THE POWER OF TOMORROW. TODAY.

VELOX RANGE

VELOX // ULTRA-RAPID DC EV CHARGING DISPENSER

CUSTOMER MANUAL

CM 1-3

MADE IN BRITAIN

IMPORTANT

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE USE

KEEP SAFE FOR FUTURE REFERENCE

The contents of this Customer Manual are subject to recurring updates and modifications, as the TPS product range undergoes regular reviews for improvements.

Before any use, please check and download the latest revision of the Customer Manual using the QR code or hyperlink below to stay informed about any future changes.

OR

Customer Area - Manual VELOX *m* EV Charging Dispenser - Turbo Power Systems

PLEASE NOTE:
The VELOX *m* Ultra-Rapid DC EV Charging Dispenser, subject of this Customer Manual, will hereafter be referred to as the VELOX Dispenser. This Customer Manual is intended for the following groups:
The OWNER of the VELOX Dispenser and USERS of the VELOX Dispenser including, but not restricted to, Installation and Maintenance Personnel.

Responsibilities for the **OWNER**

It is the responsibility of the **OWNER** to ensure all **USERS** are able to install, maintain and operate the VELOX Dispenser in a safe manner.

For the purposes of this manual the OWNER is defined as:
The person, people or entity which holds legal title in the VELOX Dispenser. The OWNER is also a USER.

For the purposes of this manual a USER is defined as:
Anybody who comes into contact with the VELOX Dispenser for any purpose after the point of delivery to the OWNER. This includes but is not restricted to:

- Transportation and storage of the VELOX Dispenser
- Installation of the VELOX Dispenser
- Maintenance and inspection of the VELOX Dispenser
- Operation of the VELOX Dispenser for the purpose which it is intended.

Discharging the OWNER'S responsibilities includes but is not restricted to:

- Ensuring the instructions in this manual are understood and followed at all times.
- Ensuring installation of the VELOX Dispenser is carried out by appropriately qualified personnel.
- Ensuring all maintenance and inspection of the VELOX Dispenser is carried out by appropriately qualified personnel.
- Ensuring this document is kept in a safe location where it is easily accessible. It is an essential part of the VELOX Dispenser system.

Copyright

Contents

1. General Information

Turbo Power Systems Limited (TPS) operates an integrated Business Management System which includes Health & Safety, Environmental & Quality Management. TPS complies with ISO 45001:2018, ISO 9001: 2015 and ISO / TS 22163:2017.

1.1. Product Support Contact Information

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Queensway North
Team Valley Trading Estate
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+44 (0) 191 482 9200
info@turbopowersystems.com

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gridley@turbopowersystems.com

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ahenriques@turbopowersystems.com

You can contact the Turbo Power Systems Customer Support Team via the following means:

customersupport@turbopowersystems.com

+44 (0) 191 482 9227

+44 780 9656 709

Monday to Friday (excluding bank holidays): 08:00 to 21:00 GMT*
*Additional support may be available outside these hours. For further details, please refer to your contract / service level agreement.

www.turbopowersystems.com

Before contacting TPS, please ensure you have the serial number of your VELOX Dispenser to hand. Details of where to find the serial number are in section 3.4 of this manual. The serial number must be quoted in all communications with TPS.

1.2. Language

The original language of the document is English. All other language versions are translations of the original instructions.

1.3. Acronyms and Abbreviations

AC	Alternating Current
CCS	Combined Charging System
DC	Direct Current
DC-DC	DC-DC converter
DGI	Distribution Grid Inverter
Dispenser	VELOX *m* Ultra-Rapid DC EV Charging Dispenser
EV	Electric Vehicle
Equipment	Electric Vehicle Charger- in this manual the Velox *m* Ultra-Rapid Dispenser
HMI	Human Machine Interface
kW	Kilowatt
LH	Left Hand
MCC	Megawatt Charging Cabinet
MCS	Megawatt Charging System
NACS	North American Charging Standard
OWNER	The Person who retains the title of the goods
OCPP	Open Charge Point Protocol
PCB	Printed Circuit Board
PE	Protective Earth
RH	Right Hand
SiC	Silicon Carbide
SWL	Safe Working Load
TPS	Turbo Power Systems
USER	The person who uses the equipment for its intended purpose of charging or discharging an EV
V2G	Vehicle to Grid
V2X	Vehicle to Everything

1.4. Figures

It is not always possible or practical to show the exact configuration of your VELOX Dispenser. Any figures used within this document are indicative and are for instruction and description purposes only.

2. Safety

2.1. Safe Working Practices

WARNING
1. Only suitably trained and authorised personnel should be allowed to work on this VELOX Dispenser.
2. This VELOX Dispenser uses high voltage: all possible steps must be taken to maintain safety of the personnel and any staff working near the VELOX Dispenser at all times.
3. Once the installation is completed, under no circumstance should the covers be removed unless undertaken by either TPS or an approved / trained person.

2.2. Precautionary Notices

	**WARNING!** **RISK OF ELECTROCUTION**	Indicates an operation, sequence, or function that, if not followed, may cause electrocution or death to personnel and/or serious damage to equipment. Strictly adhere to all warnings.
	**WARNING!** **RISK OF INJURY**	Indicates an operation, sequence, or function that, if not followed, may cause serious injury or death to personnel and/or serious damage to equipment. Strictly adhere to all warnings.
	**CAUTION!** **RISK OF DAMAGE TO EQUIPMENT**	Indicates an operation, sequence, or function that, if not followed, may cause damage or malfunction of equipment.
	**ATTENTION!** **OBSERVE PRECAUTIONS FOR HANDLING**	This unit contains Electrostatic Sensitive Devices (ESD). DO NOT TOUCH any electrical components without Anti-Static Precautions.
	**WARNING!** **RISK OF TIPPING**	Indicates an operation, sequence, or function that, if not followed, may cause the unit to tip over and cause serious injury or death to personnel and/or serious damage to equipment. Strictly adhere to all warnings.
	**NOTE**	Provides additional explanatory information that may not be readily apparent from the text or illustrations.

2.3. Safety Precautions to Consider When Working on the Dispenser

This section contains a list of general safety precautions. Before attempting any work, read and understand these precautions. Failure to do so can result in death or serious injury to individuals or damage to equipment. If in doubt regarding any of these precautions, ask for an explanation from your immediate supervisor before proceeding with any installation or maintenance task.

WARNING:

- High Risk of electrocution in this VELOX Dispenser if covers are removed.
- 920V DC and 120V AC are present within this VELOX Dispenser when it is not isolated.
- Should the covers need to be opened by either TPS or an approved / trained person all supplies must be isolated and a minimum of 5 minutes be allowed for the VELOX Dispenser to discharge.

2.4. Disclaimer

The manufacturer (TPS) is not liable for any damages, losses, costs, expenses, or injuries incurred by any USER of the VELOX Dispenser, if such damages, losses, costs, expenses, or injuries occur as a result of failure to comply with all the instructions contained in this manual. This includes, but is not limited to, any equipment damage and/or personnel injury resulting from any of the following:

- Power outages or disruptions to the electrical supply to the VELOX Dispenser
- Accumulation of dirt or ingress of foreign substances within the VELOX Dispenser
- Corrosion of component parts.
- Unauthorised upgrades, enhancements or modifications to the VELOX Dispenser or its use.
- Software or hardware issues due to an IT security problem (i.e. virus breakout, malicious hacking of the system, etc.)
- Vermin, insect infestations or the like.
- Faults in some other equipment connected to the scope of work.
- Hazards such as fire, flood, storm or the like, spillage or leakage of chemicals or harmful substances into the VELOX Dispenser
- External sourced, unprofessional, incorrect, or non-compliant installation,
- Improper operation, negligence or unauthorised repairs by third parties.
- Failure to comply with all safety instructions or legal standards by USERS of the VELOX Dispenser.
- Insufficient ventilation of the VEOX Dispenser.
- Operation of the VELOX Dispenser outside of its design conditions.

2.5. Warranty

As per the Supply of Goods and Services agreement between TPS and the OWNER, the goods supplied, and all products supplied shall:

- Conform to the configuration specified and technical data, contained within section 3.3.
- Be of satisfactory quality and fit for any functionality and purpose set out in the configuration specified and technical data, contained within section 3.3.
- Be free from defects in design, material and workmanship and remain so for the contract specified period after delivery to the OWNER.

3. Product Information

3.1. Functionality

The TPS designed VELOX *m* Dispenser is an innovative DC supplied Electric Vehicle CCS / NACS Charging Dispenser designed for connection to a DC supply, ideally a TPS supplied POTENZA DC Microgrid and VELOX MCC (Megawatt Charging Cabinet).

The VELOX Dispenser has been designed and tested in accordance with international standards IEC 61851 (DC Charging) and IEC 62196 (Plugs).

A DC Microgrid enables most efficient integration of additional capacity by enabling connection of on-site energy storage and generation directly into the charging scheme and not via the local electricity distribution network. The DC connection also gives geographical flexibility by enabling the network to span larger distances.

The charging control module located within the VELOX Dispenser, interfaces with the back-office systems of Charge Point or fleet Operators, other vehicles and other EV charging subsystems to allow compatible vehicles to be charged. The VELOX Dispensers which connect to the DC Microgrid are linked to a bi-directional DC-DC converter which both controls the charge to the EV and enables V2X vehicle discharging capability.

PLEASE NOTE: The VELOX Dispenser is primarily intended for use with TPS' own POTENZA DC Grid Connection and charging systems, such as the MegaWatt Charging Cabinet (MCC). If the application for which the VELOX Dispenser is intended requires its use with a non-TPS supplied DC grid connection or charging system please contact TPS to discuss the details of this application, as variations to the contents of this manual may apply, and there may be an impact on the Warranty terms and conditions.

3.2. Technical Overview

The VELOX Dispenser provides the fixing for a single CCS or NACS charging cable and a docking point for the connector.

All charges are monitored through an insulation monitor PCB which measures and reports the resistance of the charge cable before performing a charge to ensure the charging cable is safe to operate.

The user interface is provided by an HMI. Instructions are clearly displayed on the user interface for a simple and reliable user experience. The HMI will display active real time charging data during a charge such as state of charge (SOC), power transferred (kWh), time and cost where appropriate.

Each VELOX Dispenser (there can be up to 8 per MCC, for example) has its own charge controller which enables Dynamic Power Sharing between VELOX Dispensers (when specified) up to the maximum available charging power from the DC supply of the MCC and the connected vehicle requirements.

The EMC characteristics of this product meet the interference voltage limits Class A <= 20 kVA (IEC 61851-21-2:2018). The MCC is designed for Type A (industrial) environments. Use in Type B environments (residential, commercial, and small businesses) may result in undesirable electromagnetic interference.

Figure 1 - A typical VELOX m EV Charging Dispenser

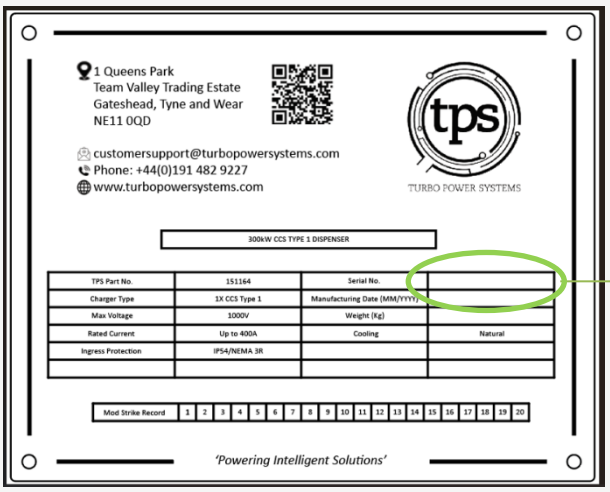
3.3. Technical Data

VELOX *m* Dispenser	
TECHNICAL DATA	
Electrical	*Dispenser*
Power	150 - 450 kW
Input DC Voltage range	150 – 920 V
Input DC Current	up to 600 A
Output DC Voltage range	150 – 920 V DC
Output DC Current	up to 600 A
Average Efficiency	NA
General Data	
Dimensions	353 (W) x 1,154 (H) x 293 (D) mm
Weight	75 kg
Cooling of charge cables	Natural Air up to 300 kW / 400A Liquid > 300 kW / 400 A
Ingress Protection Rating	IP54 Electronics Protection
Operating temperature range	-30 °C to +50 °C
Storage temperature range	-10 °C to +60 °C
Humidity	< 95% non-condensing
User	
Charging Plug	CCS / NACS (Single connector only)
Authentication Options	Payment Terminal / RFID / Plug & Charge
User Display	HMI
Charging Status Indication	RBG LED (option)
Communication	OCPP v1.6 now & v2.0.1 ready
Modes available	G2V / V2G / V2X (dependent upon overall system specification)
Standards	
Certificates, standards, directives	CE, UKCA, IEC 62477-1, IEC 62109-1, IEC 62109-2, ISO 15118-20, UL
EMC standards	EN61000-6-2, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-2, EN 61000-6-4, IEC 61851-21
Metering	DC Power Meter compliance to 2014/32/EU

3.4. General Arrangement of VELOX Dispenser

Figure 2 – VELOX m Dispenser Front and Left-side Views

Figure 3 – VELOX m Dispenser Left-side View



PLEASE NOTE: The rating plate is located on left-side face. Always quote the unit serial number when contacting the TPS Product Support Team.

3.5. Storage

3.5.1. General Storage

- The VELOX Dispenser must be transported and stored in its original packaging. TPS is not liable for any damage incurred when the Dispenser is stored or transported in non-TPS packaging.
- It must be stored out of direct sunlight in a dry environment.
- Always disconnect the input power before removing the VELOX Dispenser for storage or transport.
- Always transport the VELOX Dispenser in the flat position.
- Always lift the VELOX Dispenser crate from the base using a suitable forklift truck.

3.5.2. Longer Term Storage

If the VELOX Dispenser is switched off for a period exceeding 6 months, an inspection will be needed before it can be switched back on. This must be carried out by TPS or an approved / trained person. Please contact your TPS Product Support Team, details are provided in section 1.1.

3.6. Packaging

The standard VELOX Dispenser packing arrangement is shown in Appendix D – Packing. As can be seen, it is for a qty of four VELOX Dispensers shipped together. The VELOX Dispensers are fixed onto a wooden pallet base. They are encapsulated with a foil bag to prevent moisture ingress, before being enclosed by a bespoke wooden crate. This crate must be kept on its back at all times, as the VELOX Dispensers have a high centre of gravity. Care must be taken when removing the crate to avoid damage to the VELOX Dispensers.

The approximate dimensions and weight of the packaged VELOX Dispensers are below:

Height	1,490 mm / 58.7 inches
Width	1,440 mm / 56.7 inches
Depth	1,090 mm / 42.9 inches
Weight	300 kg / 662 lbs with packing crate

For a VELOX Dispenser shipped as a single unit, the approx. dimensions will be 1,500 x 500 x 500 mm with a weight of 130 Kg.

