

Mounting flush with non-ferrous metals

If the WPP plastic surface is flush with a ferrous metal plate, then at least 100mm clearance from the edge of the WPP is necessary.

Failure to adhere to this installation requirement may result in reduced performance issues and/or damage to the system.

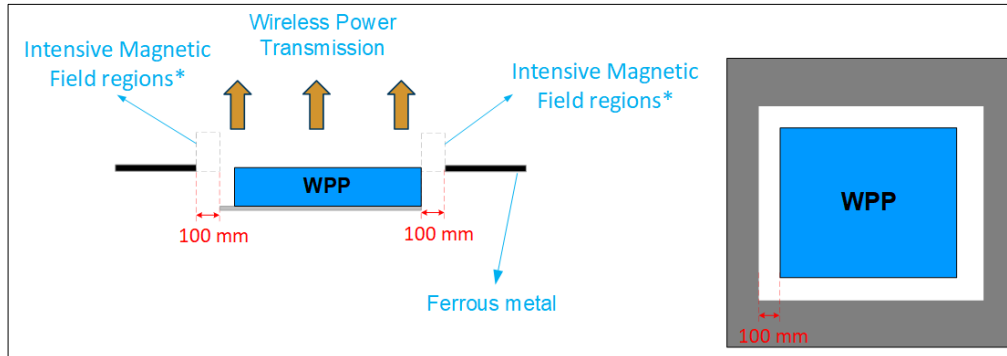


Figure 34 WPP – Mounting flush with ferrous metals

* In addition to directly in front of the WPP.

Mounting flush with non-ferrous metals

If the WPP plastic surface is flush with a non-ferrous metal plate, then a 100 mm (3.94 in) clearance from the edge of the WPP is necessary.

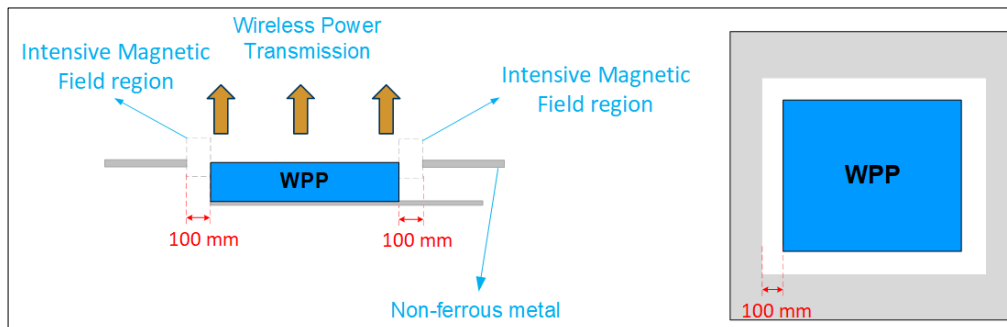


Figure 35 WPP – Mounting flush with non-ferrous metals

Material and tools needed for mounting the WPP

- No special tools are required while installing WPP.

9.2.3 WSU

General recommendations

- As the WSU is mounted to the vehicle, the vehicle integrator is responsible for the following:
 - Ensuring compliance with the safety distances on the vehicle for the electromagnetic fields generated by the WSU and the WPP.
 - Correct mechanical and electrical installation of the WSU on the vehicle.
 - Providing the facility integrator with the necessary safety and installation instructions for the WPP, so that the WCS works safely and properly.
- Consider the weight of the WSU when choosing the mounting material for mounting the WSU to the vehicle.

Mounting on non-ferrous metals

The WSU can be mounted directly on non-ferrous (e.g. Aluminum) metals.

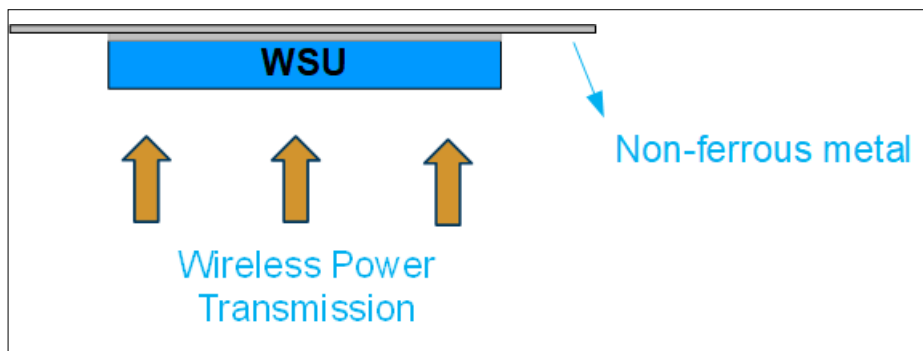


Figure 36 WSU – Mounting on non-ferrous metals

Mounting on ferrous metals

If the WSU is to be mounted on ferrous metal (e.g. Steel), then a non-ferrous plate must be installed between the WSU and ferrous metal. The non-ferrous plate must overlap by at least 80 mm (3.15 in) in all directions.

Failure to adhere to this installation requirement may result in reduced performance issues and/or damage to the system.

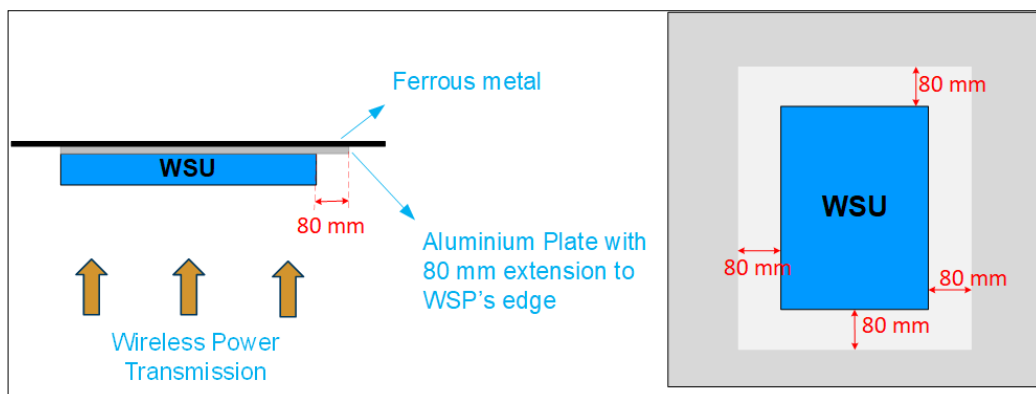


Figure 37 WSU – Mounting on ferrous metals

Mounting flush with non-ferrous metals

If the WSU plastic surface is flush with a non-ferrous metal plate, then a 100 mm (3.94 in) clearance from the edge of the WSU is necessary.

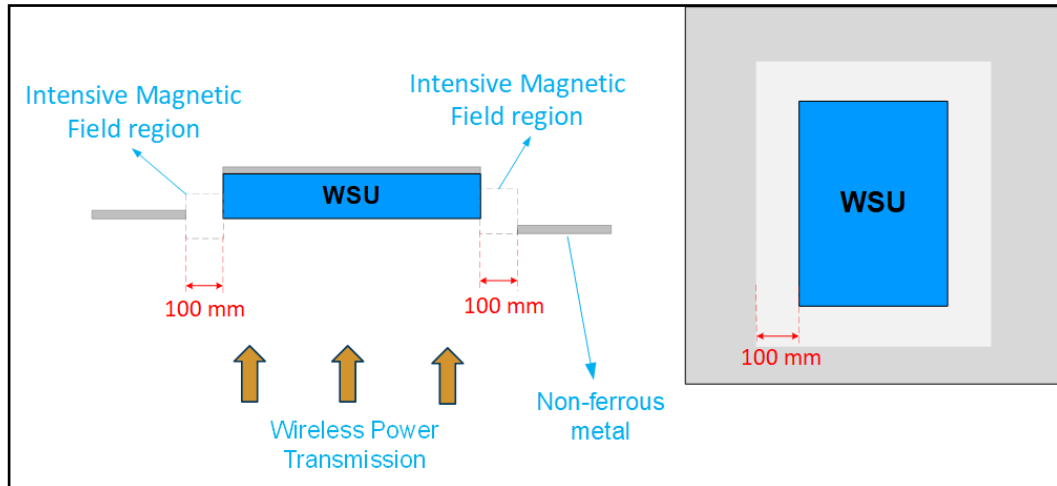


Figure 38 WSU – Mounting flush with non-ferrous metals

Mounting flush with ferrous metals

If the WSU plastic surface is flush with a ferrous metal plate, then a clearance of at least 100 mm (3.94 in) from the edge of the WSU is necessary.

Failure to adhere to this installation requirement may result in reduced performance issues and/or damage to the system.

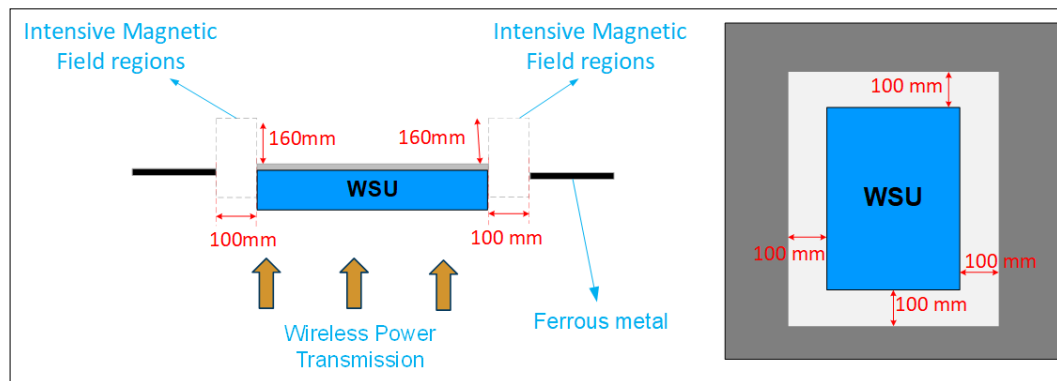


Figure 39 WSU – Mounting flush with ferrous metals

9.3 Safety

9.3.1 Introduction

DANGER:



- Always consider the national and local safety regulations regarding the installation and use of wireless charging systems in industrial environments.

During operation, WPP and WSU generate two types of electromagnetic fields (EMF):

- The first electromagnetic field (EMF) is generated by wireless communication between the WPP and WSU. The communication EMF on the WPP is always present because the WPP constantly searches for a nearby WSU. The WSU only generates a communication EMF when the WPP and WSU communicate with each other.
- The second EMF is generated during the charging process when power is transmitted from the WPP to the WSU. This EMF is significantly stronger than the EMF generated by the wireless communication.

When not charging (no power transmission), during communication, any person has to be at least 200 mm (7.87 in) away from both pads (WSU and WPP) in all directions from the magnetic center.

Medical Implant

Use of the WCS may affect or impair the operation of any medical devices, such as an implantable cardiac pacemaker. Check with your medical device manufacturer concerning the effects that wireless charging may have on such devices before using the WCS.

General note

Due to the EMFs, keep-out areas have to be set up. These keep-out areas hinder people to get too close to the center of the EMF.

The safety distances provided in section [9.3.2 “USA/FCC: Safety keep-out areas and safety markings for charging zone”](#) on page 74 apply when the WPP and WSU are surrounded by air on all sides.

If metal (e.g. from the vehicle) is in the keep-out areas during charging, the magnetic field will be deformed. In this case, perform a magnetic field measurement after the WSU is installed into the vehicle. Adjust the safety distances if necessary and update the user instructions regarding the keep-out areas for your application. **Note:** It is likely that the measurement result allows shorter distances.

9.3.2 USA/FCC: Safety keep-out areas and safety markings for charging zone

9.3.2.1 Introduction

NOTE: The safety information in this section applies only to the United States.

NOTE to the Facility Integrator: When planning the installation and operation of the WPP, always consider the latest safety regulations regarding wireless charging of IEVs in an industrial environment. The information in this section is based on the regulations as of January 22, 2026.

Technological and regulatory background

This WCS has a maximum power output of 10 kW, which generates a fringing electromagnetic field (EMF) that extends beyond 20 cm from its magnetic center.

Therefore, the FCC requires a technical barrier (physical or electronical) as defined in FCC document “951290 - Equipment Compliance Review (ECR) KDB Inquiries” to prevent people from accessing the keep-out area while charging is in progress. This prevents any person from being exposed to the fringing electromagnetic field.

The facility integrator is responsible for designing and implementing a suitable technical barrier based on the actual implementation concept.

Safety recommendations

WPP and WSU can be mounted in different orientations, resulting in different keep-out areas. The following section shows the keep-out safety distances and recommended safety markings for each orientation. Those keep-out areas must be protected as defined by FCC.

It is also recommended to use administrative tools, such as limited access or visual/audible warnings, to increase safety.

Provide safety instructions to all persons who may come near the WCS regarding the correct behavior **during the charging process**.

9.3.2.2 WPP mounted with the cables on the left

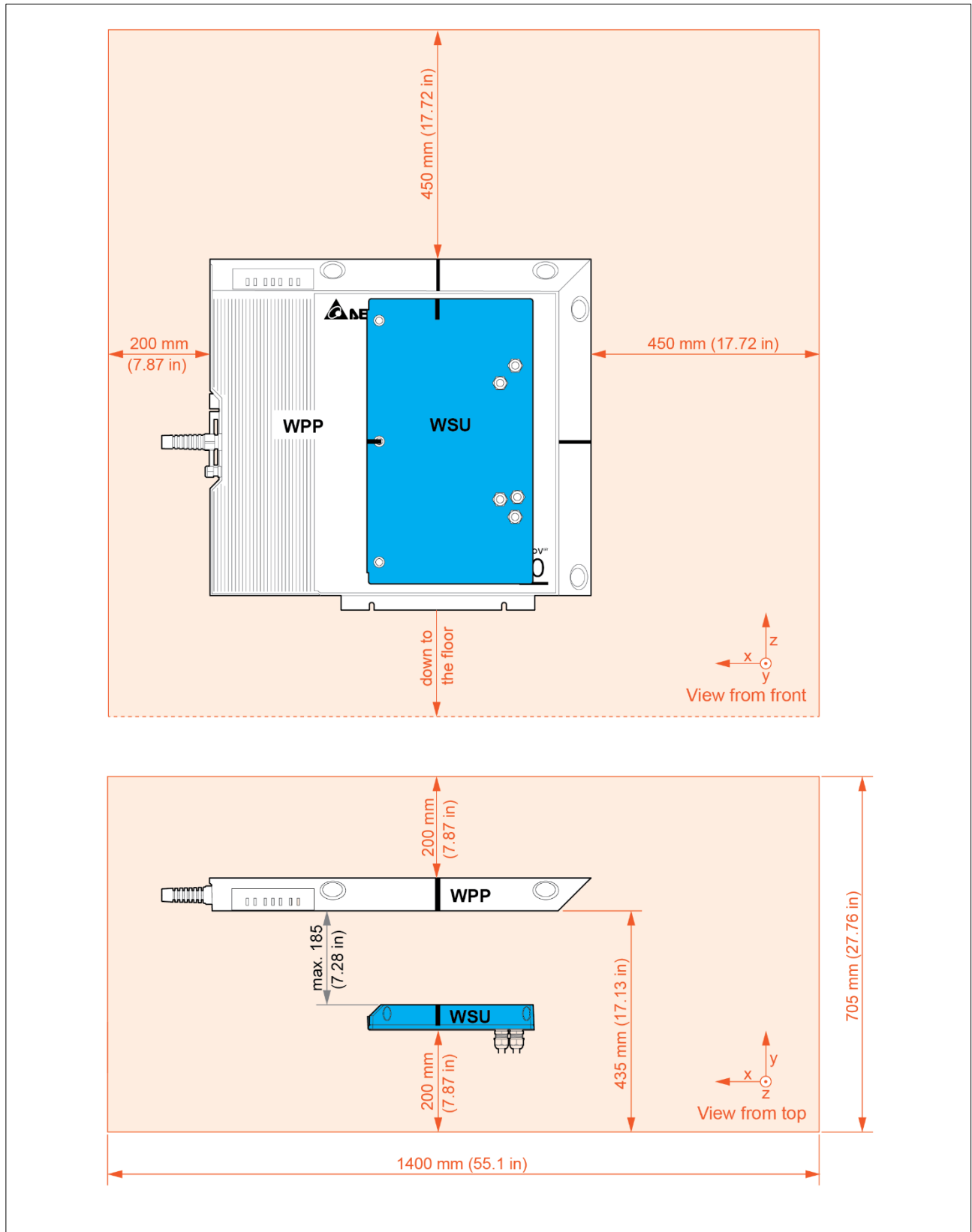


Figure 40 EMF keep-out area, Mounting variant 1: WPP cables on the left

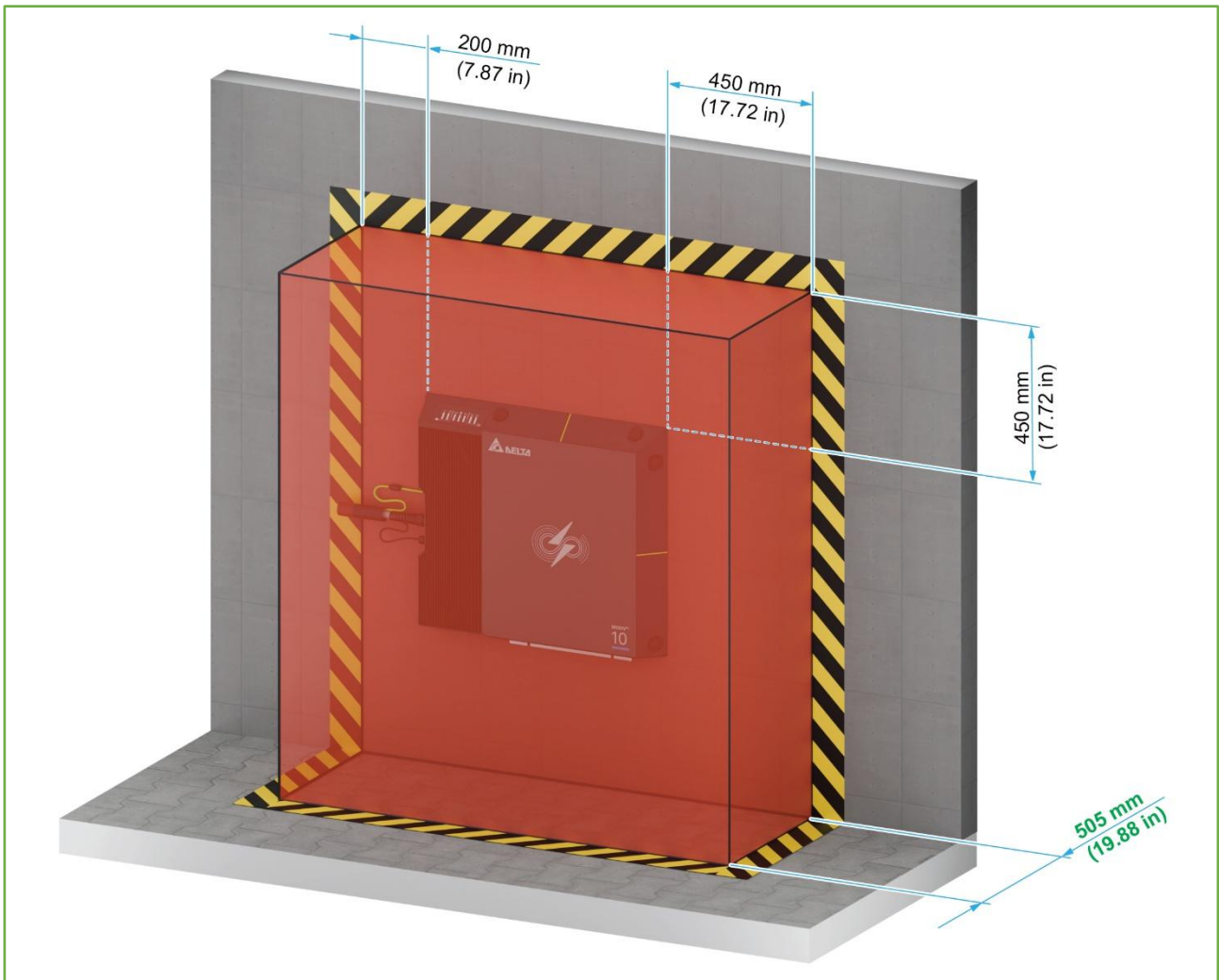


Figure 41 Example for safety markings; WPP mounted to a wall, cable on the left

The red cube is the keep-out area that has to be protected with a technical barrier.

