolts and nuts on the wiring terminals and the nut on the grounding stud: 
3	Adjust terminal covers. Check the wiring size against the terminal covers and punch out the blanks: 

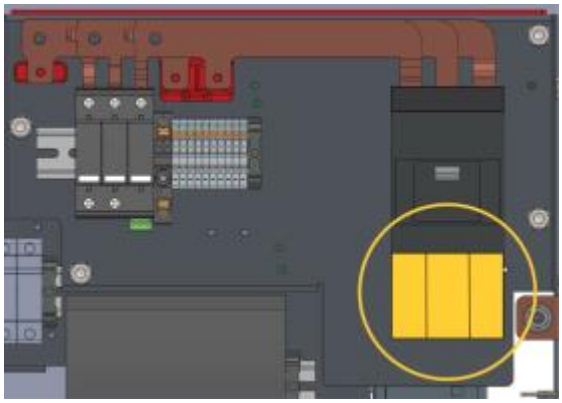
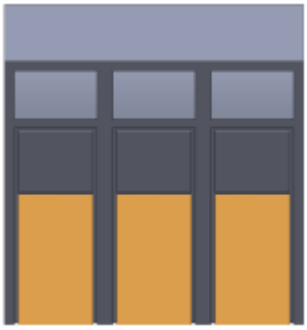
10.2.2 Cable termination

Step	Action
1	Place the supplied ferrites over the HP Input wiring only: • Class A devices (blue NANO ferrite) are those that are marketed for use in a commercial, industrial, or business environment. • Class B devices (black ferrite) are those that are marketed for use in the home and for more stringent applications. It is highly recommended that both ferrites are installed.
2	Check that the terminal cover fits. Adjust wiring if necessary.
3	Fix the HP input wiring to the terminals with the supplied fasteners. **Note:** Insert the bolts from the front of the charger and secure with the nut at the rear of the terminal. This ensures terminal covers fit correctly.
4	**Cable preparation and termination**  *Single gland plate input*  *5 gland plate input*  Blue NANO ferrite: • Installed on AC cable. • Required to ensure the charger meets conducted EMC immunity limits. Black ferrite: • Installed on AC cable. • Allows the charger to achieve Class B EMC emissions. • Without installation, the EMC emissions are Class A.

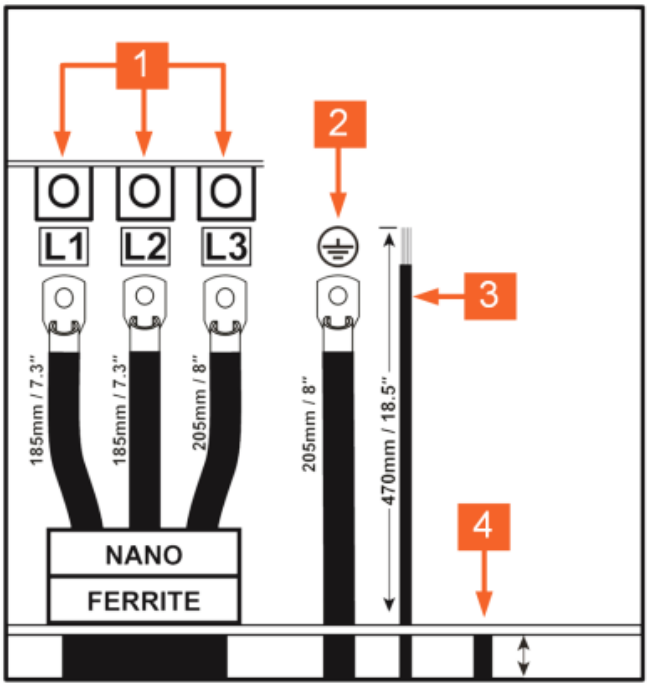
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td></td><td>
<table>
<tr><th>#</th><th>Action</th></tr>
<tr><td>1</td><td>Terminals:
1. Cut from sheath cut
2. Trim and fit M8 lugs
3. Torque to 20Nm</td></tr>
<tr><td>2</td><td>Grounding wire:
1. Cut from sheath cut
2. Trim and fit M8 lugs
3. Torque to 20Nm</td></tr>
<tr><td>3</td><td>Auxiliary field wires:
1. Cut from sheath cut
2. Trim and fit bootlace ferrule (if present)</td></tr>
<tr><td>4</td><td>Ethernet:
1. Cut from foundation
2. Trim to suit connector
3. 600mm (23.5") (if present)</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Fix the grounding wire to the M8 earth terminal and secure with supplied M8 nut.
Note: For auxiliary field wiring termination go to the appropriate section.</td></tr>
<tr><td>6</td><td>The wiring-in label is located on the inside of the hinged, left side panel.
Use a torque wrench to tighten to the specified tightening torque and apply a torque mark to the stud and nut:
<table>
<tr><th>Wire</th><th>Cut length</th><th>Lug</th><th>Torque</th></tr>
<tr><td>L1</td><td rowspan="2">185 mm (7.3")</td><td rowspan="4">M8</td><td rowspan="4">20 Nm</td></tr>
<tr><td>L2</td></tr>
<tr><td>L3</td><td rowspan="2">205 mm (8")</td></tr>
<tr><td>Earth</td></tr>
<tr><td>Auxiliary</td><td>470 mm (18.5")</td><td>Bootlace ferrule</td><td>Push in</td></tr>
</table>
Measurements in mm (inches)</td></tr>
</table>

10.3 Configuration 2 (circuit breaker)

10.3.1 Termination preparation

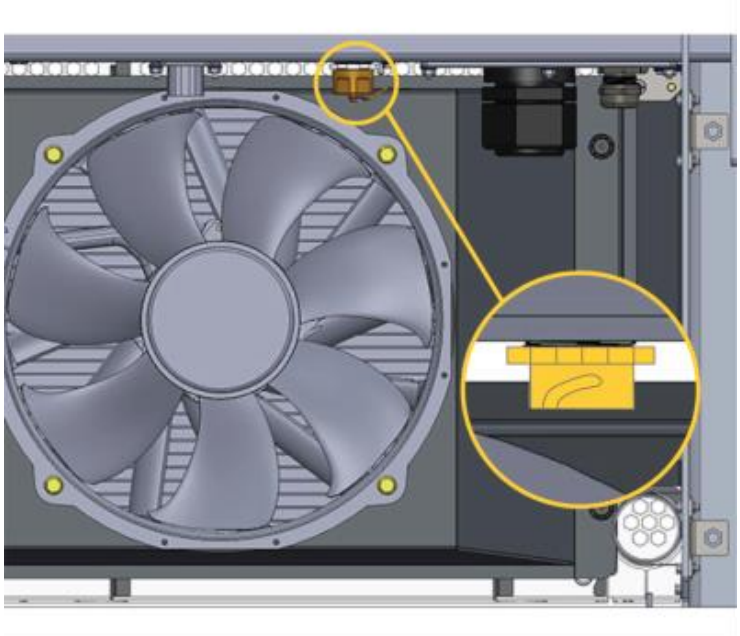
Step	Action
1	Pull the terminal covers away from the mounting to disengage and remove: 
2	Insert an Allen key into each of the 3x holes at the front of the mini circuit breaker, remove the 3x bolts and nuts on the wiring terminals, then remove the nut on the grounding stud: 
3	Remove input fasteners. Check the wiring size against the terminal covers and punch out the blanks: 