4. Installation

PLEASE NOTE: The VELOX Dispenser must only be installed by TPS or a qualified Installation Engineer.

The qualified Installation Engineer must:

- Have a full working knowledge of the VELOX Dispenser and its safe installation.
- Be qualified according to the applicable local rules to do the work e.g. in the UK, BS 7671 18th Edition, in the USA, NFPA 70, National Electrical Code (NEC)
- Comply with the instructions contained in this manual.

4.1. Tools Required to Install the VELOX Dispenser

This is a non-exhaustive quick reference list of the essential tools required to carry out the key elements of the installation:

- Terminal screwdriver to enable the AC connections.
- 17mm socket for attachment of the DC in conductors.
- 13mm socket for attachment of the PE conductors.
- Torque wrench, range 4.5-30 Nm.
- 5mm hex driver
- Tools to cut and strip electrical cables.
- Crimping tool to suit any electrical crimps that are used to terminate cables.

4.2. Preparing the Foundation

TPS cannot advise on individual installations, however the following recommendations should be followed to ensure proper functioning of the VELOX Dispenser, and compliance with warranty requirements. If there is any doubt, please contact your TPS Product Support Team, details are provided in section 1.1.

The VELOX Dispenser must be mounted on a firm and level surface. Ideally this should be a concrete foundation of suitable strength to withstand the static weight of the VELOX Dispenser and any loading imposed. Location details can be found on the Outline Drawing, the latest version of which can be found in the Customer Area. The cable bending radius must be considered in any underground routing. It will aid installation if the cables are left with at least 1m of length above the foundation mounting face.

4.3. Mechanical Installation of the Dispenser

This section contains information relating to the siting, unpacking and fixing of the VELOX Dispenser into its designated location.

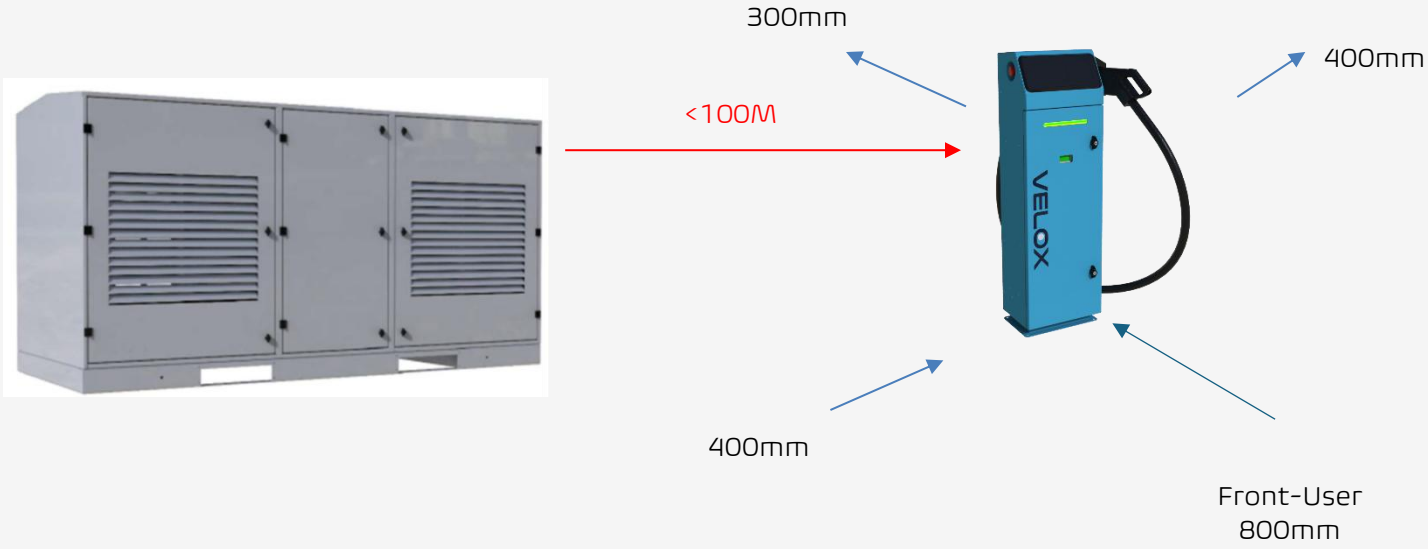
For mounting details and dimensions, please refer to the Customer Area as detailed below.

Customer Area - Manual VELOX *m* EV Charging Dispenser - Turbo Power Systems

4.3.1. Dispenser Clearance Zone and Distance to the POTENZA DC Power Source

Within a TPS system, the total cable length between the Potenza DC power source and VELOX Dispenser must not exceed 100 metres.

Recommended minimum free space for ventilation and maintenance is shown below:



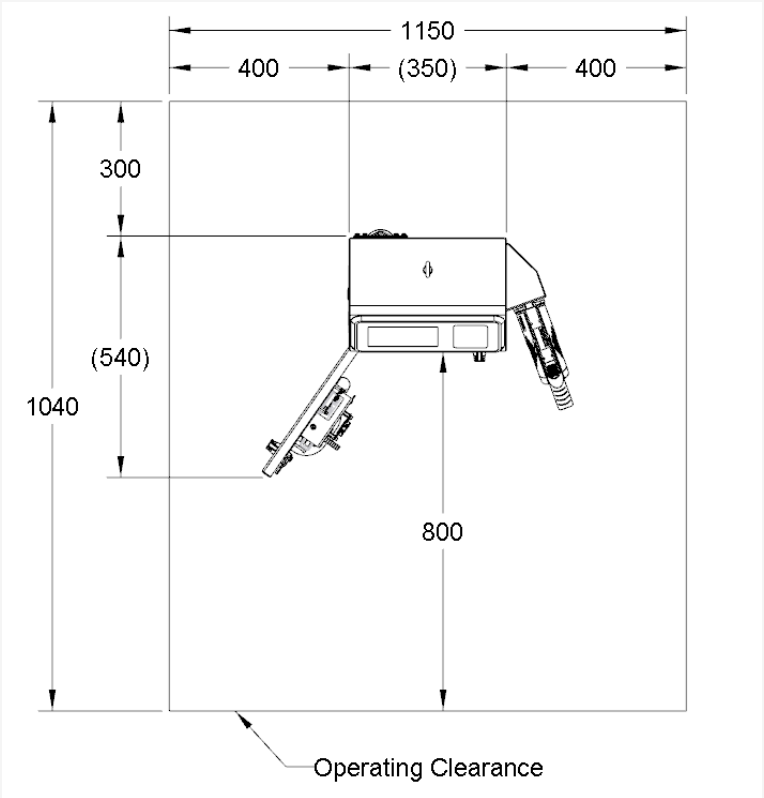


Figure 4 – Recommended VELOX Dispenser Clearance Zones plan view

4.4. Unpacking the VELOX Dispenser

Before beginning the unpacking process, please check the transport indicators as instructed in the VELOX Dispenser Quick Guide CM2-3, which accompanies the VELOX Dispenser. There are 2 types of indicators fitted; one to record shock, the other to record tilt. If either of these has been triggered, they will show a RED signal.

Figure 5 – Typical Packing Crate & Indicators

If either indicator is showing a red signal, a record of this must be made on the delivery paperwork. Next, Inspect the packaging fully. If there is any visible damage, pause the unpacking process until the carrier can attend to make a full inspection and witness the rest of the unpacking process.

Figure 6 – A typical Packed Unit

A typical packing crate is shown above. To help with removal, the main screws are circled with a RED marker pen as shown. For details of the construction of the packing crate, please refer to Appendix D – Packing. Disassembly is the opposite of assembly. The protective foil bag surrounding the VELOX Dispenser is sealed during packing to protect it from moisture. This should still be intact. Carefully cut the foil bag open and remove it. Locate and remove the charging cable and place in the holster.

If, after unpacking, the VELOX Dispenser is found to be damaged in any way, **STOP** immediately. Inform the OWNER of the VELOX Dispenser and TPS urgently, taking and sharing photographs to indicate the areas of this damage. See section 1.1 for TPS contact details. YOU will be informed of the next steps.

If there is no visible damage, proceed as below.

4.5. Lifting and Positioning the VELOX Dispenser

The VELOX Dispenser must be lifted from its transport pallet with appropriate equipment suitable for a SWL of 70 kg / 155 lbs. One lifting eye with M8 male thread of appropriate SWL will be required. It is the responsibility of the OWNER to ensure that all lifting and handling operations are carried out in a safe manner and are compliant with any local regulations.

Please refer to the following steps for information on lifting the VELOX Dispenser. Please pay particular attention to any Health and Safety requirements which may apply (e.g. working at height, selection and use of appropriate lifting equipment, use of appropriate PPE etc).

Please refer to drawing 003075 - Sketch for the latest details and information on the installation of the VELOX Dispenser.

Step 1: Remove the blanking bolt from the top panel of the VELOX Dispenser. Screw the lifting eye into the M8 threaded hole. The eye must screw in fully. Remove the 8x M8 bolts securing the plinth to the VELOX Dispenser body. Remove the gland plate from the plinth.

Step 2: Fix the VELOX Dispenser plinth directly to its concrete foundation using suitable fixings. Drill the gland plate as required for cable access, route all cables through the plate and refit to the plinth ensuring the gasket is present and undamaged.

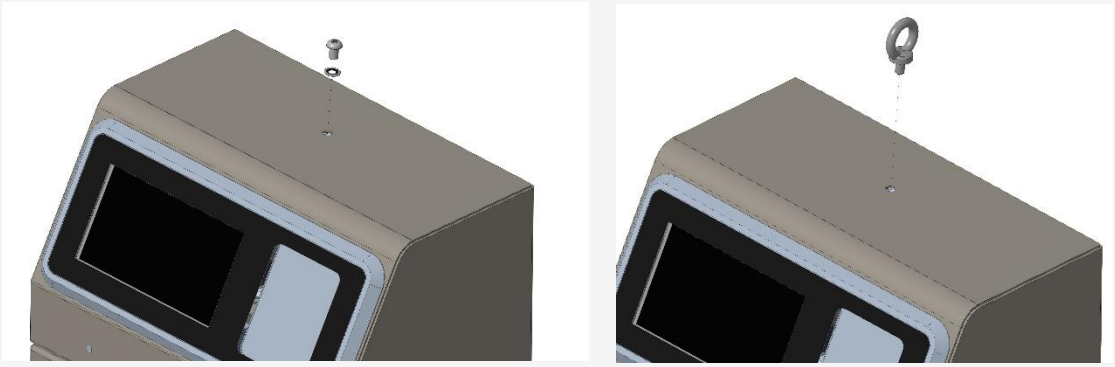


Figure 7 - Top view of lifting eye location

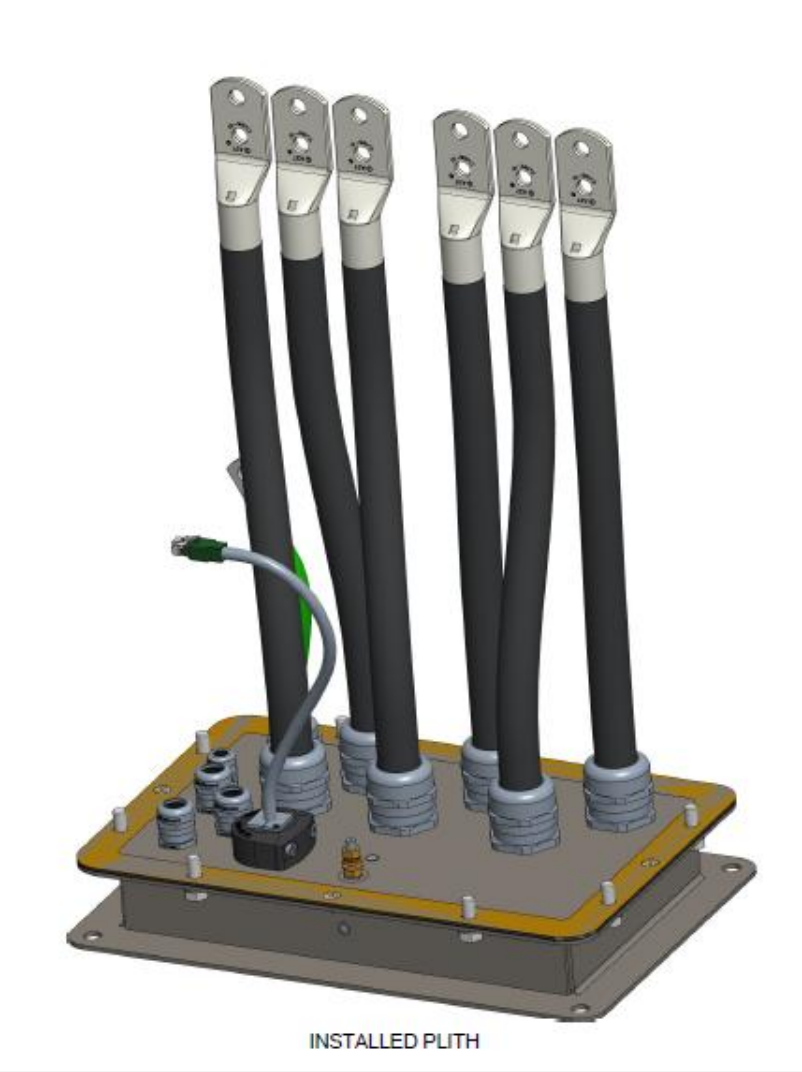


Figure 8- Installed plinth with cables routed through glands

Step 3: The VELOX Dispenser can now be lifted and moved into position. Before lowering the VELOX Dispenser onto its foundation, care must be taken to ensure the incoming cables are located appropriately through the glanding in the plinth (see section 4.6.1 for details).

Step 4: Align the VELOX Dispenser, tightening all fixings to recommended torques. Refer to drawing 003075 for latest details and information.

Step 5: Remove lifting eye and replace with the blanking bolt and sealing washer. Ref fig 8 above. Torque to 10Nm.