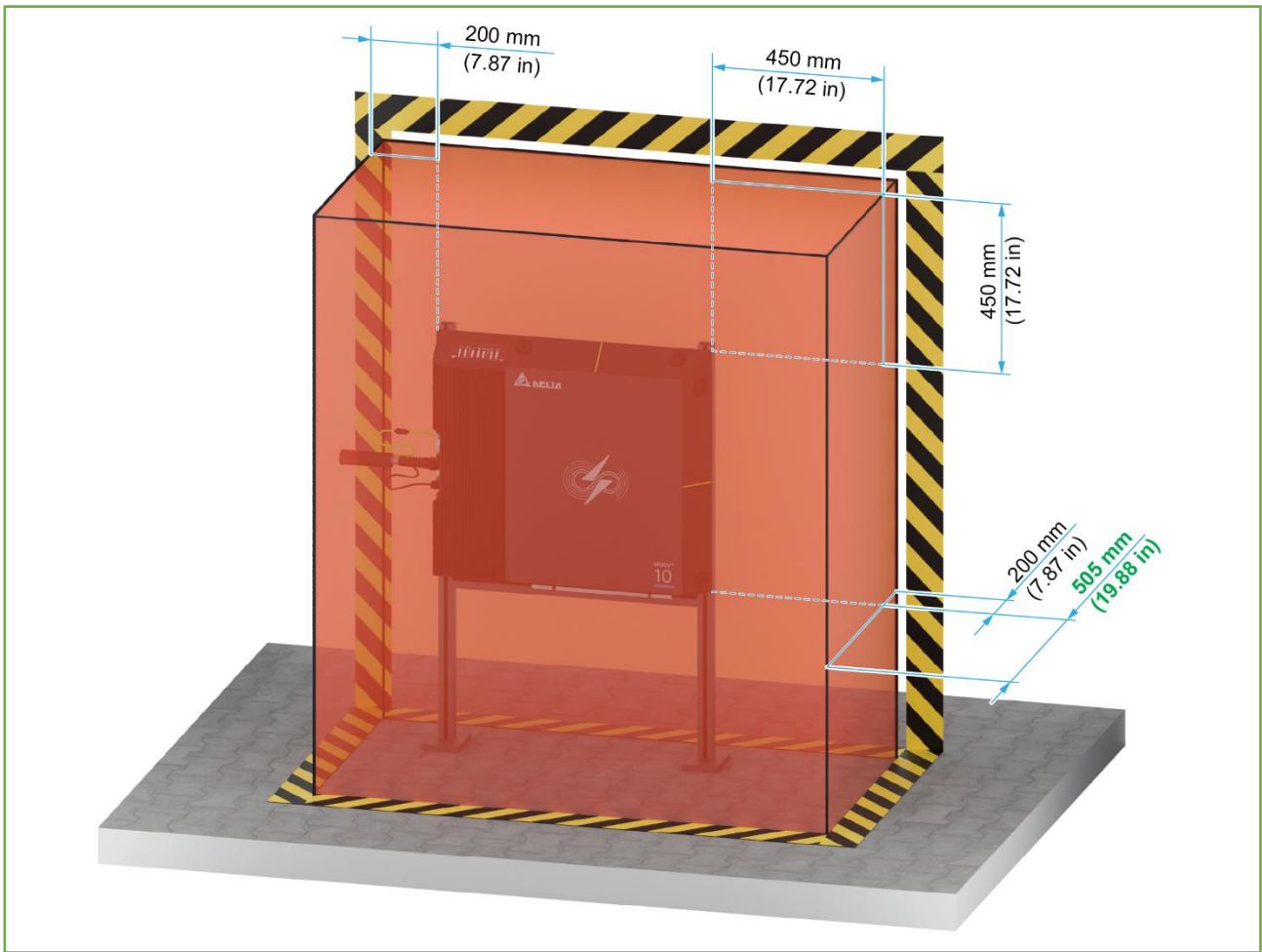


Figure 42 Example for safety markings; WPP mounted to a post, cable on the left

The red cube is the keep-out area that has to be protected with a technical barrier.

9.3.2.1 WPP mounted with the cables on the top

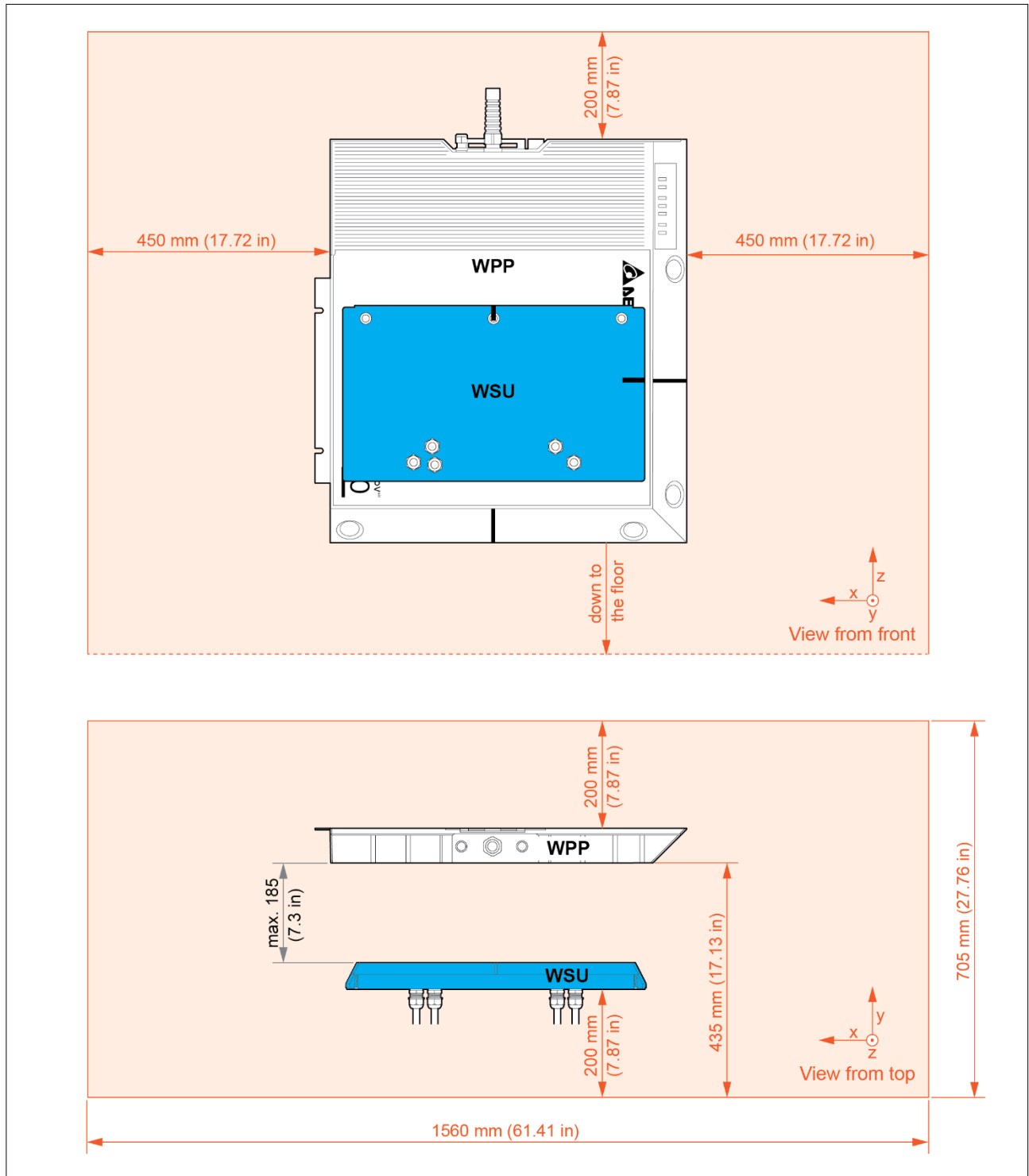


Figure 43 EMF keep-out area, Variant 2: WPP cables on the top

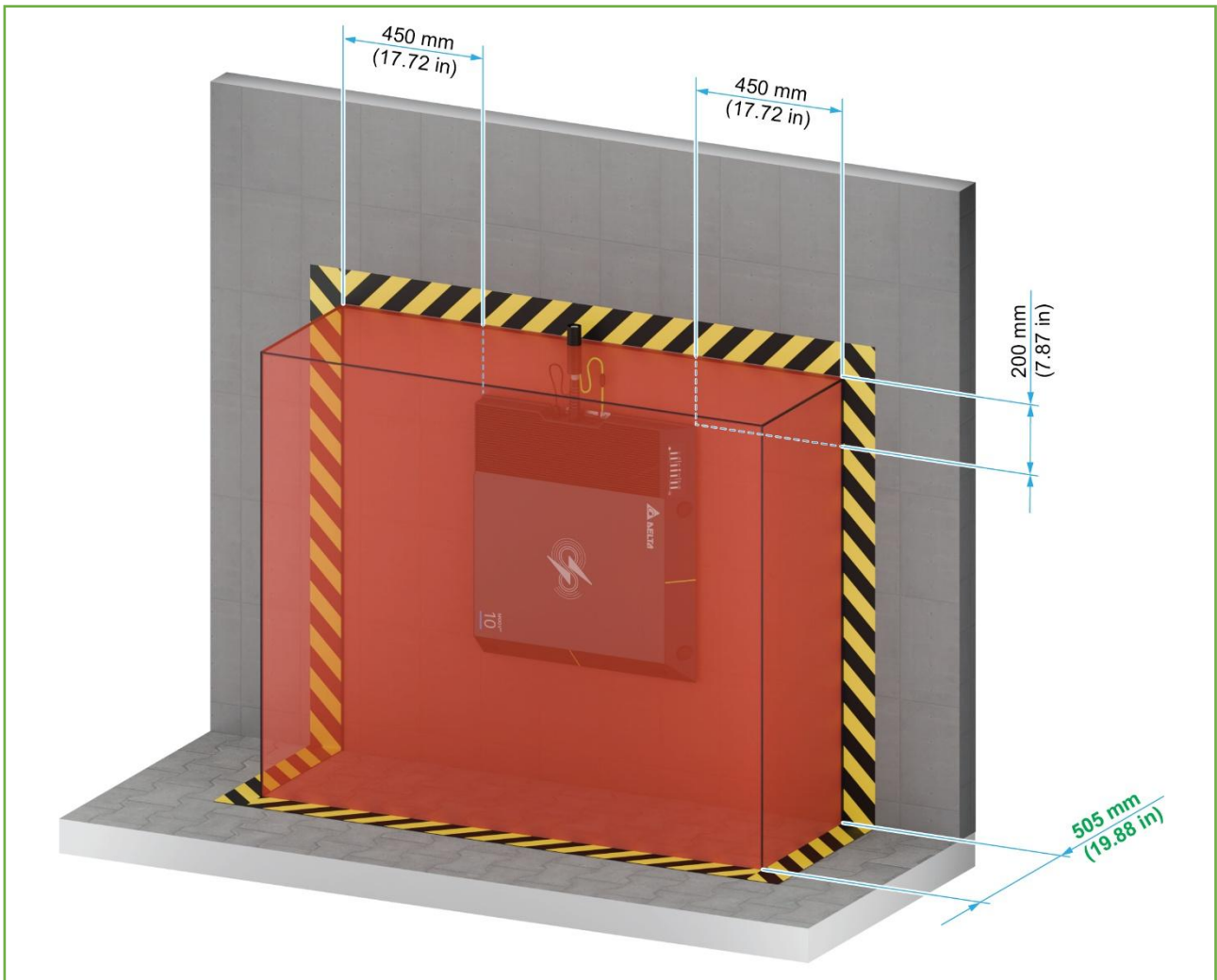


Figure 44 Example for safety markings; WPP mounted to a wall, cables on the top

The red cube is the keep-out area that has to be protected with a technical barrier.

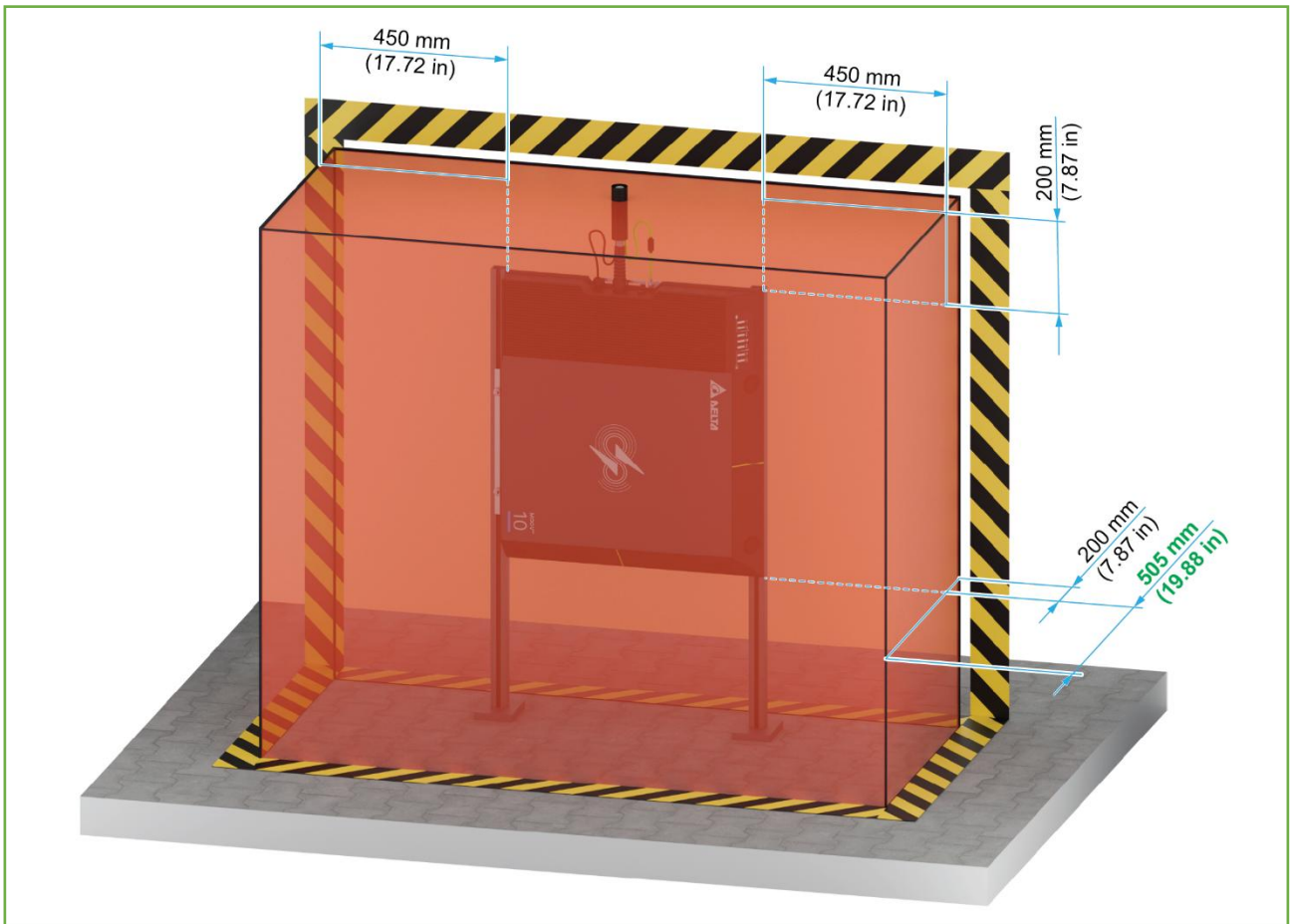


Figure 45 Example for safety markings; WPP mounted to a post, cable on the top

The red cube is the keep-out area that has to be protected with a technical barrier.

