

/ ENG

EVECUBE
WALLBOX B+ / 2B+
COLUMN B+ / 2B+

- » EV Expert WALLBOX 22kW or 2 x 22 kW
- » Compatible with the European Union and Norway







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IMPORTANT SAFETY INSTRUCTIONS

This document contains important instructions and warnings that must be followed when using the portable charger for electric vehicles from EV Expert s.r.o.

WARNING

Read this document before using the charging station. Failure to follow some of the instructions or warnings described in this document may result in fire, electric shock, serious injury, or death.

- » The charging station connector contains an RCD-A-EV residual current device.
- » The charging station is designed only for charging electric vehicles supporting the IEC 62196-1 and IEC 61851-1 standards.Do not use it for other purposes or with other vehicles or objects.
- » The charging station is intended only for vehicles that do not require ventilation during charging.
- » Do not use the charging station in combination with outlets that are not dimensioned for the required current load.
- » Do not use the charging station if it is defective or damaged, or if the LED indicates an internal error.
- » The device may only be opened for the purposes of connecting or disconnecting from the electrical network and configuration by a trained installation technician.
- » A product exposed to direct sunlight may overheat and as a result, may limit or stop charging until the internal components have cooled down to the operating temperature. Do not use the charging station in very heavy rain.
- » The body of the station and the connecting cable may increase in temperature during the charging process due to the passage of electric current, especially if exposed to direct sunlight or high ambient temperature. Be careful of burns.
- » Do not touch the terminal leads with sharp metal objects, such as wires, needles, or other tools.
- » Make sure the charging cable does not obstruct the movement of pedestrians, other vehicles, or other entities.

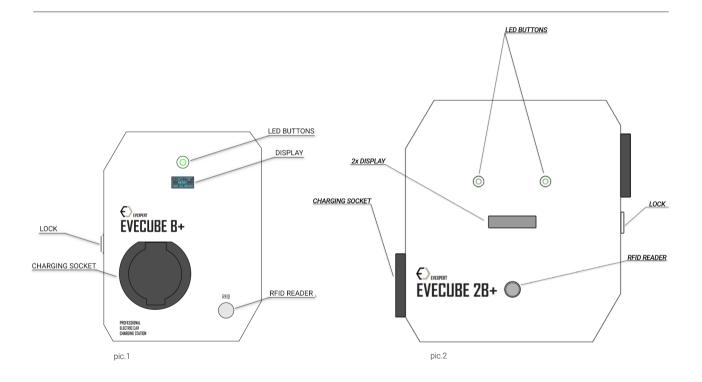
The charging station must not be exposed to direct sunlight!

Installation may only be performed by persons with appropriate qualifications.

Contact your dealer for the installation or servicing of the station. If a malfunction occurs, the user is not authorized to open, disassemble, repair, or otherwise modify the device. If a repair is necessary, contact EV Expert s.r.o. or your dealer. If you have any questions or recommendations, please contact us at: info@evexpert.eu

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DESCRIPTION OF BIDDING STATIONS



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INSTALLATION

- 1. Installation may only be performed by persons with appropriate qualifications.
- 2. Before installing the charging station, check for visible external damage.
- 3. Choose a suitable location for the installation of the station. A product exposed to direct sunlight may overheat and as a result, may limit or stop charging until the internal components have cooled down to the operating temperature. Do not use the charging station in very heavy rain.
- 4. Connect to the electrical network professionally according to the instructions and graphic diagram. See Fig. 1.

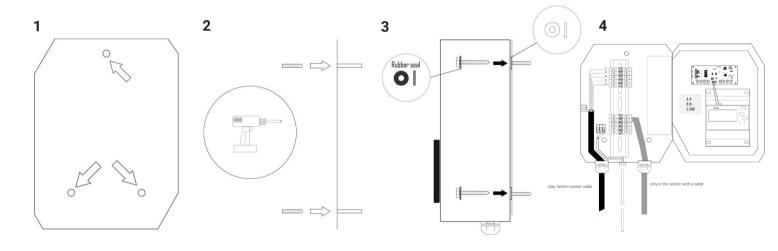
PACKAGE CONTENTS

KS	EVECUBE B+ Charging Station	EVECUBE 2B+ Charging Station
1	EVECUBE B+ 22 kW	EVECUBE 2B+ 2 x 22 kW
1	Manual	Manual
1	Unlocking Key	Unlocking Key
3	RFID Keys	RFID Keys
3	Sealing Washers	Sealing Washers
1	Drilling Hole Template	Drilling Hole Template

MOUNTING THE B+ CHARGING STATION

Danger of damaging the charging station's control electronics!