10.3.2 Cable termination

Step	Action
1	Place the supplied ferrites over the HP input wiring only: • Class A devices (blue NANO ferrite) are those that are marketed for use in a commercial, industrial, or business environment. • Class B devices (black ferrite) are those that are marketed for use in the home and for more stringent applications. It is highly recommended that both ferrites are installed.
2	Check that the terminal cover fits. Adjust wiring if necessary.
3	Fix the HP Input wiring to the terminals with the supplied fasteners: **Cable preparation and termination**  *Single gland plate input*  Blue NANO ferrite: • Installed on AC cable. • Required to ensure the charger meets conducted EMC immunity limits. Black ferrite: • Installed on AC cable. • Allows the charger to achieve Class B EMC emissions. • Without installation, the EMC emissions are Class A.  *5 gland plate input*

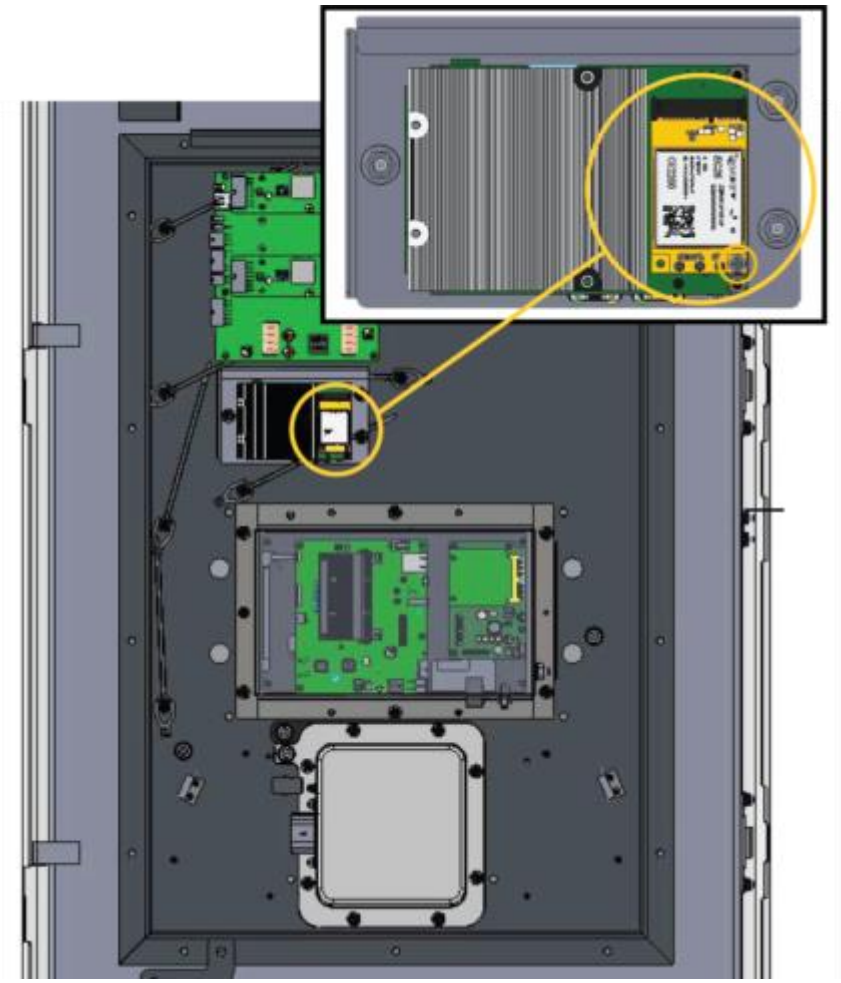
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td></td><td>
<table>
<tr><th>#</th><th>Action</th></tr>
<tr><td>1</td><td>MCB terminals:
1. Cut from sheath cut
2. Trim and fit M6 lugs
3. Torque to 6Nm</td></tr>
<tr><td>2</td><td>Grounding wire:
1. Cut from sheath cut
2. Trim and fit M8 lugs
3. Torque to 20Nm</td></tr>
<tr><td>3</td><td>Auxiliary field wires:
1. Cut from sheath cut
2. Trim and fit bootlace ferrule (if present)</td></tr>
<tr><td>4</td><td>Ethernet:
1. Cut from foundation
2. Trim to suit connector
3. 600mm (23.5") (if present)</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Fix the grounding wire to the M8 earth terminal and secure with supplied M8 nut.
Note: For auxiliary field wiring termination go to the appropriate section.</td></tr>
<tr><td>5</td><td>The wiring in label is located on the inside of the hinged, left side panel.
Use a torque wrench to tighten to the specified torque, and apply a torque mark to the stud and nut:
<table>
<tr><th>Wire</th><th>Cut length</th><th>Lug</th><th>Torque</th></tr>
<tr><td>L1</td><td>185mm (7.3")</td><td rowspan="3">M6</td><td rowspan="3">6Nm</td></tr>
<tr><td>L2</td><td></td></tr>
<tr><td>L3</td><td>205mm (8")</td></tr>
<tr><td>Earth</td><td></td><td>M8</td><td>20Nm</td></tr>
<tr><td>Auxiliary</td><td>470mm (18.5")</td><td>Bootlace ferrule</td><td>Push in</td></tr>
</table>
Measurements in mm (inches)</td></tr>
</table>

10.4 Ethernet port

Step	Action
1	The ethernet port is situated under the front of the chassis. Remove the ethernet cap.
2	Use the supplied watertight ethernet adaptor to terminate the ethernet wire. **Note:** A Cat 6a shielded ethernet cable is recommended for high signal integrity. The shield should be earthed at the building end because the shield will not be connected at the charger end.
3	Fit the wire onto the ethernet port.
4	Alternatively use 3G/4G connectivity: 

10.5 SIM card installation

A SIM card provision is available for remote communications to the unit:

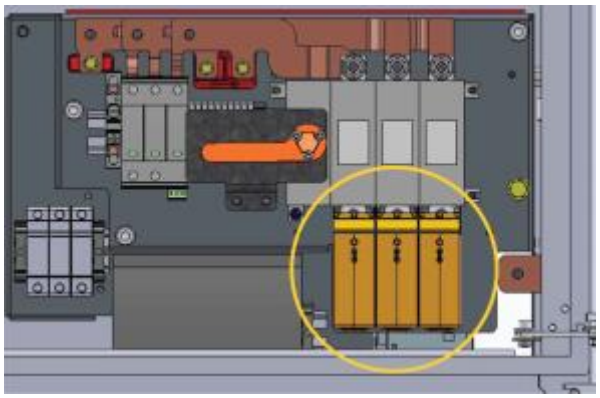
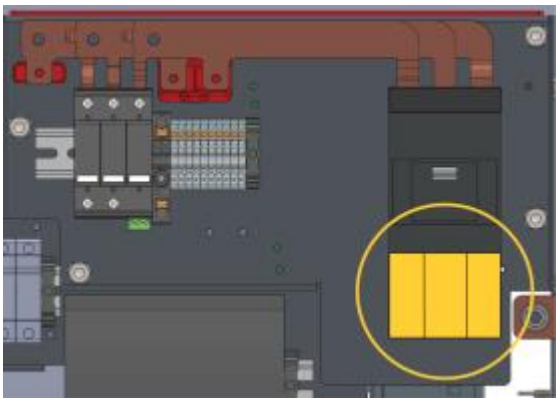
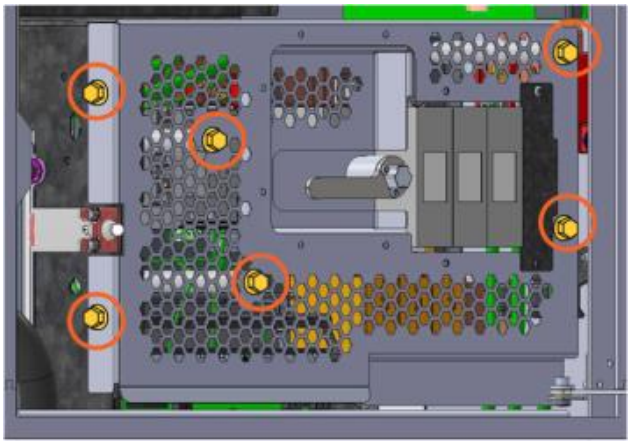
Step	Action
1	The SIM card is fitted to the 4G modem card, inside the door on the HMI module: 
2	Remove the M3 screw and tilt the 4G modem card 45 degrees upwards to release the spring finger from the slot and remove. **Note:** The antenna should remain attached during this operation. If the antenna is detached, refit to the connector marked MAIN (closest to the mounting screw).
3	Insert the SIM on the underside of the card.
4	Reinsert the 4G modem card back into the slot on a 45-degree angle to engage the spring finger. Fix with the M3 screw.

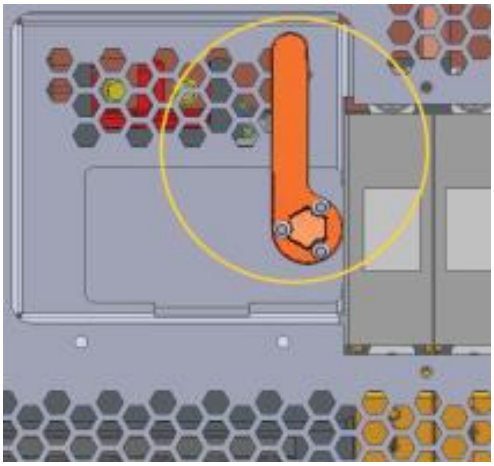
11 Closing instructions

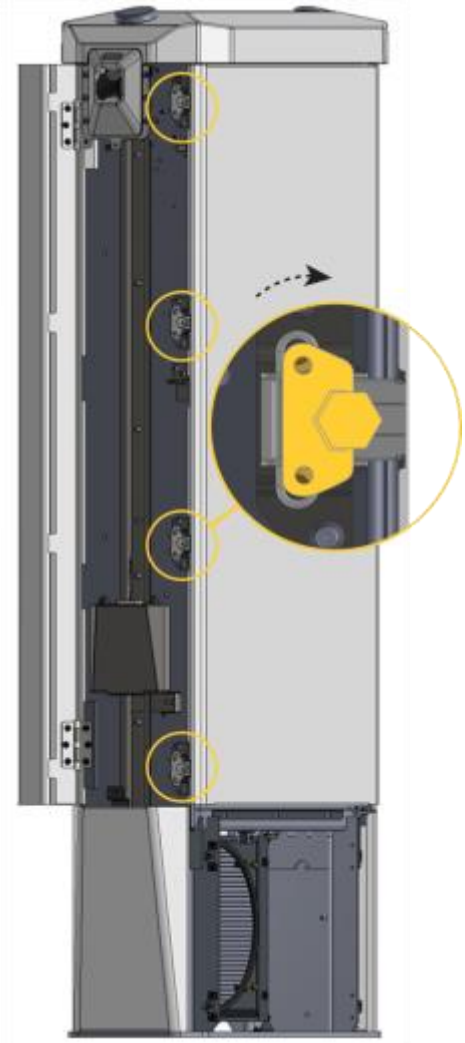
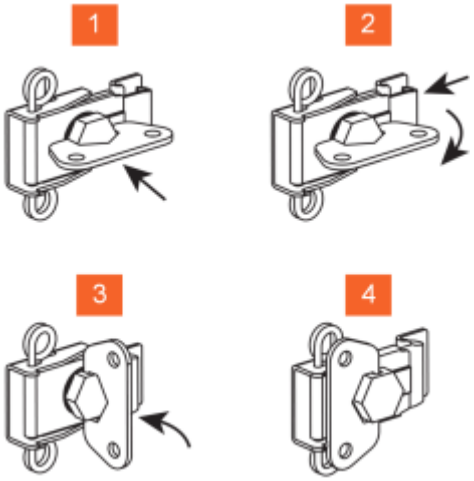
CAUTION

It is critical to product safety and warranty that IP65 is achieved for all input wiring.

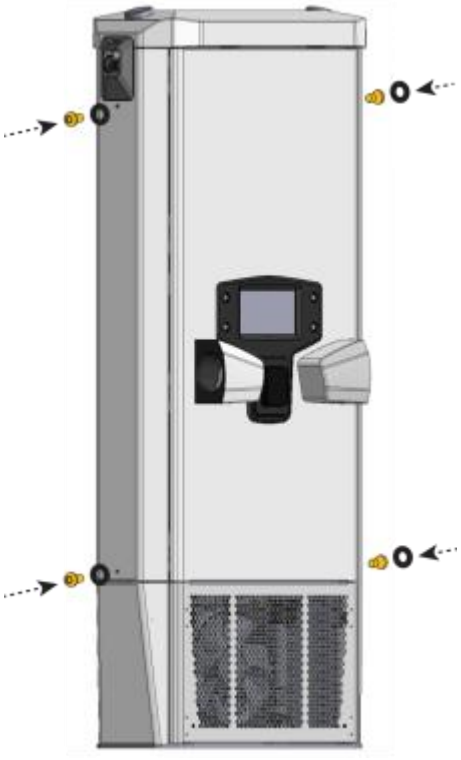
To continue to achieve the IP65 rating the power cabling must be fitted correctly into the conduit and the conduit sufficiently sealed so no water or debris can enter.