9.3.2.2 WPP mounted with the cables at the bottom

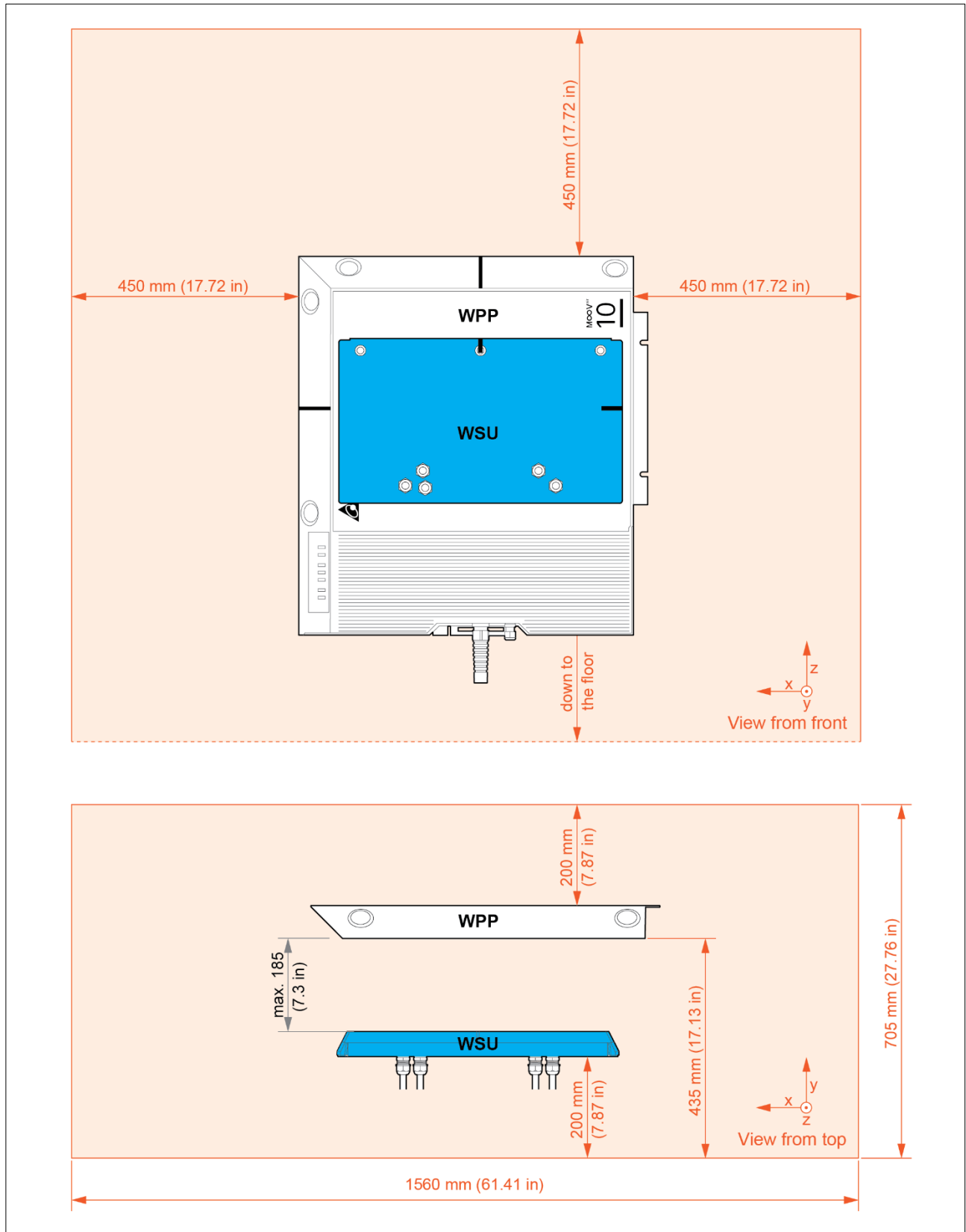


Figure 46 EMF keep-out area, Variant 3: WPP cables at the bottom

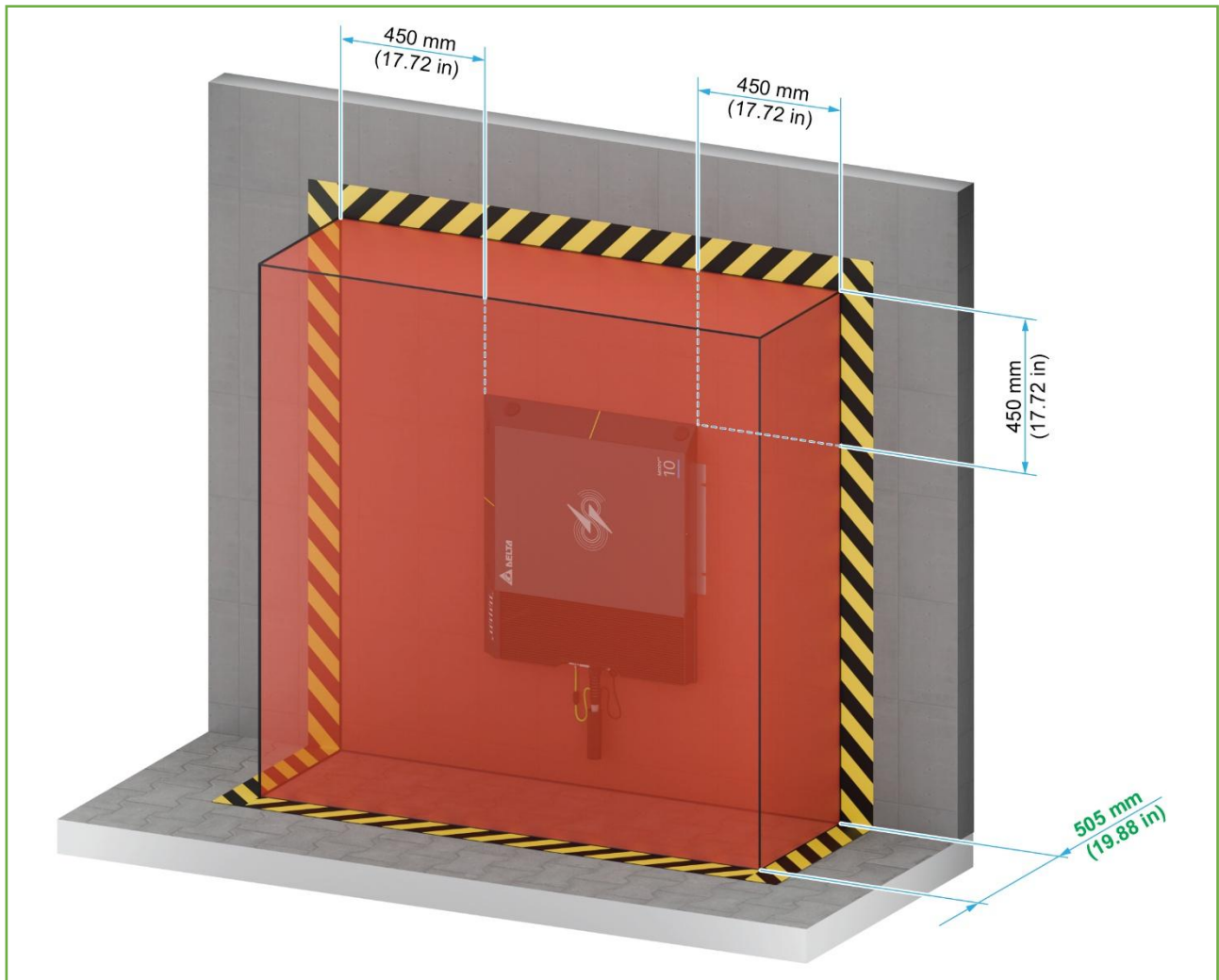


Figure 47 Example for safety markings; WPP mounted to a wall, cables at the bottom

The red cube is the keep-out area that has to be protected with a technical barrier.

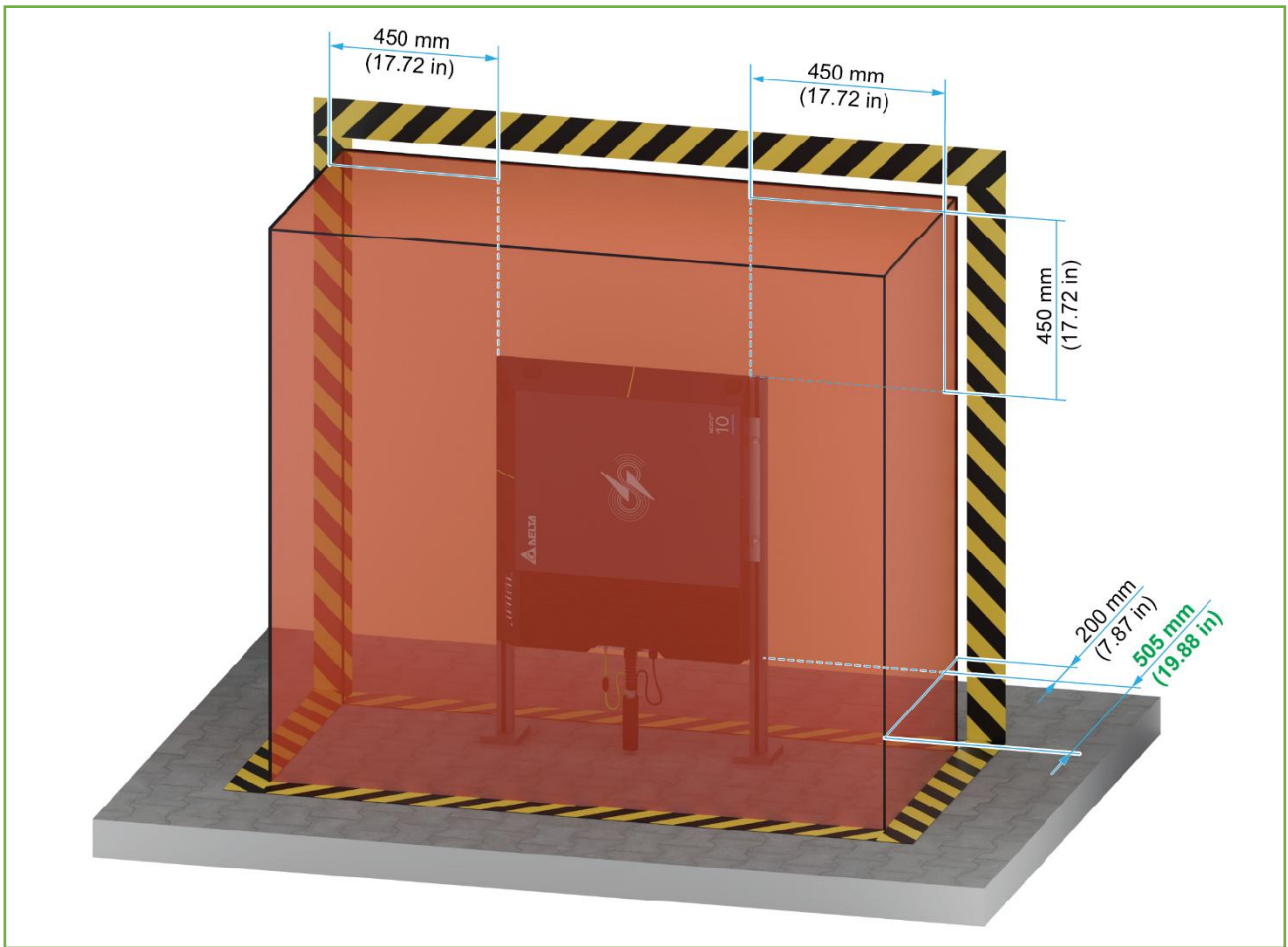


Figure 48 Example for safety markings; WPP mounted to a post, cable at the bottom

The red cube is the keep-out area that has to be protected with a technical barrier.

Communication

When not charging (no power transmission), during communication, any user has to be at least 200 mm (7.97 in) away from both pads (WSU and WPP) in all directions from the magnetic center. The WSU and WPP will attempt to pair the communications between each other at all times when they are powered on.

Medical Implant

Use of the WCS may affect or impair the operation of any medical devices, such as an implantable cardiac pacemaker. Check with your medical device manufacturer concerning the effects that wireless charging may have on such devices before using the WCS.

In general, ISO14117 specifies immunity levels for implantable cardiac pacemaker at 15 μT_{rms} .

General note

The distances provided in this document are valid for the use in free air. If metal is used in the keep-out areas, the magnetic field will be deformed. In this instance, after the WSU is installed into the vehicle, the magnetic field measurement must be performed for the application to ensure the given distances remain valid. If the distances are different to what is provided in this document, then the keep-out distances must be adjusted within the User Instructions for the application.

Note: It is likely that the measurement result allows shorter distances.

9.4 Planning the commissioning

9.4.1 Power Up & Health Checks

It is best practice to install and connect the WPB and WPP prior to powering up and performing health checks, see 11.2 “Power Up & Health Checks”, page 118.

10 Installation

10.1 Installing the Primary System (WPB + WPP)

10.1.1 Mounting the WPB

10.1.1.1 Safety Instructions

WARNING:



Only skilled persons should install WPB.

CAUTION:



WPB is provided with M8 threaded holes (5) at the top, that can be used with eyebolts for lifting purposes (supplied by others), See [Error! Reference source not found.](#)

Replace provided four bolts (for lifting) after eyebolts are removed to retain ingress protection.

CAUTION:



WPB must be fixed securely to the floor or fixed securely to a wall / stand using provided fixture brackets.

Electric shock

DANGER:



- ▶ Make sure that there is no power supply to WPB for the installation process, it may lead to death of Personnel.
- ▶ Once the WPB is installed and operating, it should not be opened. In case of emergency, only skilled persons should open it. Make sure to disconnect the main power supply and wait for 30 min before opening WPB.

WARNING:



Risk of Fire

- ▶ The WPB must be protected by an external fuse/circuit breaker.
- ▶ In North America, use only on circuits provided with branch circuit protection in accordance with the National Electrical Code, NFPA 70 or Canadian Electrical Code.

CAUTION:



- ▶ Do not connect the WPB to any public grid, always connect to industrial grid. On public grid, our system will work as intended, but it might cause malfunction of other devices.

CAUTION:



- ▶ Ground the WPB housing on the grounding screw before connecting it to power supply.

CAUTION:

Heavy loads

- ▶ The WPB is heavy. To avoid strain or injury, take care when lifting and carrying the WPB and use lifting and transport aids as required.

ATTENTION:

Material damage

- ▶ Do not use powder or foam fire extinguishers on WPB when there is a fire around, it is recommended to use Co2 fire extinguisher or something similar otherwise WPB may get damaged.

ATTENTION:


- ▶ The WPB does not have any serviceable parts except fans and fuses. Once installed and in operation the user must never open WPB.
- ▶ The WPB does not have any serviceable parts and must never be opened.

ATTENTION:


- ▶ WPB could be disconnected using Supply Disconnecting Device (SDD) and must be disconnected only in following conditions,
- ▶ in case of an emergency
- ▶ for maintenance/service (replacement of fans or fuses)

Disconnecting is recommended only when charging process is not happening. A skilled person could also disconnect the WPB using supplementary fuses in the building or area.

- ▶ In Europe - As SDD a CeKon connector could be used in order to disconnect the WPB.
- ▶ In North America - An SDD in accordance with NFPA70 and C22.1-15 must be part of the building infrastructure.

10.1.1.2 General Information

- The WPB can be mounted standing or hanging.
- The WPB is very heavy. The wall, mounting system, or floor must be able to support the heavy weight.
- Always use the mounting plate supplied with the WPB for wall mounting.
- Use mounting materials (wall plugs, screws, etc.) that are suitable for the wall, mounting system, or floor and can support the heavy weight.

10.1.1.3 Material and tools needed for mounting

For wall mounting

- At least 4 screws (Ø 10 mm), spring washers, washers for the hanging bracket

For floor mounting

- 4 screws (Ø 8 mm), spring washers, washers

10.1.1.4 Unpacking and lifting the WPB

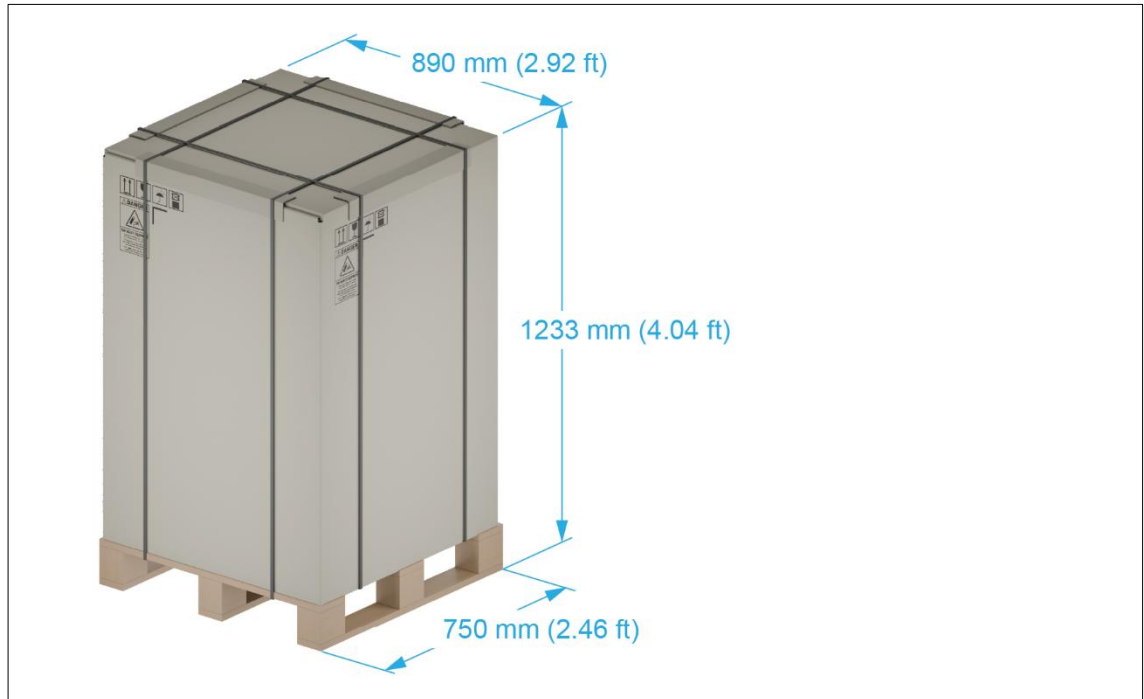
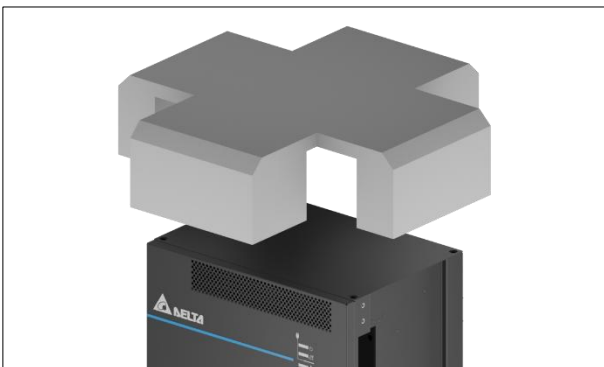


Figure 49 Dimensions of WPB packaging



1. Remove cardboard box and Styrofoam top.

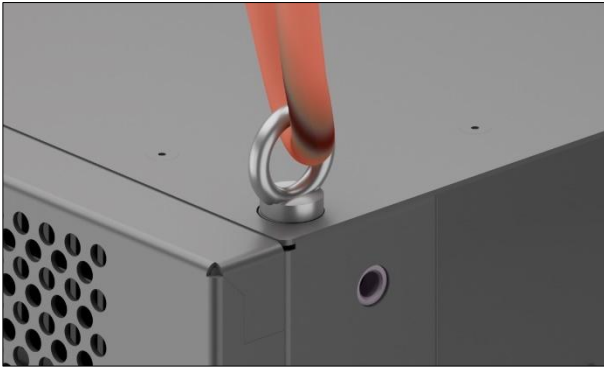




CAUTION

The WPB is attached to the pallet with two metal brackets. Before removing the brackets, secure the WPB with a pulley to prevent it from falling over accidentally.

2. Secure the box with a pulley. Use 4 x M8 O-rings.

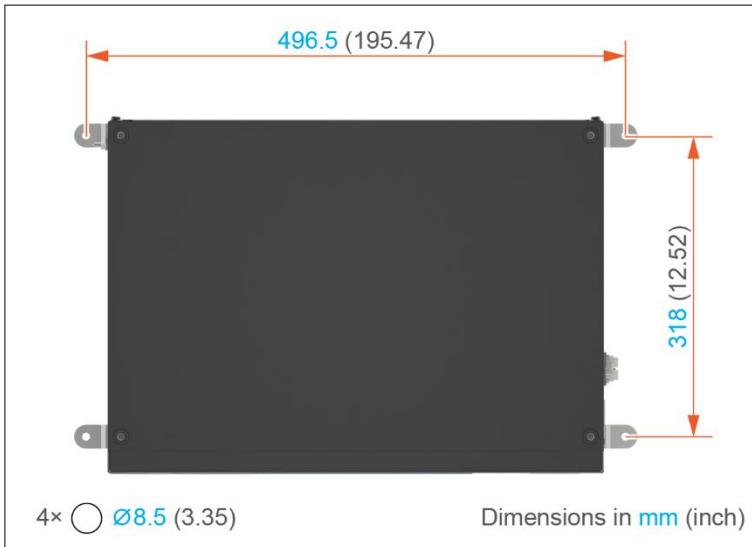


3. Remove the two metal brackets at the bottom.



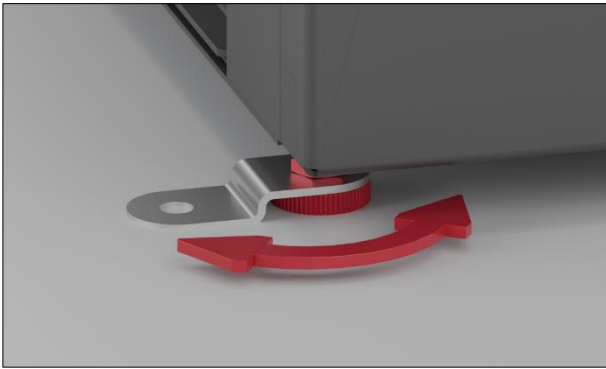
10.1.1.5 Mounting the WPB to the Floor (upright)

Alternatively, the WPB can be mounted suspended on a wall or mounting system, see [10.1.1.6 "Mounting the WPB suspended \(optional\)"](#), page 94.