During the installation of the charging station, avoid any contact with liquid or conductive objects with the internal part of the control electronics. This could lead to degradation, or a conductive connection between contacts, which can cause a short circuit at the connection point, or complete damage to the station.



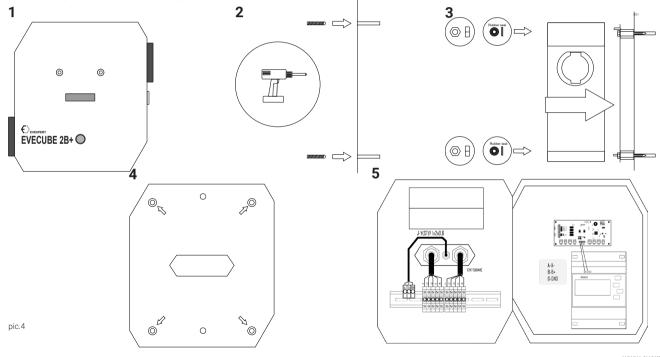
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pic.3

MOUNTING THE 2B+ CHARGING STATION

Danger of damaging the charging station's control electronics!

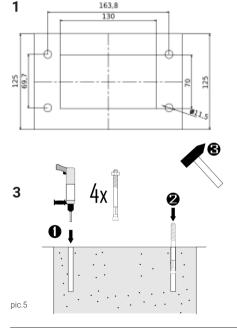
During the installation of the charging station, avoid any contact with liquid or conductive objects with the internal part of the control electronics. This could lead to degradation, or a conductive connection between contacts, which can cause a short circuit at the connection point, or complete damage to the station.

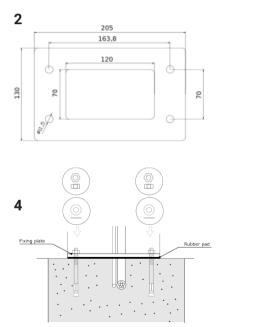


MOUNTING THE 2B+ CHARGING STATION COLUMN

Danger of damaging the charging station's control electronics!

During the installation of the charging station, avoid any contact with liquid or conductive objects with the internal part of the control electronics. This could lead to degradation, or a conductive connection between contacts, which can cause a short circuit at the connection point, or complete damage to the station.





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INITIAL STARTUP OF THE CHARGING STATION

1. During the startup of the charging station, an automatic system check is performed.



pic.6

STATUS INDICATION

The charging station can indicate several states before, during, or after charging. The charging station has a display on which you can see information both during and outside of charging.

- » Blue LED means ready to charge after RFID key authorization (RFID mode)
- » Green LED means ready to charge (without RFID mode)
- » Orange LED indicates that charging is in progress.





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pic.8



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pic.9

CHARGING STATION CONFIGURATION

To access the main menu of the charging station, press and hold the button during the ,automatic system check', which is described on page 9. Another way to access the main menu is to switch the internal switch to position no. 3 to the ,ON' position.



pic.10

- 1. Settings: current limitation, dynamic power management, solar modes.
- 2. Type of Distribution Network in which the station operates. For the vast majority of countries, this will be the default TN-S. (this item is only for qualified personnel)
- 3. Number of connected phases (or forcing charging on only one phase) This setting may be suitable for charging only from surpluses in the winter period, or assuming low power of the PV in the "solar only" mode (only about 1.3kW is required to start charging).



