

EVBox **BusinessLine** 3rd generation

**Installation and commissioning
manual Part A**

EVBox BusinessLine 3rd generation

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1. Introduction

Thank you for choosing the EVBox BusinessLine (3rd Generation), our best-selling charging station with proven technology and reliability. Built to be connected and intelligent, BusinessLine makes going electric at your workplace or business easier than ever.

This Installation and commissioning manual tells you how to install BusinessLine and make it ready to use. Carefully read the safety information before you start.

These instructions are valid for several models of the BusinessLine (3rd Generation) charging station. It is possible that some features and options described may not apply to your charging station.

1.1. Scope of the manual

Keep this manual for the entire life cycle of the charging station.

The installation and commissioning instructions in this manual are intended for qualified installers who can assess the work and identify potential danger.

The user instructions are intended for users of the charging station.

This manual comprises two parts:

- Manual Part A - This part contains the instructions.
- Manual Part B - This part contains the illustrations for the instructions.

You must read both parts of the manual.

All EVBox manuals can be downloaded from www.evbox.com/support.

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1.2. Compatibility

The EVBox BusinessLine (3rd generation) is not compatible with other generations of the BusinessLine charging station. Each hub-satellite installation must consist of the same generation of BusinessLine charging stations.

1.3. Symbols used in this manual

**DANGER:**

Indicates an imminently hazardous situation with a high risk level which, if the danger is not avoided, will cause death or serious injury.

**WARNING:**


Indicates a potentially hazardous situation with moderate risk level which, if the warning is not obeyed, can cause death or serious injury.

**CAUTION:**





Indicates a potentially hazardous situation with a medium risk level which, if the caution is not obeyed, may cause minor or moderate injury or damage to the equipment.

**Note:**

Notes contain helpful suggestions, or references to information not contained in this manual.

	<p>This symbol indicates that the illustrations corresponding to the indicated chapter are to be found in Manual Part B.</p>
<p>1., a. or i.</p>	<p>Procedure that must be followed in the stated order.</p>

1.4. Certification and complianc

	<p>The charging station has been CE-certified by the manufacturer and bears the CE logo. The relevant declaration of conformity may be obtained from the manufacturer.</p>
<p>RoHS Compliant</p>	<p>The charging station complies with the RoHS Directive (RL 2011/65/EU). The relevant declaration of conformity may be obtained from the manufacturer.</p>
	<p>Electrical and electronic appliances, including accessories, must be disposed of separately from the general municipal solid waste.</p>
	<p>Recycling of materials saves raw materials and energy and makes a major contribution to conserving the environment.</p>
	<p>Recycling of materials saves raw materials and energy and makes a major contribution to conserving the environment. Recycle the packaging in accordance with national regulations.</p>

2. Safety

2.1. Safety precautions

**DANGER:**

Not following the installation and user instructions given in this manual will result in the risk of electric shock, which will cause severe injury or death.

- Read this manual before installing or using the charging station.

**DANGER:**

Installation, servicing, repair and relocation of this charging station by a non-qualified person will result in the risk of electric shock, which will cause severe injury or death.

- Only a qualified electrician is permitted to install, service, repair and relocate the charging station.
- The user must not attempt to service or repair the charging station as it does not contain user-serviceable parts.
- Local regulations may be applicable and may vary depending on your region / country of use. The qualified electrician must always ensure that the charging station is installed according to the local regulations.

**DANGER:**

Working on electric installations without proper precautions will result in the risk of electric shock, which will cause severe injury or death.

- Switch off input power before installing the charging station.
- Do not switch on the charging station if it is not fully installed or not secure.
- Do not install a charging station that is faulty or has a noticeable issue.

**DANGER:**

Operating the charging station when it indicates an error state, or when the charging station or the charging cable have cracks, show extensive wear, or other physical damage, will result in the risk of electric shock, which will cause severe injury or death.

- Do not operate the charging station if the enclosure or an EV connector is broken, cracked, open, or shows any other indication of damage.
- Do not operate the charging station if a charging cable is frayed, has broken insulation, or shows any other indication of damage.
- In the event of danger and/or an accident, a qualified electrician must immediately disconnect the electrical supply from the charging station.
- Contact your installer if you suspect that the charging station is damaged.

**DANGER:**

Some electric vehicles release hazardous or explosive gasses when charging which will result in the risk of explosion, which will cause severe injury or death.

- Refer to your vehicle user manual to check if your vehicle releases hazardous or explosive gases when charging.
- Follow the instructions given in the vehicle user manual before choosing the location of the charging station.

**DANGER:**

Extensive exposure of the charging station to water or handling the charging station with wet hands will result in the risk of electric shock, which will cause severe injury or death.

- Do not direct powerful jets of water toward or onto the charging station.
- Never operate the charging station with wet hands.
- Do not put the charging plug into any liquid.

**WARNING:**

Installing the charging station during wet environmental conditions (for example rain or fog) can result in the risk of electric shock and damage to the product, which can cause severe injuries or death.

- Do not install or open the charging station during wet environmental conditions (for example rain or fog).

**WARNING:**

Incorrect use of the charging station will result in the risk of electric shock, which may cause injury or death.

- Make sure that the contact area of the charging plug is free from dirt and moisture before starting a charging session.
- Make sure that the charging cable is positioned so that it will not be stepped on, tripped over, driven over or otherwise subjected to excessive force or damage. Where applicable, make sure that the charging cable is correctly stowed when it is not in use, making sure that the charging plug does not touch the ground.
- Only pull on the charging plug hand grip and never on the charging cable itself.
- Keep the charging plug away from heat sources, dirt and water.

**WARNING:**

Using adapters, conversion adapters or cord extensions with the charging station may result in technical incompatibilities and can result in damage to the charging station, which will cause injury or death.

- Use this charging station to charge compatible electric vehicles only. Refer to the charging station specifications in the charging station installation manual for details.
- Refer to your vehicle user manual to check if your vehicle is compatible.

**WARNING:**

Exposure of the charging station or the charging cable to heat or flammable substances can result in damage to the charging station, which will cause injury or death.