1. Lift the WPB with the pulley/crane and place it on the floor.

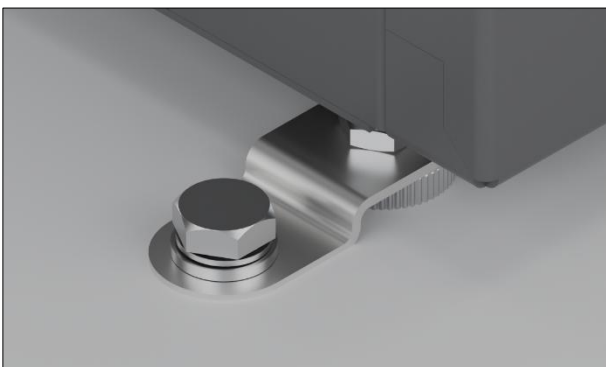




- 2.** Level the WPB by rotating the feet at the bottom.



- 3.** Screw all 4 feet to the floor. Use screw, spring washer and washer.



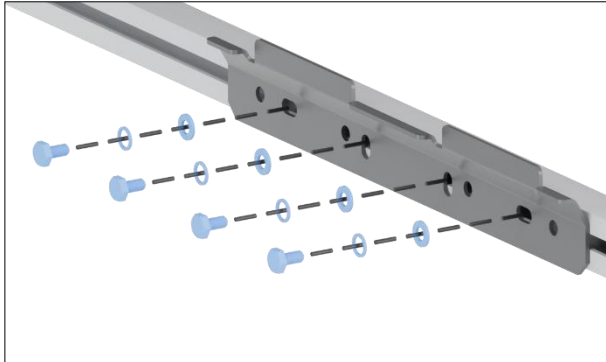
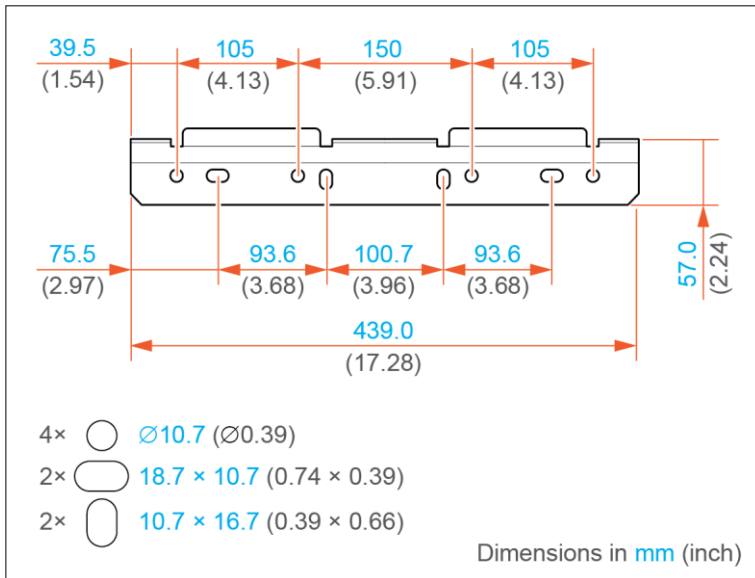


Mounting the WPB to the floor is finished.
Continue with 10.1.2. "Grounding the WPB housing", page 99.

10.1.1.6 Mounting the WPB suspended (optional)

The mounting description in this section shows one possible way to mount the WPB suspended. Your application can look different.

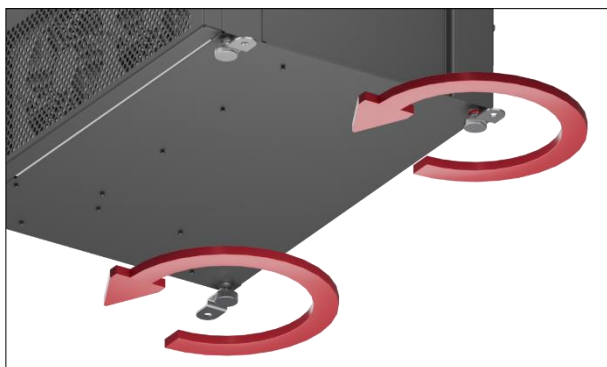
Alternatively, the WPB can be mounted upright to the floor, see [10.1.1.5 “Mounting the WPB to the Floor \(upright\)”](#), page 91.



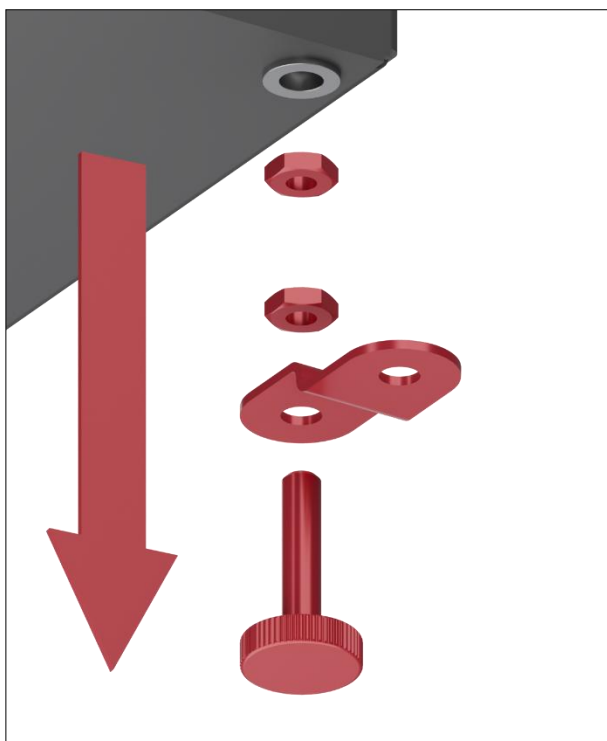
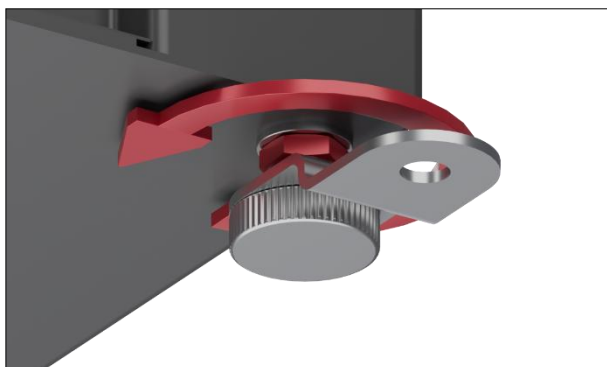
1. Attach the mounting plate to the wall/mounting system with at least 4 screws (Ø 10 mm).



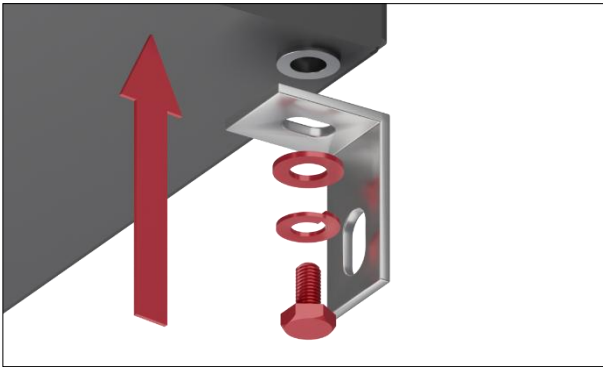
2. Lift the WPB with the pulley/crane.



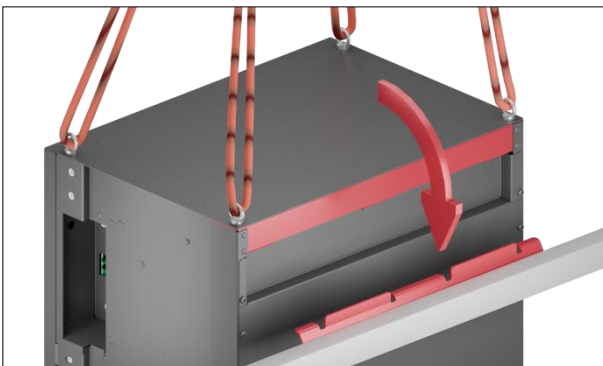
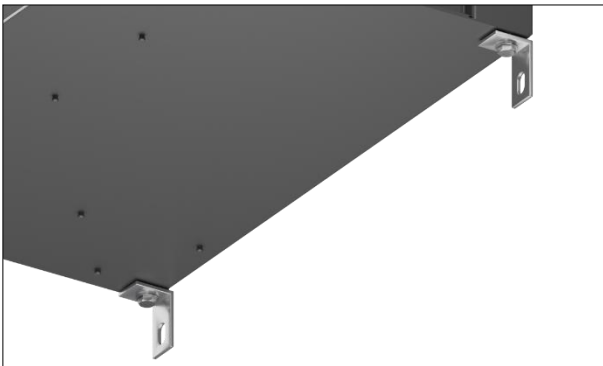
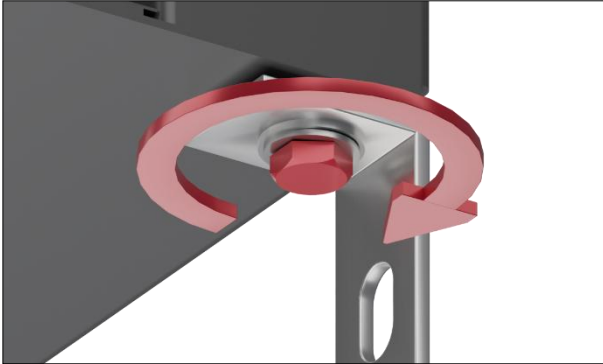
3. Unscrew the 2 rear feet.



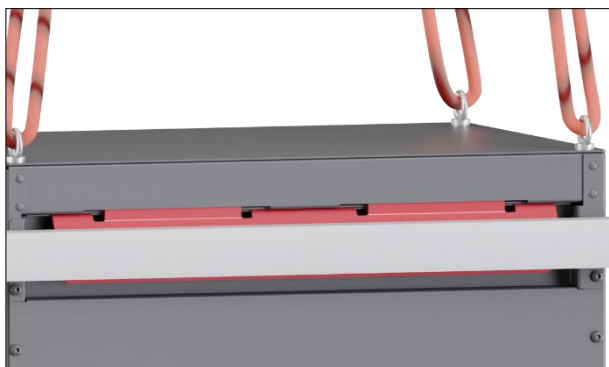
4. Remove the parts of the 2 rear feet.



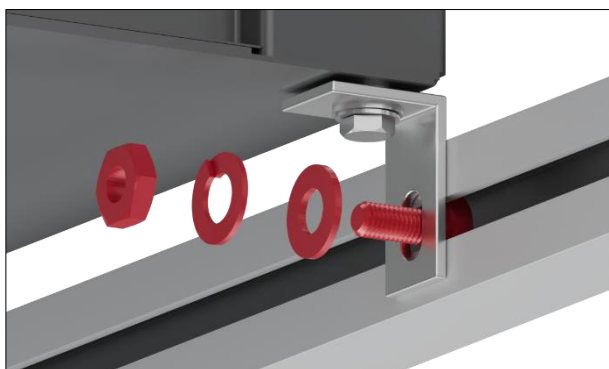
- 5.** Screw the brackets to the 2 rear feet. Use spring washer and washer.



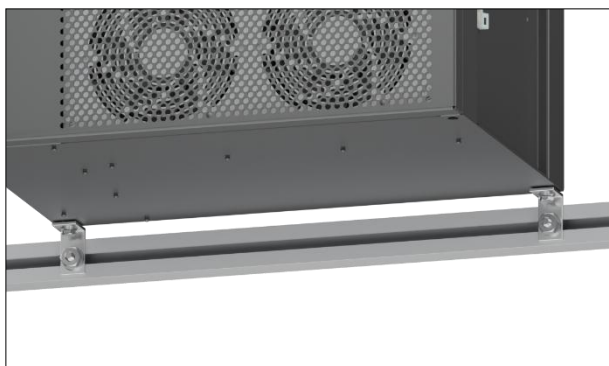
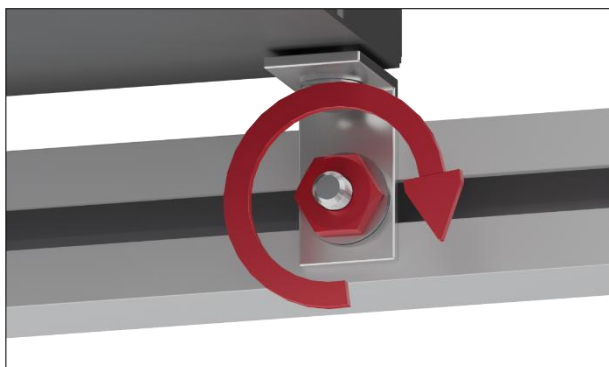
- 6.** Hang the WPB into the mounting plate.



7. Check that the WPB correctly hangs in the mounting plate.



8. Screw the brackets to the wall or mounting system. Use spring washer and washer.





Mounting the WPB to the wall / mounting system is finished.

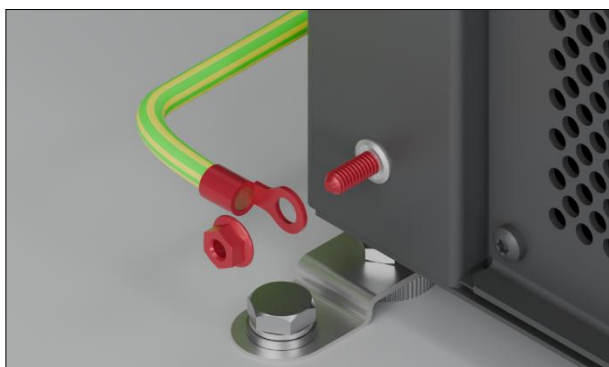
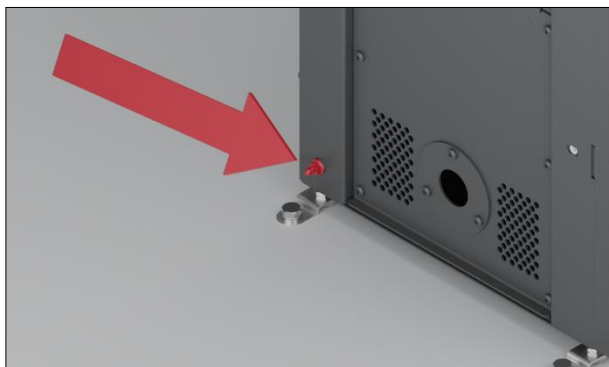
Continue with [10.1.2. “Grounding the WPB housing”](#), page 99.

10.1.1.7 Installing a Stack Light (Optional)

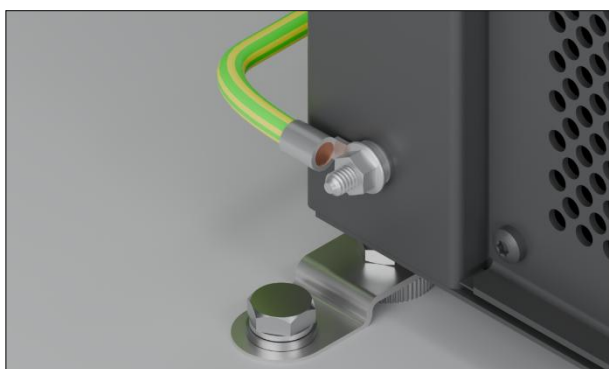
For the installation of a stack light, refer to [17 “Connecting a Stack Light”](#), page 183.

10.1.2 Grounding the WPB housing

Position of the grounding connection.



1. Screw the grounding cable to the grounding connection on the WPB.



10.1.3 Mounting the WPP

10.1.3.1 Safety Instructions

WARNING: 	Electromagnetic Field (EMF) Make sure that there is no WSU in charging range when the installation of the WPP is carried out, particularly when connecting the WPP cable to the WPB. Charging could begin unexpectedly, which enables the magnetic field.
CAUTION: 	Sharp edges The back plates of the WPP have sharp edges. Protective gloves should be worn during the handling and installation of the WPP.
CAUTION: 	Heavy loads The WPP is heavy. ► Lift the WPP with at least 2 people or use a pulley or crane.
ATTENTION: 	Cable damage due to harsh weather conditions The cables of the WPP are not certified for outdoor use. ► Protect the cables with an appropriate cover if you want to use them outdoor.

10.1.3.2 Material and tools needed for mounting

- 3 screws (Ø 8 mm), spring washers, washers to attach the mounting plate to the wall/mounting. The mounting plate is delivered with the WPP.
- No special tools are required for mounting the WPP.

10.1.3.3 Installation Procedure

Note: The lifting hole provided on the WPP cannot be used when it is mounted on the wall.

Note: WPP shall be installed only in vertical-landscape orientation, not in portrait orientation.

CAUTION: 	WPP is provided with M8 threaded holes at the top, that can be used with eyebolts for lifting purposes (supplied by others).
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ATTENTION:


- WPP could also be installed on a metal sheet which acts as a heat sink, this improves the heat dissipation during the charging process.
- Mounting the WPP with a heat sink would increase the operation time at full output current before de-rating occurs (refer [8.5.1 Output Power and De-rating](#)).

1. Make sure to read and understand all the safety messages. Refer [10.1.3.1 Safety Instructions](#) and [6.5 EMF Safety Instructions](#).
2. Remove the metal mounting strip (2) from WPP packaging (see [0](#)).
3. Mark and drill three holes on the mounting wall/fixture in order to install the mounting strip (2). The mounting strip has 9 mm diameter holes.
4. Mark and drill two holes on the mounting wall/fixture in order to attach the WPP (1). The mounting strip has 9 mm diameter slots.
5. Attach the mounting strip (2) to the mounting wall/fixture using suitable stainless steel screws e.g. 3x M8 hexagon head screws. Make sure that the screws are tightened firmly.
Note: Similar screw size for U.S. would be 5/16"- 18 UNC.
6. Hang the WPP (1) onto the mounting strip (2). Refer to section [10.1.3.1 Safety Instructions](#).
7. Attach the WPP (1) to the mounting wall/fixture using suitable stainless steel screws e.g. 2x M8 hexagon head screws. Make sure that the screws are tightened firmly.
Note: Similar screw size for U.S. would be 5/16"- 18 UNC.
Note: After installation, close the holes in plastic housing with plugs (3231163600).
8. Make sure that WPP is fixed in a level position.