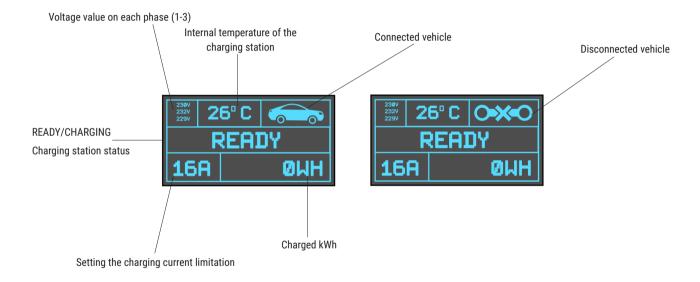
pic.12



- Communication mode allowing stations to communicate with other devices via Modbus. For normal operation, leave it on "Master". The "Slave" mode is used for control by a superior system, and the station will not be able to communicate with external electricity meters.
- 2. Control of external load. In this mode, especially resistive loads can be switched via an additional relay. (12V 50mA max.)
- 3. RFID kevs

The active selection is confirmed with the # symbol.

DISPLAY



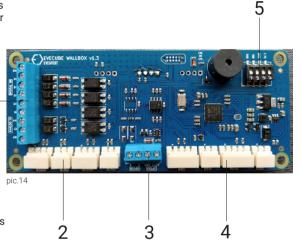
pic.13

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DESCRIPTION OF THE EVECUBE WALLBOX CONTROL PANEL

Configuration of the charging station must be carried out only by persons with the appropriate qualifications. Contact your dealer for installation or service of the station.

- 1. Terminal block inputs for connection
 - » ANALOG
 - » DIGITAL
- 2. Connectors
 - » EVSE1
 - » BTN2, EVSE2 button (only for dual-port version) and the BTN2 button
- 3. Terminal blocks
 - » RS485 (external MODBUS)
 - » RELAY Relay switching output (with control coils +12V and maximum current consumption 80mA) - control of others appliances depending on the state of the PV plant
- 4. Connection connectors
 - » DLM for connection of wireless LoRa DLM module
 - » SPK external speaker for acoustic signaling
 - » RFID connector for connection of Rfid WG34 reader
 - » PWR Connector for Evecube Wallbox board power supply (DC12V)
- 5. Configuration DIP switch functions
 - » RFID 0-1 Enable/disable RFID key authorization function for charging
 - » BTN 0-1 Enable/disable button for configuring charging current
 - » CONF 0-1 Configuration menu access only for installation technicians
 - » SW X 0-1 Reserved function.



ANALOG INPUT FUNCTIONS

INPUT	FEATURES
ANA1	Analog output current regulation for EVSE1
ANA2	Analog output current control for EVSE2

- » The analog inputs are not galvanically isolated.
- » They are designed for input voltage in the range of (0V; 10V).
- » They are equipped with protection against ESD and reverse polarity within the specified voltage range.

The logic for regulation is as follows:

- » 10V corresponds to a current of 0A
- » 0V corresponds to the maximum current determined by the limit.



pic.15

DIGITAL INPUTS FUNCTION

INPUT	FEATURES
DIG1	Authorize charging - Same behavior as authorization with user RFID tag.
DIG2	The HDO signal (6A max) limits the charging current to 6A*
DIG3	HDO signal - limit charging current to 0A*
DIG4	Reserved for future use.

pic.16

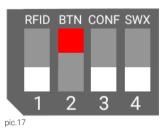
Inputs are dimensioned for input voltage in the range of (0V; 12V) where:

- » 0V corresponds to logical zero
- » 12V corresponds to logical one
- » Digital inputs are galvanically isolated by optocoupler and have separate ground
- » They are equipped with protection against ESD and reverse polarity within the specified voltage range.

The HDO function requires the installation to be supplemented with an HDO relay for switching and an additional 12V power supply (to maintain galvanic isolation).

ENABLING/DISABLING OF THE STATION CAN BE DONE USING THE LED BUTTON

In case the switch no. 2 is turned to the ON position, you can freely set the charging current at the station and lock the option to switch solar modes while a vehicle is connected. After setting up the charging station, we recommend turning off switch no. 2 if you want to prevent reconfiguring the station (e.g., if it is publicly accessible). The LED button will now only function to display the charging history.

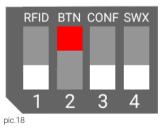


CHARGING CURRENT SETTING

(operation mode without DLM mode)

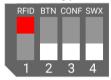
Setting the charging current is always done with DIP switch no. 2 turned ON

- 1. Now you can use the LED button to select the charging current to values of 6A, 8A, 10A, 13A, 16A, 20A, 25A, and 32A.
- 2. You can now start charging immediately after connecting your electric vehicle (in case RFID mode is not used).