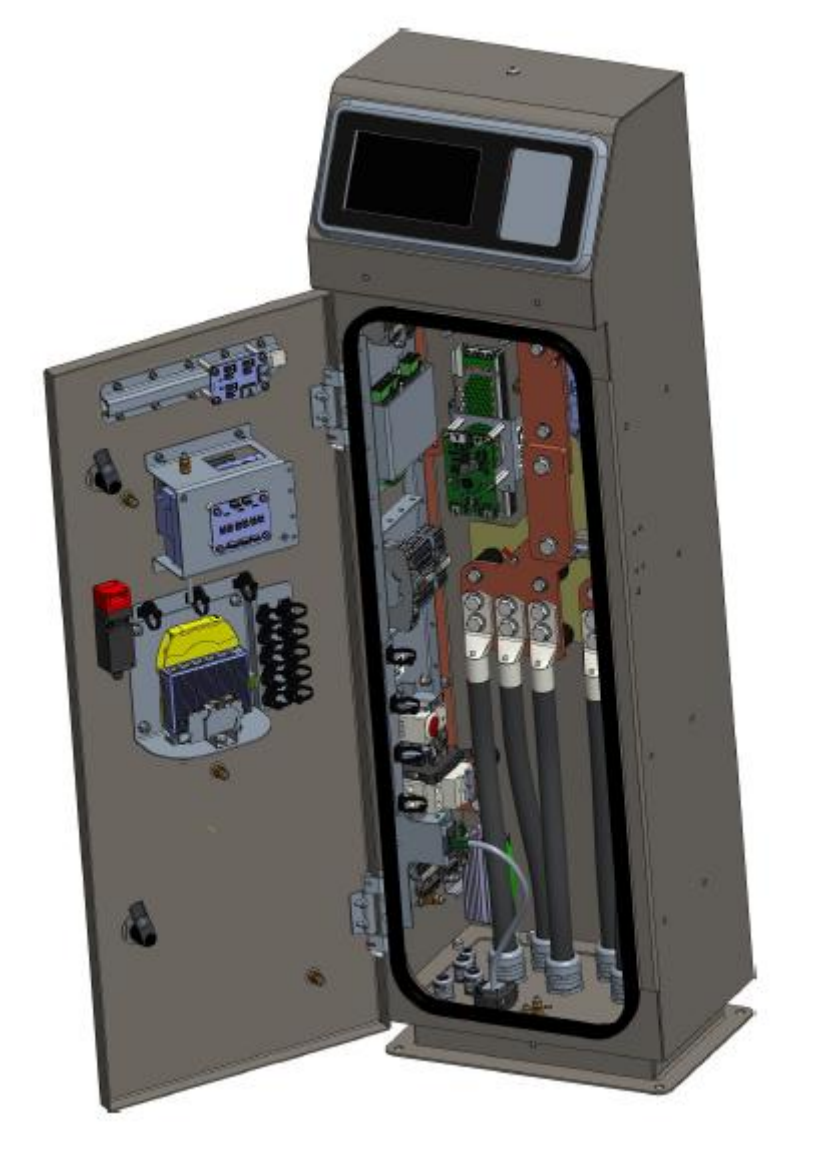


Figure 9- VELOX Dispenser fitted to plinth with all cables connected

4.6. Electrical Installation of the VELOX Dispenser

The information provided in this section is for guidance only. For the latest details on electrical installation please refer to 'Unit Outline', shown in Appendix A – VELOX *m* Ultra-Rapid Dispenser – Outline Drawing, which includes a link to the latest version. Please also see the drawing 003075 – Sketch for details of tightening torques and detailed connection information.

The Top Level electrical connection information can be found on the latest version of drawing 375-050 Fleet Charging Megawatt DCFC. Please refer to the customer area.

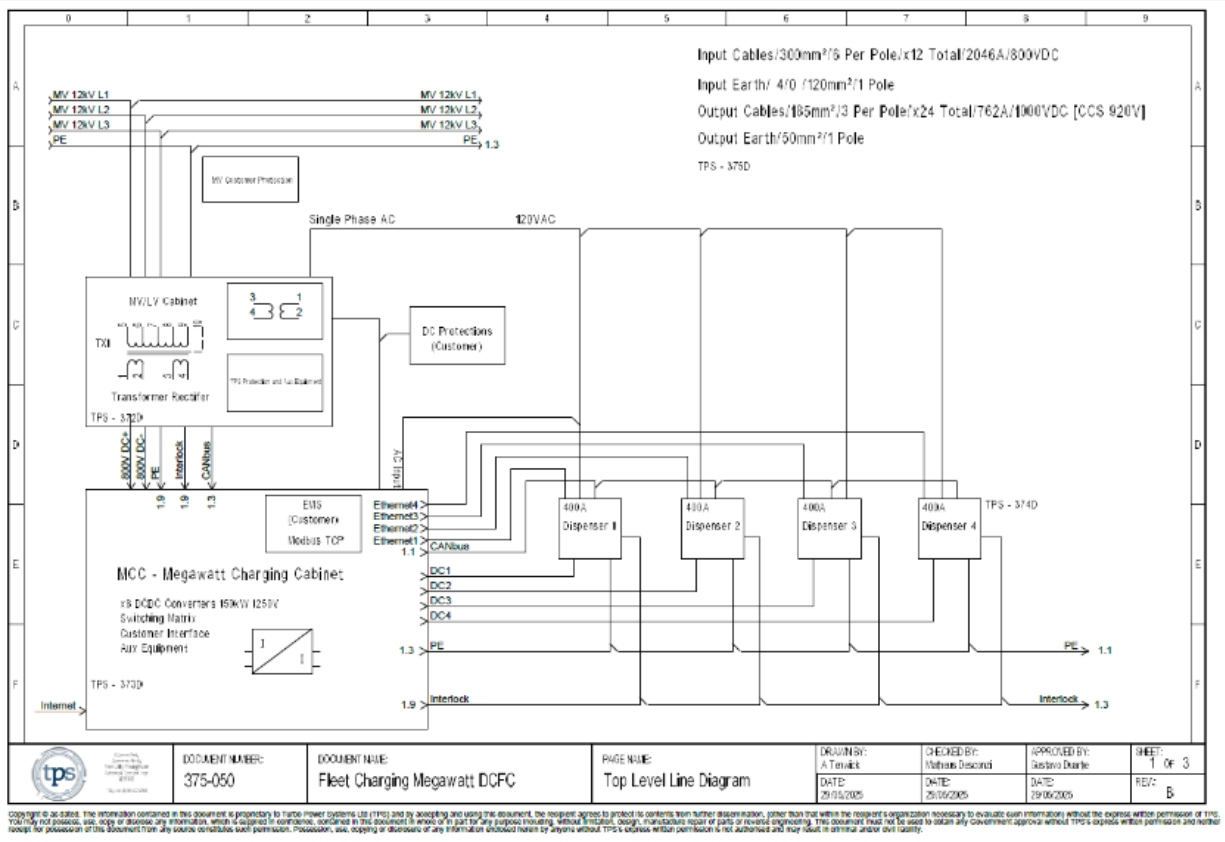


Figure 10 - Top Level electrical diagram

4.6.1. Cable Entry Points

DC, PE (Protective Earth), Aux (120V AC) and Comms interface.

DC, Aux and comms termination points and the PE terminal are located inside the Dispenser enclosure at the base.

Input cables enter the enclosure through the base of the VELOX Dispenser plinth. The VELOX Dispenser design has allowed for a suitable cable bend radius. Refer to drawing 003075 – Sketch for the suggested cable routing.

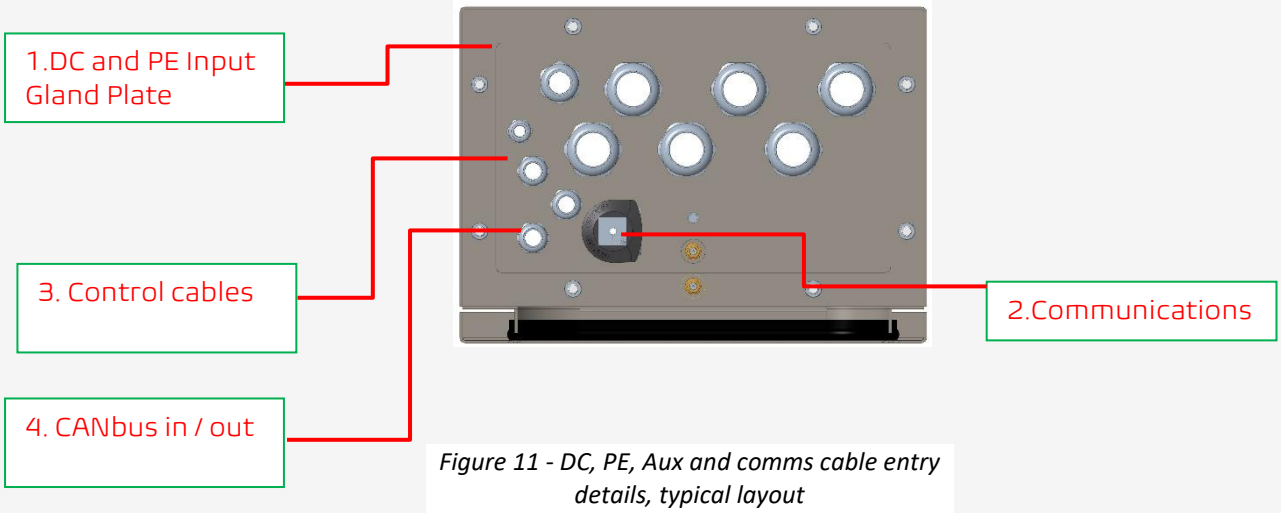


Figure 11 - DC, PE, Aux and comms cable entry details, typical layout

PLEASE NOTE: Gland plates are undrilled to allow installation using different cable sizes. IP65 glands are recommended. Make sure that all gland plate PE cables are re-fitted if they have been removed for gland hole drilling. The gland plate MUST be used in all installations to preserve the VELOX Dispenser warranty.

Health and Safety guidance must be followed when drilling holes for the cable glands.

Figure 12 - DC terminal connection details

4.6.2. Termination Details

To make the internal electrical connections, the front cover of the VELOX Dispenser needs to be opened. **THIS IS THE ONLY INSTANCE WHERE THE COVER SHOULD BE REMOVED OR OPENED**. Before doing this, it is important to ensure that any isolation devices in the VELOX Dispenser feed power cables are in the **OFF** position.

To open the front cover, the 2 off quarter turn latches will need to be unlocked and opened. For location see Figure 25 - Location of E Stop Button and cover access latches. Then the front cover must be carefully opened.

All incoming power cables must be cut to the required length and terminated in an approved manner (in the UK this would be BS 7671 18th Edition) using the correct tooling. Use the following information as a guide, and a reference to the required fixing torques.

4.6.3. Connection of DC Cables from the POTENZA or other DC Power Source

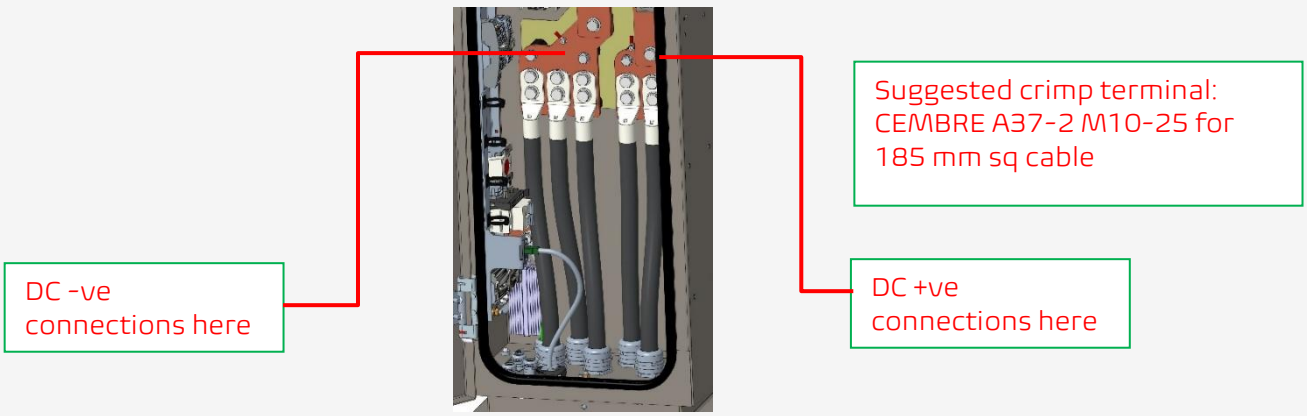


Figure 13 – DC terminal connection details

Both the DC +ve and -ve terminations are made using the same type of M10 bolted connection. There are 3 off double fixing terminals required for each polarity. A 17mm socket and torque wrench are required. Tighten to a maximum of 10Nm. DO NOT overtighten as damage to the busbars may result. **PLEASE NOTE**: These connections use a pressed-in threaded insert, over tightening may cause the insert to fail.

4.6.4. Connection of Aux Cables (Auxiliary power)

The 120 VAC 1P cables are terminated into standard 'Wago' push-in connectors. Cables should be terminated with an appropriately sized bootlace ferrule before being inserted. Note the connection positions above on TB2

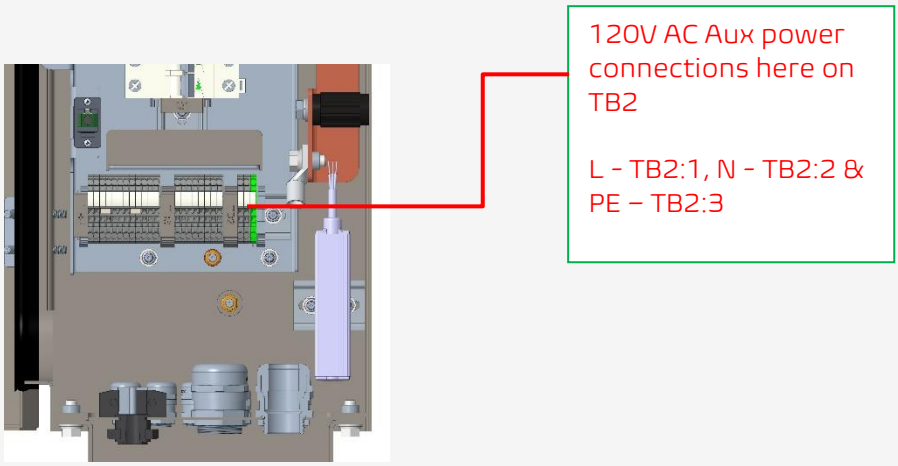


Figure 14 - 120 VAC Live (L), Neutral (N) and Earth (E) can take cable up to 1.5 mm²

4.6.5. Connection of Earth (PE)

Figure 15 - PE connection detail

The PE cable is connected to the PE busbar with an M8 fixing. A 13mm socket and torque wrench are required. Tighten to a maximum of 8Nm. DO NOT overtighten as damage to the busbars may result. **PLEASE NOTE**: These connections use a pressed-in threaded insert. Overtightening may cause the insert to fail.

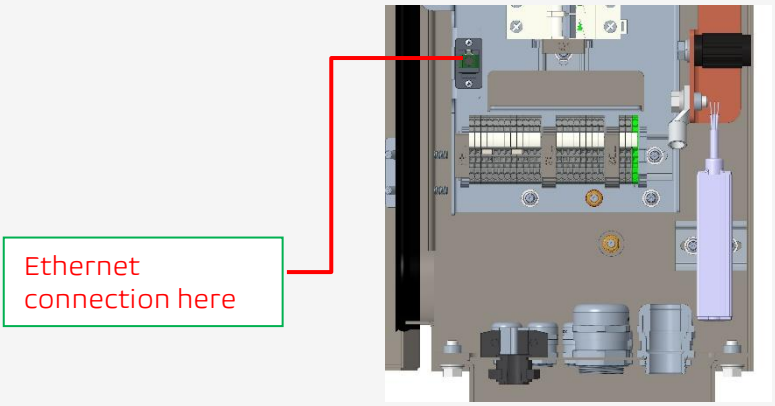
4.6.6. Connection of Control and Communications (e.g. Ethernet, CAN Bus)

The control cable must be a 6-core shielded cable, with the shields connected to a convenient PE terminal.
Subject to specification, there may be a requirement for a communications cable such as Ethernet to be included. This should be routed through a gland and terminated with a suitable connector.