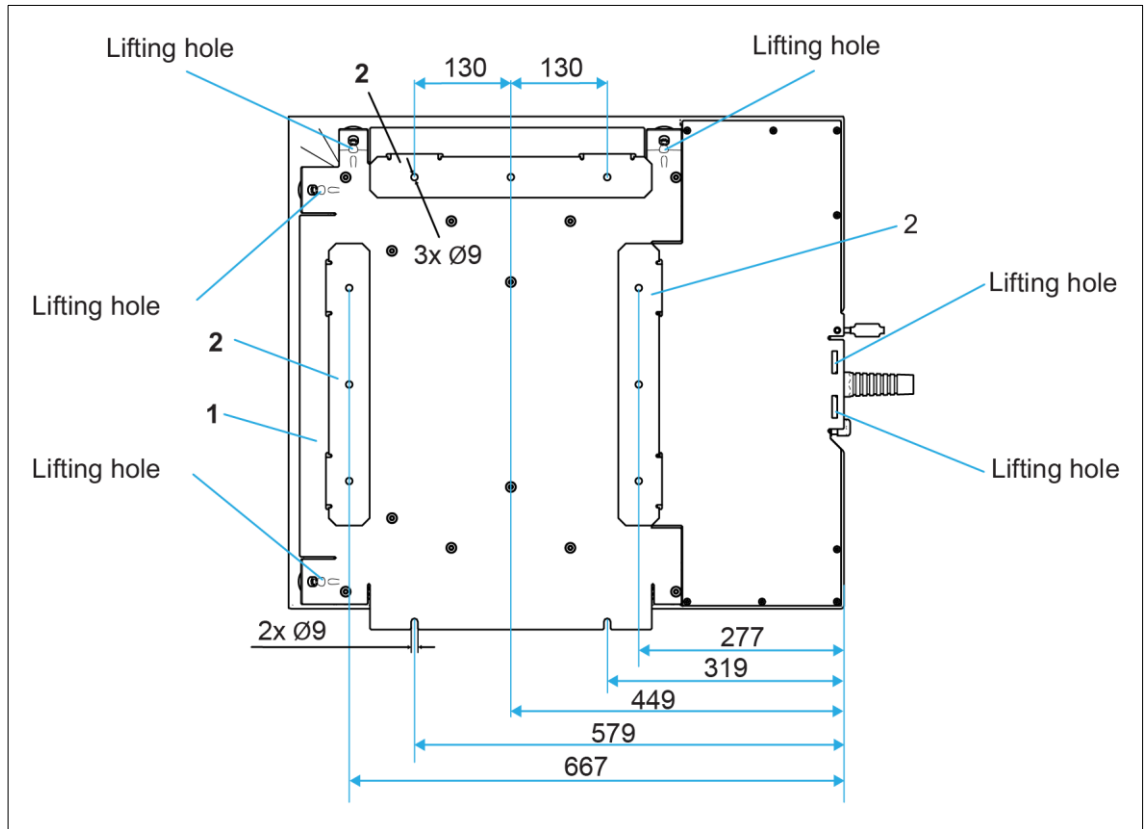


Figure 50 Installation of WPP – Rear View

- | | |
|---|----------------|
| 1 | WPP |
| 2 | Mounting strip |

10.1.4 Connecting the WPP to the WPB

WARNING: 	Electric shock Make sure to disconnect the Supply Disconnecting Device (SDD) of the WPB before connecting WPP to WPB, as it may lead to death of Personnel.
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The connector for the WPP cable is on the right side of the WPB, see [0](#) and [Error! Reference source not found.](#). Connect the cable as follows:

1. Make sure to read and understand all the safety messages. Refer [10.1.3.1 Safety Instructions](#).
2. Connect the heavy duty WPP connector onto the WPB and tighten the connector screws with a screwdriver to secure the connection.

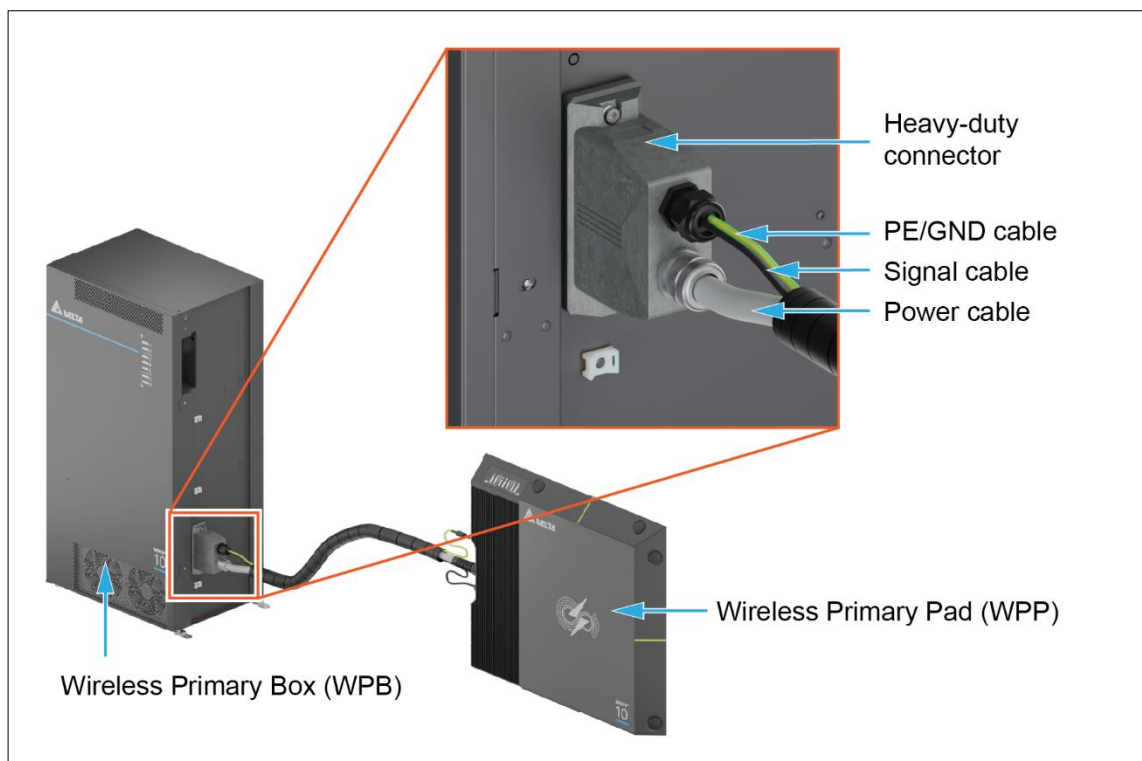
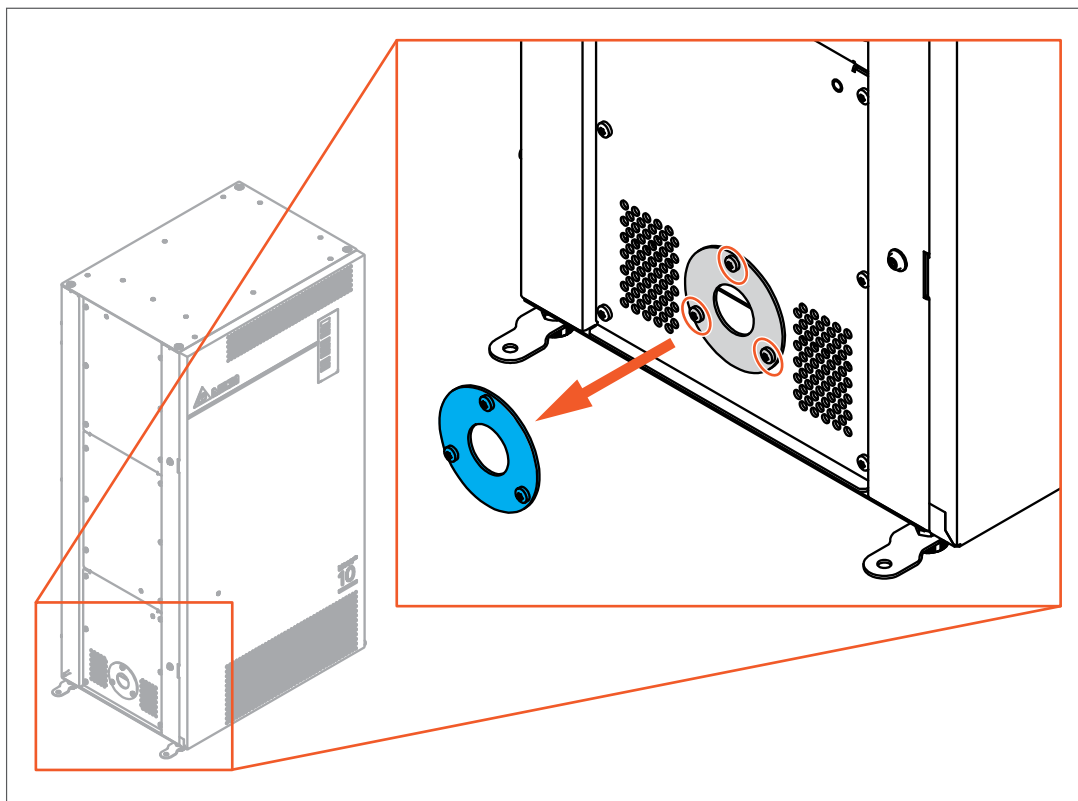


Figure 51 Connecting WPP heavy-duty plug to WPB

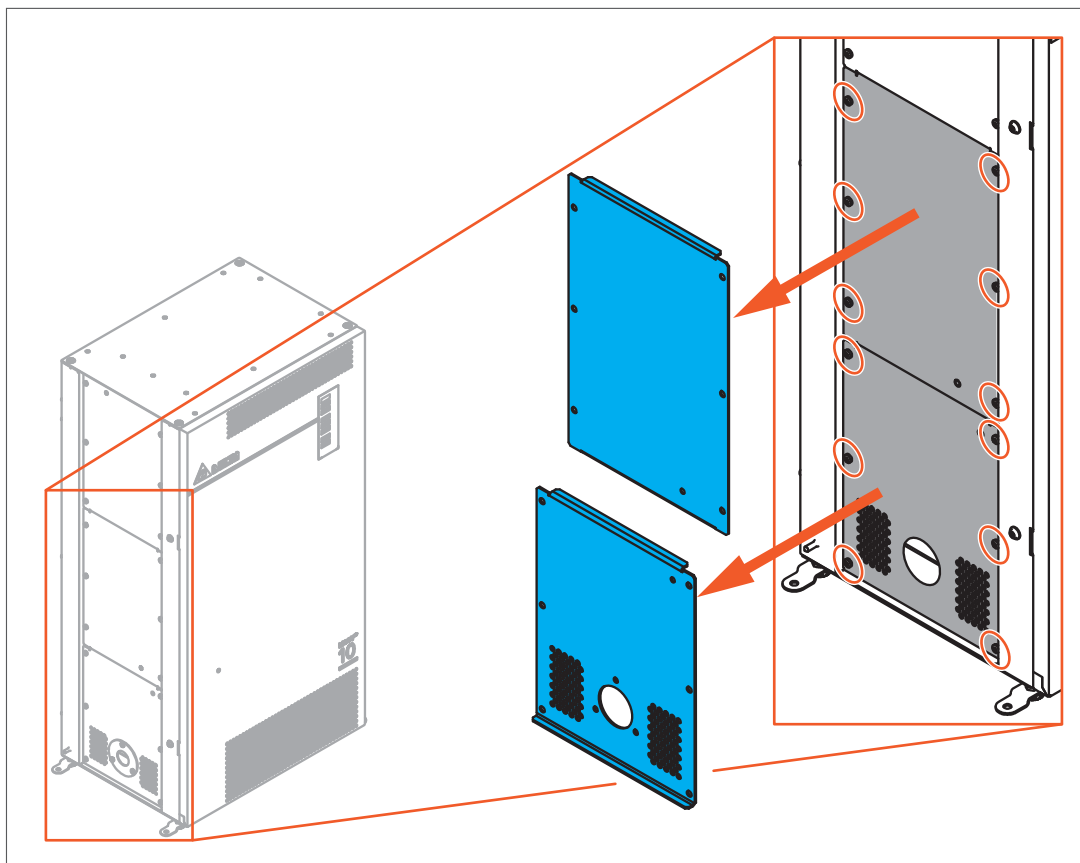
10.1.5 WPB Electrical Installation

1. Make sure to read and understand all the safety messages. Refer [10.1.1.1 Safety Instructions](#).
2. Unscrew and remove the cable conduit ring.

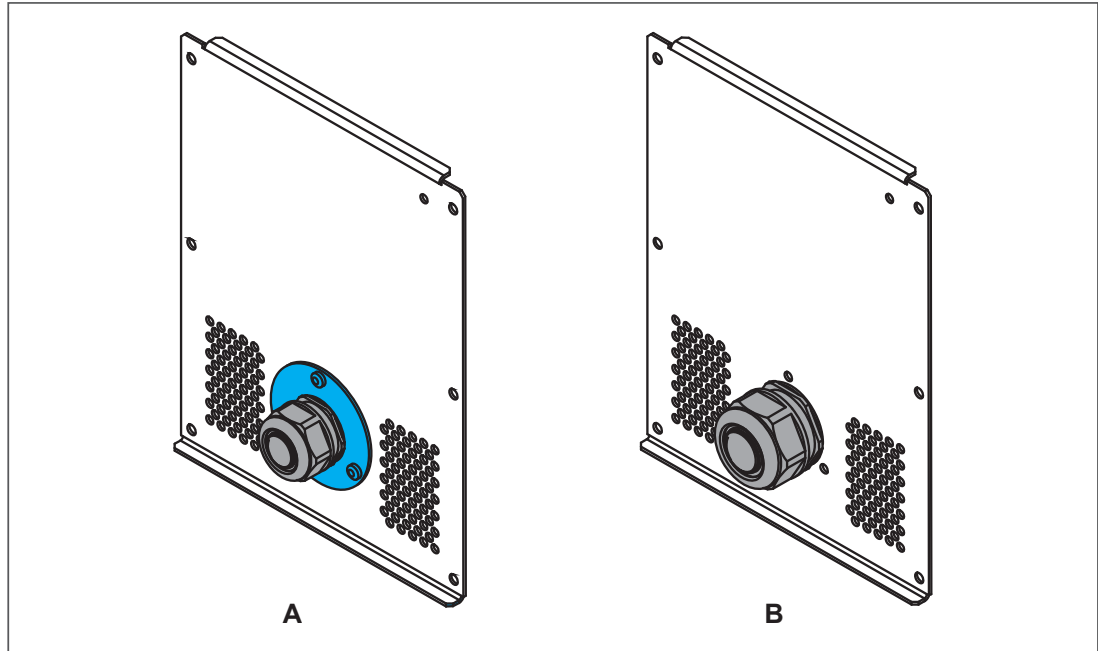


3. Unscrew and remove the middle cover plate (1) and lower cover plate (3).

NOTE: Each cover plate has a grounding cable attached. Remove the cover plates carefully. The grounding cables do not need to be disconnected for installation.



4. Choose the suitable opening for installation as per your requirement:



A with connection ring	B without connection ring
Diameter: 34.8 mm (1.37 in)	Diameter: 50.0 mm (1.96 in)
For cable gland/conduit:	For cable gland/conduit:
• M32 • 1 inch	• PG36 • 1.5 inch



Make sure that the cable gland matches the diameter of cable to prevent possible removal or pushing the cable in the unit.

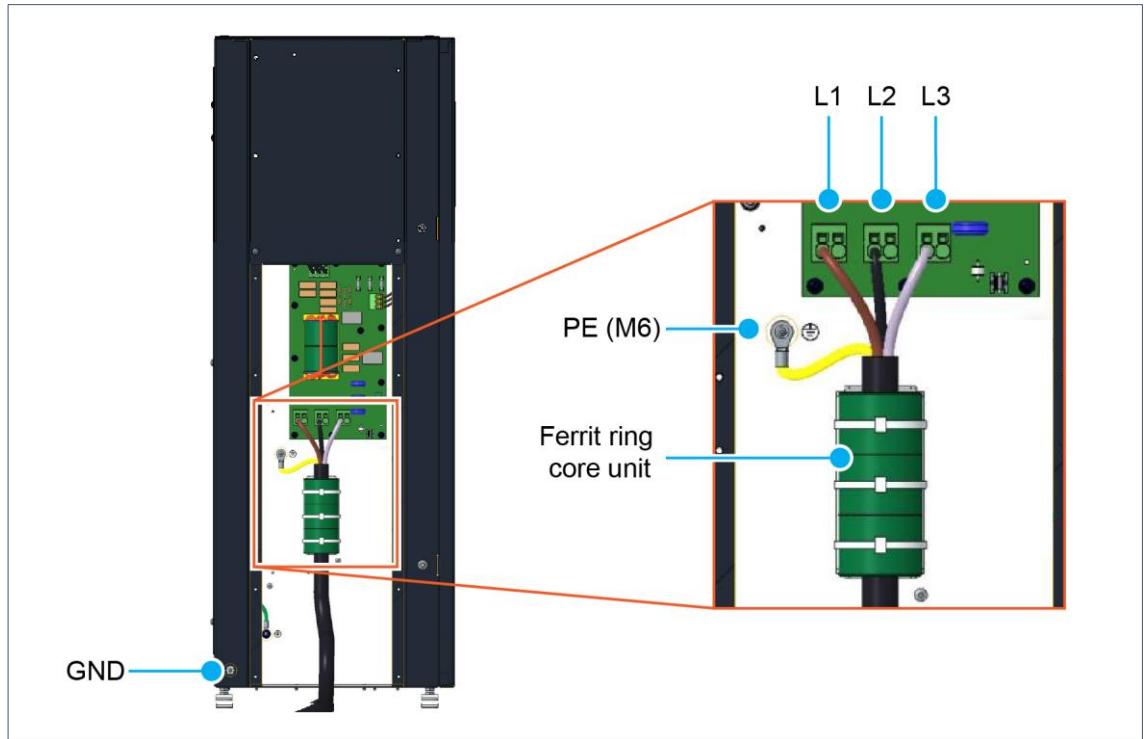


Figure 52 Feeding the Cable through Cable Gland (view without Covers)

Note: In [Figure 52](#), EU wire colors are shown in .

Note: PE/GND wire shall be longer than supply wires.

5. Attach the grounding cable to the GND bolt. Nut and contact washer are mounted to the bolt.
6. Attach the cable gland or conduit and feed the cable through to reach the ferrite ring core unit, see [Figure 52](#)).
Note: Make sure not to damage the lower cover plate.
7. Carefully feed the cable through the ferrite ring core unit.
8. Pull enough cable through the ferrite ring core unit) to reach the connections at the protective ground stud (PE) and the terminal block without causing any tension.

DANGER:	Electric Shock • Always connect the PE/GND conductor before connecting the power conductors. • The system leakage current is 150 mA_{RMS}. • When WPB is up and running, there are high touch currents which may lead to electric shock or injury to personnel.
Note:	• The minimum conductor size for the PE/GND connection is 6 mm²/10 AWG. • PE/GND wire shall be longer than L wires.

- 9.** Tighten the cable gland and attach the lower cover plate using the six screws (Torque T25 driver).
- 10.** Connect the M6 PE/GND cable lug to the protective ground stud (PE). Mounting order, first comes contact washer followed by cable lug and nut, torque (10 Nm/14 lb-ft).
- 11.** Make sure that the M6 PE/GND cable lug is attached firmly.
- 12.** Connect the three L wires (L1, L2, L3) to the terminal block by stripping them approx. 15 mm (0.59 in), attach ferrules and insert the ends of the wires into the three connection points in the terminal block.
- 13.** Make sure that the L wires (L1, L2, L3) are tight enough by pulling them carefully.
- 14.** If the cable contains Neutral (N) wire, snip it off and isolate the end to prevent unwanted contact with the WPB.
- 15.** Attach the middle cover plate using six screws (Torque T25 driver).
- 16.** Now fix the WPB to the floor using four screws with nominal diameter of 8 mm (0.3 in) through the floor fixing brackets.