MASTER RFID KEY REGISTRATION

Each B+/2B+ station comes with one preconfigured MASTER key. In case of deletion or loss, a new MASTER key can be created using the following procedure.



Switch the CONF DIP switch to position 1.



Select the RFID item on page 2/2.



Select "CREATE MASTER TAG".





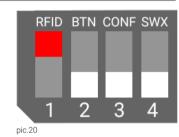


When prompted by reading the RFID key by the reader at the head of the station, the the MASTER RFID key is generated

pic.19

RFID KEY CONFIGURATION

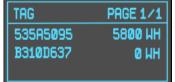
Configuration DIP switch for RFID should be set to position 1 (to enable RFID authorization).



Read the Master RFID key with the reader.







Scan additional keys that you want to add to the database, which will then be used to authorize charging in RFID mode (after the vehicle is connected).



pic.21

USER MENU

Access to the user menu when using RFID keys.

1. Pressing the LED button for 2 seconds will bring you to the list of RFID keys with information about the total charged kWh for each RFID user as shown in figure

18. Press the button to navigate through the list of RFID users.



2. After double-clicking the LED button within 2 seconds intervals, you will enter the user menu.

Access to the user menu without using RFID keys.

- 1. Hold down the LED button for 2 seconds to access the basic menu.
- 2. Use the button to navigate the menu.

USER MENU



pic.23

- 1. Last charging session
- 2.Total kWh charged



pic.25

1. Displaying the current state of DIP switches.



pic.24

- EVSE Firmware version of the charging controller firmware
- 2. this fw version of the control module firmware.
- 3. branch firmware branch.



- 1. Current measured by the DLM on Phase 1, 2, and 3
- 2. Current value measured by the DLM module on Phase 1, 2, and 3

SETTING THE DYNAMIC CONTROL MODULE

WIRING WITH EASTRON ELECTRICITY METER

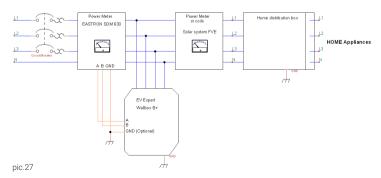
The Dynamic Load Management system (DLM) is designed to dynamically control and direct the flow of energy from sources to vehicle charging. It is primarily used to manage the energy flow of a building and prevent overload of the circuit breaker, while also enabling charging at the maximum available power.

To ensure proper function of the DLM, one of the following components must be installed:

- » Electrometer Eastron SDM 630
- » EV Expert DLM Module v 1.0 or higher

These modules allow wired or wireless (depending on the purchased version) connection to the station. The measuring module is typically located right after the main circuit breaker or at the point where we want to control the maximum current load. In the case of a photovoltaic power plant (hereinafter referred to as FVE), the measuring module is placed between the main circuit breaker and the measuring point of the FVE control system. The power supply of the Wallbox is led out behind the DLM measuring point (*the station thus sees its own consumption).

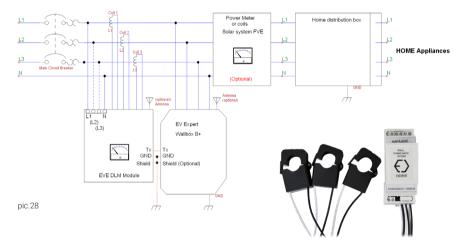
Wiring with Eastron meter:



CONNECTION WITH DLM MODULE EV EXPERT

DLM can be activated in the service menu. You can switch between different modes by pressing the button on the front of the station, while the station is charging (orange LED is on).

The measuring module is typically located right after the main circuit breaker, or at a point where we want to control the maximum current load. In the case of, for example, a photovoltaic power plant (PVPP), the measuring module is placed between the main circuit breaker and the measuring point of the PVPP control system. The power supply of the Wallbox is led out after the DLM measuring point (*thus, the station also sees its own consumption).