- Make sure that the charging station or the charging cable never come into contact with heat.
- Do not use explosive or readily flammable substances near the charging station.

**WARNING:**

Using the charging station under conditions not specified in this manual may result in damage to the charging station, which may cause injury or death.

- Only use the charging station under the specified operating conditions in this manual.

**WARNING:**

Working on electrical installations without using personal protective equipment will result in the risk of injury.

- Use personal protective equipment such as eye protection, cut-resistant gloves and non-slip safety shoes to prevent personal injuries.

**WARNING:**

Fire safety:

- When safe to do so, switch off power to the equipment that is burning or endangered by fire.
- Do not use water to extinguish electrical installations and equipment that have a live power supply.
- To extinguish a charging station, use an extinguisher that is specified for use on electrical equipment with a rating of up to 1 kV.

**CAUTION:**

Charging a vehicle with the charging cable not completely extended may result in overheating of the cable, which can damage the charging station.

- Before you connect the charging cable to the vehicle fully unwind the cable. Make sure that the charging cable has no overlapping loops.

**CAUTION:**

Putting fingers into or leaving other objects inside the plug port (for example, during cleaning) may cause injury or can damage the charging station.

- Do not put your fingers into the plug port.
- Do not leave objects inside the plug port.

**CAUTION:**

The use of devices with (electro) magnetic properties in the vicinity of the charging station may damage the charging station and affect its operation.

- Keep and use (electro) magnetic devices at a safe distance from the charging station.

**CAUTION:**

Not taking precautions against ESD (Electrostatic discharge) can damage electronic components in the charging station.

- Take the necessary precautions against ESD before touching electronic components.

2.2. Moving and storage precautions

Obey the following guidelines when moving and storing BusinessLine:

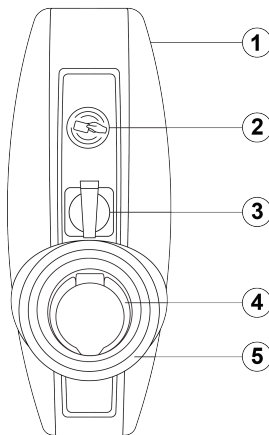
- Disconnect input power before removing the charging station for storage or relocation.
- Only transport and store the charging station in its original packaging. No liability can be accepted for damage incurred when the product is transported in non-standard packaging.
- Store the charging station in a dry environment in the temperature and humidity ranges given in the specifications.

3. Product features

The charging station is compatible with all Mode 3 electric vehicles and is designed for both indoor and outdoor use. The charging station can be connected to a Charging Management Platform (CMP).

3.1. Description

Description



1. Charging station

The charging station can either be a hub station or a satellite station, and in any installation there must be one hub station.

- A hub station includes the charge card reader, LED ring, cellular modem, communication module, and charging cable socket.
- A satellite station includes the charge card reader, LED ring and charging cable socket.

The station is mounted on a ground pole, a wall pole, or directly to a wall.

2. Charge card reader

This is the area where you scan your charge card or key fob. Depending on configuration settings, the charging station reads the data from your charge card or key fob to start or stop a charging session.

3. CEE 7/5 (Type E) socket

Depending on the model, the hub charging station can also include a CEE 7/5 (Type E) socket. A double socket hub-satellite charging station has two CEE 7/5 (Type E) sockets, one on each side.

4. Charging cable socket

Connect the connector of a type 2 charging cable to the socket.

5. LED ring

The LED ring indicates the status of the charging station.

Configuration

BusinessLine charging stations come in the following configurations:

- Single socket, communications hub.

3. Product features

- Single socket, satellite.
- Double socket, one communications hub and one satellite.
- Double socket, two satellites.

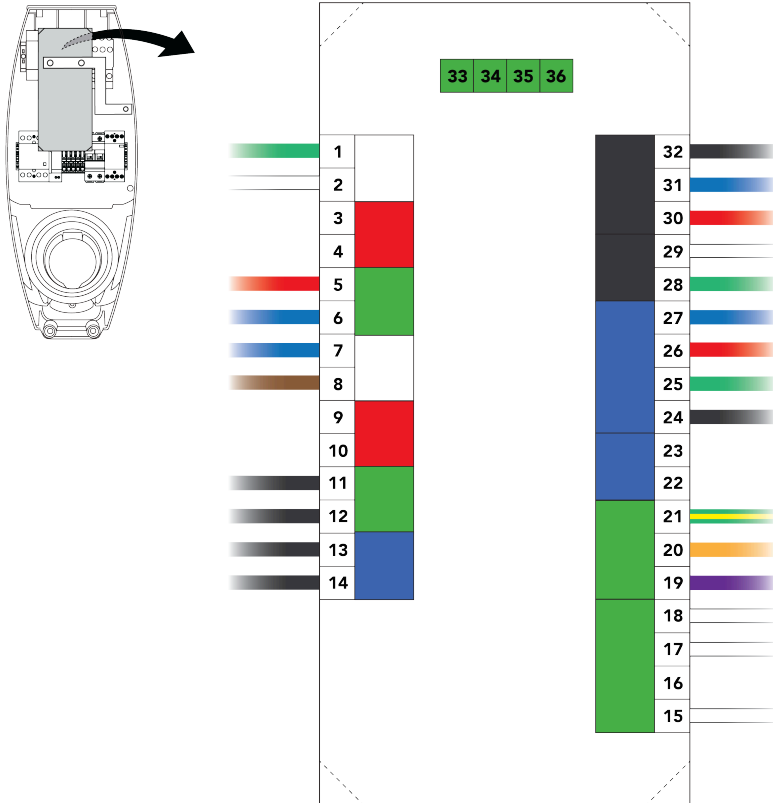
One hub station can be connected to a maximum of 19 satellite stations. Cluster load balancing can be established over all stations in the hub-satellite installation. This optimizes power usage and lets more vehicles charge simultaneously should power limitations exist.

