



Instruction Manual

AC Charging Station 2x22kW

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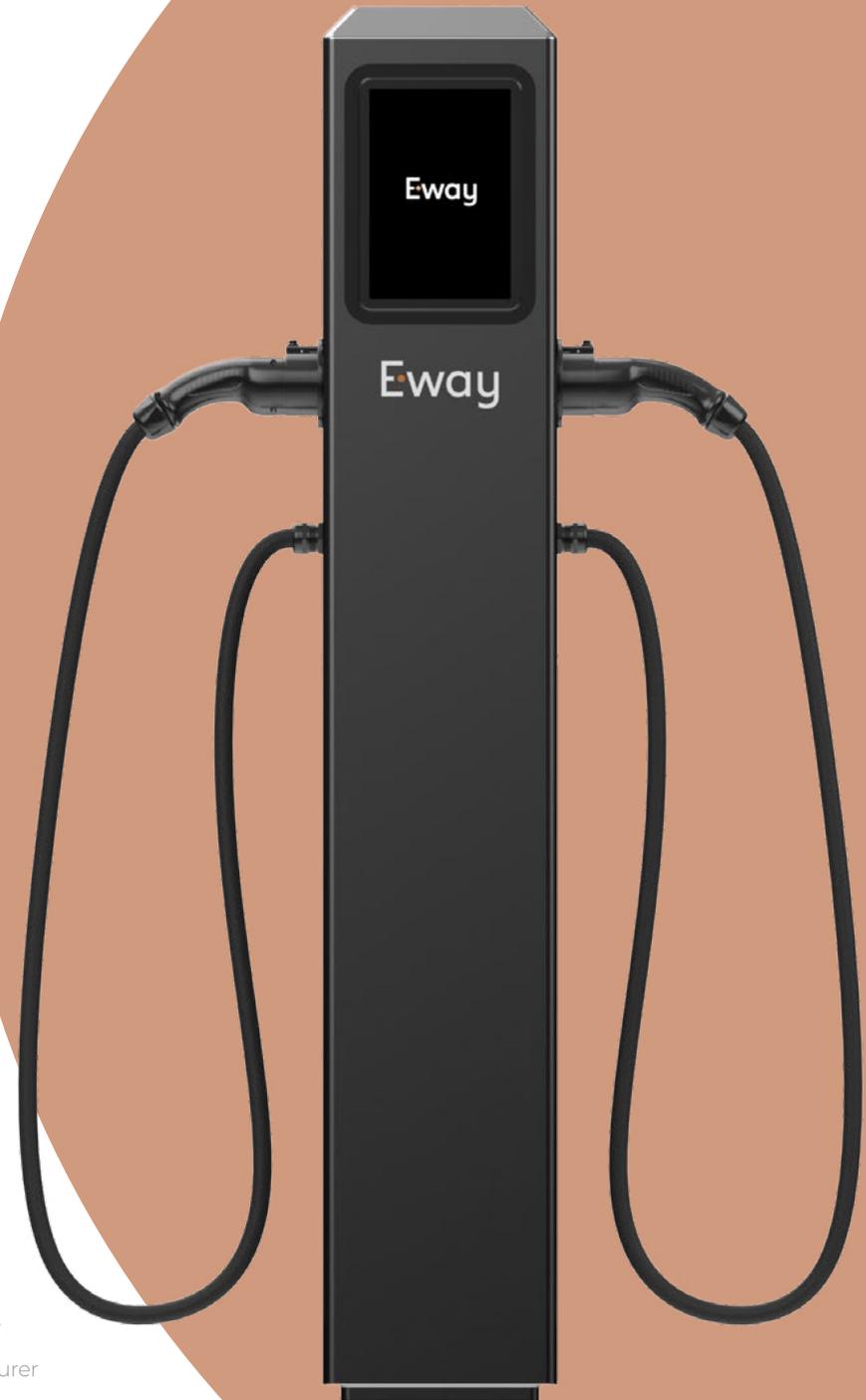


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1. General information

Copyright

Eway owns its trademarks and has the exclusive right to use them for commercial, advertising and promotional purposes. Eway's trademark may not be used without the company's exclusive permission unless an appropriate licence is granted. Trademark infringement is illegal and may lead to serious legal consequences, including legal proceedings and financial penalties.

The data used in all graphics is for illustrative purposes and has been generated for demonstration and training purposes only. They serve as examples of real data but do not reflect or relate to actual information. Any coincidence of data is coincidental.

Waiver of liability

We have reviewed the contents of this publication to ensure compatibility with the hardware and software described. As variability cannot be completely excluded, we cannot guarantee full compatibility. However, the information contained in this publication is regularly checked and any necessary corrections are included in subsequent editions of the publication.

Storage and transport

The following conditions, in particular, must be observed when storing and transporting the equipment:

- The permissible storage temperature of the device is between -20 °C and +60 °C.
- Permissible humidity ranges from 5 to 98%, without condensation.
- The appliance may only be transported in the transport packaging provided, using the safety and cushioning materials provided.
- Avoid shocks and impacts during transport.
- During transport, the unit should be orientated according to the marking on the packaging.
- The packaging may only be opened at the point marked on the sticker.

Description of the device and its purpose

The Eway Charging Station is a device designed for charging electric or hybrid vehicles using cashless payment, without external applications. Each station is equipped with a set of electrotechnical apparatus to ensure the safety of the charging process and a 10.1" interactive tablet. It uses AC mains voltage to charge electric or hybrid vehicles. Eway's Charging Stations are available to any User with an electric or hybrid vehicle that has cashless payment options. They do not require an external application. They are located in car parks and parking spaces, in particular car parks and parking spaces at shopping centres, petrol stations, municipal car parks, hotels, stadiums, airports, railway stations, hospitals and other places of general access and places with limited accessibility (in particular guarded car parks).

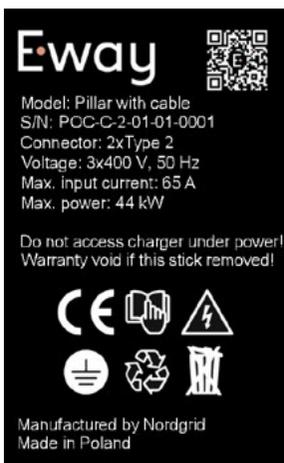
Name and information plate

The nameplate is located on the outer wall of the appliance. It contains key information about the appliance, viz:

- device model,
- the serial number of the device,
- number of Charging Points and type of Connector,
- rated voltage,
- rated current,
- the rated power of the appliance.

Note: The information on the nameplate is essential for service and support when troubleshooting - do not remove the nameplate.

Note: Data on the nameplate may vary depending on the appliance model.



Drawing 1. Nameplate of the appliance

Eway's information plaque contains contact details that may be useful if a Charging Station breaks down or problems arise during a Charging Session. The plaque includes a helpline telephone number where a company representative can be contacted. There is also an email address to contact Eway if you have any questions, reports of breakdowns or other vehicle charging issues.