REGULATION -> DLM

MODES:

MAX CHARGE - Charges always at the maximum available power

MIN CHARGE - Charges at least 6A constantly (if possible) and adds all available flows

SOLAR ONLY - Charges only from flows (6A and more, otherwise charging is suspended)

DLM LIMIT - Setting the value of the main circuit breaker or measured node. If this value is exceeded, charging will be limited and vice versa, it will be increased when power is available. (0 - 100A)

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DLM SETUP PROCESS

DLM (dynamic charge power management)

The station must have access to consumption data from an external meter to enable this feature. The Modbus Eastron SDM630 meter (connected via Modbus to the terminal block) is compatible with DLM modules.



Modul EVE meter

Wired version - connected to the DLM terminal block on the control board. The wireless variant - LoRa module connected to the DLM connector.

Support for additional Modbus energy meters is under development.



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DLM SETUP PROCESS

The connector is used for connecting the RS485 and wireless LoRa DLM modules.



pic.31

Terminal block for connecting MODBUS electricity meter

» brown-grey - A » white-gray - B » white - yellow GND



pic.32



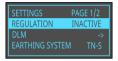
pic.33

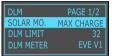
DLM SETUP PROCESS

Set DIP switch CONF to position 1

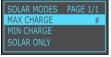


On page 1/2, select the DLM item





SOLAR MODES



pic.34

DLM mode selection

DLM LIMIT



Submenu for setting the maximum value for the DLM algorithm (example - Main object breaker 32A = DLM LIMIT 32A)

DLM METER



EVSE RS - 485 - DLM controlled using data from SDM630 EVE V1 - Data driven DLM from DLM EV Expert Module (wireless receiver) ITL DTS353F - electricity meter

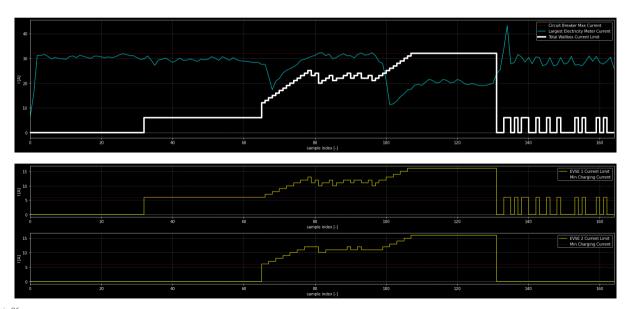
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MAX CHARGE

- » Limits the charging current to a value that does not exceed the DLM LIMIT.
- » It balances the consumption between phases to avoid uneven loading.



pic.35



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pic.36

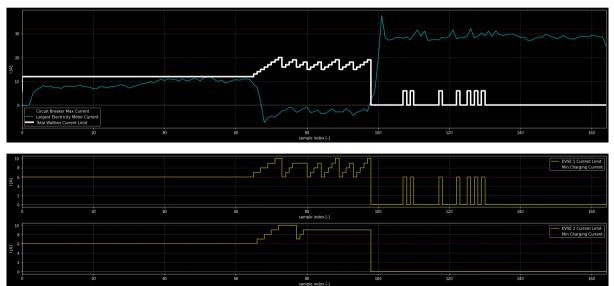
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MIN CHARGE

- » Limits charging to 0A when DLM LIMIT is exceeded.
- » This mode limits the charging current to 6A if the current drawn from the distribution network exceeds a certain threshold.
- » Balances the power consumption between ports.



pic.37



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pic.38

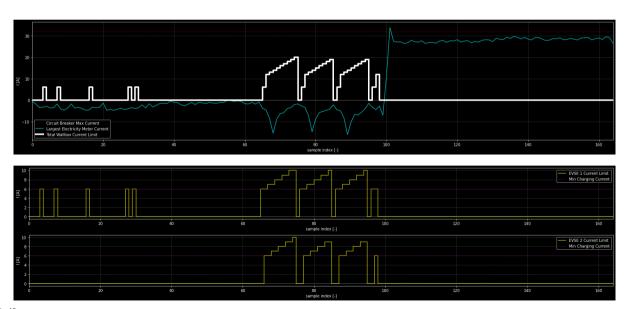
SOLAR ONLY

- » Limits the charging power to 0A in case the DLM LIMIT is exceeded.
- » Limits if the current drawn from the distribution network is OA.
- » Balances the load between ports.



pic.39

Note: This is only a simulation. If the charging current of the EVSE is increased in real-world applications, it will be reflected by changes in the current measured by the electricity meter. Under the azure time graph labeled "Largest Electricity Meter Current", the largest current effective value of the phases is meant, i.e. max(L1, L2, L3).



