

# Technical File

## The Electric Vehicles (Smart Charge Points) Regulations 2021

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This template is provided to assist sellers of relevant charge points that are subject to the Electric Vehicles (Smart Charge Points) Regulations 2021 (“the Regulations”) in meeting the requirements of Regulation 13.

This requires the seller to have a technical file for any relevant charge point that they sell, and to supply a copy of the technical file to any purchaser on request. In the event of bulk purchases, a single technical file can be provided for all identical charge points. Separate technical files are required however if there are any differences in make, model, software version etc between charge points sold.

The seller is not mandated to use this template, but any alternative format must meet the requirements of the Regulations.

**This document is the technical file for the following charge point:**

<b>Charge point make:</b>	Charge Amps
<b>Charge point model:</b>	Charge Amps Halo - 7.4 kW 1P 32A T2 OCPP – Monta (131345) Charge Amps Halo - 11 kW 3P 16A T2 OCPP – Monta (131355)
<b>Software version at point of sale:</b>	TBD
<b>Seller:</b> <i>Person responsible for compliance with the Regulations</i>	Charge Amps AB
<b>Manufacturer(s):</b> <i>If different to seller</i>	-

**Last update to technical file:**

2023-24-10

## Description of the smart charge point

This page outlines the general description of the charge point, including a description of its design, manufacture, and operation.

*(Note: all descriptions must be written in plain English, including written descriptions of any diagrams or drawings used or referred to)*

Charge Amps Halo is designed in Sweden and meets the requirements of the IEC 61851-1 and IEC 62196-2 standards. The enclosure is made of recycled aluminium, and the product meets the requirements of enclosure rating IP 66, and Vandal resistance IK10 when properly installed.

Charge Amps Halo has advanced technology, a stylish design, and smart functions, All in a compact and hassle-free charging station.

Charge Amps Halo is compatible with all rechargeable electric vehicles.

It comes with 1 x type 2 charging connector, tethered to the charger with a 7.5M long cable.

The LED rings around the central panel give clear indication of operating status,.

Charge Amps Halo can be connected to the internet via WiFi or LAN.

There are no panels, switches or user interfaces on Charge Amps Halo so the charger must be connected to the internet, then set-up in a cloud based management platform (Charge Amps Halo utilises the Monta Platform)

After set-up Charge Amps Halo can be managed via the Monta Cloud platform, or via the Monta App when connected to the internet. This includes start/stop charging sessions as well as setting and enabling schedules for charging sessions.

Schedules etc are stored on the charger so it maintains the smart charging functionality even if internet connectivity is disturbed.

Charging sessions can also be initiated using a suitable RFID card that is associated with the charger during the set-up process.

If the charger loses internet connectivity a charging session can be started/stopped using the RFID card.

User information is securely stored in the cloud based management platform: no personal data is stored on the RFID or in the charger.

## Operating manual

<b>Copy of operating manual as available at point of sale can be found (cross as appropriate):</b>		Attached to this document (hard copy)
		Attached to this document as a digital file (soft copy)
	X	Available online via hyperlink (soft copy)
<b>Link if available online:</b>	<a href="#">Charge Amps Halo EV charger</a>	
<b>Version of file received at point of sale if available online:</b>	Rev 01	

## Technical solutions implemented to meet the requirements of the Regulations

This section provides descriptions in plain English of the solutions adopted to meet the requirements of the Regulations, including descriptions and explanations in plain English of any diagrams or drawings used.

Information provided here may be appended if appropriate, but any appendages should be listed here with clear indication of which specific requirement(s) they evidence.

### Smart functionality

Requirement	Technical solution adopted to meet the requirement
Charge point is able to send and receive information via a communications network	Compliant: Charge Amps Halo Chargers can send and receive information via a communication network.  Charge Amps Halo Chargers can connect to the internet via WiFi or LAN,  Communication to the Monta Management platform is done via OCPP 1.6J
Charge point is able to respond to signals or other information received by it by: <ul style="list-style-type: none"> <li>Increasing or decreasing the rate of electricity flowing through the charge point</li> <li>Changing the time at which electricity flows through the charge point</li> </ul>	Compliant: Charge Amps Halo Chargers can respond to signals or other information from the Management platform (Monta) to increase or decrease the rate of electricity flowing through the charge point and change the schedule.
Charge point is capable of using this functionality to provide demand side response services, including response DSR services	Compliant: Charge Amps Halo Chargers can respond to signals or other information from the Management platform (Monta) provided by demand side response services, including response DSR services.
Charge point has at least one user interface, incorporated in the charge point or otherwise made available to the owner	Compliant: There are no panels, switches or user interfaces on Charge Amps Halo so the charger must be connected to the internet, then set-up in the Monta cloud based management platform.  After set-up Charge Amps Halo can be managed via the Monta platform, or via the Monta App when connected to the internet. This includes start/stop charging sessions as well as setting and enabling schedules for charging sessions.  Schedules etc are stored on the charger so it maintains the smart charging functionality even if internet connectivity is disturbed.