Drawing 2. Information plate

Explanation of basic concepts

Charging Station - within the meaning of Article 2. point 27. of the Act on Electromobility and Alternative Fuels (i.e. - Journal of Laws of 2019, item 1124, as amended) is an infrastructure enabling the use of Charging Services, including in particular facilities for charging electric or hybrid vehicles

Charging Point - within the meaning of Art. 2. point 17. of the Act on Electromobility and Alternative Fuels, is a device enabling the charging of a single electric vehicle or a hybrid vehicle

Charging connector - the cable component that connects the vehicle to the charging infrastructure

Vehicle Charging Location - a parking space used exclusively for the purpose of providing the Charging Service, assigned to a particular Charging Station

Charging Service - a service provided to charge the battery of an electric or hybrid vehicle allowing the use of a Vehicle Charging Location and a Charging Station to carry out the charge

Charging Session - the period of time from access to the Charging Point by the User until the vehicle is disconnected from the Charging Station

Price List - a list of charges for the Charging Service. The price list is available on the start screen of each Charging Station.

Parking Charge - this is a charge levied after the charging process has been completed for vehicles occupying the Vehicle Charging Places, thereby preventing other vehicles from charging. Information on the Parking Charge is available in the Charging Station Price List.

Pre-authorisation - an operation by which funds are temporarily blocked on the User's account for subsequent payments for the charging service provided,

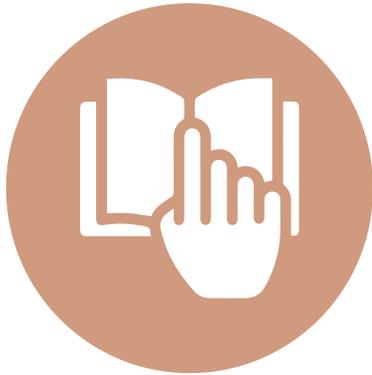
Manual - these instructions for use of the Charging Station. A shortened version is available on the start screen of each Charging Station

User - a natural person who uses the Charging Services provided by Eway

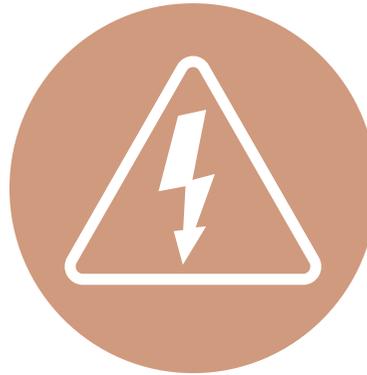
Operator of a Publicly Available Charging Station / Operator - an entity within the meaning of Article 2(7) of the Act of 11 January 2018 on electromobility and alternative fuels responsible for the construction, management, operational safety, operation, maintenance and repair of the Charging Station

Ordinance - the Ordinance of the Minister of Energy of 26 June 2019 on the technical requirements for charging stations and charging points that are part of the charging infrastructure of road public transport (Journal of Laws 2019, item 1316, as amended).

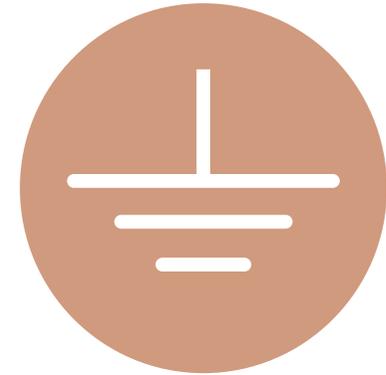
Explanation of symbols on the rating plate



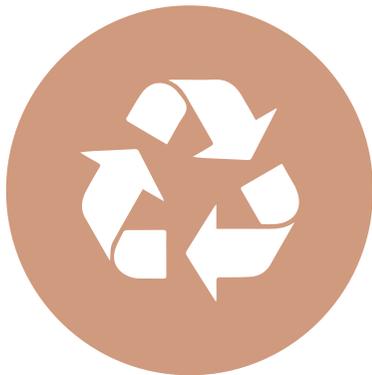
Before commissioning, read the operating instructions



Attention, electrical appliance



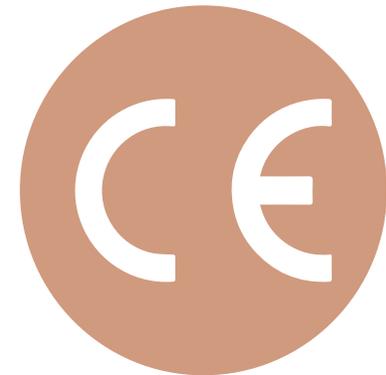
Grounded device



The packaging and the device are made of recyclable materials



Ban on disposing of waste electrical and electronic equipment in municipal waste bins



Symbol of the manufacturer's declaration, the product placed on the market complies with the requirements of harmonised standards

2. User safety

General information

- Use of the Charging Station by persons who are intoxicated or under the influence of drugs and by persons under the age of 18 is prohibited.
- The Charging Stations must be operated in accordance with the recommendations in the manufacturer's documentation.
- Vehicles shall only be charged using the cables originally fitted to the charger. The use of extension cables, adapters, splitters or other components that are not an integral part of the charger is prohibited.
- Follow the on-screen instructions.
- It is forbidden to open the Station, to place objects in plugs and sockets or to use it in a manner that is not in accordance with its intended use.
- Incorrect use risks damage to property, fire and, in extreme cases, loss of health or life due to electric shock.
- It is forbidden to modify or upgrade the Charging Station by third parties and in a manner incompatible with the documentation.
- In the event of non-compliance with the Instructions, the manufacturer of the Charging Station shall not be liable for any damage or loss resulting from improper use of the Charging Station.
- Before charging your vehicle, read the Charging Station's instructions, as well as the vehicle manufacturer's recommendations, to avoid dangerous situations and to ensure that your vehicle is charged safely and efficiently.
- In the event that the User notices a malfunction, mechanical or electrical failure of the Station, use of the Charging Station is prohibited until the device is repaired or replaced.

Occupational health and safety/ Specify how to meet the requirements of health and safety legislation.

Operation of the appliance must comply with health and safety requirements for electrical equipment. The installation instructions for the appliance require the installation of a residual current circuit breaker in the switchboard or inside the appliance to protect the user and personnel from electric shock. Maintenance (service) work may only be carried out by authorised personnel who meet the requirements stipulated by the Regulation of the Minister of Energy of 28 August 2019 on health and safety at work on power equipment (i.e. Journal of Laws 2021, item 1210) and the Act of 26 June 1974. - Labour Code (i.e. Journal of Laws 2023, item 1465, as amended). Details of the maintenance work are described in Chapter 7.