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pic.40

EXTERNAL LOAD BALANCING

When the wallbox detects energy overflow from the object and the vehicle is not charging, the charging station can start another external load (for example boiler or pool heating).

The appliance is switched on only via the upstream relay, which has +12V control coils and a maximum current draw of 80mA!

At the charging station, you can set the flow value from which the external load is activated, as well as the "inflow" value from the network, from which the external load off.







- 1. Minimum current "overflow" from the facility (in Amperes) at which the external load is activated.
- 2. The value of current (in Amperes) flowing from the grid at which the external load is turned off.
- 3. Time delay (page 2/2 on the charging station for external load) Delay in detecting current change in seconds (time hysteresis). It is used to prevent the relay from switching during short-term surge changes in current.

Graphs of regulation and utilization of individual phases.





pic.42

TROUBLESHOOTING

- » If the charging slows down or suddenly stops, check the onboard system of the vehicle for any error messages.
- » Check the signaling LED on the charging station.
- » If high temperature is the cause of the problem, stop the charging until the charging station cools down or direct cooling can help.

 If this happens regularly without external factors (direct sunlight, high ambient temperature), contact EV Expert s.r.o. or your dealer.
- » In some cases, unplugging and reconnecting the charging station to the car may help if the charging has stopped.
- » If problems persist, contact EV Expert s.r.o. at: info@evexpert.eu

MAINTENANCE

The EVECUBE charging station is made of high-quality corrosion-resistant stainless steel and is almost maintenance-free. It is necessary to regularly check the socket for connecting the charging cable or the charging cable itself (for the version with an integrated cable) for damage to plastic parts, the presence of foreign objects or dirt in the contacts, or damage to the insulation in case of the charging cable (visual inspection).

In case it is necessary to clean any dirt or debris from the contact area of the socket or connector, the station must be turned off by the upstream circuit breaker.

If it is necessary to clean any dirt from the contact area of the socket or connector, the station must be turned off by the upstream fuse. For cleaning, use a microfiber cloth with a non-abrasive structure and clean the surface of the charging station with water or a non-abrasive cleaning agent without solvents. To maintain the shine and protect the brushed stainless steel surface, it is recommended to use cleaning agents specifically designed for stainless steel surfaces.

EU DECLARATION OF CONFORMITY

THE COMPANY'S HEADQUARTERS

EV Expert s.r.o. Polská 181 / 70 779 00, Olomouc IČ: 056 99 711

We declare on our sole responsibility that the products:

Portable charging station for electric vehicles

EVECUBE

Serial number: see the type plate
Year of first CE issue: 2018
Manufacturer: EV Expert s.r.o.

devices for charging electric vehicles by conductive connection, when properly installed in accordance with the relevant standards in the country in which they are installed and appropriate maintenance and service is carried out, and also operated exclusively for the purpose for which they were manufactured

to which this declaration applies, are in conformity with the following applicable harmonized EU legislation:

- » Government Regulation No. 18/2016 Sb. (2014/35/EU)
- » Government Regulation No. 117/2006 Sb. (2014/30/EU)
- » Government Regulation No. 481/2012 Sb. (2011/65/EU)

When assessing the conformity, the following harmonized standards and technical specifications have been used as a basis for this declaration:

- » ČSN EN 61851-1:2010
- » ČSN EN 62196-2
- » ČSN EN 61000-6-3 ed.2:2007 + A1:2011
- » ČSN EN 61000-6-1 ed.2:2007
- » ČSN EN 61000-3-2
- » ČSN EN 61000-3-3

The product is safe for its usual and intended use. We have taken all necessary measures available to us to ensure the conformity of the products placed on the market with the essential requirements of the European Union legislation.