When all cable connections have been made and verified, the front cover can be closed and locked.

Once the electrical connection is completed, **DO NOT** switch on the power to the POTENZA DC power source or the VELOX Dispenser. Ensure that any isolation devices are **OFF** and locked to prevent unauthorised switch on.

Ensure you download and complete the installation checklist, which can be found in Appendix B – Installation Checklist Document. This will conclude the installation process.



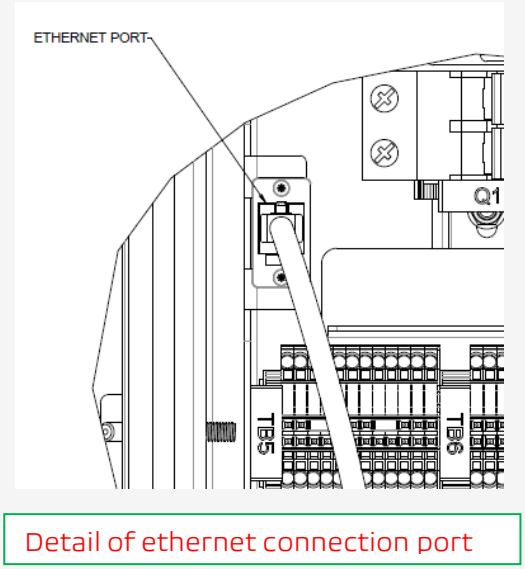
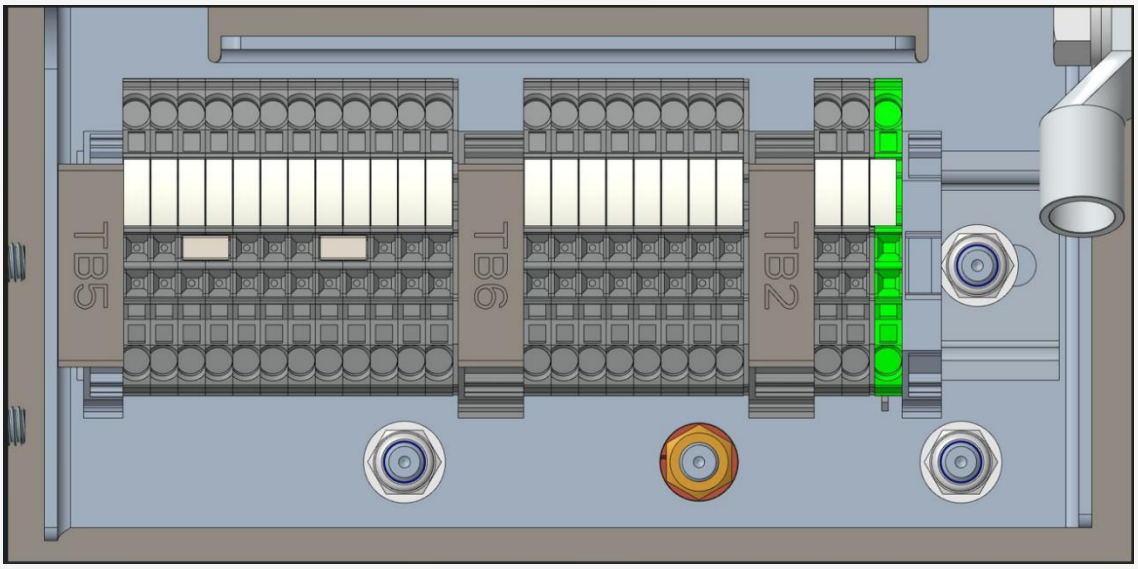


Figure 16 - The ethernet connection uses a standard RJ45 cable



DESCRIPTION	GROUPING	TB5
CAN L IN		1
CAN H IN		2
CAN GND IN		3
CAN GND IN		4
CAN SHD	DISPENSER	5
CAN L OUT		6
CAN H OUT		7
CAN GND OUT		8
CAN GND OUT		9
CAN SHD		10
CAN END OF LINE		11
CAN END OF LINE		12

DESCRIPTION	GROUPING	TB6
CONT ENB1		1
CONT ENB2		2
NA		3
NA		4
SFT RLY1	DISPENSER	5
SFT RLY2		6
E STOP IN		7
E STOP OUT		8

Figure 17 - The CANbus TB5 and Control cables TB6

4.6.7. CAN end of Line

It is very important that the dispenser which is at the end of the line has the TB5 terminals connected together with a jumper link to form a loop.

The CANbus cable must be a 4-core shielded CANbus cable. TPS recommends using 2 cores for ground, and the shield must be connected to terminals TB5-5 and TB5-10.

Please note: If any covers are removed from the VELOX Dispenser, upon re-installation the PE cable should be attached to the stud inside the front cover as shown. The fixings will be in place. Remove the M8 nut, spring washer and flat washer, fit the cable then replace the nut and washers. Tighten to 6.5 Nm.

4.6.8. Safety Interlock Loop

The VELOX Dispenser, together with all other components in the system, contain safety devices. These are a door interlock switch, an emergency (E) Stop Button and a safety relay.

The door switch and the E Stop Button are wired in series with 24V DC to the Supervisor Control PCB within the MCCB. The safety relay is also wired with 24V DC to form a loop to and from the supervisor control PCB. Each component that is added into the system is wired in series with its predecessor and simply extends the loop of the safety interlocks and safety relays.

When any of the safety interlock devices are activated, all components will be powered down by the supervisor control PCB.

Figure 10 - Top Level electrical diagram gives details of the connections which are required. The last VELOX Dispenser to be installed, will need the cables connecting internally to complete the loop as detailed above in section 4.6.7.

The mode of operation of the safety interlock devices is as follows:

- If an E Stop Button is pressed or a door is opened (safety interlock loop broken) when the unit is off, you can still power the VELOX Dispenser with the warning notification, but charging is not possible until a full power cycle reset has been carried out.
- If either of the above happens whilst running, a power cycle of the system is required, as the fault will remain lodged even if the condition is removed / reset. (As it is assumed an investigation needs to take place).

4.7. Safety Precautions During Installation, Operation and Maintenance

- Attention must be paid to all precautionary notices explained in this section.
- Do not attempt to operate the VELOX Dispenser if there is visible damage, or the VELOX Dispenser is displaying a fault.
- Please report any faults and or damage to the VELOX Dispenser immediately to the OWNER.
- Never apply power to the VELOX Dispenser without the covers in place.
- Always use the VELOX Dispenser as described.
- Ensure that the VELOX Dispenser charging connectors are correctly placed in the holsters provided when not being used, and that the charging cables are not twisted or tangled.
- Ensure that the VELOX Dispenser charging connectors cannot be immersed in any liquid.
- Do not install the VELOX Dispenser close to any heat sources.
- If in doubt refer to the installation drawing shown in the Customer Area which can be found here:

Customer Area - Manual VELOX *m* EV Charging Dispenser - Turbo Power Systems

REPORT ANY PROBLEMS, ISSUES AND CONCERNS IMMEDIATELY TO THE OWNER AND TPS

5. Commissioning

Please note: Commissioning can only take place once the installation stage has been completed correctly and in full.

The commissioning of the VELOX Dispenser is a detailed and complex process which must only be undertaken by either TPS or an approved / trained person.

To arrange commissioning, or in the event that your VELOX Dispenser needs to be relocated or decommissioned, please contact your TPS Product Support team. Details are provided in section 1.1.

6. VELOX Dispenser Operation

The VELOX dispenser has no DC power isolation built in. The DC power source which supplies the VELOX dispenser controls the power supply. It is therefore very important to ensure that all connections within the VELOX dispenser are complete before the cover is closed to make the interlock loop complete and the power is energised.

When the power is energised, the VELOX Dispenser HMI will take the USER through a step-by-step process of charging / discharging an EV. The sequence and screen layout may differ depending on the configuration of the VELOX Dispenser supplied.

Depending upon specification, there will be differences in connector and currency. All screen layouts are shown for completeness; each installation may vary.
The basic sequence with example screen layouts is as follows:

Standardised sequence below:

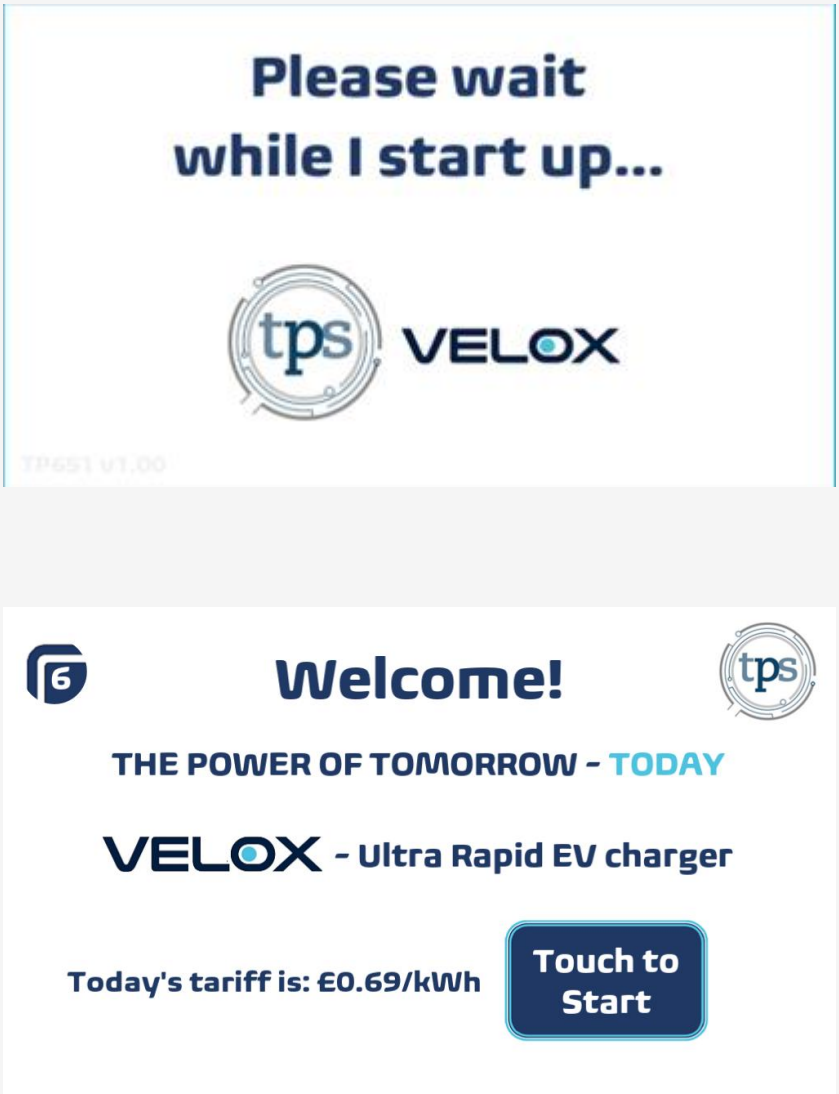
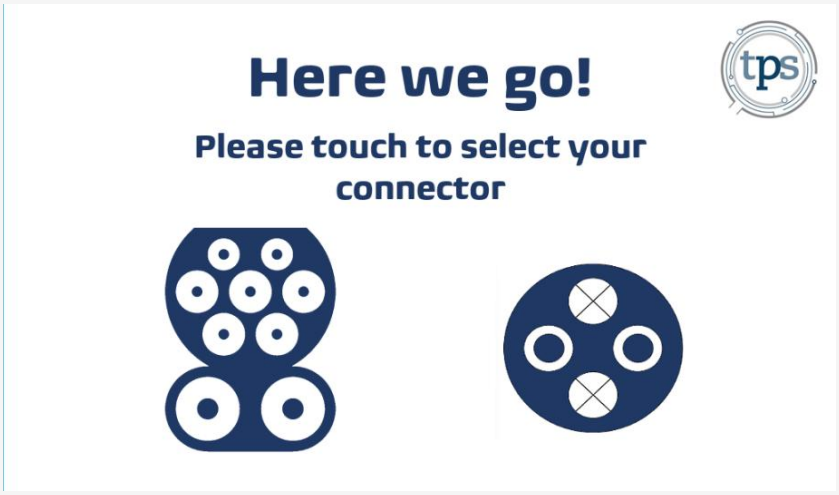
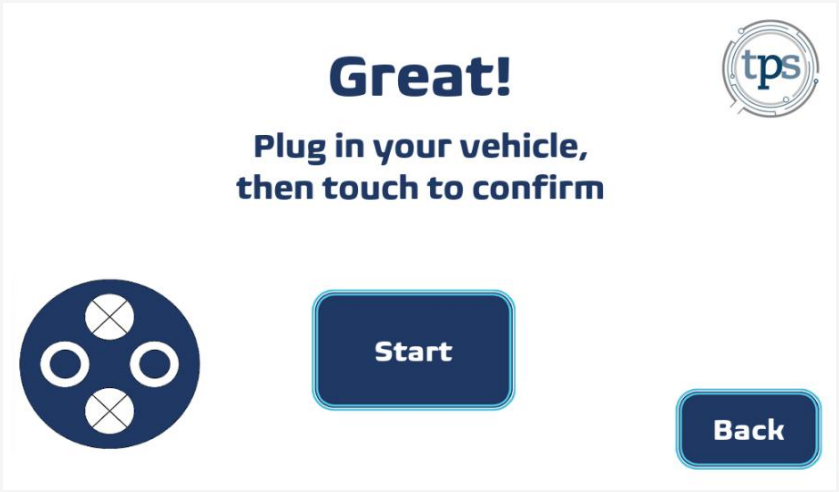
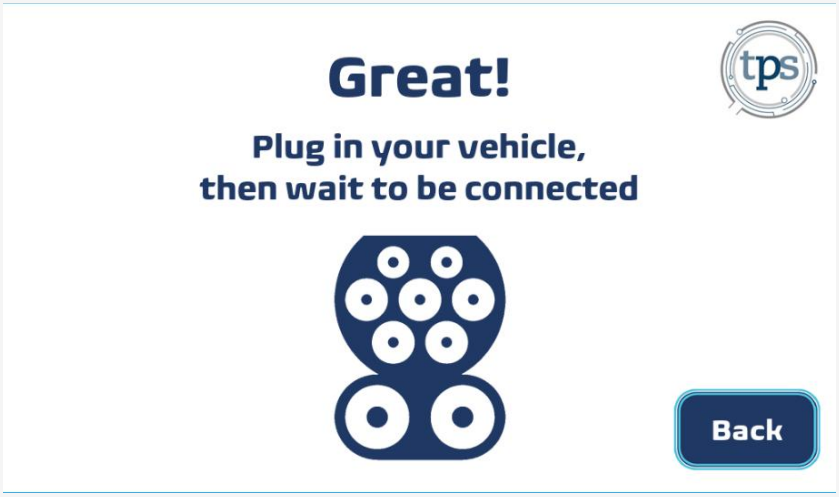
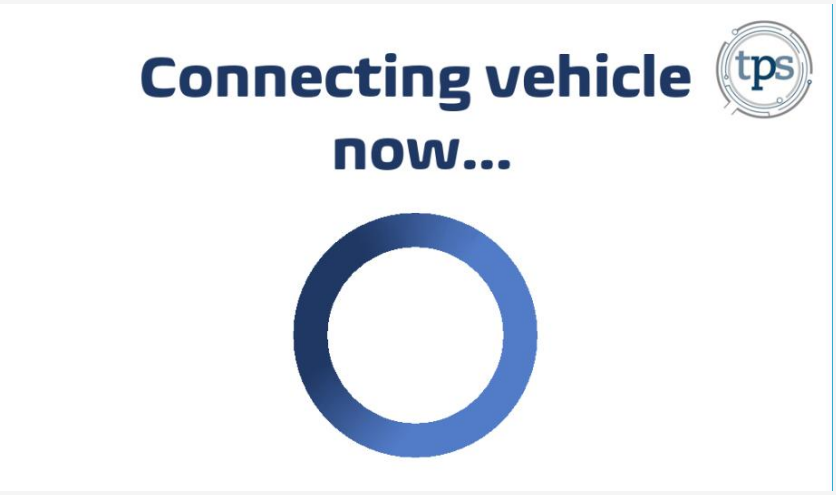