3.2. Technical specification

Feature	Description
Technical features	
Charging capacity per socket	Maximum 7.4 kW or 22 kW, depending on installation and set-up.
Socket type	Type 2 socket. Additional CEE 7/5 (Type E) socket, depending on the model.
Number of sockets	1 (single socket charging station) or 2 (double socket charging station).
Output power per type 2 socket	1-phase or 3-phase, 230 V – 400 V, 32 A.
Output power per CEE 7/5 (Type E) socket	230 V, 16 A, 3.7 kW.
Connection capacity	1-phase or 3-phase, 50 Hz, wire sizes 2.5 – 10 mm ² .
Upstream installation protection	See Power supply requirements on page 18 .
Operating temperature range	-25 °C to +45 °C.
Humidity (non-condensing)	Max. 95%.
Communication	Hub station: <ul style="list-style-type: none"> • 4G LTE-FDD CAT1 (B1/3/7/8/20) or 3G WCDMA (Band 1/8) / GSM (900/1800 Mhz) dual band. • RFID reader. Satellite station: <ul style="list-style-type: none"> • RFID reader.
Communication protocol	OCPP 1.5S / 1.6J.

Feature	Description
Physical features	
Protection	IP54, IK10.
External cover	Polycarbonate.
Maximum installation altitude	2000 m above sea level.
Dimensions (mm)	600 x 255 x 410 mm (double socket).
	600 x 255 x 205 mm (single socket).
Weight (kg)	14 kg (double socket).
	8 kg (single socket).
Mounting	Double socket: Combipole in or on the ground, or on a wall Combipole. Single socket: Combipole in or on the ground, or on a Wall Spacer. See Choose mounting on page 16 .
Standard colors	RAL 7016 (dark gray), RAL 9016 (white).
Product classificatio	
Power supply input	EV supply equipment permanently connected to AC supply network.
Power supply output	AC EV supply equipment.
Normal environmental conditions	Outdoor use.
Access	Equipment for locations with unrestricted access.
Mounting method	Stationary equipment, wall-mounted or pole-mounted.
Protection against electric shock	Class 1 equipment.
Charging modes	Mode 3.

3.3. Controller connections



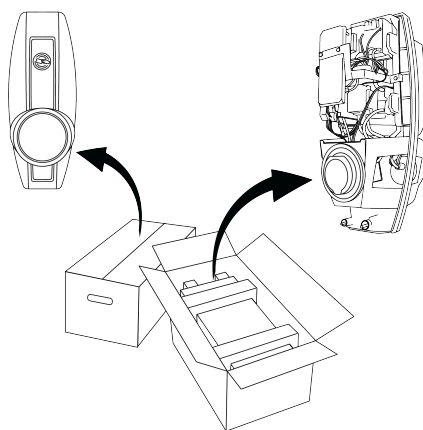
kWh meter connections

Pin	Description
1	B (ABB B23 and EV3 kWh meters) /D (SAIA S-bus kWh meter)
2	A (ABB B23 and EV3 kWh meters) D (SAIA S-bus kWh meter)

Other connections

Pin	Description	Pin	Description	Pin	Description
3	TypeB 6 mA RCD input	15	12 VDC	27	Blue LED ring
4	DC RCD input	16	--	28	RS485 A (D)
5	12 VDC	17	Temperature sensor	29	RS485 B (/D)
6	0 VDC	18	Ground	30	Lock motor, red wire
7	Detection for ZE Ready	19	Control pilot	31	Lock motor, blue wire
8	230 V, welded contact	20	Proximity pilot	32	Lock motor, black wire
9	Relay for ZE Ready	21	Ground	33	0 VDC
10	Voltage detection	22	--	34	RS485 for external satellite
11	Relay 16 A	23	--	35	RS485 for external satellite
12	230 VAC	24	12 VDC LED ring	36	12 VDC
13	Relay 32A	25	Green LED ring		
14	230 VAC	24	Red LED ring		

3.4. Delivered components



Item	Description
Charging station	EVBox BusinessLine unit (single socket hub or single socket satellite, or double socket hub with satellite, or double socket 2x satellites).
Cover *	1x EVBox BusinessLine cover (for a single socket). 2x EVBox BusinessLine covers (for a double socket).
Cover label set	Information and usage labels to be applied to the cover after installation.
M6 bolt and washer	Double socket station only: To ground the mounting pole to a double socket charging station.
Connector set for satellite models	Satellite station only: To terminate the RS485 connector of the last satellite charging station in a hub-satellite installation.
Hex key, 1x	To open the cover.
Instructions folder	Installation and commissioning manual, security code and station ID, and charge card.

* On models with a CEE 7/5 (Type E) socket, the cover is installed on the charging station.

3.5. Optional components

Depending on the installation, the following components can also be required. Contact your supplier to order the optional components.



Note:

The installer is responsible for supplying the power cables, data cables and any minor items required for the installation.

Component	Part number
EVBox Combipole (in the ground).	290150
EVBox Combipole (floor mount).	290305
EVBox Combipole (wall mounted, for a double socket station only).	290600
EVBox Adapter Kit to install a single socket station on a ground or floor-mount Combipole.	290165

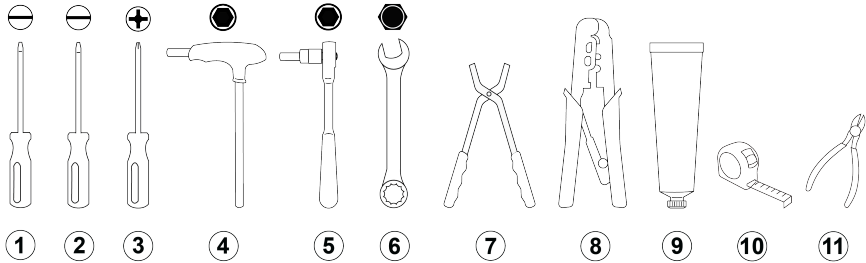
Component	Part number
EVBox Wall spacer to install a single socket station directly on a wall.	290190