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WARRANTY CONDITIONS EVECUBE

- EV Expert, s.r.o (hereinafter referred to as "EV Expert") has developed a highly reliable electric vehicle charging device, known as EVECUBE, designed to withstand normal operating conditions when operated in accordance with the manual provided by EV Expert.
- The EV Expert Limited Warranty ("Limited Warranty") covers defects in materials and workmanship in the EVECUBE ("Defective Product") for a period of two (2) years ("Warranty Period") from the date of original purchase of the product.
- The Limited Warranty does not apply, and EV Expert assumes no re sponsibility for any defect or damage to any EVECUBE that has been:
 - a. Misused, neglected, modified, or otherwise damaged, either internally or externally
 - b. Improperly operated, handled, or used, including use under conditions for which the product was not designed or used in an unsuitable environment or used in a manner that is inconsistent with the EV Expert operating manual or applicable laws and regula tions.
 - c. Exposed to fire, water, corrosion, biological attack, or input voltage that creates operational conditions beyond the maximum or minimum limits specified in EV Expert's technical specifications, including high input voltage from generators or lightning strikes.
 - Exposed to random or consequential damage caused by defects in other components of the electrical system.
 - e. If the original identification mark (including trademark or serial number) of such EVECUBE equipment has been soiled, altered, or removed.
- The Limited Warranty does not cover costs associated with resolving customer electrical system issues. The Limited Warranty does not apply beyond the original costs of EV Expert.

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- During the warranty period, EV Expert will, at its discretion, repair or re place any defective product at no charge provided that EV Expert determines, through inspection, the existence of a defect covered by the limited warranty.
- EV Expert will use new and/or reconditioned parts in performing warranty repairs and in building replacement products. EV Expert reserves the right to use parts or products of original or improved design in the repair or replacement of defective products.
- 7. If EV Expert repairs or replaces a defective product, the limited warranty will continue to apply to the repaired or replacement product for the remainder of the original warranty period or for ninety (90) days from the date of return of the repaired or replacement product by EV Expert, whichever occurs later.
- 8. The limited warranty covers the cost of parts and labor necessary to repair the defective product.
- 9. The limited warranty covers the cost of transportation of the repaired or replacement product by a carrier selected by EV Expert to locations within the European Union, but not to any locations outside the Europe an Union. The limited warranty does not apply to damage incurred during transportation or damage caused by improper handling by the carrier, for which the carrier is responsible.

PROCEDURE FOR APPLYING WARRANTY CONDITIONS

- 1. To obtain repair or replacement under the limited warranty, the customer must follow the certified return merchandise authorization process (RMA).
- 2. All defective products must be returned with a RMA (Return Merchandise Authorization) number, which the customer must request from EV Expert.

The RMA request must include the following information:

- a.i. Receipt of purchase of the defective product
- a.ii. Model number of the defective product
- a.iii. Serial number of the defective product
- a.iv. Detailed description of the defect
- a.v. Shipping address for the return of the repaired or replacement product.
- 3. Every defective product approved for return must be returned in its original shipping package or in another package that properly protects the product from damage during transportation.
- 4. The returned defective product must not be disassembled or modified without the prior written consent of EV Expert.

ADDITIONAL PROVISIONS

- 1. The limited warranty is the sole and exclusive warranty provided by EV Expert, which is permitted by law. Its meaning supersedes all other warranties, express or implied, statutory or otherwise, including warranty of title, quality, merchantability, fitness for a particular purpose, or warranty relating to accuracy, effectiveness, or suitability of any technical or other information provided in manuals or other documentation.
- 2. In no event shall EV Expert be liable for any special, direct, indirect, incidental, or consequential damages, losses, costs or expenses, whether in contract, or any limitation on the commencement of any economic loss of any kind, any loss or damage to property, or any personal injury.
- 3. To the extent required by applicable law, any implied warranties relating to the EVECUBE will be limited in time to the warranty period. In states and provinces that do not allow limitations or exclusions of implied warranties or on the duration of implied warranties, or on the limitation or exclusion of incidental or consequential damages, the above limitations or exclusions may not apply.
- 4. This limited warranty gives the customer specific legal rights. The customer may have other rights which vary from state to state or region to region.

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VAT ID: CZ05699711

Stupkova 18, 779 00 Olomouc Czech Republic

For more information, please visit our website: www.evexpert.eu or contact us at info@evexpert.eu