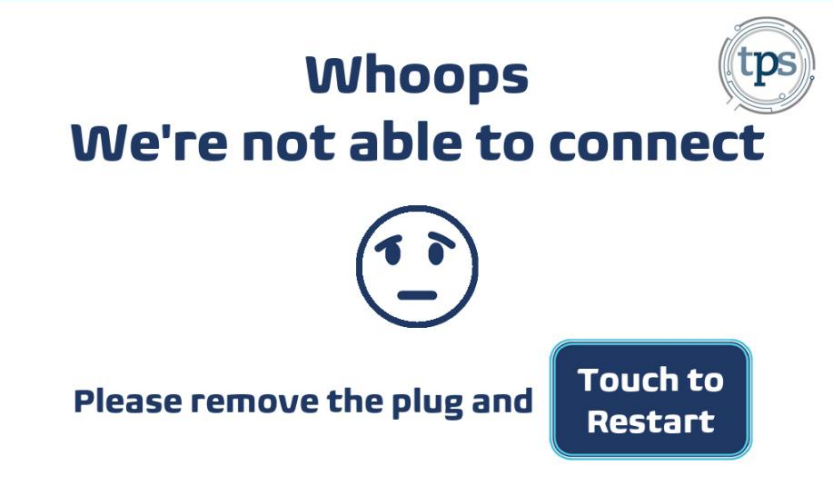
*Figure 18 *Note: the currency symbols shown are configurable.*











[One of the below 3 screens will show depending on the payment method]

Connected!

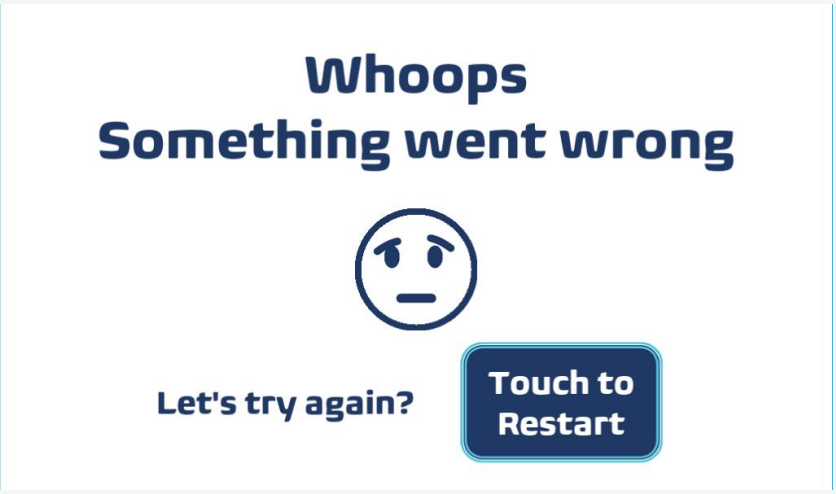
Please scan your credit card
or RFID to start

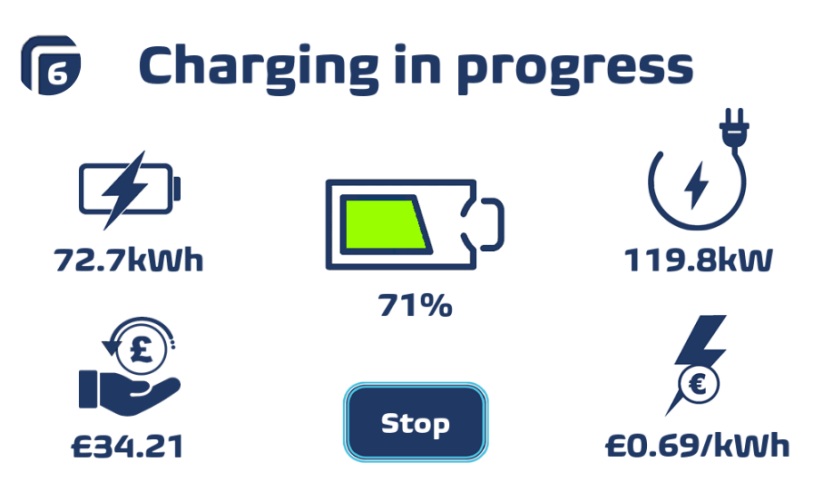
Connected!

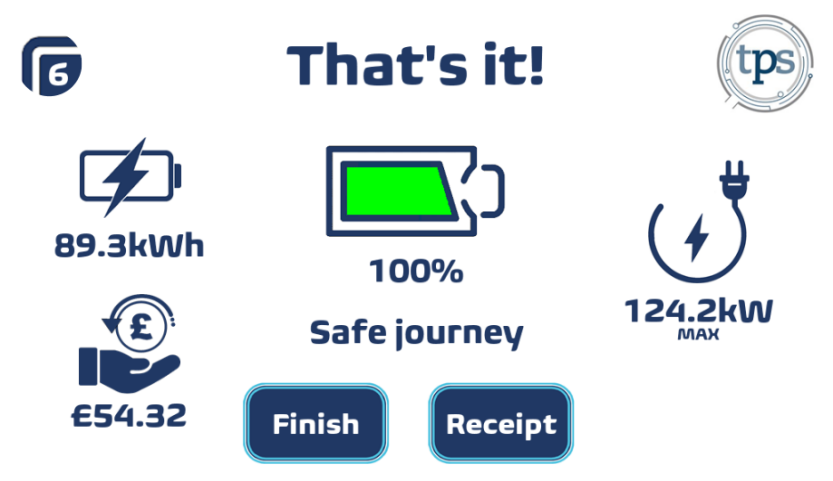
Please scan this code
and follow the instructions

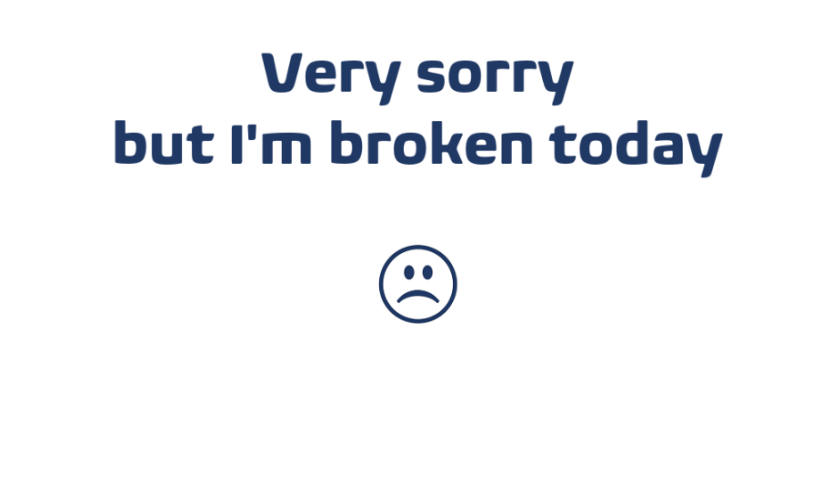
Setting up...

Stop









[Configurations are below]

*Figure 19*The screen might appear like the above if there is no cost shown.*

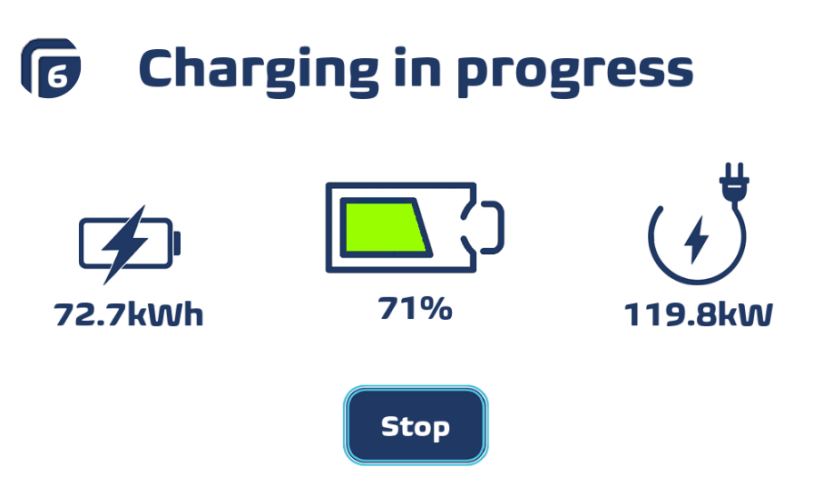


*Figure 20 *The screen might appear like the above if there is no cost shown.*

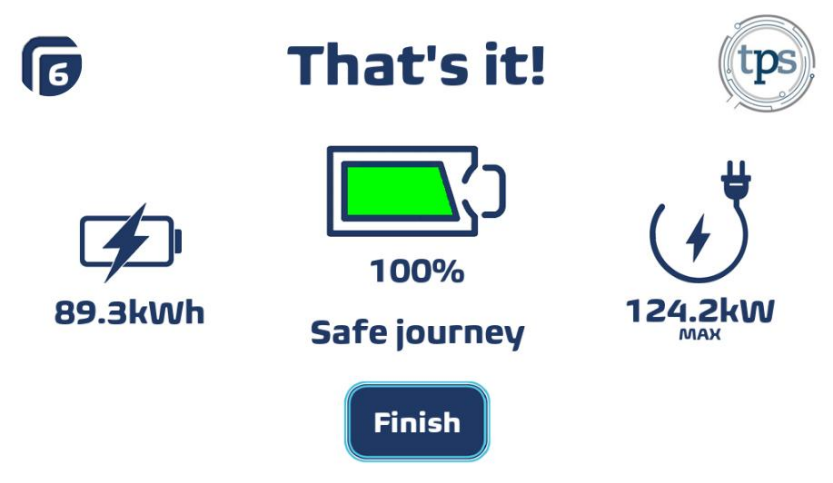


*Figure 21 *The screen might appear like the above if there is no cost shown.*

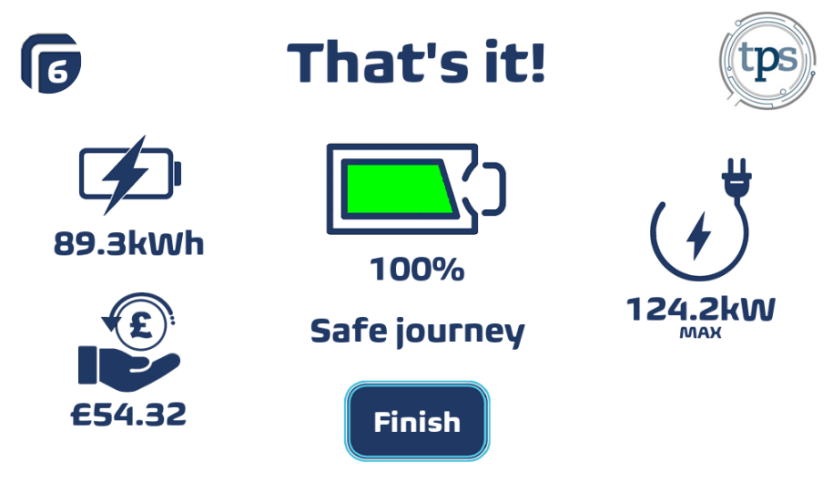


*Figure 22 *The screen might appear like the above if there is no receipt shown.*