4. Installation instructions

4.1. Prepare for installation

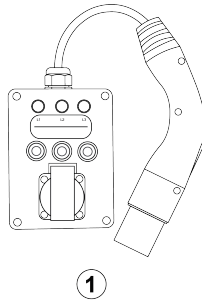
4.1.1. Tools and materials

Tools and materials required



- | | |
|--|-----------------------------------|
| 1. Screwdriver, flat blade, 4 mm. | 6. Wrench, 8 mm. |
| 2. Screwdriver, flat blade, 8 mm. | 7. Wire stripper (power cable). |
| 3. Philips screwdriver, PH2. | 8. Wire stripper (network cable). |
| 4. Hex keys, 4 mm, 5 mm and 6 mm. | 9. Silicone grease. |
| 5. Socket wrench with 4 mm, 5 mm and 6 mm hex sockets, ¼ inch drive. | 10. Tape measure. |
| | 11. Wire cutter. |

Tools - optional



1. EVBox test box with fixed cable, EVBox part number 462322.

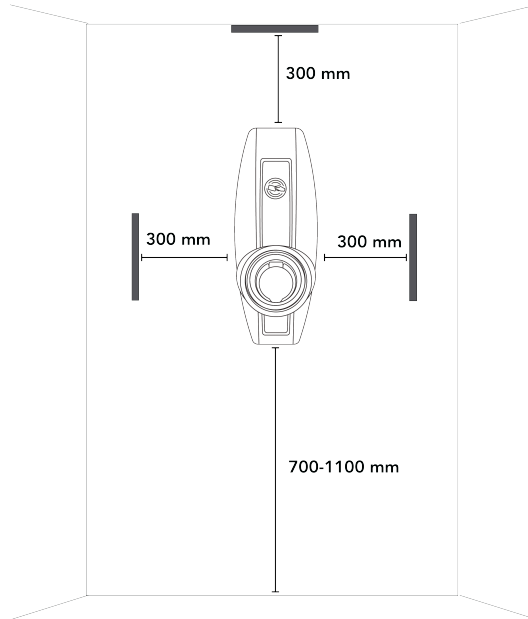
4.1.2. Plan for installation

The following recommendations are a guide to help you plan the installation of the charging station.

Choose location

- Choose a location that provides protection from damage (for example, by collision or water), and from direct sunlight.
- The minimum free space around the charging station is 300 mm.

- The location must allow the charging cable to remain within its bending tolerance.


Note:

The illustration indicates a standard installation height. Observe and comply with the local accessibility regulations.

Pre-installation checklist

- The installation will be in accordance with IEC 60364 and any applicable local regulations.
- All necessary permits are obtained from the local authority that has jurisdiction.
- The existing electrical load has been calculated to find the maximum operating current for the charging station installation.
- A miniature circuit breaker (MCB) and residual current device (RCD) are installed upstream and have ratings that correspond to the local power supply as well as to the required charging power.
- The correct specification of power supply cable has been routed to the installation area, and there is sufficient cable length to strip and connect the wires.
- The power supply cable remains within its bending tolerance during and after installation.
- All cables match the specifications for the charging station that will be installed.
- The required tools and materials are available on site. See [Tools and materials on page 15](#).

4.1.3. Choose mounting

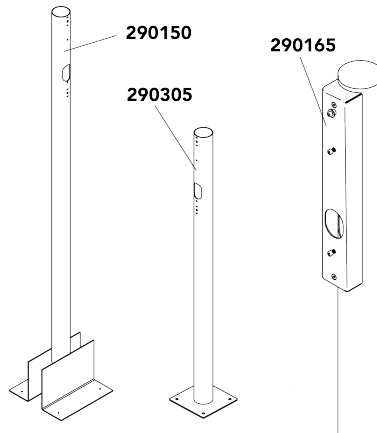
EVBox BusinessLine charging stations can be mounted in the following ways:

Pole mounting in the ground or on the floor

BusinessLine charging stations, both single and double socket versions, can be mounted on an EVBox Combipole set into the ground, or on a EVBox Combipole fixed to the floor (see [Optional components](#)

on page 13).

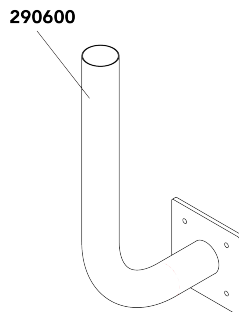
- The double charging station can be mounted directly onto a Combipole without additional parts or accessories.
- The single charging station is attached to a Combipole with the BusinessLine Adapter Kit.



Pole mounting on a wall

Double socket BusinessLine charging stations can be mounted on an EVBox Combipole mounted on a wall (see [Optional components on page 13](#)). Wall mounting has the following requirements:

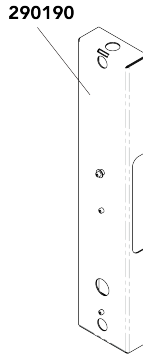
- The wall must be able to hold a load of at least 70 kg.
- Mount the Combipole onto a vertical surface so the bottom of the charging station is between 70 cm and 110 cm above ground level.



Wall mounting

A single charging station can be mounted on an EVBox Wall Spacer fixed directly to a wall (see [Optional components on page 13](#)).

- The wall must be able to hold a load of at least 70 kg.
- Install the wall spacer at a height of between 900 and 1200 mm above ground level.



4.1.4. Power supply requirements



DANGER:

Connecting the charging station to the power supply other than as specified in this section can result in incompatibility of the installation as well as the risk of electric shock, and thus cause damage to the charging station, and injury or death.

- Only connect the charging station to a power supply in a configuration that is specified in this section.

Earthing system	TN-system	PE-cable.
	TT-system IT-system	Earth electrode, installed separately.
Power input	1-phase	230 V \pm 10% 50/60 Hz.
	3-phase	400 V \pm 10% 50/60 Hz.