10.2 Installing the WSU

10.2.1 Safety Instructions

DANGER: 	Electric shock Only qualified skilled person shall install, uninstall, service and maintain the WSU.
DANGER: 	Electric shock Make sure to disconnect or switch off all the power sources before installing the WSU.
DANGER: 	WSU cables should not be connected in the vicinity of WPP to avoid the danger of electric shock.
DANGER: 	Electric shock • Make sure to disconnect the power to WSU before removing it from Forklift for service or maintenance. • Always refer to Forklift user manual as power cables are fixed to the batteries. • Only skilled person shall remove WSU from forklift and shall make sure that WSU is completely disconnected from all power sources. • Do not connect or disconnect the battery from the WSU, whilst the WSU is in operation.
WARNING: 	Electromagnetic Field (EMF) WSU cables should not be connected in the vicinity of WPP to avoid the danger of magnetic field.

WARNING: 	Electromagnetic Field (EMF) • The Wireless Primary Pad (WPP) and Wireless Secondary Unit (WSU) produces a potentially harmful magnetic field during the charging process. • Make sure to maintain a safe distance from WPP when charging is in progress. For more details about the safe distance see 6.5 EMF Safety Instructions. Use of the WCS may affect or impair the operation of any medical devices, such as an implantable cardiac pacemaker. Check with your medical device manufacturer concerning the effects that wireless charging may have on such devices before using the WCS. • Electromagnetic field exposure to pregnant women and Children is strictly forbidden. • Advise all user types about safety distances and affix appropriate warnings. • Warning signs should be clearly displayed at the charging area. • Do not install or operate the system in the public area. • Electronic objects such as cell phones and hearing aids may get damaged.
ATTENTION: 	Polarization Connect the DC output wires properly with correct polarization: • RED → connect with positive (+) pole • BLACK → connect with negative (-) pole The WSU will not start the charge process if it detects a reverse polarization.
ATTENTION: 	Charging Make sure to install the WSU at the same height as the WPP and within a tolerance limit of 50 mm otherwise charging is not possible.
ATTENTION: 	The WSU does not have any serviceable parts and must never be opened.

ATTENTION:

Cable damage due to harsh weather conditions

The battery charging cables of the WSU are not certified for outdoor use.

- Protect the battery charging cables with an appropriate cover if you want to use them outdoor.

10.2.2 Special Tools & Equipment

No special tools are required while installing the WSU.

10.2.3 Installation Conditions

ATTENTION:


Mentioned distances are valid only when the surface of the pad is aligned with the surface of the metal (ferrous or non-ferrous).

10.2.4 Installation Procedure

Connect all the four power cables (two Black (-) and two RED (+)) of WSU to the same battery, otherwise charging is not possible.

10.2.4.1 Mounting the WSU on the Vehicle

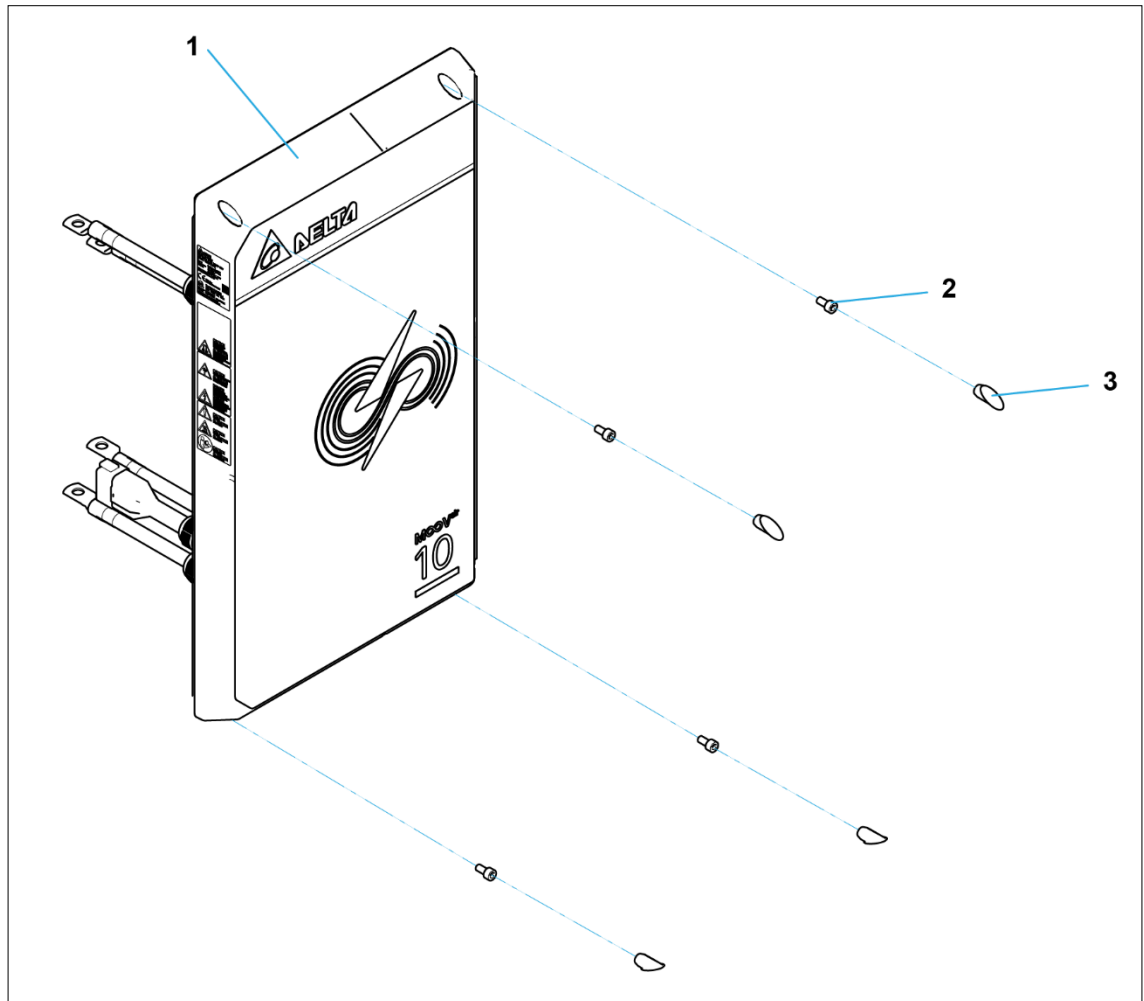


Figure 53 Mounting WSU on Vehicle

1	WSU
2	M6 stainless steel screws
3	Plugs

1. Make sure to read and understand all the safety messages. Refer [10.2.1 Safety Instructions](#).
2. Make sure to disconnect all the cable connections to WSU (1). Refer [10.2.4.2 WSU Cable Connections](#).
3. Remove the screws (3) and remove the edge cover (2) from the WSU (1).
4. There are 8 mounting holes (Ø 7 mm), four at the top edge and four at the bottom edge of the WSU (1).
5. Install the WSU (1) to the vehicle with 8xM6 stainless steel screws (4) (strength class ≥ 8.8)

Note: Make sure to select the screw length based on the installation vehicle requirements.

Note: After installation, close the holes in plastic housing with plugs (34794013xx).

6. Make sure that all the connections are tight.
7. Install the edge cover (2) with screws (3), torque 0.6 Nm/0.84 lb-ft.

ATTENTION: 	- WSU could also be installed on a metal sheet which acts as a heat sink, this improves the heat dissipation during the charging process. - Mounting the WSU with a heat sink would increase the operation time at full output current before de-rating occurs (refer 8.5.1 Output Power and De-rating).
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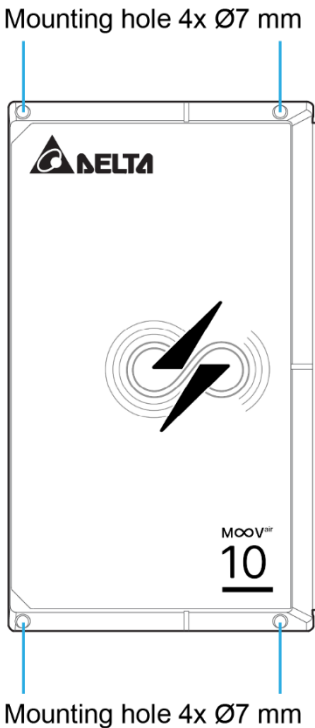


Figure 54 WSU mounting holes

10.2.4.2 WSU Cable Connections

DANGER: 	Electric shock - Make sure to power off WSU before disconnecting the cables. The output voltage of battery is very high so make sure to take appropriate measures before working on cables. - The WSU cable connections (battery connection cables and control cable) must always be installed and serviced only by skilled persons.
---	---



Electric shock

Dangerous voltage levels are output by the WSU during charging.

- Do not handle the cable connections during the charging process.
- Make sure to disconnect the WSU from all electrical connections during installation or service of the cable connections.
Disconnecting WSU from battery is done in reverse order.

1. Make sure to read and understand all the safety messages. Refer [10.2.1 Safety Instructions](#).
2. Connect the DC output cables RED (1) to the positive pole (+) of the battery and BLACK (2) to the negative pole (-) of the battery.
3. Connect the control cable (3) to the BMS. The control cable (3) connection on the WSU is of type Deutsch receptacle DT04-12PA (refer [0](#) and [10.2.4.3](#)), which requires a mating half of Deutsch plug DT04-12PA-C015 (refer 8.2 Accessories).

ATTENTION:


- The AUX power input connections in the control interface (Pi 1 AUXIN+/Pin 2 AUXIN-) must be connected to the respective poles of the battery.
- The AUX power input connection to Pin 1 (AUXIN+) of the control interface must be provided with a 2 A fuse (short-circuit protection) with breaking capability appropriate for the respective battery.
- The charging process cannot begin until the battery and the control interface are both connected.
- The WSU will not initialize when there is no battery connected or when the battery voltage is less than 23 V of the rated battery voltage.
- The vehicle AUX_IN- shall have the same potential as the DC Power OUT-.

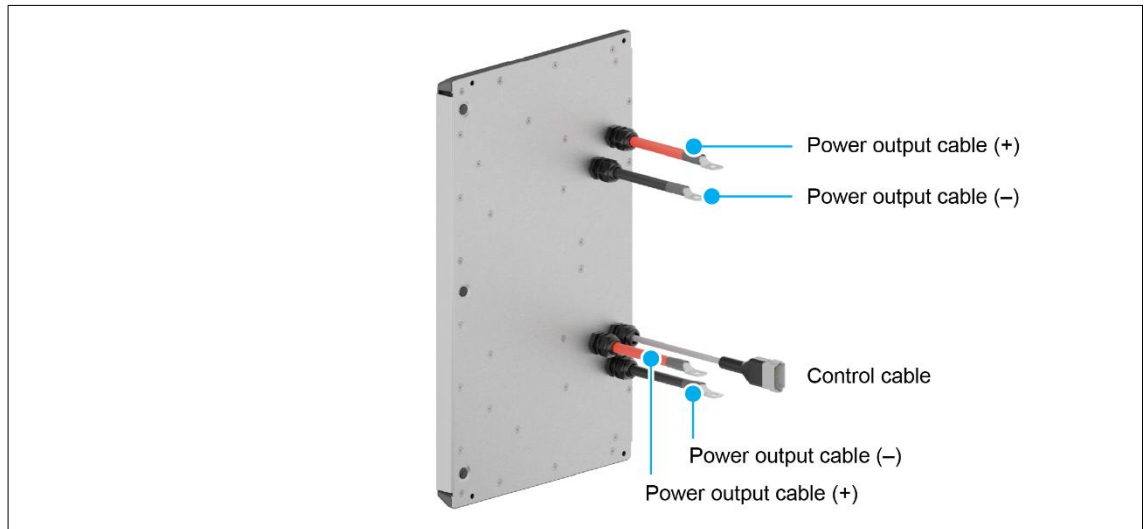


Figure 55 WSU Cable Connections

10.2.4.3 Communications Interface

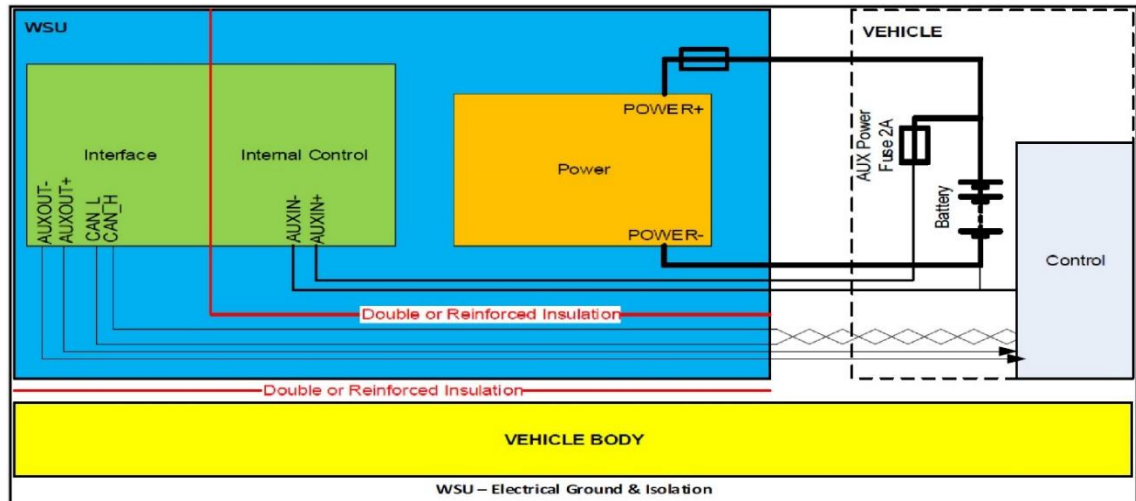


Figure 56 Auxiliary Connections

10.2.5 Power Up & Health Checks

1. Depending on where the WSU AUX-IN power supply is being sourced from, either:
 - a. Enable the power source within the vehicle that is supplying the WSU AUX-IN.
 - b. Check the voltage on the battery terminals is within voltage tolerance of the WSU AUX-IN interface if it is being supplied from the battery directly.
2. Establish CANopen® communications, refer to section 3.2.3.3.3.
3. Verify that the WSU SW version by can read and is the latest revision.
4. Verify that all information that is desired is being received by the vehicle.
5. Verify that the WSU is not reporting any Warnings/Faults.
6. Check and/or modify the User Configurable parameters as required.

11 System Commissioning / Start-up

11.1 Safety Instructions



Electromagnetic Field (EMF)

- The Wireless Primary Pad (WPP) and Wireless Secondary Unit (WSU) produces a potentially harmful magnetic field during the charging process.
- Make sure to maintain a safe distance from WPP when charging is in progress. For more details about the safe distance see [6.5 EMF Safety Instructions](#).

Use of the WCS may affect or impair the operation of any medical devices, such as an implantable cardiac pacemaker. Check with your medical device manufacturer concerning the effects that wireless charging may have on such devices before using the WCS.

- Electromagnetic field exposure to pregnant women and Children is strictly forbidden.
- Advise all user types about safety distances and affix appropriate warnings.
- Warning signs should be clearly displayed at the charging area.
- Do not install or operate the system in the public area.
- Electronic objects such as cell phones and hearing aids may get damaged.

11.2 Power Up & Health Checks

1. Verify that the previous WPB and WPP installation instructions have been carried out successfully.
2. Enable the Supply Disconnecting Device (SDD) connected to the WPB AC Input.
3. Once WPB is energized, each LED of WPB, WPP and stack light are illuminated in a sequence.
4. Observe that only Power LED is illuminated green on the WPB and WPP Status LED Panels and on the Stack Light (if fitted).
5. If the *WPU Fault* LED and/or the *Fault* LED on the stack light is illuminated, refer to [16 "Troubleshooting"](#), page 170.

11.3 Setting up the WSU for CAN bus

11.3.1 Setting the CAN bus Node ID

To start up the WCS, a CANbus node ID must be set for the WSU. Each WSU in the CAN bus must have a unique Node ID. To set up the Node ID, refer to [13.1 “Setting the CAN bus Node ID for a new WSU”](#), page 130.

11.3.2 Setting the CAN bus bitrate

The standard bit rate for the CAN bus is 125 kbits/s. If you need to change the bit rate, refer to [13.1 “Setting the CAN bus Node ID for a new WSU”](#)

11.3.3 Introduction

A new WSU does not have a factory-configured node ID for the CAN bus. During commissioning, the node ID must be set to a valid value (1 ... 127) in accordance with CiA® 305 Layer Setting Services (LSS).

The steps in this section have been done with the *PCAN-view* tool from *PEAK-System Technik GmbH*.

To connect your PC to the multi-purpose cable of the WSU, you need the Delta Dev Kit (for order number, refer to) or another Kit with Deutsch connector (for pin assignment, see 5.5.3 “Multi-purpose control cable”, page 30).

Your PC (the LSS master) sends messages on CAN ID 0x7E5.

The WSU (the LSS slave) sends its response messages on CAN ID 0x7E4.

In the following tables, the values in the messages are all hexadecimal values.

B0 ... B7 stand for Data Byte 0 ... 7

11.3.4 Procedure

1. Connect your PC to the multi-purpose cable of the WSU.
2. Set WSU to state *pre-operational*.

Send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
0	80	00							Send NMT command switch to pre-operational (0x00 = currently no WSU Node ID set)

(B0 = 01 starts the node = operational)

The WSU should response as follows.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
0700	7F								pre-operational

(0x00 = no Node ID set for WSU)

3. Switch WSU into LSS state *selective* (= configuration mode).

Explanation – START

The part number, revision number, and serial number referenced in the message table following this explanatory section are printed on the WSU type label.

How to convert the numbers on the type label into hex numbers.

Bytes B1 to B4 in the message are used for the numbers.

First convert the whole decimal number into a hexadecimal number.

Afterwards, starting from the end of the hexadecimal number, apply every two digits to the byte position.

Note: Numbers can be different on your WSU – the serial number definitely is!

	Conversion to hex number	Byte codes in message			
Part number for: WSU 10 kW 24 VDC	EOE18010850 = 0x112D2E2	B1	B2	B3	B4
		E2	D2	12	01
Part number for: WSU 10 kW 36/50 VDC	EOE17010950 = 0x1039106	B1	B2	B3	B4
		06	91	03	01
Revision number	01 = 0x01	B1	B2	B3	B4
		01	00	00	00
Serial number (as an example)	000089 = 0x59	B1	B2	B3	B4
		59	00	00	00

Explanation – END

In order to connect to the WSU via the CAN bus, send the following messages from your PC to the WSU in exactly this order.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E5	40	C4	04	00	00	00	00	00	Send vendor ID (0x4C4 = Delta Energy Systems IMBU)
7E5	41	E2	D2	12	01	00	00	00	Send part number
7E5	42	01	00	00	00	00	00	00	Send revision number
7E5	43	59	00	00	00	00	00	00	Send serial number

The WSU compares the submitted values with the value stored in the WSU. If all values were correctly submitted, the WSU response as follows.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E4	44	00	00	00	00	00	00	00	Device acknowledge (WSU switched to configuration mode)

Note: If WSU sends a different message or does not response at all, check the values in your message and resend the message.