Measures to be taken in the event of irregularities or malfunctions and in the event of a fire

In the event of a malfunction of the Charging Station (damaged cable plug, broken cable insulation, or other damage disqualifying the Charging Station from use), the manufacturer of the device categorically prohibits charging operations and orders the user to move away from the device. The damaged device must be reported as soon as possible to the Operator or the entity responsible for the Station, in order to be taken out of service. The Charging Station is equipped with a "Self-healing" system, the purpose of which is to detect individual faults and failures of the Station and to implement remedial measures to restore the basic functionality of the device, if possible. In the event of a critical failure, the Charging Station is shut down.

If a malfunction, damage or irregularity in the operation of the Station is discovered during charging, the use of the device must be stopped immediately and the situation reported to the Station Operator or the entity responsible for the use.

In the event of a fire at the Charging Station, switch off the power as soon as possible, then disconnect the vehicle and, if possible, move the vehicle to a safe distance. Call the appropriate services - emergency number 112 or call the fire brigade directly - 998.

Those who undertake fire extinguishing activities do so at their own risk and responsibility, so it is recommended that during any fire extinguishing, suitable extinguishing agents are used which are designed to extinguish electrical equipment up to 1000 volts. These include snow (CO₂) extinguishers, powder extinguishers or sand. Detailed information on how to deal with a fire can be obtained from the website of the National Fire Service.

Caution: in the event of a fire, it is advisable to move safely away from the Charging Station and to call the appropriate emergency services.

It is forbidden to disconnect the cable from the vehicle while the device is in operation. There is a risk of damage to the socket, the cable, the vehicle and even loss of health or life.

Conditions for safe operation of the appliance and warnings of dangers arising from improper use

The appliance must be operated in accordance with the recommendations contained in the manufacturer's documentation and the principles of limited trust, taking into account atmospheric conditions and the circumstances surrounding the charging activity (e.g. behaviour of other people). Electric vehicles may only be charged with the Station, charging cables and vehicle in working order. In the event of doubts as to the operation of the Station, the vehicle or any element of the charging infrastructure, the charging process must not be commenced.

When charging is complete, the charging cables must be hung up in the designated place, the plug should be placed into the holder. It is imperative that the cables are left in such a way as to prevent the cables or plug from being run over when manoeuvring the vehicle. Do not use plugs that are visibly dirty, wet or damaged. The vehicle must be parked in such a way that the charging cable is not overstretched, a situation that risks tripping and falling for the User or a bystander.

In the event of electrocution, call for medical assistance immediately and contact the Station Operator via the contact number on the information plate.

It is forbidden to interfere in any way with the operation, structure, characteristics of the Charging Station. The device may only be opened by qualified personnel. Unauthorised persons run the risk of causing material damage, injury or death.

Fire protection

Fire protection in accordance with the Act of 24 August 1991 on fire protection (i.e. Journal of Laws of 2022, item 2057, as amended) consists in the implementation of undertakings aimed at protecting life, health, property or the environment against fire, natural disaster or other local hazard by:

1. Preventing the occurrence and spread of a fire, natural disaster or other local emergency;
2. Providing forces and resources to combat a fire, natural disaster or other local emergency and for civil protection;
3. Conduct of rescue operations by fire protection units.

In the case of the Electric Vehicle Charging Station, compliance with fire protection requirements is understood to mean, among other things, the prevention or reduction of the potential danger caused by the transmission of a fire from a burning electric vehicle (or Electric Vehicle Charging Point) to a facility that is located in the immediate vicinity of these Stations. In addition, the safety of emergency crews is important, given the aftermath of a fire at the Electric Vehicle Charging Station in question.

With regard to the aspect concerning the protection of EV Users, attention should be paid above all to the EV Charging Station located in the vicinity of other building structures. Therefore, for charging electric vehicles, places should be designated (by marking them with horizontal and vertical signs) located at the maximum extreme in terms of accessibility (length) of the vehicle charging cable. This will avoid a situation where a vehicle fire cuts off the escape route for people in the vicinity of the Charging Station. In addition, it is recommended that there should be no combustible materials in the vicinity of the EV Charging Stations which, during a fire, may aggravate it.

Emergency stop/description of emergency stop operations.

Emergency stopping is usually possible from within the vehicle (button on the key, inside the vehicle or from the in-car app - depending on the car model). This is the first emergency stop for a given charging session.

The second way is to use the main circuit breaker located in the main circuit of the charging station's power supply in a place provided by the electrical designer, e.g.: in the supply switchboard, cable joint or main switchboard.

3. User interface and description of devices indicating status and availability of the Charging Point

General information

The User Interface consists of the following elements:

1. touchscreen,
2. LED strips,
3. payment card reader integrated into the touch screen.

Note: Some elements of the user interface may differ depending on the version of the device.



Drawing 3. User Interface

Touchscreen

The touchscreen allows the user to interact directly with the device. It is used to operate the Charging Station application. Figure 4 shows its start-up screen with its elements listed:



Drawing 4. Start-up screen of the application

1. Current time
2. Language selection - the interface can be operated in one of five languages: Polish, English, Italian, Swedish, Danish, German
3. Interface shortcut - by clicking on this button the User can access the Terms and Conditions, Quick Guide and Price List at any time when using the Charging Station
4. Home screen - clicking on the home screen button takes you to the Charging Point selection screen
5. Start panel - current screen
6. Rules and regulations for the use of the Charging Station
7. Operating instructions
8. Price list for using the Service

LED strips

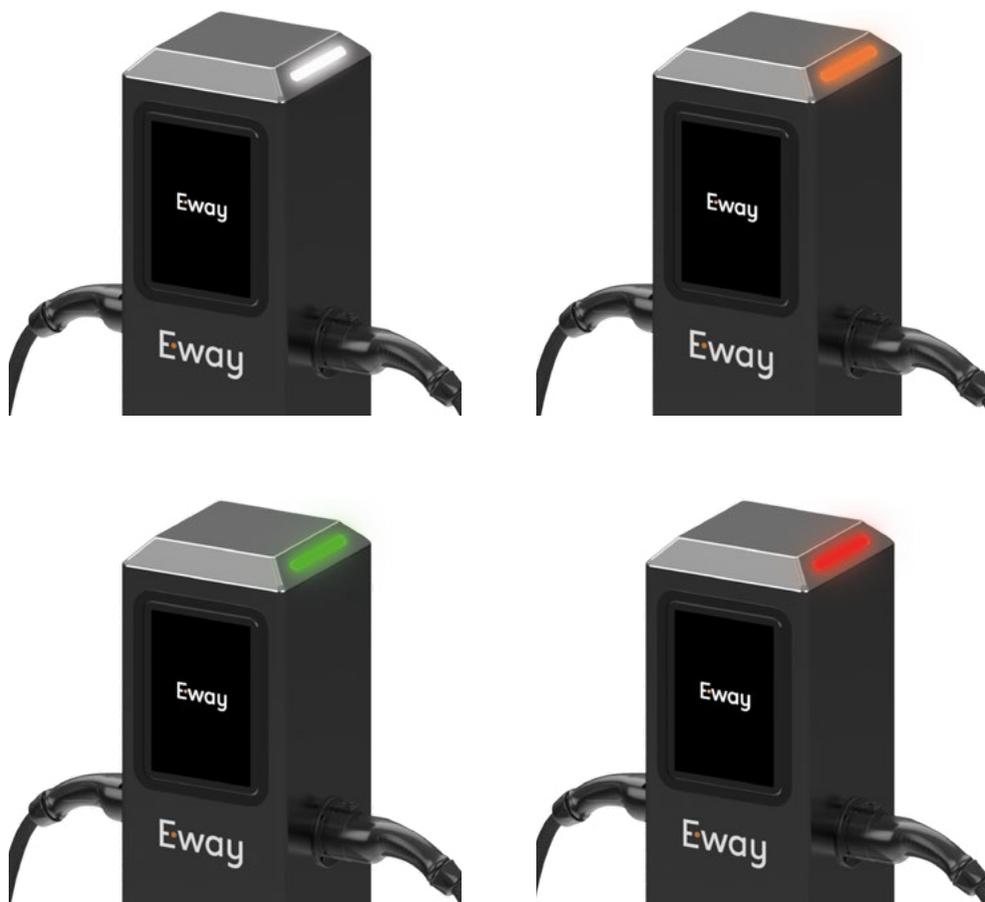
LED strips, located on the sides of the Station, above the handles of the Charging Connectors, indicate the current status and availability of the respective Charging Point .