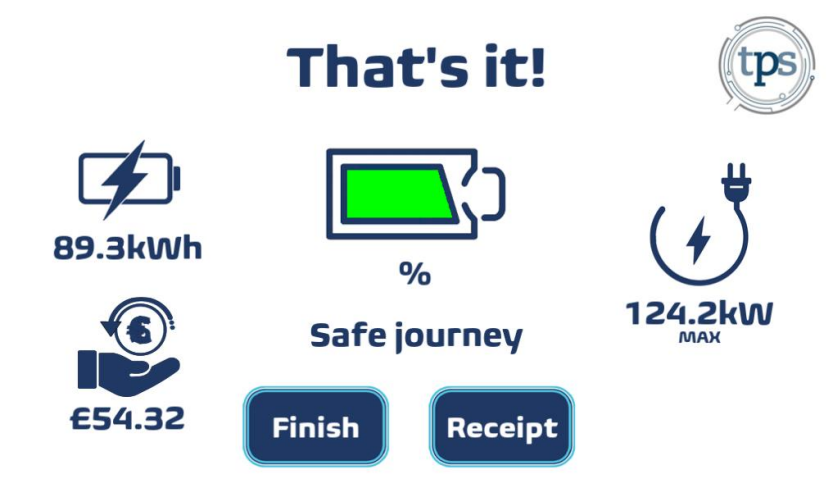
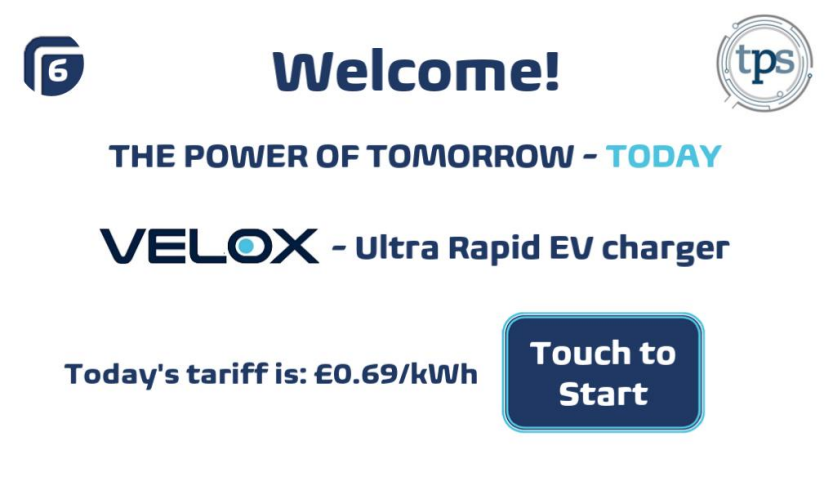
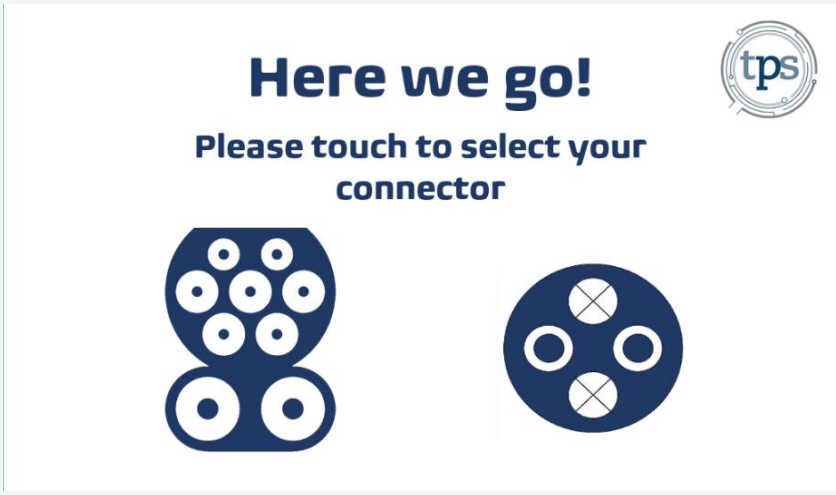
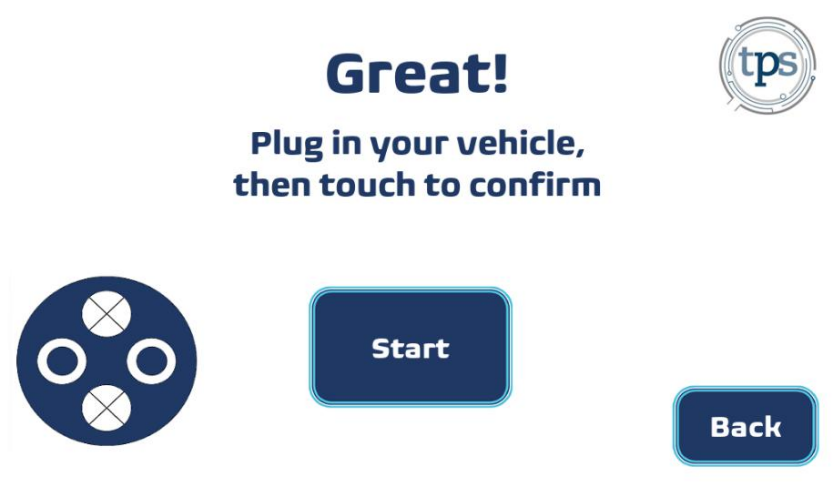


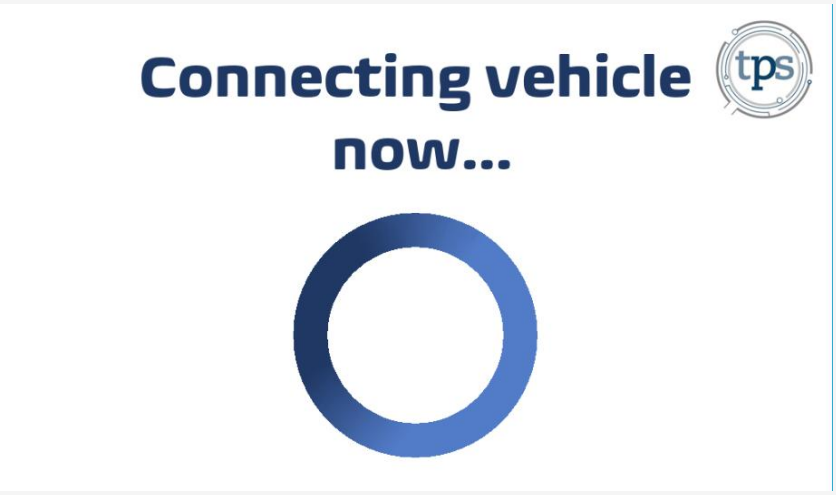
*Figure 23 *The screen might appear like the above if it is a single dispenser.*

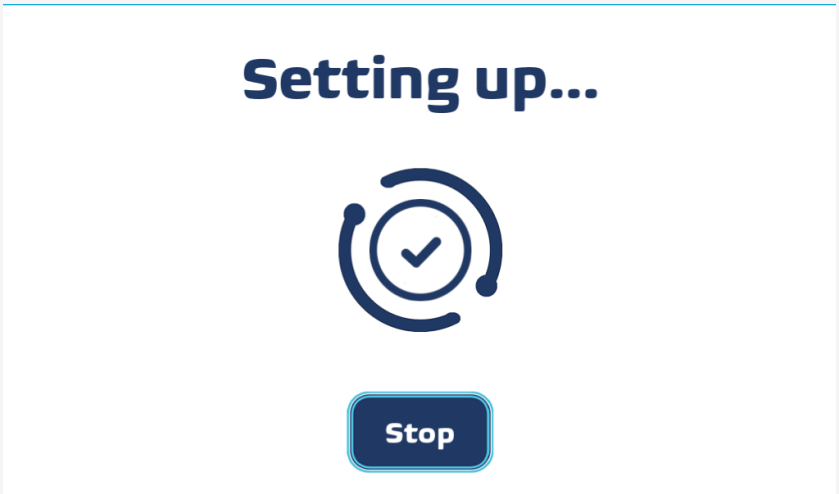
[Running order for successful charge]

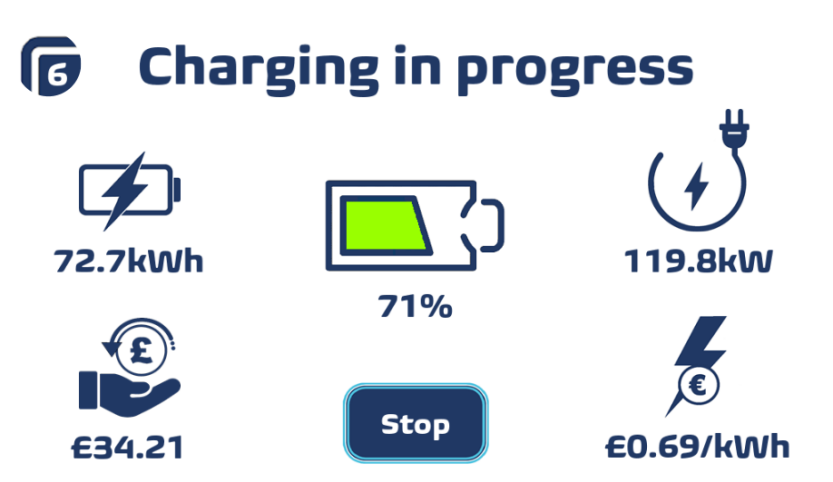


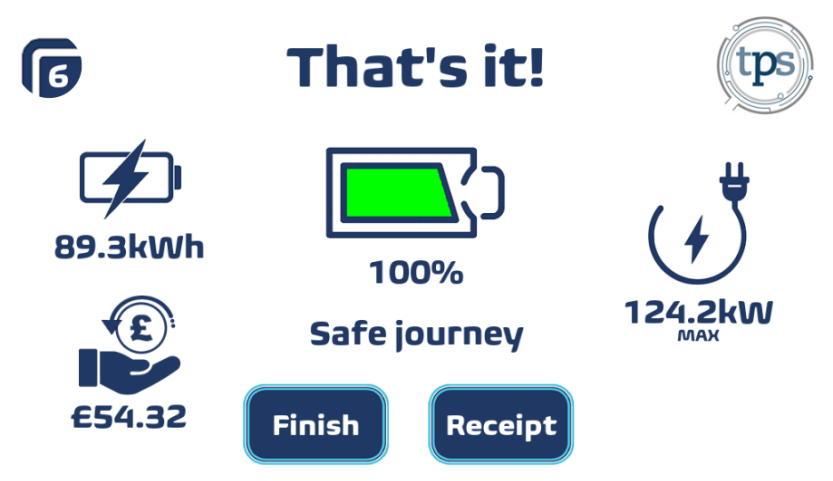




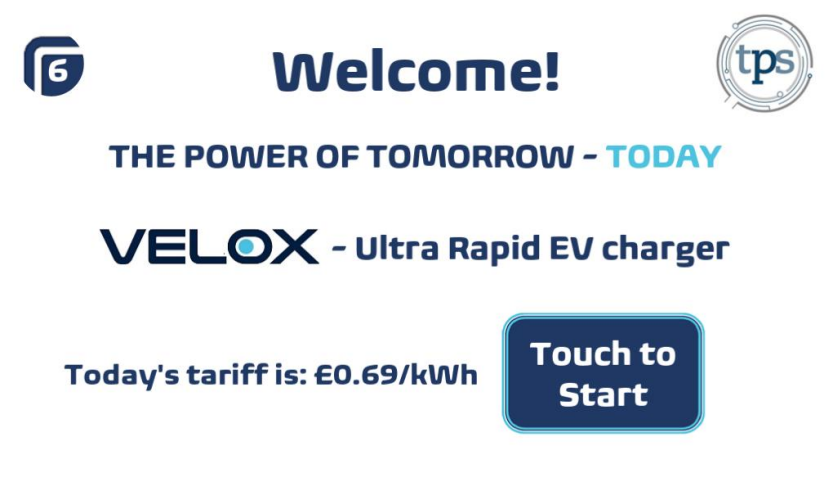


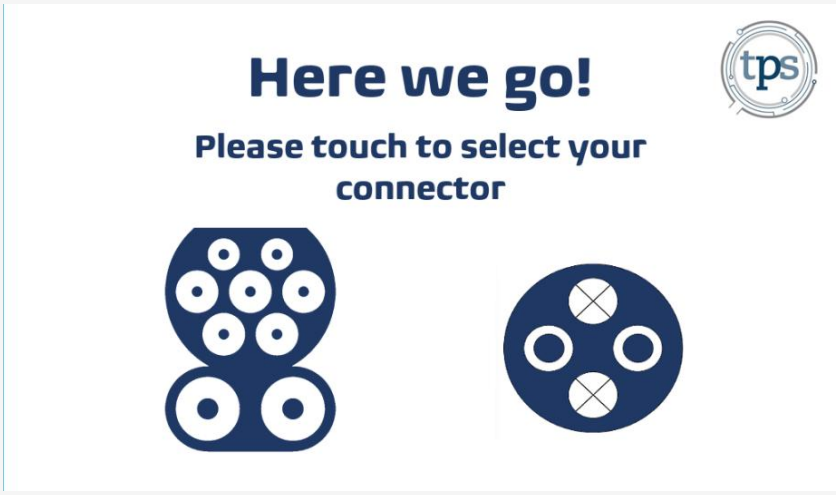


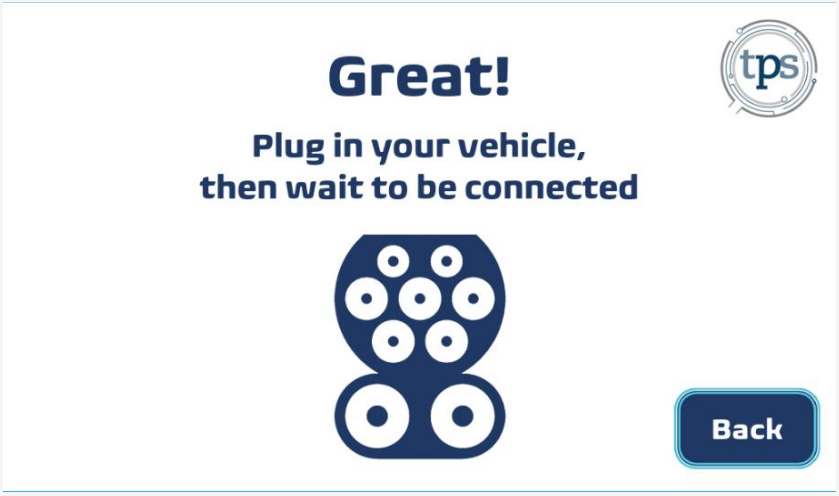


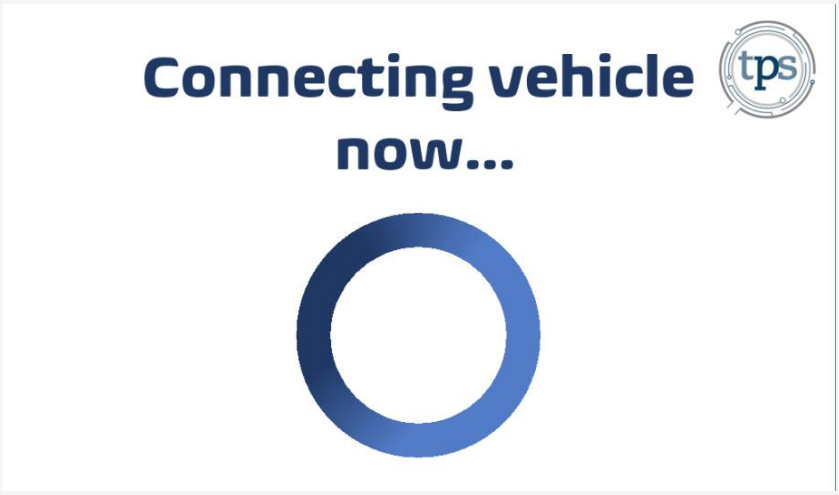


[Running order for unsuccessful charge]