4. Set Node ID.

Note: All Delta WSU in the CAN bus must have a different node ID!

To set the node ID, send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E5	11	01	00	00	00	00	00	00	set new Node ID (e.g. 0x01 = dec 1)

If the node ID was correctly set, the WSU responses as follows.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E4	11	00	00	00	00	00	00	00	Device acknowledge

5. Store configuration.

To save the Node ID, send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E5	17	00	00	00	00	00	00	00	Send LSS store configuration command

If the configuration is stored, the WSU responses as follows

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E4	17	00	00	00	00	00	00	00	Device acknowledge

6. Switch WSU to LSS state *global* (that's the normal mode, back from configuration mode).

To set the WSU to LSS state *global*, send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E5	04	00	00	00	00	00	00	00	Switch to LSS state global

WSU sends no answer message.

7. Power on the WSU to ensure that the Node ID is activated.

After the power-on cycle, the WSU sends a boot-up message which contains the Node ID:

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
701	00								Boot-up message from Node ID 0x01 (= dec 1)

8. Switch on the *Heartbeat* signal of the WSU.

To switch on the *Heartbeat* signal, send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
601	2B	17	10	00	E8	03	00	00	In this example, the <i>Heartbeat</i> signal is set to a cycle time of 0x03E8 (= 1000 msec).

If the *Heartbeat* signal was successfully switched on, the WSU sends the following message.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
581	60	17	10	00	00	00	00	00	Device acknowledge (0x581 = 0x580 + 0x01 for Node ID)

Afterwards, the WSU transmits its current operating status at the time interval set for the *Heartbeat* signal (in this example, 1000 msec).

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
701	7F								If the status is " <i>Pre-operational</i> ". (0x01 = Node ID)
701	05								If the status is " <i>Operational</i> ". (0x01 = Node ID)

This completes the setup of the Node ID and the *Heartbeat* signal.

Setting the CAN bus bitrate, page 130.

11.4 Wireless Charging

Once the subsystems have been installed, powered up and health checked successfully, the wireless charging process can then be performed on a battery that requires charging.

1. Position the vehicle so that the WSU is within range of the WPP (see [8.5.1.2 Output power derating vs. charge time](#))

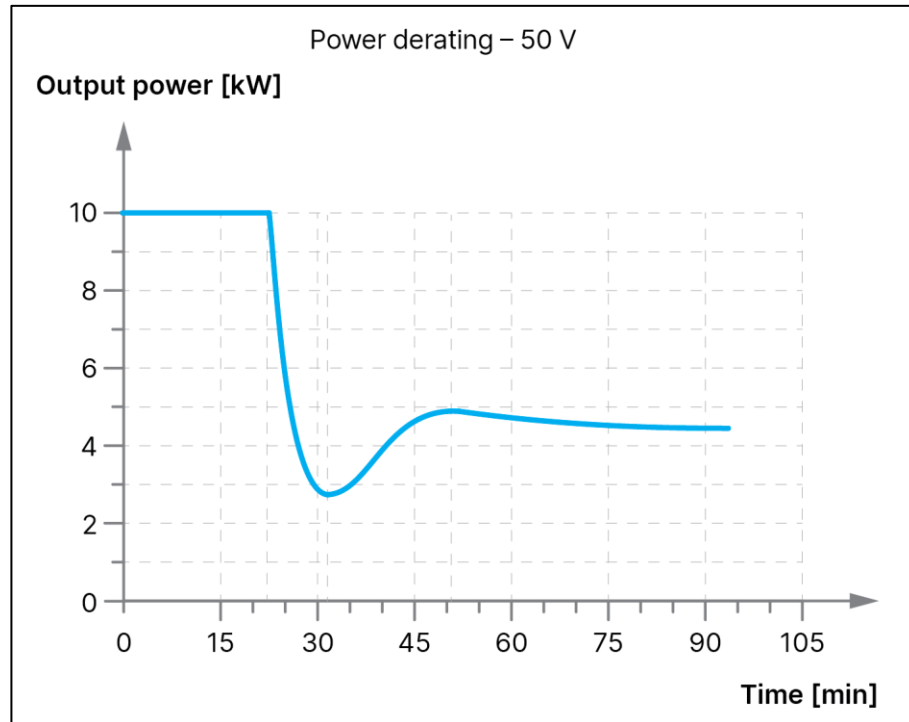


Figure 18 Output Power Derating vs Charge Time - 50V

2. WPP & WSU Positioning for correct positioning).
3. Send the charge enable and setpoint commands via CANopen®.
4. Verify that the following WPB & WPP Status LEDs are illuminated only:
 - a. AC Power: Green
 - b. Positioning: Green
 - c. Charging: Green Flash
5. Verify that the following WPB Stack Light lamps are illuminated only (if fitted):
 - a. Green: WPU Power ON, normal conditions
 - b. Blue Flash: Charging
6. If applicable, verify that all data that has been configured to be sent from the WCS to the vehicle is being received e.g. positioning information.
7. Monitor the Battery SoC from the vehicle and ensure that the charge time is as expected (calculation).
8. After the battery has been charged, verify that the following WPB & WPP Status LEDs are illuminated only:
 - a. AC Power: Green
 - b. Positioning: Green
 - c. Charging: Green (charge complete)

9. Verify that the following WPB Stack Light lamps are illuminated only (if fitted):
 - a. Green: WPU Power ON, normal conditions
 - b. Blue: Charge Complete

ATTENTION:


The Charge Complete indication will illuminate when vehicle stops sending CANopen® set-points to WSU or

The Charge Complete indication will turn off when either:

WPP & WSU PPL communications is lost e.g. vehicle drives away.

Vehicle starts sending charge request over CANopen®

WPU and/or WSU is in Fault.

12 Every-day Charging

12.1 Introduction

ATTENTION:



Material damage

The magnetic field generated during the charging process can cause metal and other foreign objects to become hot. Therefore, it is important to keep the charging area free of foreign objects.

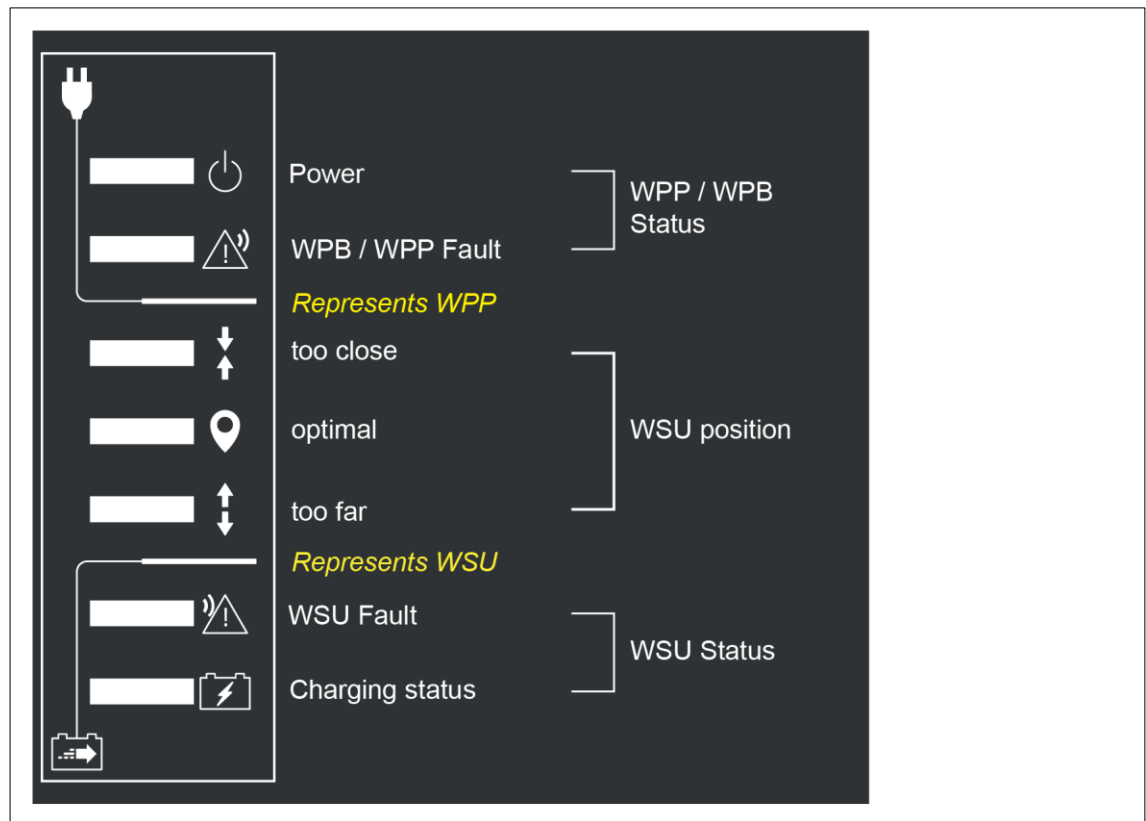
The WCS wirelessly charges the battery of an industrial electric vehicle by means of near field coupling between WPP and WSU. A magnetic field is generated by the WPP and coupled to the WSU. The WSU converts the magnetic field back to electrical current and charges the battery.

The magnetic field is only emitted by the WPP when there is a WSU in the charging area.

12.2 LED status indication

The charging status can be seen on the Status LED panels provided on the WPP and WPB.

For error descriptions and troubleshooting, refer to [16 Troubleshooting, p. 170](#).



LED 1		Description
	ON	AC input power supplied.
	ON	WPB and/or WPP fault active or latched.

Table 11 LED indications – general

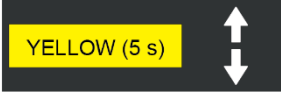
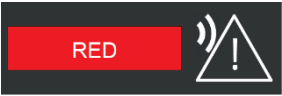
LED indication		Description
		WSU in optimal charging position.
		WSU in charging range, but too close to WPP for optimal charging.
		WSU in charging range, but too far away from WPP for optimal charging.
		WSU in charging range, but too far away from WPP for optimal charging.
		WSU in charging range, but too far away from WPP for optimal charging.

Table 12 LED indications – WSU positioning during charging

LED		Description
	ON	WSU fault active or latched.
	ON	Data communication between WPP and WSU is established. BMS has not requested charging.
	FLASH	Battery is charging.
	FLASH	No WSU detected.

13 Further Settings

13.1 Setting the CAN bus Node ID for a new WSU

13.1.1 Introduction

A new WSU does not have a factory-configured node ID for the CAN bus. During commissioning, the node ID must be set to a valid value (1 ... 127) in accordance with CiA® 305 Layer Setting Services (LSS).

The steps in this section have been done with the *PCAN-view* tool from *PEAK-System Technik GmbH*.

To connect your PC to the multi-purpose cable of the WSU, you need the Delta Dev Kit (for order number, refer to) or another Kit with Deutsch connector (for pin assignment, see 5.5.3 “Multi-purpose control cable”, page 30).

Your PC (the LSS master) sends messages on CAN ID 0x7E5.

The WSU (the LSS slave) sends its response messages on CAN ID 0x7E4.

In the following tables, the values in the messages are all hexadecimal values.

B0 ... B7 stand for Data Byte 0 ... 7

13.1.2 Procedure

9. Connect your PC to the multi-purpose cable of the WSU.

10. Set WSU to state *pre-operational*.

Send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
0	80	00							Send NMT command switch to pre-operational (0x00 = currently no WSU Node ID set)

(B0 = 01 starts the node = operational)

The WSU should response as follows.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
0700	7F								pre-operational

(0x00 = no Node ID set for WSU)

11. Switch WSU into LSS state *selective* (= configuration mode).

Explanation – START

The part number, revision number, and serial number referenced in the message table following this explanatory section are printed on the WSU type label.



How to convert the numbers on the type label into hex numbers.

Bytes B1 to B4 in the message are used for the numbers.

First convert the whole decimal number into a hexadecimal number.

Afterwards, starting from the end of the hexadecimal number, apply every two digits to the byte position.

Note: Numbers can be different on your WSU – the serial number definitely is!

	Conversion to hex number	Byte codes in message			
Part number for: WSU 10 kW 24 VDC	EOE18010850 = 0x112D2E2	B1	B2	B3	B4
		E2	D2	12	01
Part number for: WSU 10 kW 36/50 VDC	EOE17010950 = 0x1039106	B1	B2	B3	B4
		06	91	03	01
Revision number	01 = 0x01	B1	B2	B3	B4
		01	00	00	00
Serial number (as an example)	000089 = 0x59	B1	B2	B3	B4
		59	00	00	00

Explanation – END

In order to connect to the WSU via the CAN bus, send the following messages from your PC to the WSU in exactly this order.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E5	40	C4	04	00	00	00	00	00	Send vendor ID (0x4C4 = Delta Energy Systems IMBU)
7E5	41	E2	D2	12	01	00	00	00	Send part number
7E5	42	01	00	00	00	00	00	00	Send revision number
7E5	43	59	00	00	00	00	00	00	Send serial number

The WSU compares the submitted values with the value stored in the WSU. If all values were correctly submitted, the WSU response as follows.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E4	44	00	00	00	00	00	00	00	Device acknowledge (WSU switched to configuration mode)

Note: If WSU sends a different message or does not response at all, check the values in your message and resend the message.

12. Set Node ID.

Note: All Delta WSU in the CAN bus must have a different node ID!

To set the node ID, send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E5	11	01	00	00	00	00	00	00	set new Node ID (e.g. 0x01 = dec 1)

If the node ID was correctly set, the WSU responses as follows.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E4	11	00	00	00	00	00	00	00	Device acknowledge

13. Store configuration.

To save the Node ID, send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E5	17	00	00	00	00	00	00	00	Send LSS store configuration command

If the configuration is stored, the WSU responses as follows

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E4	17	00	00	00	00	00	00	00	Device acknowledge

14. Switch WSU to LSS state *global* (that's the normal mode, back from configuration mode).

To set the WSU to LSS state *global*, send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
7E5	04	00	00	00	00	00	00	00	Switch to LSS state global

WSU sends no answer message.

15. Power on the WSU to ensure that the Node ID is activated.

After the power-on cycle, the WSU sends a boot-up message which contains the Node ID:

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
701	00								Boot-up message from Node ID 0x01 (= dec 1)

16. Switch on the *Heartbeat* signal of the WSU.

To switch on the *Heartbeat* signal, send the following message from your PC to the WSU.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
601	2B	17	10	00	E8	03	00	00	In this example, the <i>Heartbeat</i> signal is set to a cycle time of 0x03E8 (= 1000 msec).

If the *Heartbeat* signal was successfully switched on, the WSU sends the following message.

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
581	60	17	10	00	00	00	00	00	Device acknowledge (0x581 = 0x580 + 0x01 for Node ID)

Afterwards, the WSU transmits its current operating status at the time interval set for the *Heartbeat* signal (in this example, 1000 msec).

CAN ID	B0	B1	B2	B3	B4	B5	B6	B7	Comment
701	7F								If the status is “Pre-operational”. (0x01 = Node ID)
701	05								If the status is “Operational”. (0x01 = Node ID)

This completes the setup of the Node ID and the *Heartbeat* signal.

13.2 Setting the CAN bus bitrate

13.2.1 Introduction

The default bitrate is 125kBit/s. It can be changed as described in the CiA® 305 Layer setting services (LSS).

The present document describes the method to change the bitrate with the CANopen Device Explorer from Emotas^{Error! Bookmark not defined.}.

Note that the CANopen Device Explorer only supports 125kBit/s in demo mode. For other Bitrates a license is required. Without license you can change the bitrate from 125kBit/s to another, but you cannot use this other bitrate with the demo version.

13.2.2 Required Items

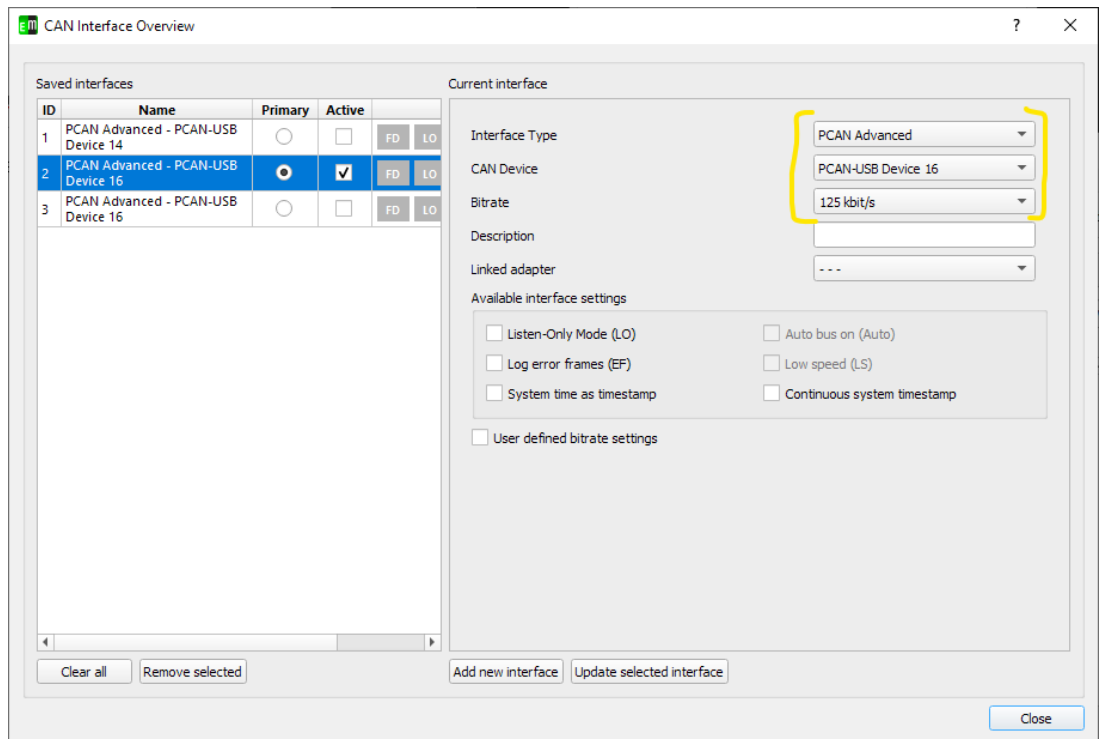
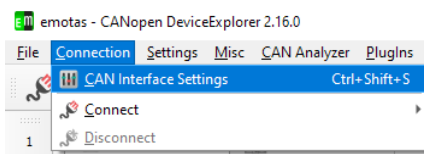
- Device Explorer from Emotas **Error! Bookmark not defined.**
- PCAN-USB from “PEAK-System Technik GmbH” 1 with installed driver.
- EDS file of the currently installed APL² version.

13.2.3 Procedure

Preperation

1. Connect the PCAN-USB with the Computer and the WSU/WSB CANbus.
2. Check that the WSU/WSB is supplied with power. The WSU over AUX-IN, the WSB over the DC-Out cables.

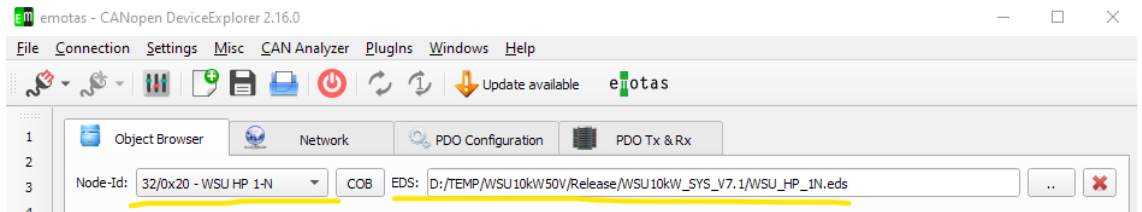
Open the Device Explorer and set the PCAN-USB to the current bitrate (125 kBit/s for a new WSU).