White - Charging point available.

Orange - vehicle connected to Charging Station.

Green - charging in progress.

Red - Charging point out of use.



Payment card reader

The payment card reader is located in the bottom left corner of the touchscreen (Figure 5.). In order to carry out the Preauthorisation and final settlement of the Charging Session, the payment card or a contactless payment-enabled device (smartphone, smartwatch, etc.) must be brought into close proximity when the payment application screen is visible on the screen.



Drawing 5. Location of the payment card reader

4. Available charging modes

The Charging Station has 4 charging modes (Fig. 5.) :

1. Unlimited charging
2. Charging on time
3. Charging for energy
4. Charging for an amount

Unlimited charging

In this mode, charging is terminated by the vehicle when the battery is fully charged or by the User at any time. In the case of unlimited charging, there is no parameter set by the User. Charging takes place immediately after Preauthorisation and the vehicle is connected. Once charging is complete, the Parking Charge begins to accrue in accordance with the Price List.



Figure 6. Selection of charging mode

Charging for energy

The vehicle is charged by specifying the amount of energy the vehicle will be charged during the Session. The volume of energy is specified in kilowatt-hours (kWh) by the User using the keypad on the screen.



Figure 8. Charging for energy

Charging on time

Charging mode, in which the User, using the sliders on the touchscreen (Fig. 7.), determines how long the vehicle will be charged. When the set time has elapsed, charging is completed and the Parking Charge begins to be charged in accordance with the Price List.



Figure 7. Charging on time

Charging for an amount

The vehicle is recharged by specifying the amount (in PLN) for which the user intends to charge their vehicle. The value is entered using the keyboard on the touchscreen.



Figure 9. Charging for an amount

5. Description of start-up, operation and shut-down operations

Charging instructions

Follow the steps indicated to start charging the vehicle:

1. Press the button in the central part of the start-up screen (Fig. 4, item no. 4).
2. On the "Select Charging Channel" screen, check that the Station has an available Charging Point. Available is indicated in green, a busy channel in yellow and an out-of-use channel in red (Fig. 10.). The User then selects an available Charging Point (left channel, right channel).
3. Select one of the available charging modes and define the necessary parameters (section 4.)
4. Pre-authorise the Charging Session with the chosen means of payment (Fig. 5.). The amount is from the amount set by the Operator depending on the Charging Station, the mode and the limit set by the User. If the entire amount is not used, the difference is refunded after the charging process is completed. The Charging Station supports Visa and Mastercard payments.
5. After a positive Payment Preauthorisation and a message on the Station screen (fig. 11.), remove the Charging Connector from the holder and connect it to the vehicle. If it communicates correctly with the Charging Station, the Charging Connector is locked and the Charging Session starts. The following parameters are displayed on the screen (fig. 12.):
 - depending on the choice - the limit which has been imposed on charging,
 - price per unit of energy,
 - the power with which the vehicle is currently charged,
 - energy charged so far,
 - duration of the Charging Session,
 - current cost of the Session.



Figure 10. Selection of the Charging Point



Figure 11. Message after Preauthorisation



Figure 12. Screen visible during vehicle charging

The user can interrupt the charging process at any time by pressing the "End charging" button (Fig. 13.).

Charging Point lock - secures the charging process so that you can move away from the device safely. Re-access to the Charging Point occurs through verification of the means of payment.

Please note that in order to unlock a Charging Point, you must use exactly the same means of payment that was used in the Preauthorisation proces



Figure 13. Button to interrupt the charging process



Figure 14. Locking button for the Charging Point

Once the charging process is complete, a parking charge is applied until the vehicle is disconnected from the Charging Station. The following information is displayed on the screen (fig. 15.):

- current parking fee,
- the current standstill time since the end of charging,
- the initial cost of the parking fee,
- the amount of the parking charge per minute,
- amount of tax,
- total charged energy,
- total charging time,
- total cost of energy loaded.



Figure 15. Screen displayed during calculation of the Parking Charge

To terminate the Charging Session, press the "Terminate Charging" button and, when the message is displayed (fig. 16), unplug the Connector from the vehicle socket and place it in the Charging Station holder. When the Charging Session is completed, the Parking Fee will cease to be charged.

Once the Charging Session has been completed, the User has the option of receiving a receipt or a VAT invoice electronically to the e-mail address indicated. To receive the invoice, press the "Yes" button on the screen shown in Figure 17. After entering the company's VAT number, it is possible to import the remaining data (with the exception of the email address). The user can also fill in additional fields (recipient's name, vehicle registration plate). This information is not compulsory for issuing the document. Their completion is voluntary (Figure 18.). After the relevant data have been obtained and approved, they are displayed on the screen to verify their correctness (Fig. 19.). After the user confirms the correctness of the entered data with the "Confirm" button in the bottom right corner of the screen, the invoice is sent. If the data entered are not correct, the User can change them using the "Back" button in the bottom left corner of the screen.