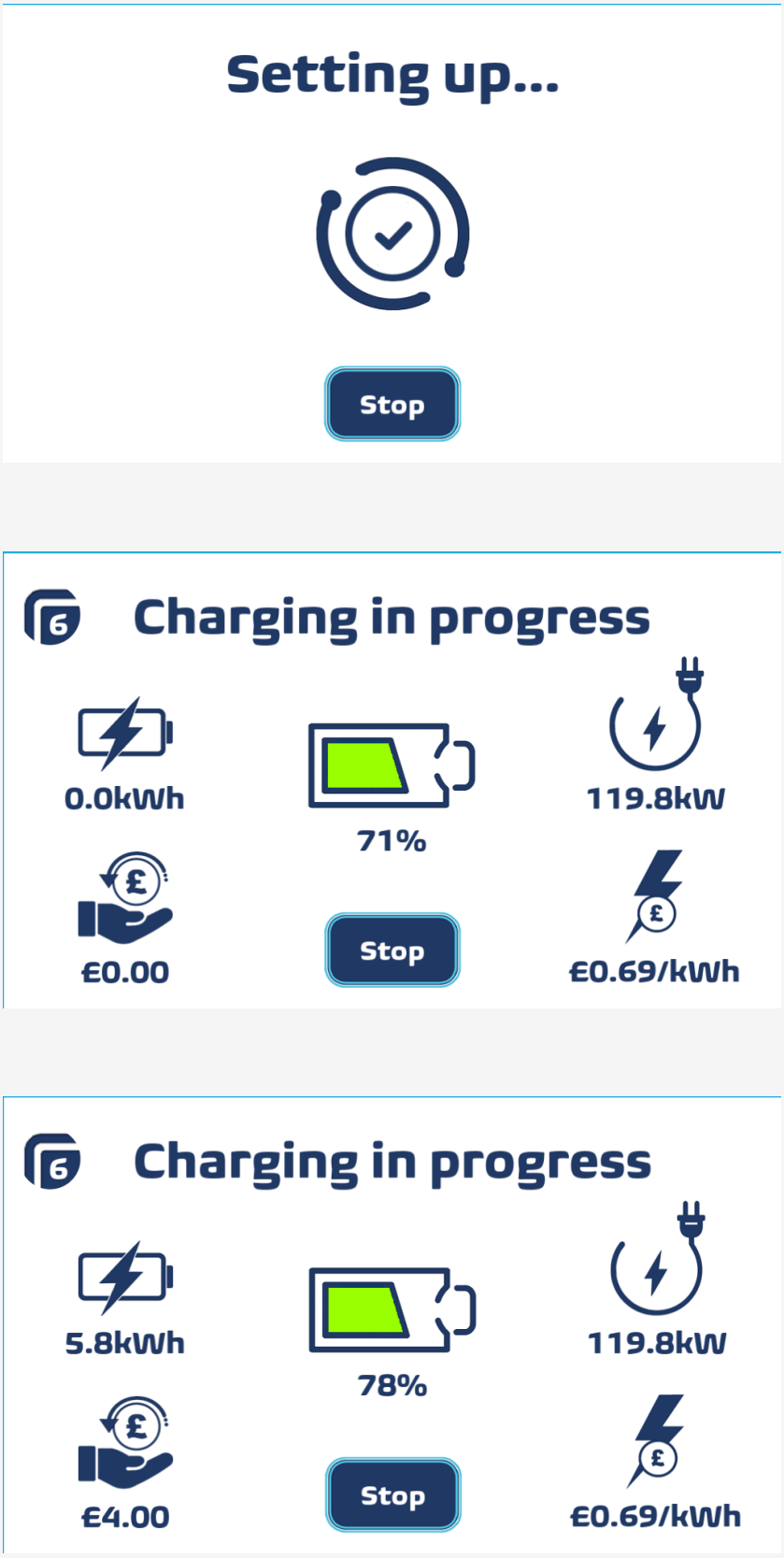
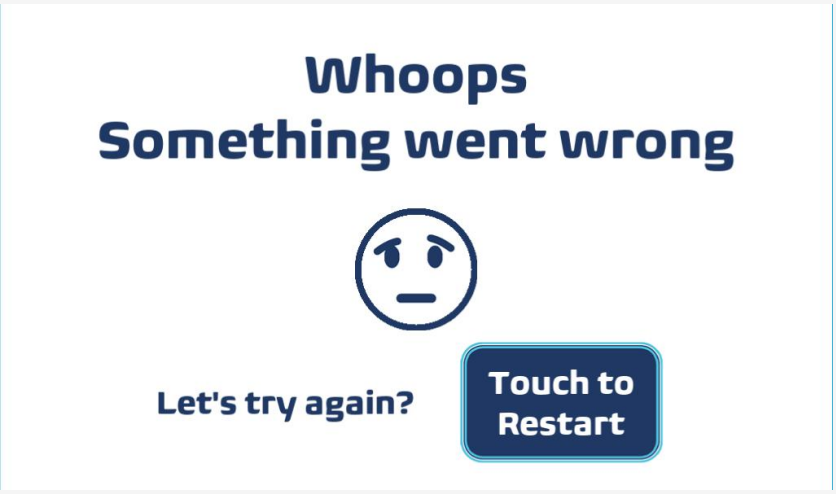
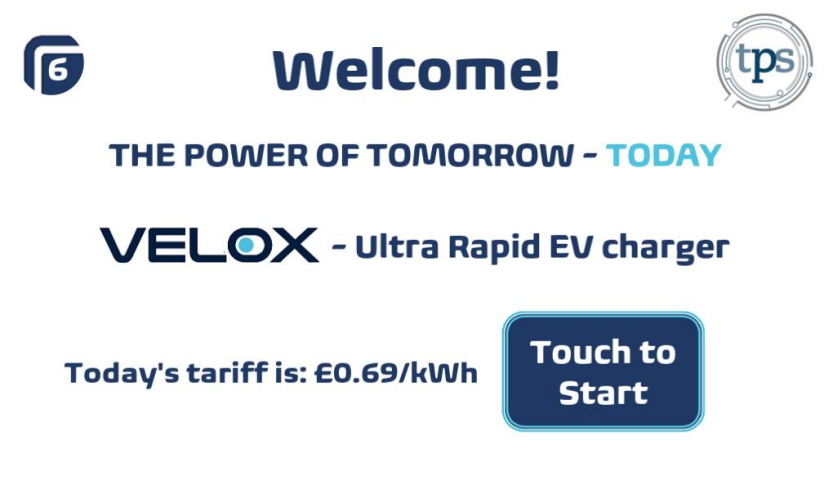
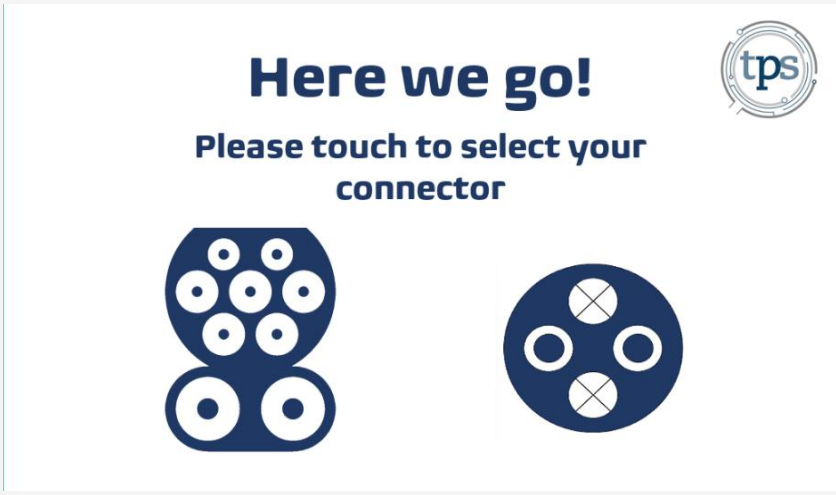


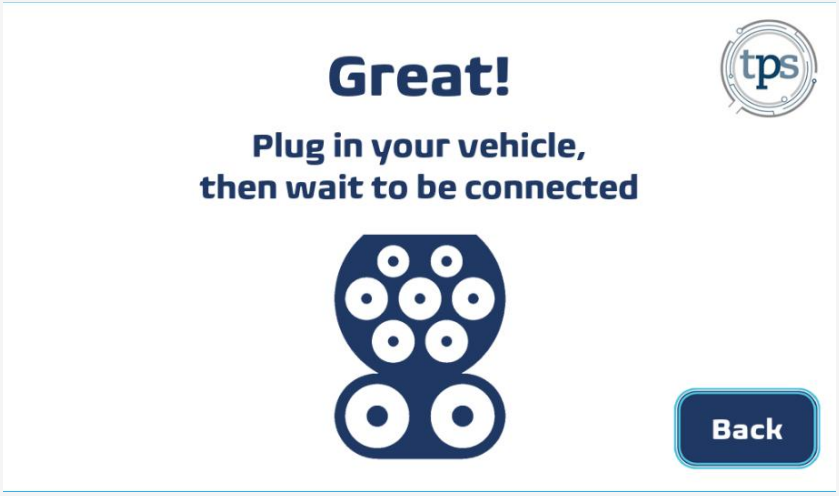
*Figure 24 *The screen might appear like the above if power is cut short during charge.*

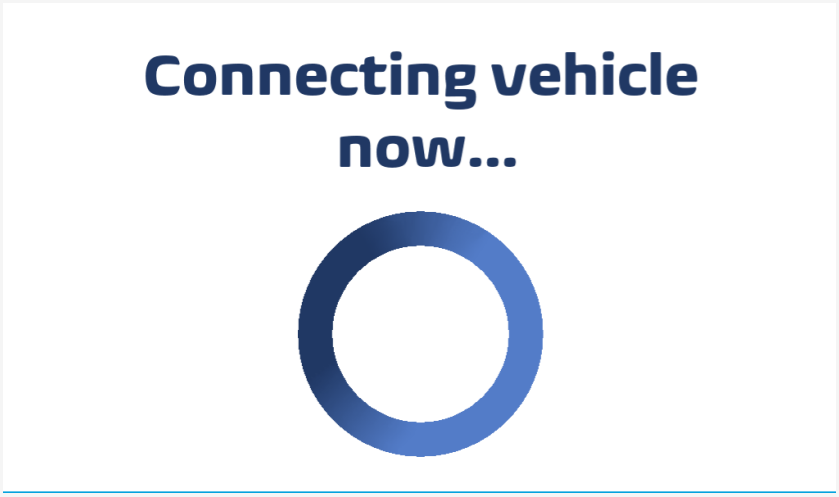


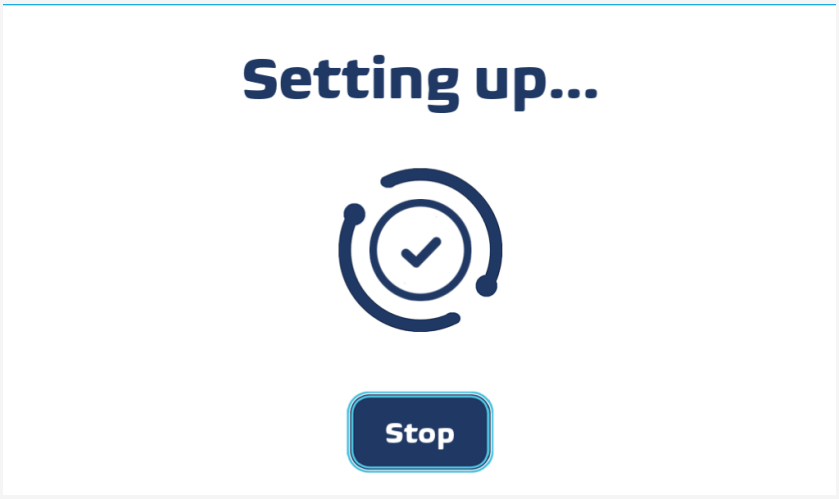
[Running order with fault]

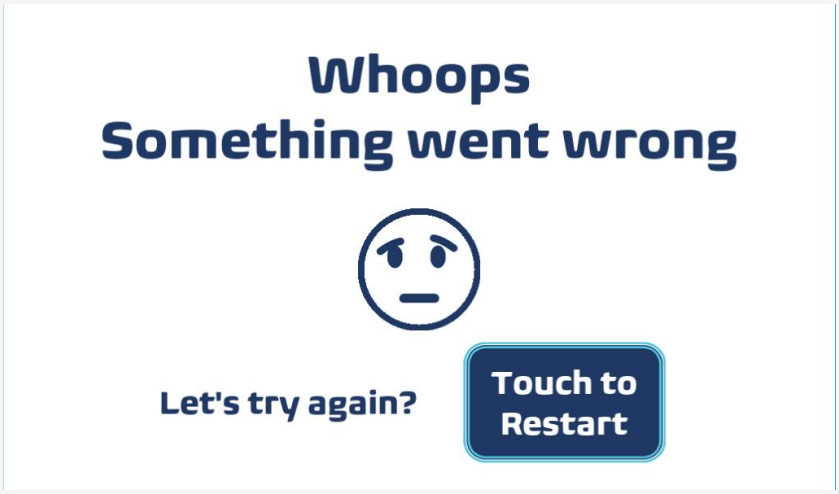












7. Preventative Maintenance and Inspection Information

PLEASE NOTE: the VELOX Dispenser contains no USER serviceable components. All repairs and maintenance can only be carried out by either TPS or an approved / trained representative. Please refer to customer contractual agreements for specific details.

However, there are a number of preventative maintenance and inspection activities which can be carried out by the USER.

TPS recommends that all preventative maintenance and inspection activities should be recorded with a date using the form provided in Appendix C – Maintenance & Inspection Record

The schedule of activities and frequency is shown below. Please use this for reference before completing the record form in Appendix C – Maintenance & Inspection Record.

Ref No.	Equipment Part No. / Description	Interval (Months)	Type of Inspection
7.1	Cables, Connectors & Holsters	1	Visual / replace if damaged
7.2	Cleaning the Exterior of the VELOX Dispenser	3	Visual and clean
7.2	Air Ducts (if fitted)	3	Visual / clean / replace as req'd
7.3	Access Door and Locks	6	Visual
7.4	LED	12	Visual
7.5	HMI	12	Visual and Test
7.6	Payment Device / RFID	12	Visual and Test
7.7	E Stop Button Safety Interlock System	12	Visual and Test

7.1. Cables, Connectors & Holsters

Locate the connector at the side of the VELOX Dispenser.
Check that the cable is still located correctly within the glands through which it enters the VELOX Dispenser frame.
Check the connector for any damage.
Check the cable for signs of damage and or wear.
Check the holster for damage and or wear.
If there are any visible defects, corrosion, or damage; this should be reported to the OWNER of the VELOX Dispenser.

Figure 25 - Location of E Stop Button and cover access latches

7.2. Cleaning the VELOX Dispenser

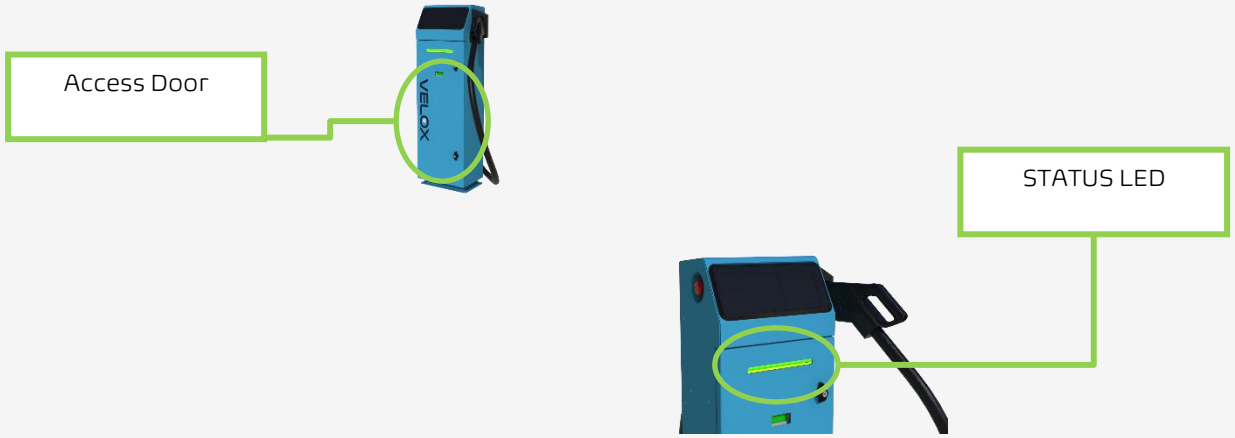
When cleaning the exterior, do not use high pressure water jets (pressure washer or steam cleaner) as there is a risk water can enter the interior and cause serious damage to internal components and / or potentially electrocution to persons.