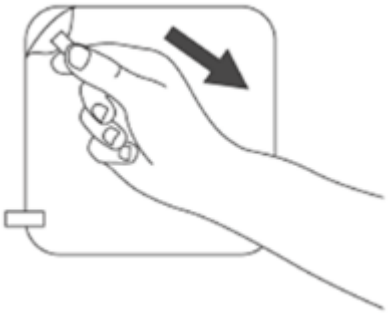
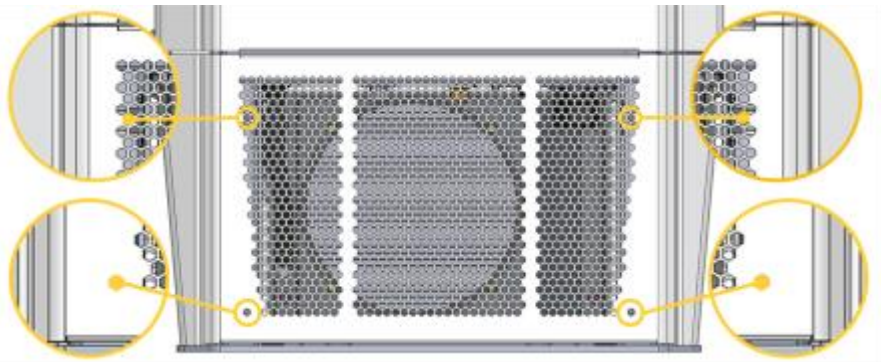
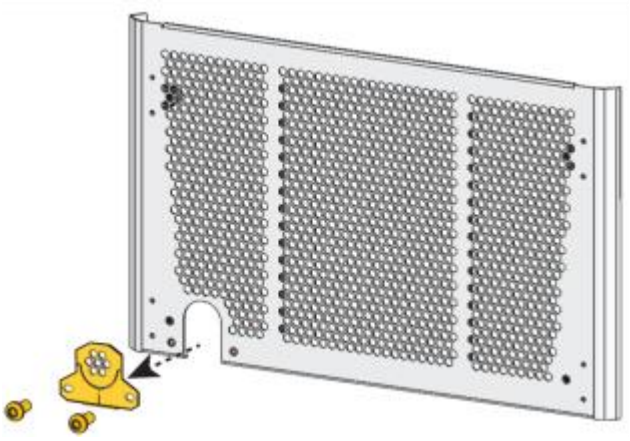
Step	Action
1	Carefully remove the lifting straps from the lifting devices.
2	Ensure the cable is sitting correctly in the gland or conduit and tighten to ensure no water or debris can enter. If in doubt, use an appropriate outdoor-rated sealant. When the cable gland has been tightened, pull on the cable to ensure it doesn't slip. Alternatively, check the conduit fitting is attached, and that the conduit is tightly fitted with appropriate sealing.
3	Place the terminal covers onto the mounting: **Configuration 1**  **Configuration 2** 
4	Replace the escutcheon, and secure with 6x M8 hex bolts: 

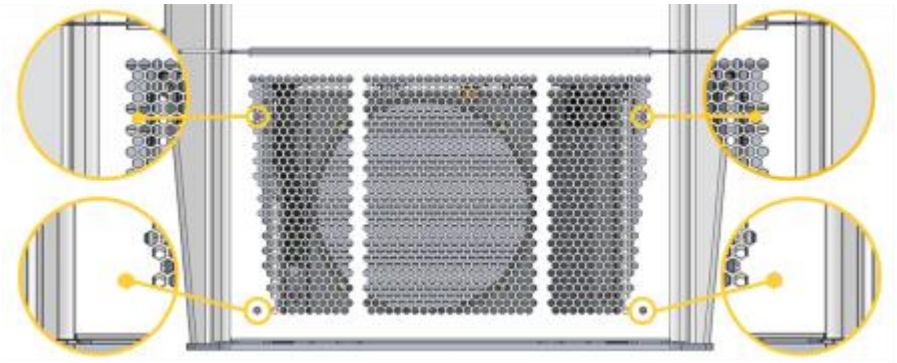
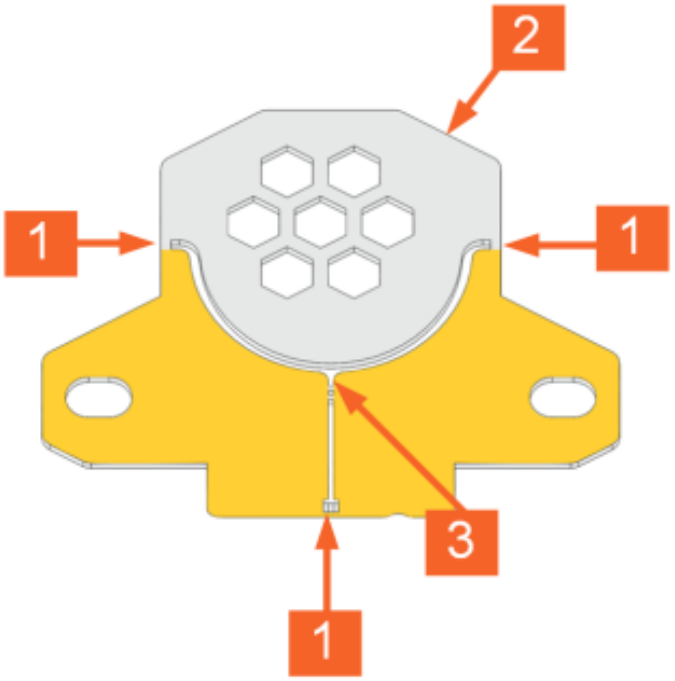
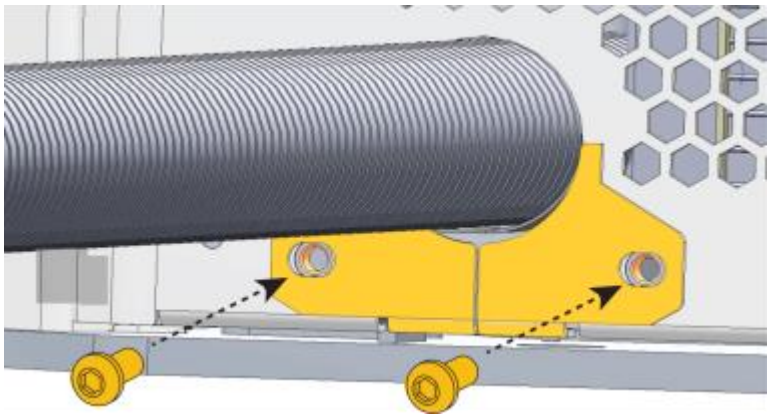
Step	Action
	CAUTION If using a power drill to fasten the nuts, ensure the torque is set to no greater than 10Nm. If using a hand tool, fasten until resistance is felt. Do not overtighten.
5	Check the fuse-disconnect switch: **Configuration 1**  Turn the fuse-disconnect switch to the vertical position. **Configuration 2**  Ensure that the switch on the MCB is in the up position.

Step	Action
6	Close and seal the front door. The front door has 4x latches that seal the door to the enclosure:  a. Check all latches are sitting inside the door edge. b. Close central latches first. c. Compressing the door seal assists in engaging the latch and hook. d. Check all latches are hooked, closed, and the door seal is compressed. e. If a lock was fitted, re-attach and lock. 

Step	Action
1	Check the latch is extended and push in to engage with the hook.
2	Turn the latch handle clockwise to slide the latch inwards. Check the hook is engaged.
3	Flip the handle down.
4	Latch closed.

Step	Action
7	<table><tr><th>IF...</th><th>THEN...</th></tr><tr><td>the charger has no cable management,</td><td>skip to the next step.</td></tr><tr><td>the charger has cable management,</td><td>a. Lower the cable management weights on both sides. b. Pull the cable cord down (not shown) to raise the weight above the latch. Slide the latch towards the door and gently let the weight lower to the natural resting position inside the lower panel. c. Hook the cord into the cut-out in the top of the side panel and close the panel.</td></tr></table> 
8	a. Secure the side panels. b. Fasten with 2x nylon washers and security screws, using the 5mm Pin Hex tool. **Note:** Do not overtighten. 