Figure 16. Screen visible at the end of the Charging Session



Figure 17. Screen asking for a VAT invoice

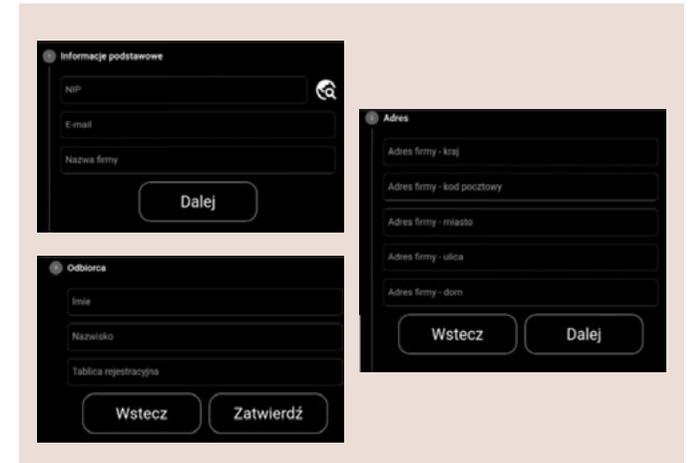


Figure 18. Data fields for a VAT invoice

If the User has not confirmed the need for an invoice, he/she will be redirected to a screen where he/she can enter an email address to receive a receipt (Fig. 20.). The user enters the email address on the keyboard. Then, after pressing the "Send" button, a receipt is sent to him for the respective Charging Session. He can also opt out by pressing the "Skip" button without receiving any sales document.

Please note that once the Charging Session has ended and a sales document has been selected, you must immediately leave the parking area designated for vehicle charging.



Figure 19. Summary of data entered for a VAT invoice

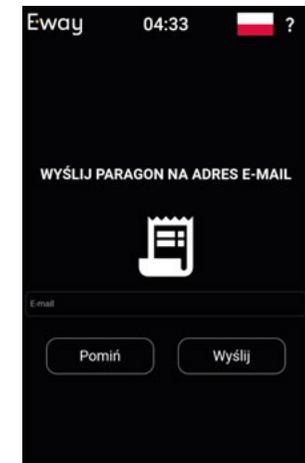


Figure 20. Screen to indicate the email address to receive the receipt

6. Maintenance and disposal

Once every six months it is recommended to carry out a visual inspection of the housing and an external inspection of the components and accessories, and once a year a detailed inspection of all the components contained in the unit by an authorised person.

These activities should never be carried out by the User.

Basic maintenance activities include:

- visual inspection of the housing surface and the Charging Connector,
- visually inspecting the charging cable and ensuring that the cable shows no visible damage or deformation.

If visible defects are found during the above checks, contact the Operator or your local Eway S.A. technical service without delay.

It is prohibited to open the rear door of the Charging Station. The internal components of the Charging Station do not require maintenance. Inspection of internal components may only be carried out by qualified personnel and in situations where this is required.

Cleaning and care (maintenance)

Before starting any grooming operations, ensure that no Vehicle Charging Session is active. The following rules must be observed when carrying out care operations:

- The surface of the charger can be cleaned with a dry cloth.
- Do not use aggressive cleaners, waxes or solvents (e.g. cleaning petrol or thinners or paints), as these may tarnish the surface and indicators.
- Do not use abrasive cleaners or sponges, as these may scratch the surface.

Under no circumstances may the Charging Station be cleaned with a high-pressure cleaner or similar device, as high pressure can cause liquids or vapours to penetrate into the housing openings. The Charging Station complies with waterproofing standard IP54.

Disposal and environmental protection (meeting the requirements of environmental legislation)

Do not dispose of electrical and electronic equipment with normal household waste. According to the European directives in force in the EU, separate methods of disposal must be used for used electrical and electronic equipment. In Poland, in accordance with the legislation on waste electrical and electronic equipment, it is prohibited to dispose of used equipment (marked with the crossed-out wheeled bin symbol) with other waste. Users who intend to dispose of this product must return the aforementioned items to collection points for used equipment. The collection points are operated, among others, by wholesalers and retailers of this equipment and by municipal entities operating in the field of waste collection.

The device fulfils the environmental protection requirements provided for by the applicable Polish and European laws (regulations and directives), in particular the Act of 27 April 2001, the - Environmental Protection Law (Journal of Laws of 2022, item 2556, as amended) and the Waste Act of 14 December 2012 (Journal of Laws of 2023, item 1587, as amended).

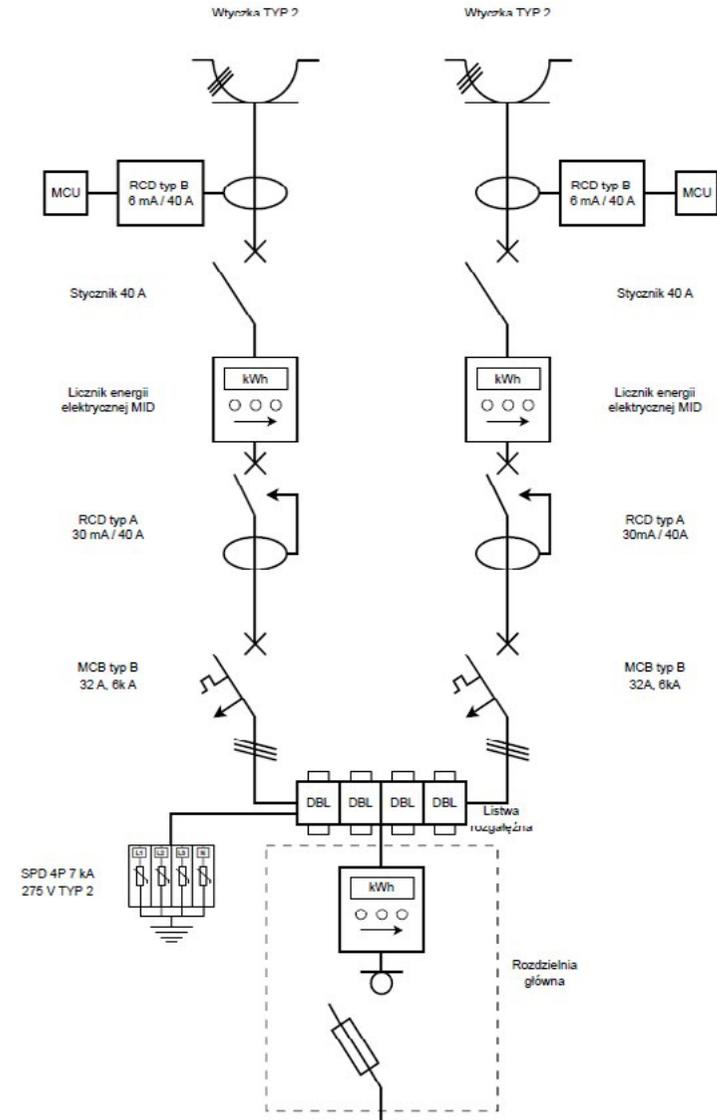
7. Testing and operation of Charging Stations

Service, repair and replacement of components and parts - service manual

A service inspection of the Charging Station should be carried out once a year. Mechanical components such as sockets, charging cables, plugs, handles and plug holders only require a surface check. During the inspection of the Station, attention should be paid to possible corrosion, water marks, cracks or other signs that may indicate a deteriorating condition of the device. A particular item to be inspected is the cable for charging electric vehicles. Any insulation damage, cracking or abrasion should be reported immediately to the Station Operator, after which the Station should be taken out of service until service repairs are made. Replacement of the above items must be carried out by the Operator's service department or an entity with the required authorisations and approval of the Operator. Replacement of safety apparatus by the service is permitted. After each replacement of apparatus, electrical tests of the Station and functional tests must be carried out again. It is not permissible to operate the equipment after replacing components without carrying out the aforementioned tests.