<p>MCB (Miniature Circuit Breaker) in power supply cabinet</p>	<p>16 A installation: use a 20 A MCB, C-characteristic. 32 A installation: use a 40 A MCB, C-characteristic.</p> <p>Note:</p> <ul style="list-style-type: none"> • The installation, including the MCB, must be in accordance with IEC 60364 and any applicable local regulations. • The MCB should match the amperage settings of the charging station and the maximum current available for the station, considering MCB manufacturer specifications. • Consider the availability of additional sources of power (for example solar) together with a dynamic load balancing system (optional).
<p>RCD (Residual Current Device) in power supply cabinet</p>	<p>40 A, 30 mA AC type RCD Type A-EV or Type B, with 6 mA DC leakage detection.</p> <p>Note:</p> <ul style="list-style-type: none"> • The installation, including the RCD, must be in accordance with IEC 60364 and any applicable local regulations.

**Note:**

For a TT or IT electric grid with 230 V from line to line, the charging station must be installed with one phase being connected to terminal L1 and the other phase being connected to terminal N.

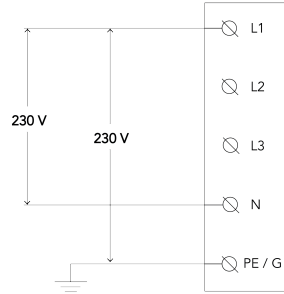
Power supply wiring

The table below shows how to connect the power supply to the charging station, depending on the specifications of the power supply cabinet and the model of the charging station.

<p>Option 1: 400 V 3-phase with neutral</p> <p>For 3-phase use of a Wye-connected secondary, all three phases (L1, L2 and L3) and neutral must be connected. Each phase voltage must measure 230 V to neutral.</p>	<p>The diagram illustrates a 400 V 3-phase system with a neutral. It shows a vertical busbar with terminals L1, L2, L3, N, and PE/G. The voltage between L1 and L2 is 400 V. The voltage between L2 and L3 is 230 V. The voltage between L3 and N is 230 V. The PE/G terminal is connected to ground.</p>
---	---

Option 2: 230 V 1-phase with neutral

For 1-phase use of a Wye-connected secondary, only a single phase (L1 or L2 or L3) and neutral on the grid must be connected to the L1 and N on the charging station. This phase voltage must measure 230 V between line and neutral.

**4.1.5. Route power supply cables**

Use minimum 2.5 mm² and maximum 10 mm² copper wire, depending on the power rating and distance between the power supply cabinet and the charging station. The voltage drop must not exceed 5% (it is advisable to have a maximum allowable voltage drop of 3%).

Route the power supply cables to the location where the charging station will be installed. Make sure of the following:

- There must be enough cable for it to extend at least 500 mm out of an installed Combipole or Wall Spacer.
- There must be enough cable for it to move and bend safely during installation of a Combipole.

**Note:**

The power cable enters the station via the backplate for single stations, and through the top of the Combipole for double stations. When a single socket charging station is installed on a Wall Spacer, the recommended cable entry is through a cable gland in the base of the charging station.

The maximum power rating per connector is specified below.

Power per connector	Input type	Output current
Single socket charging station		
7.4 kW	1x 1-phase 230 V, 32 A	1x 32 A
22 kW	1x 3-phase 400 V, 32 A	1x 32 A
Double socket charging station		
7.4 kW	2x 1-phase 230 V, 32 A	2x 32 A
22 kW	2x 3-phase 400 V, 32 A	2x 32 A

4.1.6. Optional: Hub-satellite installations

In a hub-satellite installation, one hub station can connect a series of satellite stations to a Charging

Management Platform (CMP). A hub-satellite installation has the following advantages:

- All stations in the hub-satellite installation are managed by one hub station.
- Cluster load balancing across all stations in the installation allows the available power from a single power source to be shared across all stations, depending on the charge demand of each EV that is charging.
- The hub station can be connected to a dynamic load balancing system. See [Optional: Dynamic load balancing on page 21](#) for more information.

In a hub-satellite installation, one hub station can connect a series of satellite stations to a Charging Management Platform (CMP). A hub-satellite installation has the following advantages:

- All stations in the hub-satellite installation are managed by one hub station.
- Cluster load balancing across all stations in the installation allows the available power from a single power source to be shared across all stations, depending on the charge demand of each EV that is charging.
- The hub station can be connected to a dynamic load balancing system. See [Optional: Dynamic load balancing on page 21](#) for more information.

A hub-satellite installation can consist of up to 19 satellite charging stations connected to a hub charging station. Route a SFTP Category 5 or 6 network cable between each station, making sure that there is sufficient cable length to connect the cable to the each charging station. For outdoor installations, use a UV stabilized network cable. See [Optional: Connect hub-satellite network cables on page 24](#) for cable connection instructions.

4.1.7. Optional: Phase rotation

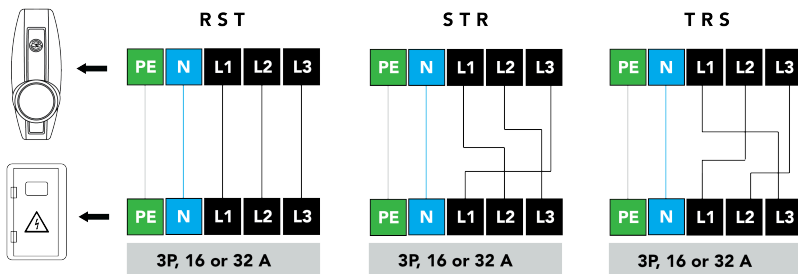
For charging stations that connect to a 3-phase supply in a hub-satellite installation, to avoid overloading the first phase with one-phase electric vehicles we recommend rotating the phases as shown below.



Note:

If phase rotation is used, you must configure the correct phase rotation settings in the Charging Management Platform (CMP).

Single 3-phase 400 V AC 16 or 32 A power cable



4.1.8. Optional: Dynamic load balancing

The charging station installation can be connected to a dynamic load balancing system that monitors the power consumption of all electrical appliances using the same power source. The dynamic load balancing system supplies a control signal to the station to regulate the power that the station is using,

so safely balancing the total power consumption from the power source within preset limits. In a hub-satellite installation, the hub station regulates the connected satellite stations.