1. Rinse with low pressure tap water to remove rough or loose dirt.
2. Apply a mild detergent-based cleaning solution if required and let it soak.
3. Manually remove dirt with a non-abrasive tool such as a sponge or brush.
4. Rinse with low pressure tap water.

If there are any visible defects, corrosion, or damage, this should be reported to the OWNER of the VELOX Dispenser.

7.3. Enclosure and Access Door

The Access Door is on the front of the VELOX Dispenser. It is held closed by 2 keyed, quarter turn latches. Make sure the locks and latches work, and that the door seal is not damaged. The door must be kept locked unless an authorised person is carrying out maintenance work.



7.4. STATUS LEDs

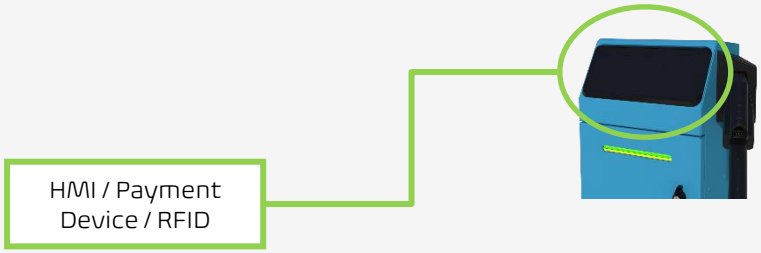
Locate LEDs. Make sure they are clean and damage free.

7.5. HMI

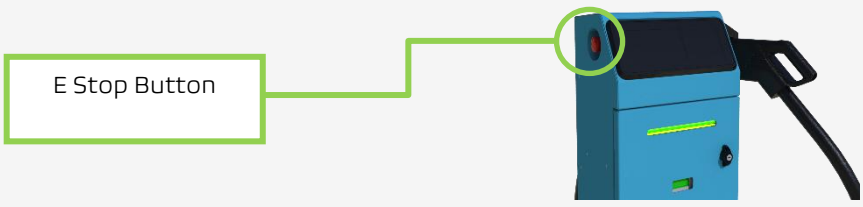
Locate HMI. Make sure it is clean and damage free.

7.6. Payment Device / RFID

Locate Payment Device / RFID (if fitted). Make sure it is clean and damage free.



7.7. E Stop Button



Locate the E Stop Button on the side of the VELOX Dispenser.

At least once every 12 months perform a full power down cycle of the VELOX Dispenser. This can only be implemented by the authorised Site Engineer as part of a planned maintenance procedure. (This procedure may have implications on the protection system of the MV supply).

Please observe the following when the VELOX Dispenser powers up:

- The LEDs will turn RED when the VELOX Dispenser power is first switched on.
- The LEDs will turn GREEN when the VELOX Dispenser is ready to operate.
- The LEDs will only turn BLUE when the VELOX Dispenser is connected to a vehicle and is operating.
- The HMI screen will be blank when the VELOX Dispenser power is first switched on.
- The HMI screen will display once the VELOX Dispenser is ready to operate and the vehicle controller is ready.
- The payment device(s), if fitted, can take up to 10 mins to reset from power on.

8. Trouble shooting

The table below shows a list of faults that may arise and actions that will help with troubleshooting. If they do not, please contact TPS for support. Refer to section 1.1 for details of how to do this.

8.1. Fault and Actions

Only an Authorised Person or Site Engineer can perform a power cycle reset. If any of the faults below are detected, please ensure that you contact the Authorised Person for the site before taking any further action

Ref. #	Fault	Action
1	RED Fault LED	Attempt software reset if possible (via OCPP)
2	RED Fault LED	Hard reset – Full Power Cycle (Allow 2 mins to fully reboot)
3	RED Fault LED	If issue cannot be resolved by 1 & 2, contact TPS- see section 1.1 for details
4	HMI screen is black and does not light up	Recycle input power supply, contact back office
5	Unable to lock the charging connector	Connect Dispenser charging cable to EV correctly
6	Unable to lock the charging connector	You are not authorised to use the Dispenser, contact the back-office operator
7	Unable to unlock the charging connector	Wait for 5 mins, then restart charge session
8	Issue with EV	Report to back office and follow guidance
9	HMI displays 'out of order / sorry I'm broken today'	Report to back office and follow guidance

9. End of Life Disposal of the VELOX Dispenser or Component Parts

Incorrect waste handling has a negative impact on the environment and human health due to risk of exposure to hazardous substances. By following appropriate guidelines when dealing with disposal of the VELOX Dispenser or its components you will contribute to reuse and recycling of materials and protection of the environment.

- Obey the local laws and rules when you discard parts, packaging material or the VELOX Dispenser in its entirety.
- Discard electrical and electronic equipment separately in compliance with the WEEE - 2012/19/EU Directive on waste of electrical and electronic equipment.
- As the symbol of the crossed-out wheeled bin on your VELOX Dispenser indicates, do not mix or dispose of it with your household or commercial waste, at the end of use. Instead, hand the VELOX Dispenser over to your local community waste collection point for recycling.

For more information, contact the Government Waste-Disposal department in your country.

10. Document History

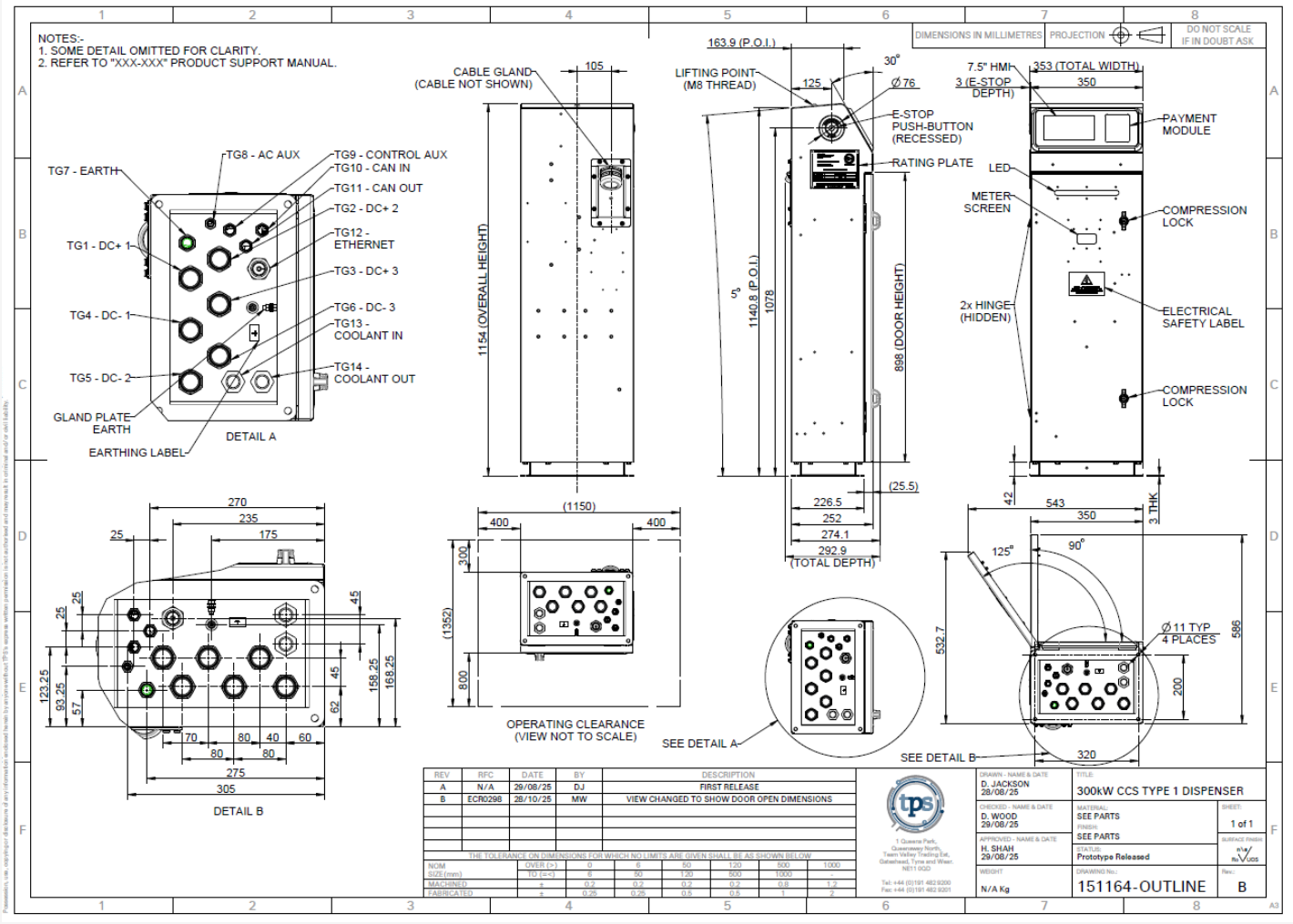
Revision Number	Revision Date	Summary of Changes	Changed By
1	1 Dec 2025	First issue of new document	A Lister
2	March 2026	Formatting correction, additional connections detailed	A Lister

11. All Appendices and associated document latest versions can be found here:

[Customer Area - Manual VELOX *m* EV Charging Dispenser - Turbo Power Systems]

12. Appendix A – VELOX *m* Ultra-Rapid Dispenser – Outline Drawing

Indicative information only. Dimensions may be subject to change. Latest revision can be found in the Customer area.



13. Appendix B – Installation Checklist Document

Latest revision can be found in the Customer area.

Checklist items	Completed?
Do you have all necessary tools as set out in section 4.1?	
Have you unpacked the VELOX Dispenser as set out in section 4.4?	
Have you lifted the VELOX Dispenser in location as set out in section 4.5?	
Have you mechanically installed the VELOX Dispenser as set out in section 4.3?	
Have you electrically installed the VELOX Dispenser as set out in section 0?	

Completed By	Date

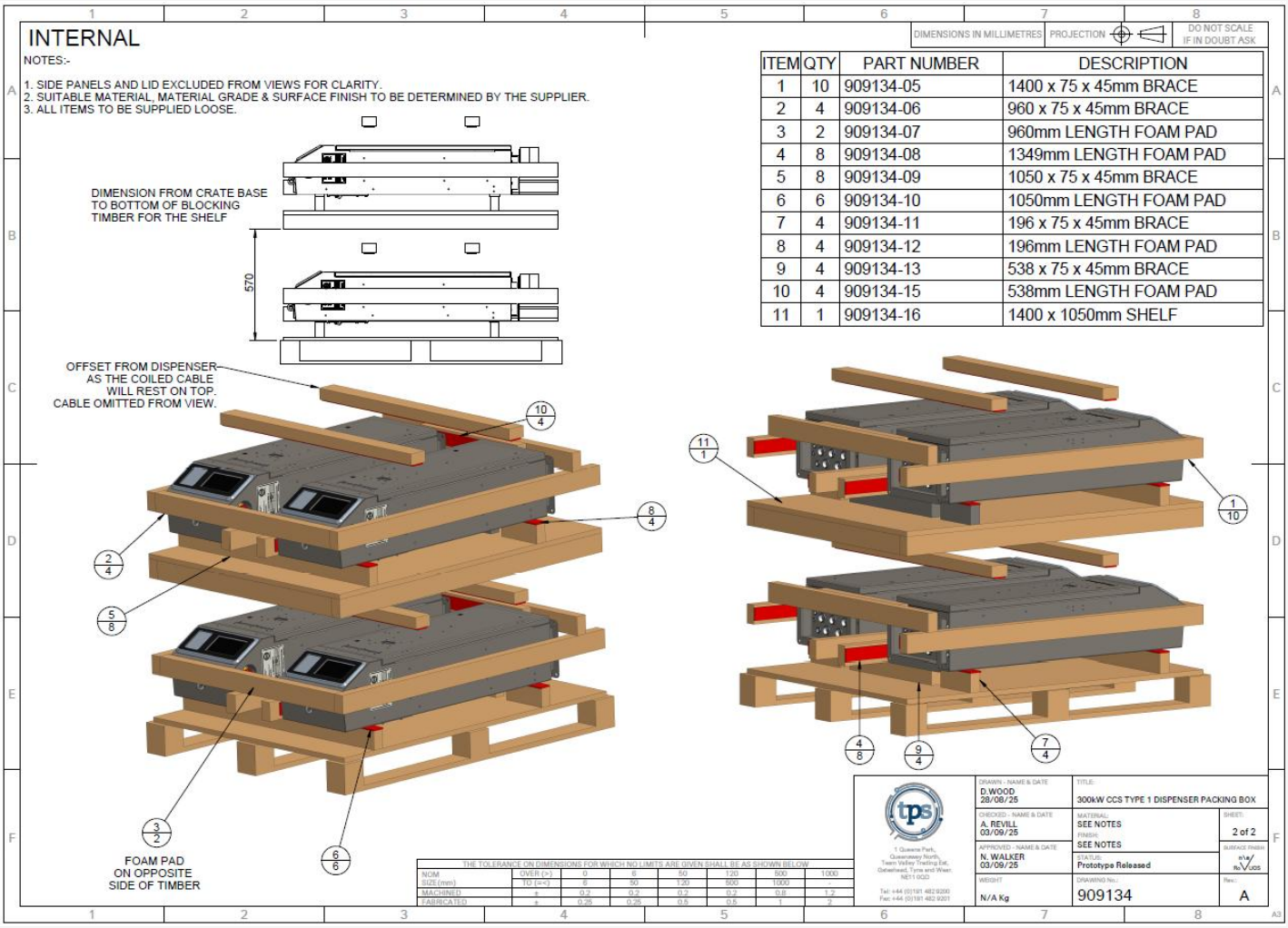
14. Appendix C – Maintenance & Inspection Record

Latest revision can be found in the Customer area.

Ref. #	Inspection Details List - Description	Inspection Requirement	Completed By	Date
7.1	Cables, Connectors & Holsters	All operating correctly		
7.2	Cleaning the Exterior of the Dispenser	Clean and Functional		
7.2	Air Ducts (if fitted)	Not blocked		
7.3	Enclosure and Hatches	All operating correctly		
7.4	LEDs	All operating correctly		
7.5	HMI	All operating correctly		
7.6	Payment Device / RFID	All operating correctly		
7.7	Emergency protection Switches	All operating correctly		

15. Appendix D – Packing

Latest revision can be found in the Customer area.



Multiple packing option shown above.

Single packing option will be as shown below.

Remove the screws circled in RED to open the crate and remove the bracing pieces. Carefully open the foil bag.

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