Service and maintenance work may only be carried out when the operating voltage is switched off. All health and safety measures must be observed.

The electrical tests must be carried out and approved by a person who meets the qualification requirements for the position of operation and supervision, as referred to in the regulations issued pursuant to Article 54(6) of the Act of 10 April 1997. - Energy Law.



Drawing 21. Electrical diagram of the charging station

The Charge Station components may only be replaced when the power supply is switched off and by authorised personnel. Replacement of components and subassemblies must be carried out in accordance with these instructions. The components to be replaced must have the appropriate parameters defined by the station manufacturer. The individual components and subassemblies of the Charging Station must be replaced as follows:

- **Terminal blocks** - remove the front cover, unscrew the terminals, remove the wires and detach the apparatus from the mounting rail. Place new terminal blocks on the same mounting rail, screw on the supply wires and close the front cover. Ensure that connections are made in accordance with the wiring diagram.
- **Surge protector** - first unplug the power supply cables and earth wire, then unplug the apparatus from the mounting rail and proceed with the installation of the new device.
- **12 V power supply** - disconnect the supply and output wires, unplug the unit from the mounting rail, fit a new power supply and electrically connect according to the wiring diagram of the Charging Station.
- **Overcurrent circuit breaker** - first unplug the power supply wires, then unplug the unit from the mounting rail and proceed to mount the new unit. After installation, ensure that the wires are firmly connected to the unit.
- **Residual current device (RCD) type A** - first unplug the supply cables, then unplug the device from the mounting rail and proceed with the installation of a new device. After installation, ensure that the wires are firmly fitted in the device
- **Contactors** - disconnect the supply and output wires, unplug the unit from the mounting rail, fit a new contactor and electrically connect according to the Charging Station wiring diagram. Ensure that the electrical connection of the control contacts is compatible. Incorrect connection may result in failure of the entire unit.
- **Type B RCD system** - unplug the electrical cables passing through the measuring coil from January to the terminal strip under the charging cable and disconnect the signal tape, then remove the cables passing through the coil, remove the measuring system by unscrewing the mounting screws and fixing the new system. Then place the phase cables together with the with the neutral conductor through the measuring coil and connect the wires to the contactor and terminal strip for cable connection, then connect the signal tape to the controller.

- **Charging cable with Type 2 plug** - unscrew the cable gland, unhook the cables from the terminal strip located on the side inside the station. Then grasp the cable on the outside of the station and remove it from inside the station. Once the cable has been removed, feed the new cable through the cable gland into the inside of the station, attach the terminals to the strip and press the cable through the gland into the station housing.
- **GSM communication module** - unscrew the module from the mounting rail, disconnect the power cable, GSM communication cable and Ethernet cable. Install a new device and connect the previously disconnected cables. Make sure there is a SIM card in the GSM module.
- **Display 10.1 "** - disconnect the power cable, USB cable and Ethernet cable, then remove the four screws securing the display to the casing. In the next step, unscrew the clamping screws for the screen casing and remove the whole device together with the casing. Pay particular attention to the gasket surrounding the screen when installing the screen.

Electrical testing of the Charging Station - description of how to check the condition of the equipment, including safety components.

The Charging Stations should be electrically tested at least once every 3 years. Cyclically, the residual current protection, which protects against electric shock, should be tested every year.

All tests should be carried out by suitably qualified persons and in accordance with the applicable standards and regulations. Electrical measurements should include at least:

- continuity measurement of protective conductors, including conductors in the main and secondary equipotential bonding and, in the case of ring consumer circuits, of live conductors,
- insulation resistance measurements on electrical cables, measured between live conductors, between live conductors and the neutral conductor, between live conductors and the protective conductor and between the neutral conductor and the protective conductor connected to the earthing system,
- resistance measurements of the working earthing, where applicable,
- checking the operation of residual current devices,
- measurements of the effectiveness of protection against electric shock.

Continuity measurement of protective conductors

The continuity of the protective conductors is measured including the conductors in the main and auxiliary equalisation connections. To carry out the measurement, a measuring device must be connected between the equipotential bonding point (1) and the individual ends of the conductors coming out of this point earthing the following:

- connection terminal for door and protective conductor (2),
- terminal 4 of block J6 (3),
- PE pin of the first Station socket (left side, 4),
- PE pin of the second Station socket (right side, 5),
- tablet case clamp,
- main controller terminal.

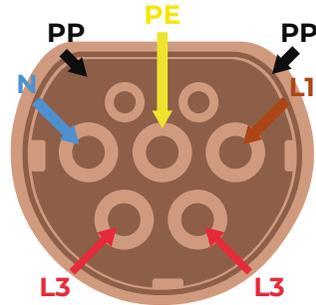


Figure 22. Marking of the pins of the Type 2 socket of the charging station

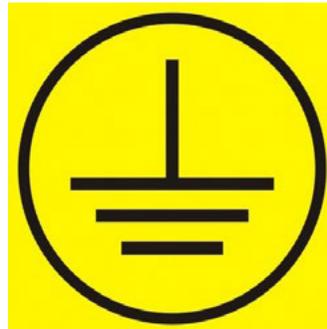
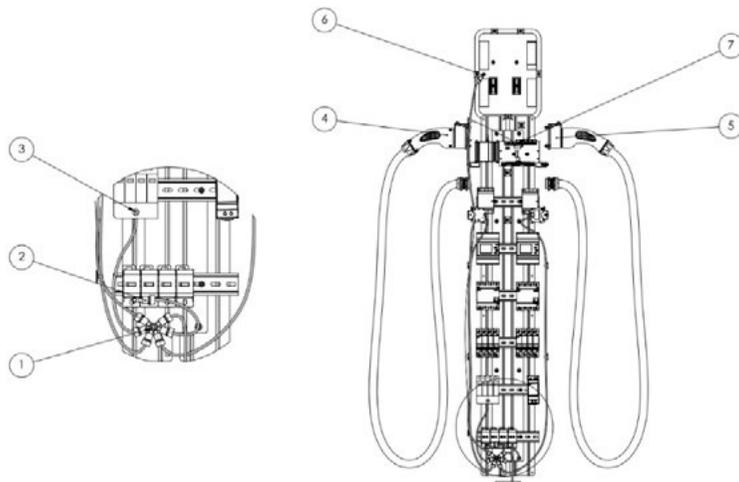


Figure 23. Designation of the main earthing point



Drawing 24. Protective conductor continuity measurement points

The open circuit measurement voltage should be between 4 and 24 V (AC or DC). The continuity measurement is to be performed with a current greater than or equal to 200 mA. The required measurement accuracy is to be better than 30 %. If the resistance of the entire single connection does not exceed 1Ω the continuity of the wire is satisfied.