Route a SFTP Category 5 or 6 network cable from the dynamic load balancing system where the power is measured to where the station will be installed, making sure that there is sufficient cable length to connect the cable to the station. For outdoor installations, use a UV stabilized network cable. See [Optional: Connect dynamic load balancing network cables on page 25](#) for cable connection instructions.

4.2. Install charging station

When the installation area is prepared and the charging station mounting systems are installed, you can then install and connect the charging station.

Compatibility

The EVBox BusinessLine (3rd generation) is not compatible with other generations of the BusinessLine charging station. Each hub-satellite installation must consist of the same generation of BusinessLine charging stations.

4.2.1. Install the station



See the corresponding illustrations in manual B.

1. If the cover is installed, remove the cover or covers from the charging station.



Note:

A double socket charging station has two covers.

- a. Use the hex key (supplied) or a socket wrench with a hex socket to remove the screws at the bottom of the charging station.
- b. Open the cover from the bottom and lift it off the charging station.
- c. Put the cover front side up in a place where it cannot be damaged.



CAUTION:

On models with an CEE 7/5 (Type E) socket, the cover is permanently attached to the charging station by the wiring to the CEE 7/5 (Type E) socket. During installation, take extra care to prevent damage to the cover and the wiring.

2. **For a double socket charging station:** Mount on a ground, floor or wall Combipole.

- a. Lift the double socket charging station onto the Combipole, feeding the power cables and optional RS485 communication cables through the back plate of the station.



Note:

A double socket charging station can have one shared power cable or two separate power cables, and may have RS485 communication cables for hub-satellite and dynamic load balancing communication. During installation, feed the power and RS485 communication cables through the backplate of the charging station to which the cables will be attached.

- b. Make sure that the charging station slides fully down the pole to rest on the internal stop inside the charging station.
- c. Route the ground cable from the ground terminal block to the Combipole grounding point.

- d. Align the grounding point in the station with the pre-drilled grounding hole in the Combipole. Connect the ground cable to the grounding point with the 4 mm bolt and washer (supplied).
- e. Tighten the clamps with a hex key to secure the charging station on the Combipole.

3. For a single socket charging station: Mount on an Adapter Kit or on a Wall Spacer



Note:

The mounting of the station on an Adapter Kit or a Wall Spacer is the same.

- The Adapter Kit is used to mount the station on a Combipole.
- The Wall Spacer is used to mount the station on a wall.

- a. Install the EVBox Adapter Kit on the Combipole, or install the Wall Spacer on the wall (see [Optional components on page 13](#)). Adjust three bolts and washers on the Adapter Kit or Wall Spacer to the correct distance to engage with the backplate of the station.
- b. Lift the single socket charging station onto the Adapter Kit or Wall Spacer, feeding the power cables and optional RS485 communication cables into the station. Tighten the three bolts to secure the charging station to the Adapter Kit or Wall Spacer.



Note:

When a charging station is installed on a wall, the recommended cable entry is through a cable gland in the base of the charging station.

- c. When the cable gland on the base of the charging station is not used, install a sealing plug then tighten the gland to ensure that the IP code for the charging station is maintained.

4.2.2. Connect power cables



See the corresponding illustrations in manual B.

The connection of the power input cable to the charging station depends on the model, as shown in the following table:



Note:

Use minimum 2.5 mm² and maximum 10 mm² copper wire, depending on the power supply available and the distance from the power supply cabinet.

Power per connector	Input type	Power cable connection
Single socket charging station		
7.4 kW	1x 1-phase 230 V, 32 A	Terminal block
22 kW	1x 3-phase 400 V, 32 A	Terminal block
Double socket charging station		

Power per connector	Input type	Power cable connection
7.4 kW	2x 1-phase 230 V, 32 A	Terminal block
22 kW	2x 3-phase 400 V, 32 A	Terminal block

- Optional: If more access to connect the power wires is required, remove one PH2 screw and move the controller and bracket to gain access to the terminal blocks.

**Note:**

It is not necessary to disconnect the wires from the controller.

- Cut the power supply cable and strip the outer sheath so the cable and its wires will have sufficient length to connect the wires to the terminal blocks in the station.
- Strip the power wire ends. When stranded wires are used, install wire end sleeves with a ferrule length of 12-15 mm (0.47-0.60 in) and apply a square crimp for optimal fit into the terminal blocks.
- Connect the wires of the power cable to the input terminal blocks.

**Note:**

When multiple charging stations are connected to one power supply cabinet, consider using phase rotation (see [Optional: Phase rotation on page 21](#)).

- Pull on each wire to make sure it is correctly connected. The indicator on the terminal block must be in the locked position.
- Where necessary, secure the power supply cable and wires with one or more cable ties.
- Optional: If the controller and bracket were moved for access, move the controller and bracket back to the correct position. Secure the bracket using one PH2 screw.

4.2.3. Optional: Connect hub-satellite network cables



See the corresponding illustrations in manual B.

In a hub-satellite installation, the hub charging station contains the communication module, and it communicates with the satellite charging stations using a network cable. The network cables are attached in series between RS485 connections on the controller of the hub and each satellite (see [Controller connections on page 11](#) for a list of the connections on the controller).

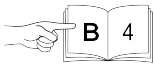
- Use a RS485 connector, 2-pin, black, for each RS485 connection.
- Use SFTP Category 6 network cable suited to the RS485 protocol for the data connection.
- Use the green/green-white twisted pair of wires for the RS485 connections.
- Connect the stations together in series network.
- One hub station can connect a maximum of 19 satellite stations to a Charging Management Platform (CMP).
- In a double socket station, the internal RS485 connection between the hub and satellite (or satellite and satellite) is already in place.
- Always terminate the hub-satellite network with a 120 Ω resistor (see [Delivered components on page 12](#)) on the black RS485 connector of the last station in the series.
- For correct operation of dynamic load balancing, a hub-satellite installation must be connected

from a single power cabinet. If clusters of stations are powered from different power cabinets then each cluster must be a separate hub-satellite installation.