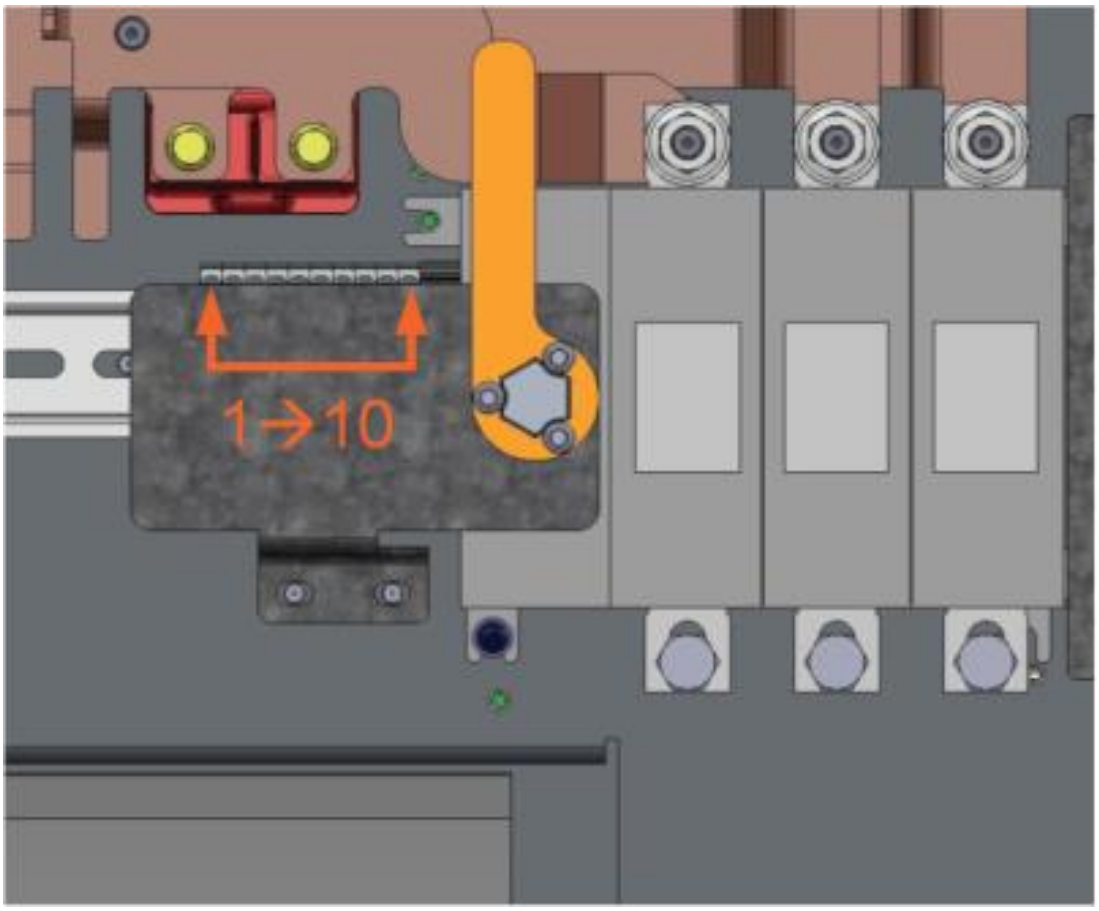
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>9</td><td>Remove the clear protective plastic film from the CCR / RFID reader:
  </td></tr>
<tr><td>10</td><td>Mount the radiator panels. Align the fasteners with the brackets on the enclosure box. Use the 5mm Pin Hex tool to fix into position. Do not overtighten:
 
<table>
<tr><th>IF...</th><th>THEN...</th></tr>
<tr><td>underground wiring is used,</td><td>• repeat this step for the rear panel.
• skip to step 11.</td></tr>
<tr><td>above ground wiring is used,</td><td>go to the next step.</td></tr>
</table></td></tr>
<tr><td>11</td><td>Mount the rear radiator panel (for above ground power).
Using the 5mm hex bit, remove the 2x security screws and rear infill panel:
  </td></tr>
</table>

Step	Action
12	Slot the rear radiator panel over the conduit. Align the fasteners with the brackets on the enclosure box. Use the 5mm Pin Hex tool to fix into position. Do not overtighten: 
13	The infill panel is made from 2mm (0.07”) aluminium. Cut the infill panel as shown and break apart into three sections. Discard the centre section with hex holes and remove any sharp edges from the remaining two pieces:  | # | Description | |---|---| | 1 | Cut | | 2 | Remove | | 3 | Break apart |
14	Fit the two infill panel pieces under the conduit, and secure with 2x M8 security screws: 

12 Auxiliary field wiring terminals

12.1 Wiring terminals

Auxiliary field wiring must be routed behind the HP input wiring and switch plate as shown:

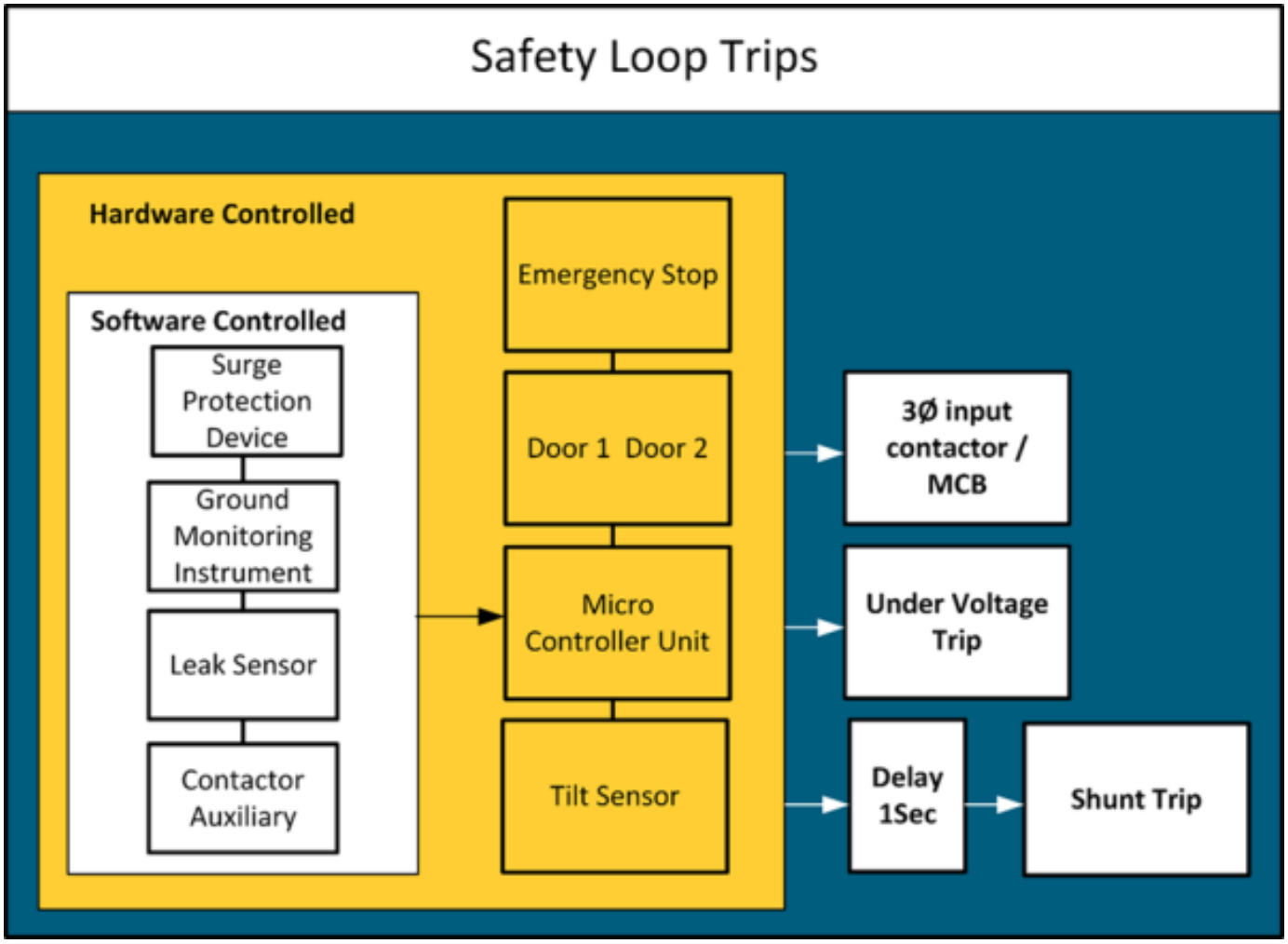


Step	Action
1	FW1 - UPS.24V+
2	FW2 - UPS.24V GND
3	FW3 - SHUNT TRIP
4	FW4 - SHUNT TRIP COM
5	FW5 - UV TRIP
6	FW6 - UV TRIP COM
7	FW7 - ESTOP
8	FW8 - ESTOP COM
9	FW9 - CHASSIS REF
10	FW10 - GMI REF

12.2 Safety loop

The RTM has an internal safety system that can detect safety events and shut off supply power to the charger. As shown in the following Safety Loop Trips diagram, there are two types of trips within the safety loop:

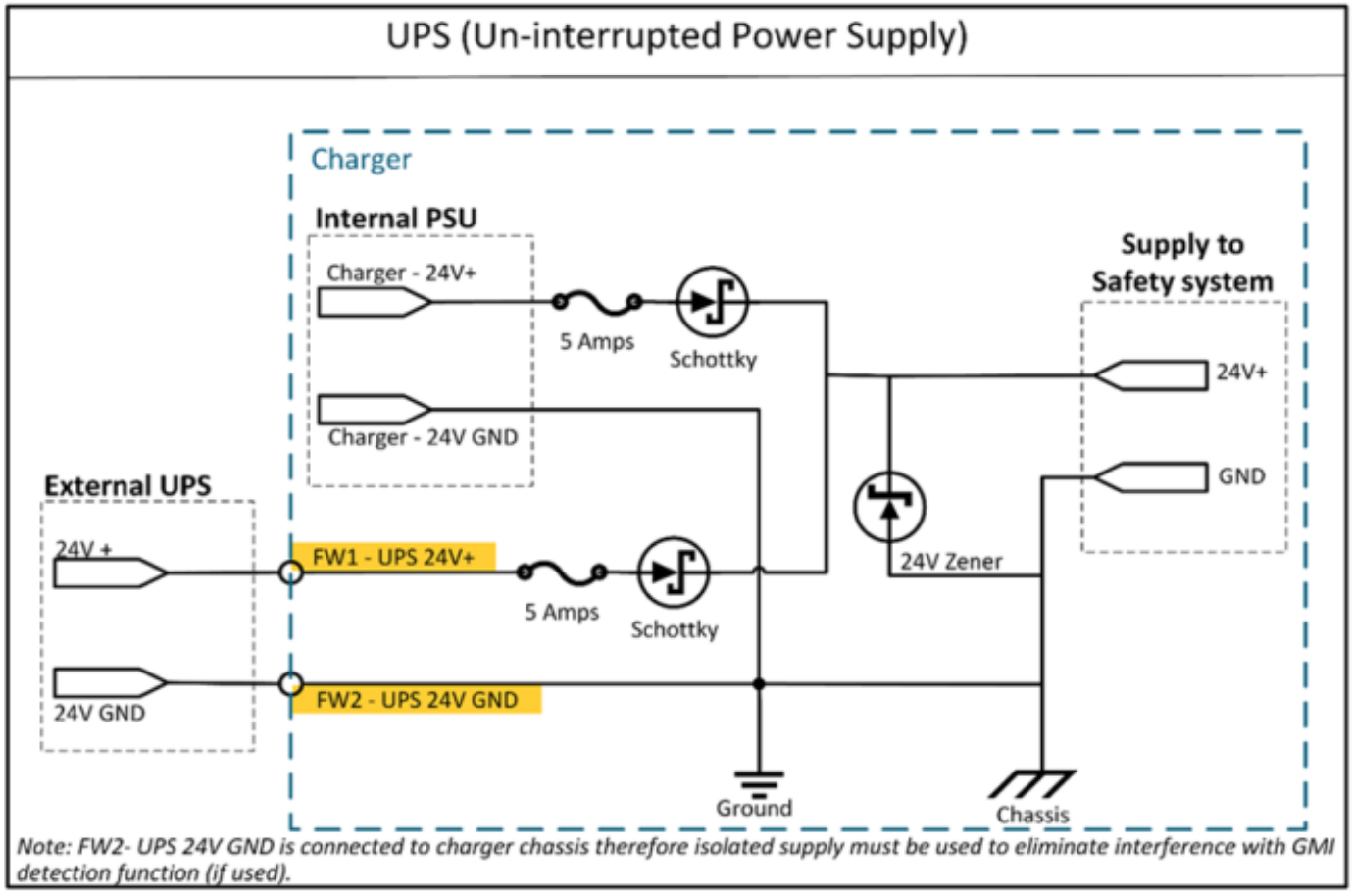
- Software controlled trip via a micro-controller unit.
- Hardware controlled trip via hard-wired components in a series loop:



Faults detected on the safety loop not only de-energise the 3Ø input contactor (Configuration 1) or MCB (Configuration 2) but also trigger external Undervoltage trip and Shunt trip relays.