Based on the standard: PN-EN IEC 61557-4:2022-05

Measurement of insulation resistance of electrical cables

Measurements of the insulation resistance of electrical cables shall be carried out between live conductors, between live conductors and neutral conductor, between live conductors and protective conductor and between neutral conductor and protective conductor connected to the earthing system. The measured insulation resistance is correct if, at the voltages given in the table, the measured value is not lower than the corresponding insulation resistance value. During the measurement, the instrument must not be connected to the mains. It is recommended to use dedicated equipment for insulation resistance measurement with a current calibration certificate. A special tip, which is a simulator of an electric vehicle, should be used.

Note - when measuring the insulation resistance, the EV charging cable must not be omitted. The correct measurement should be taken from the Charging Connector.

Caution! During the measurement of the insulation resistance, the phase and neutral wire connections of the surge protection device must be disconnected. Remember to reconnect the apparatus after the measurements have been taken. Failure to switch on the surge protection device may result in malfunction of the Charging Station. It is not necessary to disconnect other apparatus installed in the Station.

Measurements between each pair of live conductors (L1-L2, L2-L3, L3-L1) should be carried out as shown in Figure 24. Similarly, measurements should be carried out between the live conductors and the neutral conductor (L1-N1, L2-N1, L3-N1). An example of a measurement scheme for the insulation resistance between live conductors and protective conductor (L1-PE, L2-PE, L3-PE) is shown in Fig. 25. The measurement should also be carried out for the pair of neutral and protective conductor (N1-PE).

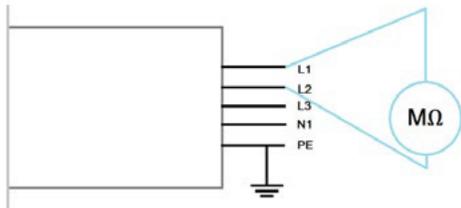


Figure 25. Measurement of resistance between live conductors L1-L2

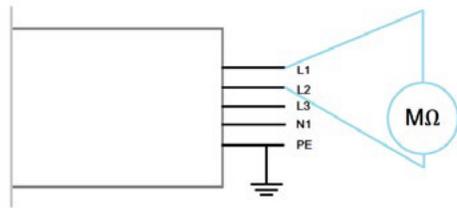


Figure 26. Measurement between the protective conductor connected to the earthing system and live conductors

Based on the standard: PN-HD 60364-6:2016-07

Minimum insulation resistance values		
Rated circuit voltages [V]	DC test voltage [V]	Minimum insulation resistance value [MΩ].
SELV and PELV	250	0,5
Up to and including 500 V, including FELV	500	1
Above 500 V	1000	1

Table 1 Minimum insulation resistance values, table data obtained from the UDT website

Measurement of the resistance of the working earths

Measurement of the resistance of the working earthing is only performed if they have been installed. The measurement should be carried out using the technical method or another method approved by the applicable regulations in accordance with sPN-EN 61557-5. sPN-EN 61557-5. The maximum permissible resistance is 30 Ω.

Functional testing of residual current devices

The effectiveness of the automatic circuit breaker with RCD should be checked using a suitable earth leakage circuit breaker tester and a vehicle simulator - adapter. The protection measure can be considered effective if the tripping occurs after the rated protection current is exceeded within a time period not exceeding the standardised maximum tripping times for type B RCDs shown in the table below.

Standardised cut-off time values for differential current equal to [ms].				
Type	2IΔn	4IΔn	10IΔn	5;10;20;50;100;200 [A]
Switch-off time [ms]	300	150	40	40

Table 2 Standardised cut-off time values for RCD type B table data obtained from the UDT website

Based on standards: PN-EN 61008-1:2013-05, PN-EN 62423:2013-06. Measurements should be made by switching on the voltage of the Station and using a suitable adapter to simulate the vehicle, start the charging process. Connect the RCD circuit breaker tester and follow the instructions of the meter. After the measurements have been taken, you should also confirm the correct operation of the "TEST" button on the RCD circuit breaker. Press the "TEST" button with the device switched on. Correct operation of this button should result in the voltage being disconnected and the lever switching to the off position.



Drawing 27. Residual current circuit breaker

Measurement of the effectiveness of protection against electric shock

Based on standards: PN-HD 60364-6 :2016-07, PN-HD 60364-4-41:2017-09 The effectiveness of fault protection measures by means of automatic circuit-breaking is checked by measuring the switch-off time and by measuring the short-circuit loop impedance, which is needed to check that the following condition is met.

$$Z_s \times I_a \leq U_o$$

Z_s - short circuit loop impedance

I_a - current causing automatic de-energisation during the time specified in the table below,

U_o - rated AC or DC voltage in relation to earth.

The test should be carried out with a meter, with a suitable attachment, allowing measurement in a circuit with an overcurrent circuit breaker without tripping the breaker with the function of measuring the short circuit loop impedance Z_s . It should be checked whether the short-circuit current will be sufficient to trip the protection. The table below shows the maximum tripping times depending on the rated voltage. The measurement should be carried out for all supply phases of the Charging Points. The test should also be carried out using an apparatus that allows work on circuits with an overcurrent circuit breaker without tripping it.

Maximum switch-off times								
System	50 V < $U_0 \leq 120$ V [ms]		120 V < $U_0 \leq 230$ V [ms]		230 V < $U_0 \leq 400$ V [ms]		$U_0 > 120$ V [ms]	
	a.c	d.c	a.c	d.c	a.c	d.c	a.c	d.c
TN	800	a	400	1000	200	400	100	100
TT	300	a	200	400	70	200	40	100

Table 3 Maximum protection tripping times for TN and TT systems, data obtained from the UDT website

A set of listed standards:	
PN-EN IEC 61557-4:2022-06	The standard relates to the requirements of equipment designed to measure the resistance of earthing conductors, protective earthing conductors and equalising conductors, together with their connections and terminals, either indicating the measured value of the resistance or signalling the achievement of the resistance limits to be monitored.
PN-HD 60364-6:2016-07	Standard specifying requirements for acceptance testing and periodic checking of electrical installations.
PN-EN 61008-1:2013-05	This International Standard applies to residual current circuit breakers with independent or mains voltage dependent operation, for domestic and similar use, without integral overcurrent protection (hereinafter referred to as RCCBs), for rated AC voltages not exceeding 440 V and rated currents not exceeding 125 A, for fixed installations, intended primarily for electric shock protection.

PN-EN 62423:2013-06	The standard applies to type F and type B residual current circuit breakers with and without integral overcurrent protection for domestic and similar use
PN-HD 60364-4-41:2017-09	The standard relates to Protection for safety - Protection against electric shock

Table 4. List of all standards in the manual

Functional tests of the Charging Station and security elements

Functional tests must be carried out with the power supply switched on and after the electrical tests have been carried out. Before testing, ensure that all safety tests have been carried out correctly and the Station can be subjected to functional tests.