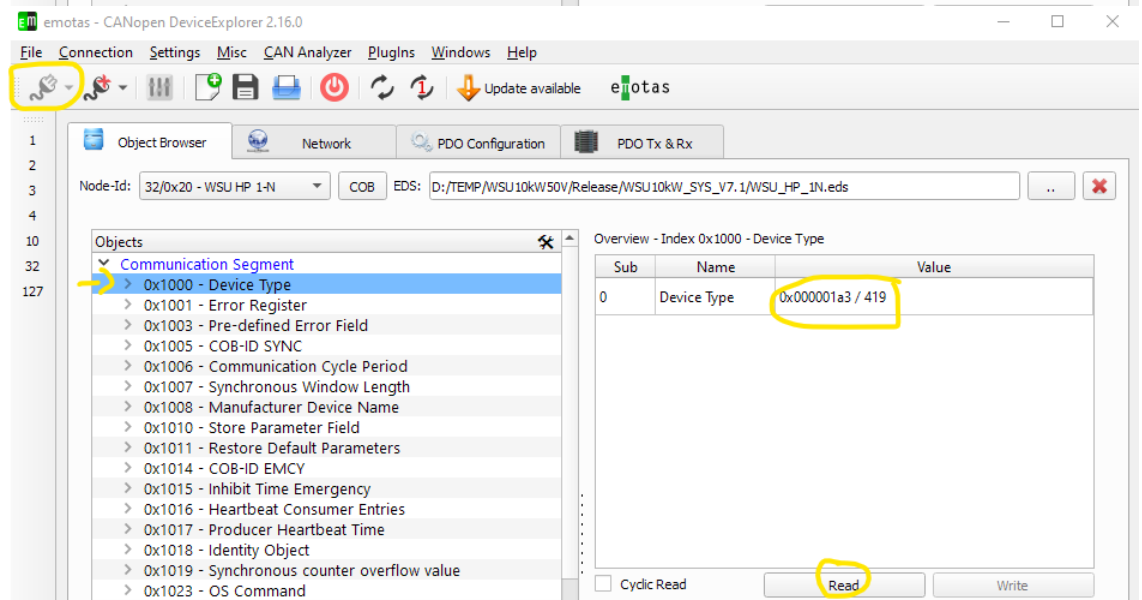
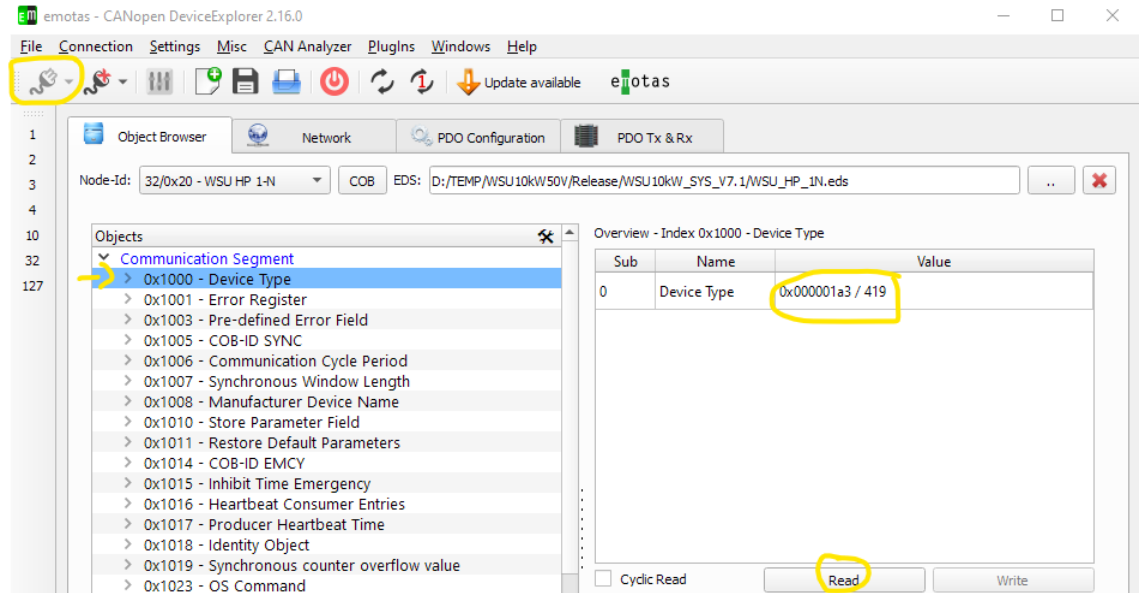
¹ <https://www.peak-system.com/>

² The device firmware is called APL (Application)

3. Set the current Node ID and load the EDS file.

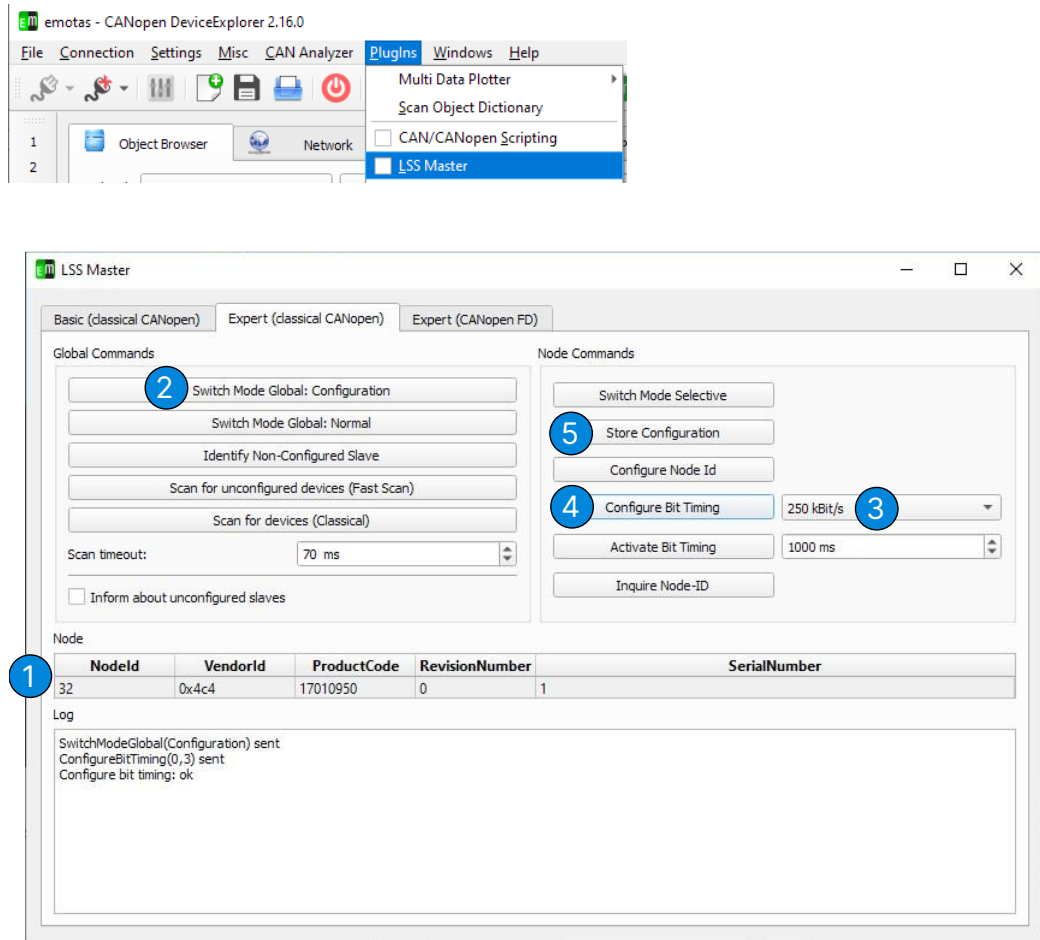


4. Connect the CAN bus and read the Device type to check that the access is possible.

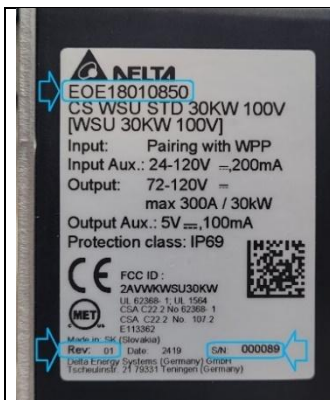


Change the Bitrate

5. Open the LSS Master plug-in.



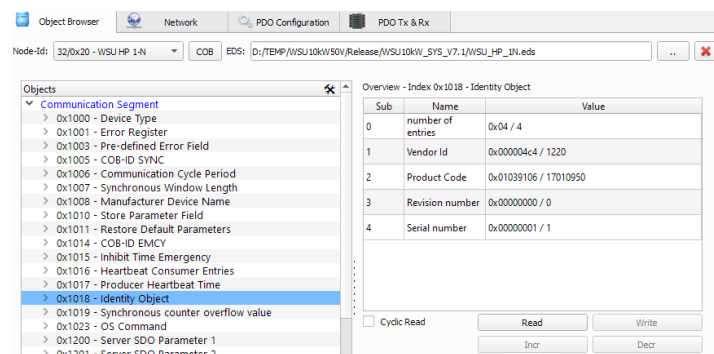
6. Enter the IDs (1).



Part number (without 'EOE', use only the digits.), revision number and serial number are printed on the WSU label.

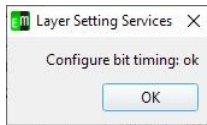
VendorID for Delta Energy Systems IMBU is 0x4C4.

You can optionally read the "Identity Object" from the device via CANopen:



7. Click *Switch Mode Global: Configuration* (2).
8. Select the new bitrate (3).
9. Click *Configure Bit Timing* (4).

The settings will be acknowledged:



10. Click *Store Configuration* (5).

The new Bitrate is now active.

14 Maintenance

This section contains detailed step-by-step instructions necessary to carry out all types of maintenance tasks on the system.

14.1 Safety Instructions

During maintenance, the following warning, cautions and notes must be observed. Refer to [Error! Reference source not found.](#) [Error! Reference source not found.](#).

14.2 Preventive Maintenance

CAUTION: 	Hot Surfaces Make sure that both the pads (WPP and WSU) are free from foreign object to avoid overheating while charging is in progress. Clean the pads as and when needed to avoid danger of overheating.
CAUTION: 	• Make sure to check all the cables (external and PE) for any damages and if necessary replace them. • Only skilled person shall replace the cables.

	Daily Check	Yearly Inspection
WPB	Make sure that the Status LED panel indicates correct function and status: Power LED on, Fault LEDs off, other indicators working as intended.	• Periodic inspection according to the NFPA 70B, EN 50110 or regional/country equivalent is recommended. • The PE/GND stud on the right side of the WPB (PE/GND connection to WPP) can be used as reference point for the protective earth conductivity.
WPP	• Make sure that the Status LED panel indicates correct function and status: Power LED on, Fault LEDs off, other indicators working as intended. • Check for metallic foreign objects on the WPP, if present clear away with a soft brush or similar. • Check the WPP for visible damage. If any damage is detected, discontinue use of the WPP and disconnect it from WPB, refer to section 10.1.4.	Periodic inspection according to NFPA 70B, EN 50110 or regional/country equivalent is recommended.
WSU	• Check for metallic foreign objects on the WSU, if present clear away with a soft brush or similar.	Periodic inspection according to NFPA 70B, EN 50110 or regional/country equivalent is recommended.

- Check the WSU on every vehicle for visible damage. If any damage is detected, discontinue the use of WSU.

14.2.1 General Cleaning

WARNING:



Disconnect the main power supply and wait for 30 min before cleaning WPB, WPP and WSU. High voltages may lead to death of Personnel.

14.2.1.1 Cleaning agents

WARNING:



Cleaning agents should be used with care. Always follow the instructions (for example dilutions) provided in the datasheets of the cleaning agents.

Recommended cleaning agents

- Kärcher VehiclePro Truck Cleaner, acidic RM 804
- Kärcher Autoshampoo 3-IN-1 RM 610

Alternative equivalents are permitted.

For plastic parts only use cleaning agents suitable for cleaning plastic.

14.2.1.2 Cleaning WPB

Make sure to follow the health and safety instructions. Refer to [4 Regulatory Compliances EU](#)

14.2.2 Declaration of Conformity (DoC)

Hereby, Delta Energy Systems (Germany) declares that the radio equipment type 10 kW Wireless Charging System is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: www.deltaww.com.

14.2.3 Radio Equipment

Radio Frequency Information:

13.56 MHz: Wireless Communication (PPL), max. 200 mW

47-63 kHz: Wireless Power Transfer, max. 10 kW

14.3 FCC (USA)

WARNING:


- During charging/operation there will be fields between the pads, human bodies proximity of the pads. Make sure to follow guidance given in section [6.5 EMF Safety](#) the responsibility of the installer to provide keep out restrictions and training to all

Active charging will generate electric and magnetic fields between the pads. The WCS has been designed to minimize stray fields and has been tested as complying with the following standards:

- 47 CFR Part 15.225 in conjunction with ANSI C63.10:2013
- 47 CFR Part 18, Subpart C
- 47 CFR FCC Part 1.1307 (clause (b)(1)(i)(B) and (b)(3)(ii)(B)), KDB 447498 D01 General RF Exposure Guidance v06 KDB 680106 D01 RF Exposure Wireless Charging App v03r01

However, it is still necessary to take precautions to work safely with the WCS.

Operators (if any) must be informed that they could be exposed to EMF, and that they must keep enough distance from the WPP at all times, including when not charging.

ATTENTION:


This WCS complies with part 15 of the FCC subject to the following two conditions:

This device may not cause harmful interference

This device must accept any interference received, including interference that may cause undesired operation

ATTENTION:


This equipment has been tested and found to comply with the requirements for a Class A digital device, pursuant to part 15 of the FCC rules, for operation in the United States.

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 may cause harmful interference in which case the user will be required to correct the interference at his own expense.

ATTENTION:


As defined in FCC document "47CFR Part 15.247", any modifications not expressly approved by the manufacturer could void the user's authority to use the equipment.

14.4 ISED (Canada)

14.4.1 Interference statement

Information in English

This device complies with Innovation, Science and Economic Development Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Informations en français

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, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

14.4.2 Basic RF notice

Information in English

This radio transmitter has been approved by Innovation, Science and Economic Development Canada as meeting the RF exposure requirements for an uncontrolled environment.

Informations en français

Cet émetteur radio a été approuvé par Innovation, Sciences et Développement économique Canada comme respectant les exigences d'exposition RF pour un environnement non contrôlé.

14.4.3 Information according to RSS-102.NS.MEAS Annex C.2.3

This Wireless Charging System is powered down within one second after the load (WSU) has been removed from the charging area.

Ce système de recharge sans fil s'éteint dans la seconde qui suit le retrait de la charge (WSU) de la zone de recharge.

15 System Overview

15.1 System Components

The Wireless Charging System (WCS) is designed to charge the batteries of electric systems wirelessly. This WCS can be used by

vehicles equipped with a battery, which are automated or manually driven, no user interaction is required to charge a battery.

The WCS consists of 3 subsystems.

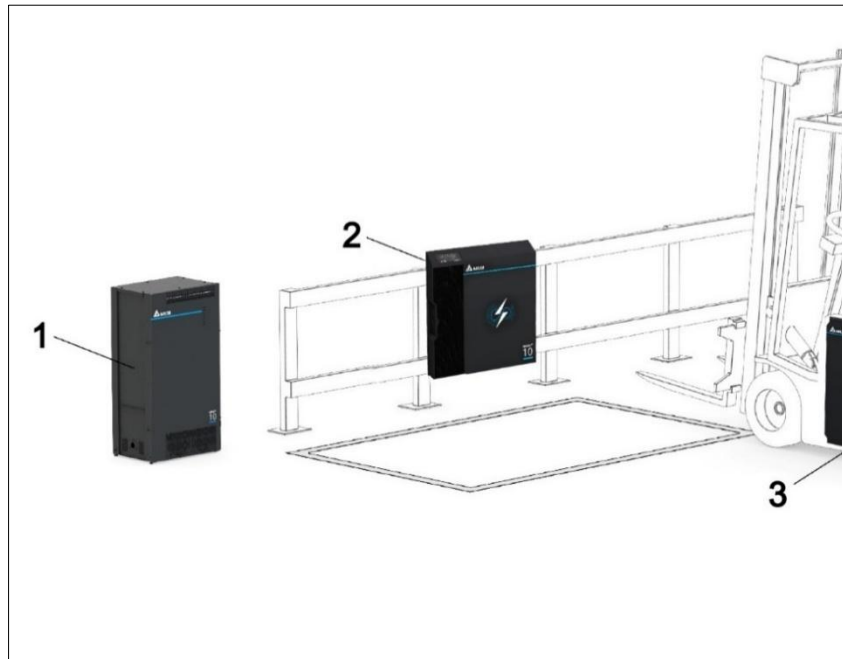


Figure 1 Components of the Wireless Charging System (WCS)

1	Wireless Primary Box (WPB)
2	Wireless Primary Pad (WPP)
3	Wireless Secondary Unit (WSU) available in 2 nominal DC output voltages: 24 VDC and 36/50 V

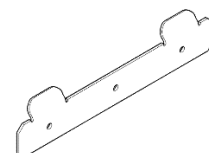
15.2 Scope of Delivery

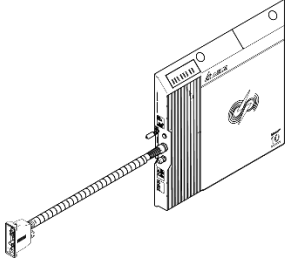
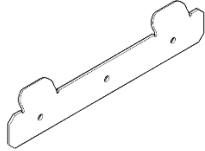
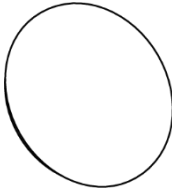
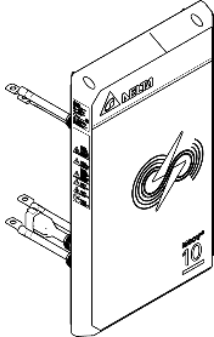
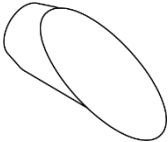
Wireless Primary Box (WPB), for grid connection
Part No: EOE17010813

1

Bracket for WPB
Part No: 3487421901

1



10 kW Wireless Primary Pad (WPP) Part number: EOE17010951		1
Mounting bracket for WPP Part number: 3487517401		1
WPP Plug Part number: 3231163600		4
10 kW Wireless Secondary Unit Part number 10 kW WSU 24 VDC : EOE17011077 Part number 10 kW WSU 36/50 VDC : EOE17010950		1
WSU Plug Part number: 34794013xx		4
	15.3 Wireless Primary Box (WPB) 15.3.1 Overview The Wireless Primary Box (WPB) is a power electronics device which provides the power to be transferred via the Wireless Primary Pad (WPP) to the Wireless Secondary Unit (WSU). The WPB draws power from the industrial grid and converts it to a medium voltage (MV) AC supply which is fed to the WPP. The WPB communicates with the WPP internally, which forms part of the control loop for safe usage. It also provides user interfaces using Ethernet, Status LEDs and an optional Stack Light.	