- A star-shaped or T-shaped network will not work because reflections can occur in the network cable.
- In a hub-satellite installation, if one or more LED rings constantly flash red then there is a crossed connection in one of the satellite RS485 connections.

1. Connect the hub-satellite network cables in series.
2. Make sure that the hub-satellite network has the correct layout. RS485 data communication configurations in a Star-shaped or T-shaped network will not function correctly because signal reflections can occur in the network.

4.2.4. Optional: Connect dynamic load balancing network cables



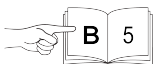
See the corresponding illustrations in manual B.

Route the RS485 network cable from the power supply cabinet to the communication module in the hub charging station. The network cable is connected to the green connector on the communication module in the hub station.

- Use a RS485 connector, 2-pin, white, for the RS485 connection.
- Use SFTP Category 6 network cable suited to the RS485 protocol for the data connection.
- Use the blue/blue-white twisted pair of wires for the RS485 connections.
- For correct operation of dynamic load balancing, a hub-satellite installation must be connected from a single power cabinet. If clusters of stations are powered from different power cabinets then each cluster must be a separate hub-satellite installation.

Connect the dynamic load balancing network cables to the communication module.

4.2.5. Install cover



See the corresponding illustrations in manual B.

1. In the station, make sure that the main power switch and the circuit breaker for the optional CEE 7/5 (Type E) socket are switched on.
B* Only on models with a CEE 7/5 (Type E) socket.
2. Install the cover:
 - a. In the station, make sure that the wiring around the socket does not touch the socket lock.
 - b. Apply silicone grease to the seal around the charging station frame and the LED ring seal to provide protection against water and dirt.

- c. Put the top of the cover over the top edge of the charging station frame and then pull the cover downwards.
 - Make sure that no wires are trapped around the edge of the cover.
 - To maintain the IP code, make sure that the cover locks onto the frame and the rubber seals are in position.

**Note:**

A double socket charging station has two covers.

- d. Tighten the bolts at the bottom of the cover using a 5 mm hex key or a socket wrench with a 5 mm hex socket.
- e. For a double charging station install the second cover in the same way.

3. Install a cover label set on each cover.

**Note:**

On a charging station with a CEE 7/5 (Type E) socket, the cover label set is already installed.

4. In the power supply cabinet, switch on electrical power to the charging station. The station powers up and runs the start-up sequence. The station emits a short, clear tone when power is connected.

The charging station is ready for commissioning.

4.3. Commission EVBox BusinessLine

Commissioning the charging station connects the station to a Charging Management Platform (CMP). In a hub-satellite installation, only the hub charging station is connected to the CMP, with the satellite stations connected through this hub using RS485 data communication.

One hub station can connect a maximum of 19 satellite stations to a CMP. The hub uses a pre-programmed SIM to connect to the CMP through a cellular network.

**Note:**

Most Charging Management Platforms (CMP) will discover the charging station automatically when the station has booted up after power is switched on. If the CMP does not discover the station, switch off power, register the station at the CMP, then switch on power again.

1. Activate the station online on the CMP website or by using the CMP-specific app. Contact the Charging Point Operator (CPO) for details about the charging station activation procedure. For stations connected to the EVBox CMP, the following data is required:
 - Charging station ID (hub station only).
 - Security code (hub station only).
 - Address.

**Note:**

The station owner must activate the station on the selected CMP, or give express permission for the installer to activate the station. Activation requires registration and acceptance of terms and conditions of the CMP.

2. If the power has not been switched on, switch on electrical power to the charging station. The station powers up and runs the start-up sequence. The station emits a short, clear tone when power is connected.

3. Operate the charging station using an electric vehicle (EV) or the EVBox test box with fixed cable to confirm correct operation. For a hub-satellite installation, operate each connector in the installation to confirm correct operation.

The charging station is connected to a CMP and is ready to use.

5. Operation instructions

5.1. Start and stop a charging session

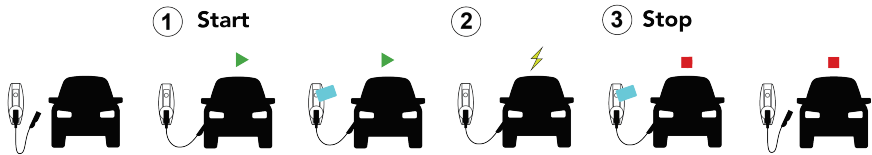
1. Start charging

- Fully unwind the charging cable, then plug the charging cable into your vehicle and the charging station.
- If you use a charge card or key fob, hold it in front of the reader on the charging station to start charging.*

2. The vehicle is charging.

3. Stop charging.



- If you use a charge card or key fob **, hold it in front of the reader on the charging station to stop charging.*
- Unplug the charging cable from your vehicle and the charging station.








* When the charging station is configured to only accept charge cards or key fobs.

** You must use the same charge card or key fob that you used to start the charging session.

5.2. LED ring indications

LED ring color	What it means	What to do
 <p>LED ring off or green.</p>	<p>The charging station is in standby mode, ready for use.</p> <p>For charging stations that do not operate with a RFID card, the LED ring is off in standby mode.</p>	<ul style="list-style-type: none"> • Plug the charging cable into your vehicle and the charging station. • Start the charging session using a charge card or key fob.
 <p>LED ring flashing green.</p>	<p>The charge card or key fob is being authorized.</p>	<p>Wait until the LED ring shows blue.</p>

LED ring color	What it means	What to do
 LED ring blue.	The charging station is charging the vehicle.	<ul style="list-style-type: none"> Let the vehicle charge. You can stop charging at any time.
 LED ring yellow.	The vehicle is fully charged.	<ul style="list-style-type: none"> Stop the charging session using the charge card or key fob that was used to start the charging session. Unplug the charging cable from your vehicle and the charging station.
 LED ring flashing yellow.	Charging session is in a queue (applicable for cluster load balancing in a hub-satellite installation only).	<ul style="list-style-type: none"> Wait. When power becomes available, charging will start or resume and the LED ring will show blue. You can stop charging at any time.
 LED ring red.	An error has occurred.	Check Troubleshooting on page 29 for a solution.
 LED ring flashing red.	The charge card or key fob is not authorized.	<ul style="list-style-type: none"> Authorize the user. Contact the charge card service operator if necessary.
	A satellite charging station has become disconnected from the hub charging station.	Check Troubleshooting on page 29 for a solution.