Testing should be carried out by passing all charging modes. The following points should be noted:

- responsiveness of the user interface,
- the correct operation of the payment terminal,
- the correctness of the entered parameters, i.e. charging time, charging amount, charging energy,
- correctness of data when sending receipts and invoices,
- the correctness of the sending of settlement documents.

Simulated Charging Station faults should be forced by a suitable test circuit dedicated to the AC Charging Station. Faults can be forced by a missing diode, shorted CP or PP wire. Functional testing of the Charging Station, especially in the fault section, should be carried out by qualified personnel or persons trained to do so, with the appropriate authorisations.

In the functional test process, the charging points should be handled as in normal operation. First go through the charging procedure according to the instructions in Chapter 5. Then proceed to simulate the station faults described in Chapter No. 8. From the faults, you can determine whether the station is diagnosing faults correctly.

The operation of the Charging Station is considered to be correct when it correctly undergoes the charging process described in section no. 5 and reacts appropriately to charging errors described in section no. 8.

In addition, functional tests to check the operation of the protective elements in the form of residual current circuit breakers must be carried out according to the instructions under "Functional verification of residual current protective devices" in this chapter.

Term of servicing

A functional test (service inspection) must be carried out once a year. A functional test (service inspection) report must be drawn up from the functional test (service inspection), including the above-mentioned chapter and noting any faults, defects or circumstances which raise doubts as to the operability of the charging station. In addition, each device within the self-healing system is equipped with a register of faults, defects and damage recorded online.

8. Troubleshooting and fault resolution

A 'Self-healing' system is implemented in the Charging Station to detect individual faults and failures of the Station and to introduce countermeasures to restore the basic functionality of the unit, if possible. The procedures implemented are automatic.

At Eway Charging Stations, the errors can originate:

- communication error with the electric vehicle,
- detection of differential current,
- abnormal voltage or current parameters,
- damage to the device.

Errors in terms of damage to the device and incorrect voltage or current parameters are regarded as critical errors. If these occur, the device will automatically abort the charging process or not start the charging process. If errors occur during an open Charging Session, transactions are automatically interrupted and cleared. The charging process is interrupted and the device is inaccessible to the User.

The Operator Service provides a control and monitoring system dedicated to Eway Charging Stations. The Infrastructure Owner or Station Operator has a constant view of the system and the ability to identify any fault that occurs at a particular Station. The Charging Station Operator has the ability to identify the fault in question and take the appropriate steps to repair or restore the Station to service.

Self-healing procedures do not involve interaction with the User to repair or restore the device to working order.

Error name	„Self-healing” procedure	Result
Charge current overload	-Charging interruption, -reset of the respective Charging Point in the controller, -re-initialisation of charging, -if the error reoccurs, the User should be prevented from charging from the Charging Point in question.	In the event of a positive "Self-healing" process, the charging process continues. If the error occurs again, the loading is interrupted and the message "Out of Service" is displayed.
Supply voltage too low	Interrupting charging or preventing it from starting. Monitoring of voltage level.	Station switched off. Message display: "Out of Service".
Supply voltage too high	Interrupting charging or preventing it from starting. Monitoring of voltage level.	Station switched off. Message display: "Out of Service".
PP communication error	-Interrupting charging or preventing it from starting, -reset of the respective Charging Point in the controller, -if the error recurs, the User should be prevented from charging from the Charging Point in question.	Abort loading. Completion of the transaction and return to the start screen.

Error name	„Self-healing” procedure	Result
CP communication error	-Interrupting charging or preventing it from starting, -reset of the respective Charging Point in the controller, -if the error recurs, the User should be prevented from charging at the relevant Charging Point.	Abort loading. Completion of the transaction and return to the start screen.
GFCI error	-Reset of the respective Charging Point in the controller, -in the event of a recurrence of the error blocking the relevant Charging Point.	Blocking of a particular Charging Point.
GFCI test error	-Reset of the respective Charging Point in the controller, -in the event of a recurrence of the error blocking the relevant Charging Point.	Blocking of the charging channel in question.
Short-circuit contactor	Not remotely repairable, this is a critical failure requiring onsite service.	Station out of service. Display of "Out of Service" message
Open contactor	Not remotely repairable, this is a critical failure requiring onsite service.	Station out of service. Display of "Out of Service" message
Energymeter communication error	-Interrupting charging or preventing it from starting, -acquisition of the current status of the counter [if an error occurs during the charging process], -Reset of the respective Charging Point in the controller, -if the error recurs, the User should be prevented from charging on the charging channel concerned, -settlement of the recorded counter value before resetting the controller channel [if the error occurs during the charging process].	Station out of service. Display of "Out of Service" message

Error name	„Self-healing” procedure	Result
Vehicle diode error	-Charging interruption, -reset of the respective Charging Point in the controller, -if the error recurs, the User should be prevented from charging at the relevant Charging Point,	Abort loading. Completion of the transaction and return to the start screen.
No PE conductor	-Interrupting charging or preventing it from starting, -reset of the respective Charging Point in the controller, -if the error recurs, the User should be prevented from charging at the relevant Charging Point,	Abort loading. Completion of the transaction and return to the start screen.
Failure of protective devices	-Interrupting charging or preventing it from starting, -acquisition of the current status of the counter [if an error occurs during charging], -settlement of the recorded counter value [if the error occurs during charging].	Station out of service. Display of "Out of Service" message
Temperature error	-Interrupting charging or preventing it from starting, -acquisition of the current status of the counter [if an error occurs during charging], -settlement of the recorded counter value [if the error occurs during charging], -observation of the error log, which will be reset after temperature stabilisation	Station out of service. Display of "Out of Service" message

9. Technical data

Charging station parameters	
Type of station	AC
Connector type	Type 2
Number of Charging Points	2
Charging point power	up to 22 kW
Dimensions (H x W x D) [mm].	1500 x 260 x 260
Weight [kg]	40
Cable range	Min. 5 m
Functional parameters	
Communication modules	Wifi, Ethernet, GSM (LTE)
OCCP protocol	2.0.1.
User interface	10.1" touchscreen display
Charging station status interface	LED signalling
Payment terminal	Built-in
Electrical parameters	
Network type	TN-S, TN-C, TN-C-S
Frequency	48 – 52 Hz
Rated voltage	380 – 415 V
Rated power	44 kW
Type of power control	Mode 3
Maximum cross-section of supply cable	16/95 mm ² (95 mm ² optional)
Recommended cross-section of power supply cable	16 mm ²
MCB	Built-in
MCB	Built-in
RCD type A	Built-in
RCD type B	Built-in
Over-voltage	Built-in
MID energy meter	Built-in

Mechanical parameters	
IP	54
IK	10
Material	Acid-resistant steel/plastic
Cable type	Spiral/straight
Colours	EWAY/RAL/ On request
Operating temperature	From -10°C to + 40°C
Moisture	95% (non-condensed)

10. Device dimensions