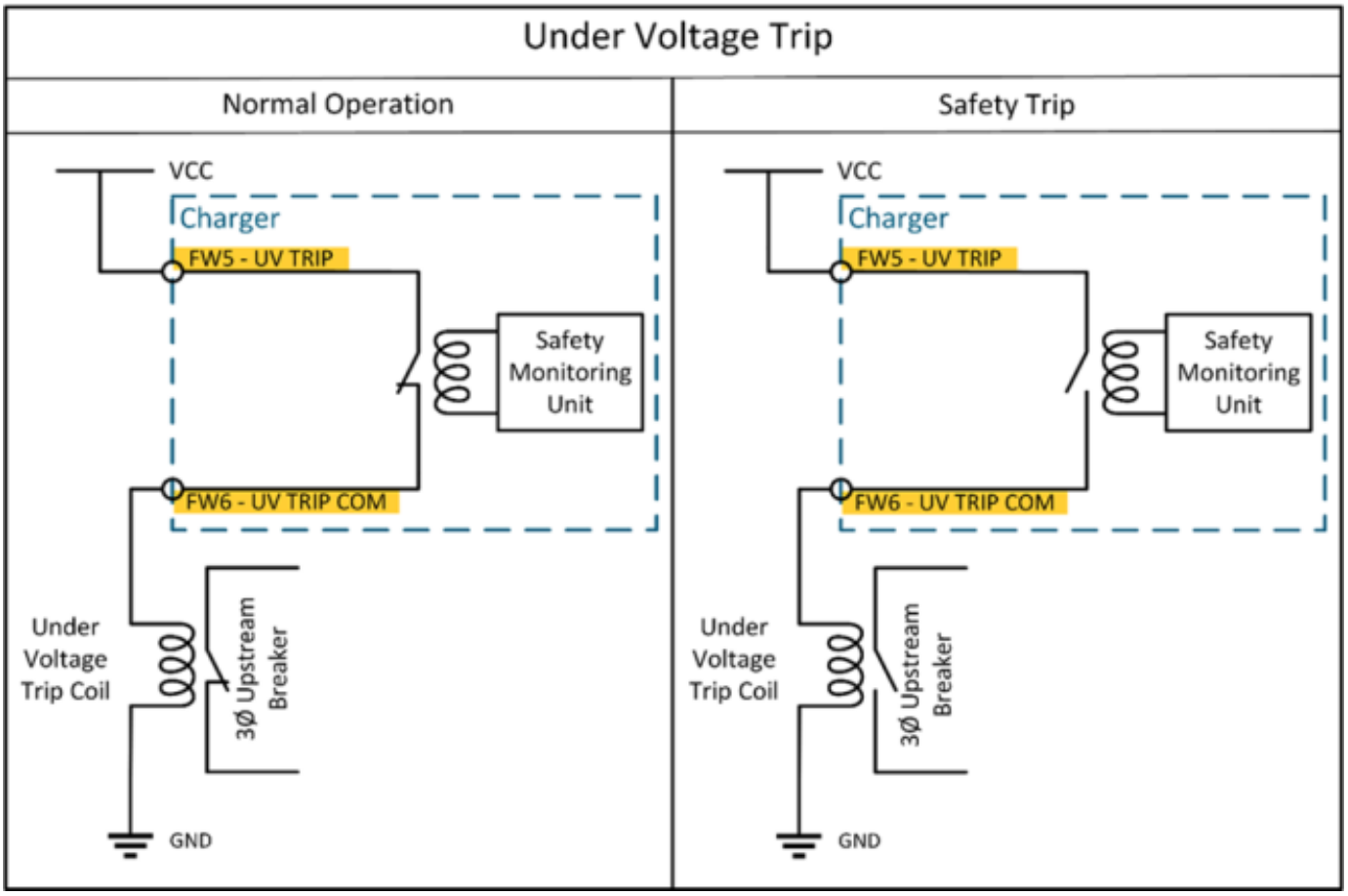
12.3 Undervoltage trip

An Under Voltage Relay (UVR) module can be used to turn off the upstream circuit breaker when the charger detects a safety fault. It is a fail-safe method of protection, break/failure in the control voltage isolates 3Ø supply power from the charger. An external 24V power source should be supplied to the charger when using the undervoltage detection function in order to bootstrap the turn on process, because an unpowered charger will not close the trip relay:



FW1 – UPS 24V+ and FW2 – UPS 24V GND - facilitates the connection of an external 24V DC backup power supply, which is essential to bootstrap the charger at power-up. The external Uninterruptable Power Supply should be rated to supply 24VDC and 5 Amps.

FW5 – UV TRIP and FW6 – UV TRIP COM - provides connection points to the safety system undervoltage trip as a normally open clean contact relay. A break in the safety loop de-energises the Under Voltage normally open relay, thus removing the control voltage from upstream Under Voltage trip coil and isolating all supply power from the charger.

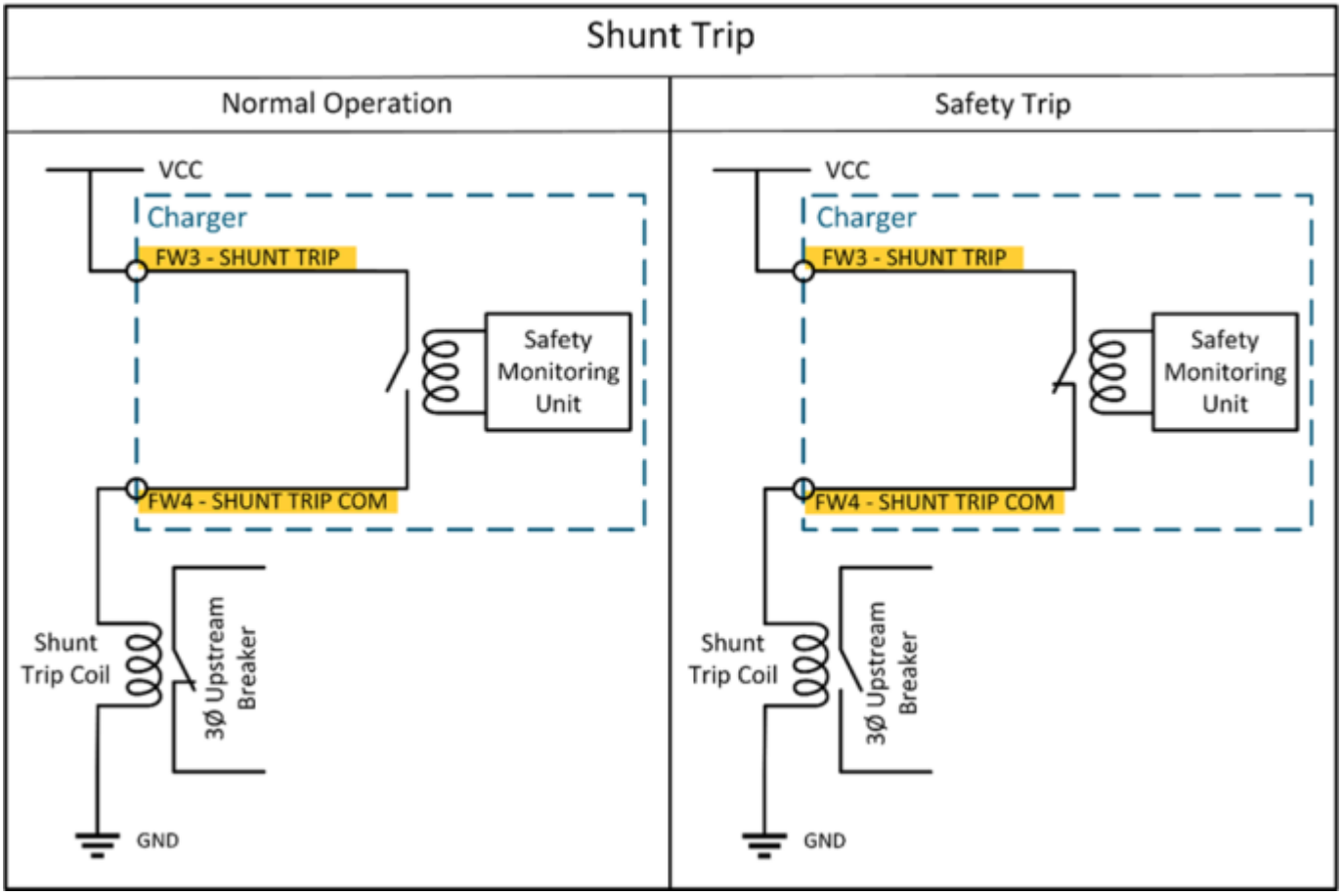


Contact specifications for the normally open clean contact relay can be found at [DDE Controller (te.com)].