5.3. Troubleshooting

This is a general troubleshooting guide listing the most common issues. Troubleshooting must only be done by a qualified electrician unless otherwise stated. If you are not able to solve an issue, visit www.evbox.com/support for further help from our service pages and support team.



DANGER:

Service and repair of this charging station by a non-qualified person will result in the risk of electric shock, which will cause severe injury or death. Only a qualified electrician is permitted to service and repair the charging station.

Problem	Possible cause	Solution
The charging station does not react.	No power to the charging station.	<ul style="list-style-type: none"> • Check that the residual-current device and circuit breaker on the main power supply panel are on. • Switch off the main power supply, wait 20 seconds, then switch on the main power supply again. • Check that the power supply cable connected to the charging station is live. The LED ring green should show green.
The charging station does not emit a clear tone when power is switched on.	<ul style="list-style-type: none"> • Small connectors on the controller or communication module are not fully pushed in. • Power connections are not connected correctly. 	<ul style="list-style-type: none"> • Check that the circuit breaker is on. • Measure the power supply on the input terminals. • Ensure all connections are secure, especially on the controller.
The residual current device trips constantly.	There is a grounding error in the charging station.	<ul style="list-style-type: none"> • Examine electrical wiring for damage. Replace damaged wiring. • Moisture or condensation on electrical connections. Dry the connections where necessary. If necessary, repair seals on the charging station.
	There is a fault in the vehicle or a defective charging cable.	<ul style="list-style-type: none"> • Refer to the vehicle handbook. • Replace the charging cable.

Problem	Possible cause	Solution
	The ground resistance is too high for the vehicle type.	Measure the ground resistance and compare it to the resistance required by the supplier of the vehicle.
The LED ring flashes red immediately when the card is held against the reader.	The charge card is not authorized for charging at this charging station.	<ul style="list-style-type: none"> • Check that the charge card is authorized for use. (Check by user.) • Check the settings of your charging station in your online account. (Check by user.)
	There is no communication with the CMP.	<ul style="list-style-type: none"> • On the communication module in the hub station, check that the station has a connection to the cellular network (network LED is flashing). • Switch off power, then switch on again to reset the station.
The LED ring shows constantly red.	Grounding fault.	<ul style="list-style-type: none"> • Check that the electrical installation is correctly grounded. • If necessary, add additional grounding closer to the installation.
In a hub-satellite installation, one or more LED rings constantly flash red.	There is a crossed connection in one of the satellite RS485 connections.	Examine RS485 cabling and connections.
	There is no connection with the hub charging station.	Examine RS485 cabling and connections.
The LED ring shows constantly yellow.	The vehicle is fully charged.	Unplug the charging cable from your vehicle and the charging station.

Problem	Possible cause	Solution
	The charging station is waiting for vehicle.	Check that the charging cable plug is inserted into the vehicle correctly. (Check by user.)
	The vehicle is on a timer.	Change the setting of the timer in the vehicle. (Done by user.)
	The charging cable has a fault.	Replace the charging cable. (Done by user.)
	The ground resistance is too high for the vehicle type.	Measure the ground resistance and compare it to the resistance required by the supplier of the vehicle, for example Renault Zoe < 150 Ω.
The LED ring shows blue for a few seconds, then changes to yellow.	The vehicle will not charge.	<ul style="list-style-type: none"> • Make sure that the minimum current accepted by the vehicle is not higher than the minimum current supplied by the station. • Check the line-to-line and neutral-to-line voltages at various locations on the power circuit(s). • Check that the electrical installation is correctly grounded.
The charging station does not start charging. The LED ring flashes green for 30 seconds, then flashes red 10 times. The LED ring changes to green or goes off.	No response from the CMP.	Use the charge card or key fob again to start the charging. If the problem remains, contact your CPO for further support. (Check by user.)
	The plug is not locked in the socket.	<ul style="list-style-type: none"> • Push the plug fully into the charging station. (Check by user.) • Examine the plug for damage or bent pins. (Check by user.) • Examine the connector to see if it is blocked by an object. (Check by user.)

Problem	Possible cause	Solution
	The vehicle not connected.	Push the plug fully into the vehicle. (Check by user.)
	The socket lock is blocked.	Remove the station cover, then check if the station internal wiring harness blocks the socket lock mechanism.
The plug cannot be removed from the charging station.	Incorrect charge card or key fob used to stop charging.	Use the same charge card or key fob that was used to start charging. (Check by user.)
	No response from the CMP.	Use the charge card or fob again to stop charging. If the problem remains, contact your CMO for further support. (Check by user.)
	The socket lock will not release.	<ul style="list-style-type: none"> • Push the plug further into the station and hold the charge card or fob against the card reader again. (Check by user.) • Switch off the main power supply, wait 20 seconds, then switch on the main power supply again. • Remove the station cover, then check if the station internal wiring harness blocks the socket lock mechanism. • Remove the station cover, then manually turn the lever on the socket lock mechanism upwards to the unlock position.

6. Appendix

6.1. Glossary

Abbreviation	Meaning
1P	1-phase power supply (input and output). The station rating is shown on the bottom of the station.
3P	3-phase power supply (input and output). The station rating is shown on the bottom of the station.
AC	Alternating Current.
CMP	Charging Management Platform. The backend platform that links a charging station to the CPO.
CPO	Charging Point Operator. The owner and/or operator of the charging station installation.
EV	Electric Vehicle.
LED	Light Emitting Diode.
OCPP	Open Charge Point Protocol.
MCB	Miniature Circuit Breaker.
RCD	Residual Current Device.

6.2. Disclaimer

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