12.4 Shunt trip

A Shunt Trip module can turn off the upstream circuit breaker when the charger detects a safety fault by causing a breaker to open when a control voltage is applied to the shunt trip coil. An external power supply is not required when using shunt trip protection as the absence of control voltage is a normal state for the shunt trip coil.

FW3 – SHUNT TRIP and FW4 – SHUNT TRIP COM - provides connection points to the safety system shunt trip output as a normally open clean contact relay. A break in the safety loop will close the shunt trip relay after a 1 second delay, thus returning the control voltage to an upstream shunt trip coil and isolating all supply power from the charger. This delay is used to bootstrap the charger at power-up:



Contact specifications for the normally open clean contact relay can be found at DDE Controller (te.com).

12.5 Emergency stop (ESTOP)

An ESTOP input is provided on the charger that can be used to trigger a fault in the charger safety system. This will open / de-energise the main3Ø input contactor (Configuration 1) or MCB (Configuration 2) in the charger and trip/trigger the undervoltage and shunt trip relays. It is a fail-safe method of protection, break/failure and the control voltage will trip the internal 3Ø power supply of the charger:

Key #	Description
1	ESTOP actuator protector
2	ESTOP button
3	Fan grill

In an emergency situation, activate the ESTOP by pressing the button. Pressing the button will cut off power to the charge station. To reset the ESTOP after it has been activated, see ESTOP Reset (authorised personnel ONLY).

12.5.1 ESTOP Installation (authorised personnel ONLY)

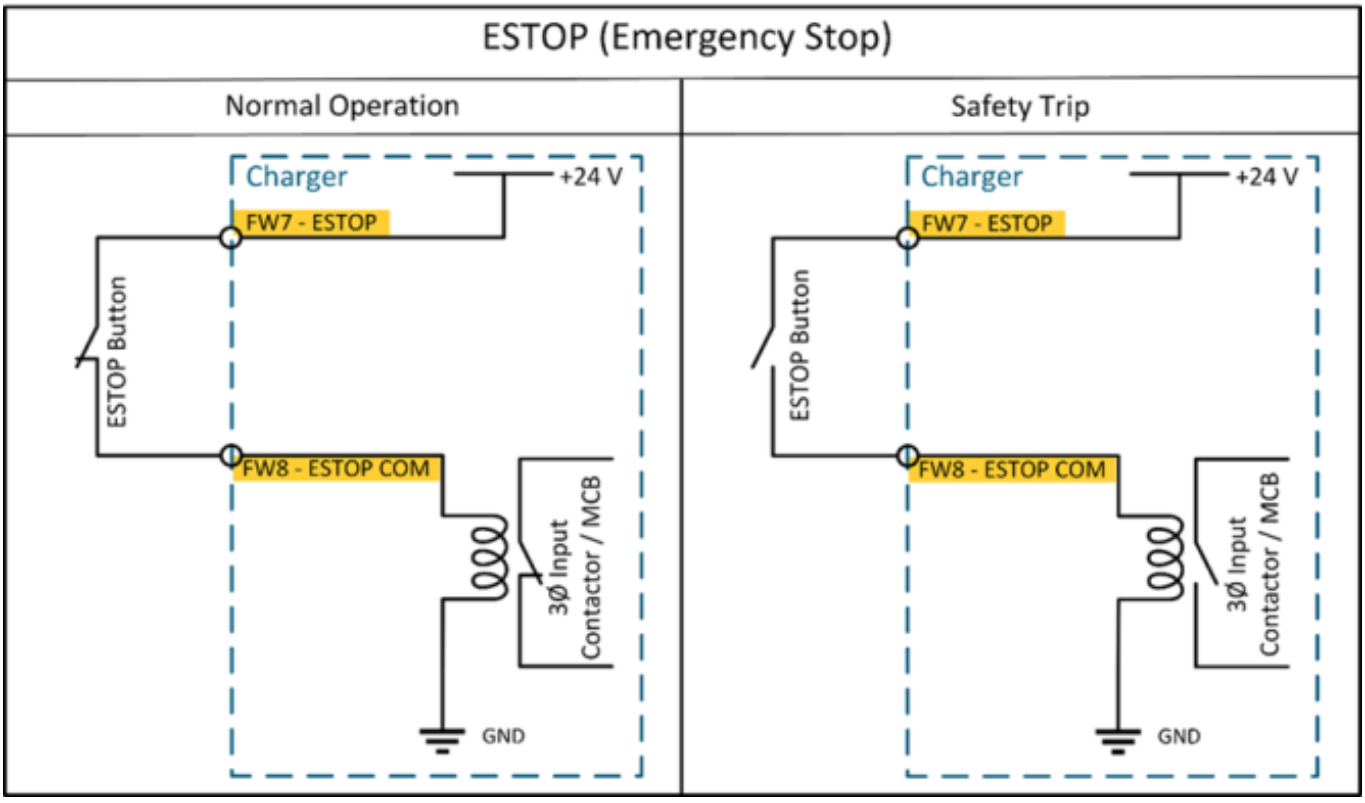
An ESTOP is ONLY installed in the factory at the time of initial manufacture.

Once the charger has been installed on site the ESTOP must be tested and signed off as functioning by the local authorities (where applicable).

FW7 – ESTOP and FW8 – ESTOP COM provides connection points to the safety system ESTOP input. A continuity break between FW7 and FW8 induces an undervoltage trip, shunt trip and de-energise the 3Ø input contactor (Configuration 1) or MCB (Configuration 2).

Multiple devices (normally closed-circuit) can be placed in series connections. For example, ESTOP followed by a vapor sensor. Break/open circuit in any of the devices will trigger ESTOP.

Note: Jumper connector between FW7 and FW8 needs to be removed before using this feature. Isolated 24VDC @ 20 mA is supplied by the charger to facilitate the connection of ESTOP.



12.5.2 ESTOP Reset (authorised personnel ONLY)

ESTOP reset and charger restarting after an ESTOP event must only be performed by authorised personnel.

The authorised person must only reset the ESTOP:

- AFTER an investigation of the ESTOP event is complete to ensure the system is safe.

12.6 GMI

The Ground Monitoring Instrument (GMI) trip feature can be used to shut off the charger supply power if the Protective Earth conductor is not connected to the charger chassis. This safety feature monitors continuity between the Protective Earth and the GMI ground reference, thus ensuring the charger chassis remains connected to Protective Earth:

FW9 – Chassis REF - an accessible reference point to chassis, enabling a jumper between FW9 and FW10 to disable the feature.

FW10 – GMI REF - allows a user to supply a GMI ground reference from the site earth point, enabling the charger to detect any discontinuity between the site Protective Earth and the charger chassis. A continuity break between FW9 and FW10 induces an Undervoltage trip, shunt trip and de-energise the input contactor (Configuration 1) or MCB (Configuration 2).

Note: The jumper connector between FW9 and FW10 needs to be removed before using this feature.