	<p>Charging sessions can also be initiated using a suitable RFID card that is associated with the charger during the set-up process.</p> <p>If the charger loses internet connectivity a charging session can be started/stopped using the RFID card.</p>
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## Electricity supplier interoperability

Requirement	Technical solution adopted to meet the requirement
Charge point is configured such that it will not cease to have smart functionality if the owner changes their electricity supplier	<p>Compliant:</p> <p>Charge Amps Halo Chargers communicate via OCPP 1.6j to the Monta Platform which controls Smart Charging functions and is not locked or dependent on the choice of electricity supplier.</p>

## Loss of communications network access

Requirement	Technical solution adopted to meet the requirement
Charge point is configured such that, in the event it ceases to be connected to a communications network, it will remain capable of charging an electric vehicle	<p>Compliant:</p> <p>When connected to the internet Charge Amps Halo Chargers are managed by the Monta Platform.</p> <p>In the event it ceases to be connected to a communications network the charger will charge accordance to following:</p> <ul style="list-style-type: none"> <li>- Given the charger is offline and is configured to allow local offline authorization, when the RFID tag is presented to the charger, then the RFID tag shall be authorized locally and, if approved, allow charging.</li> <li>- Given the charger is configured with a local charging schedule, when the charger is temporary or permanently offline, then the charger shall follow its schedule locally.</li> </ul>

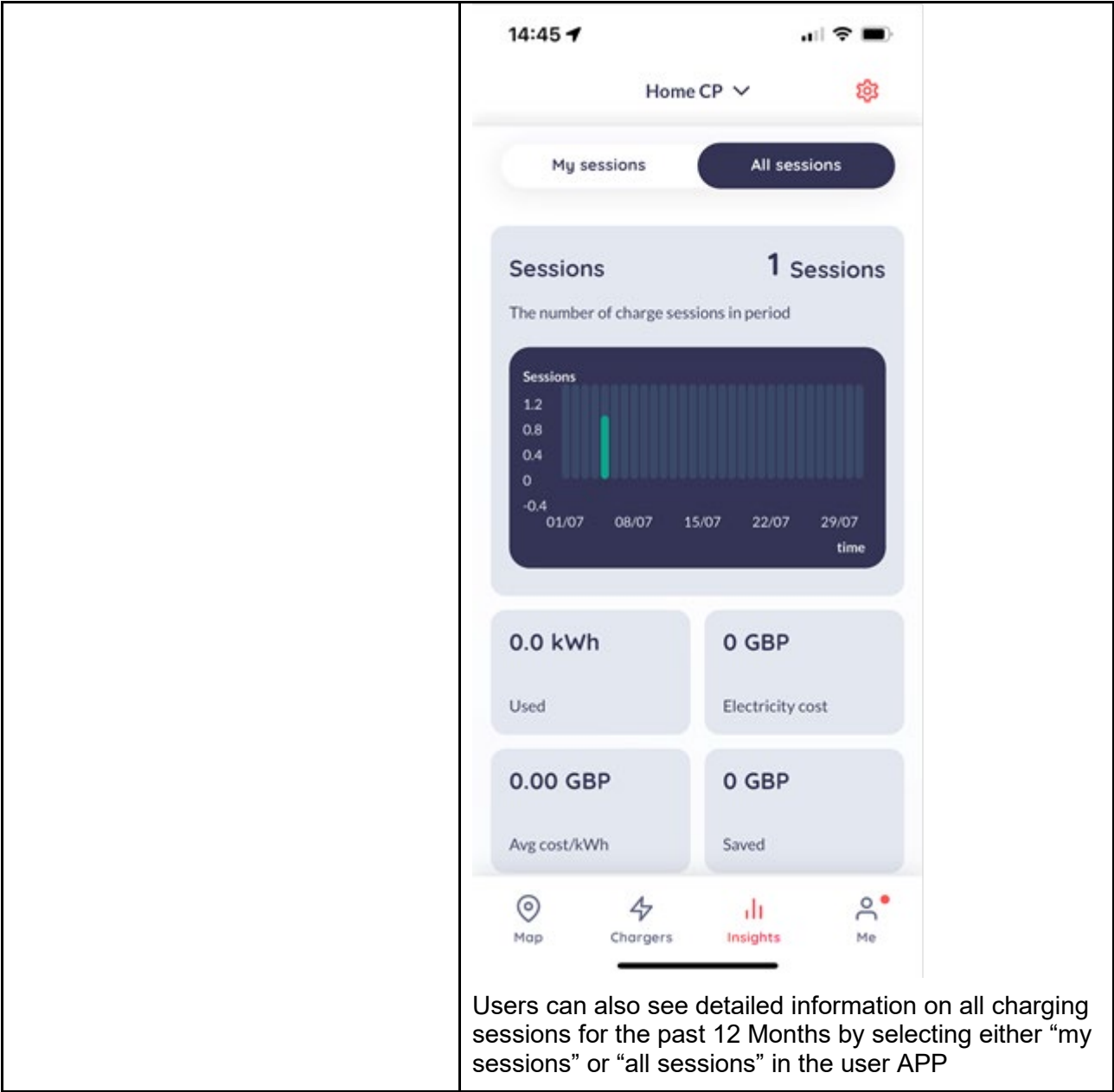
## Safety

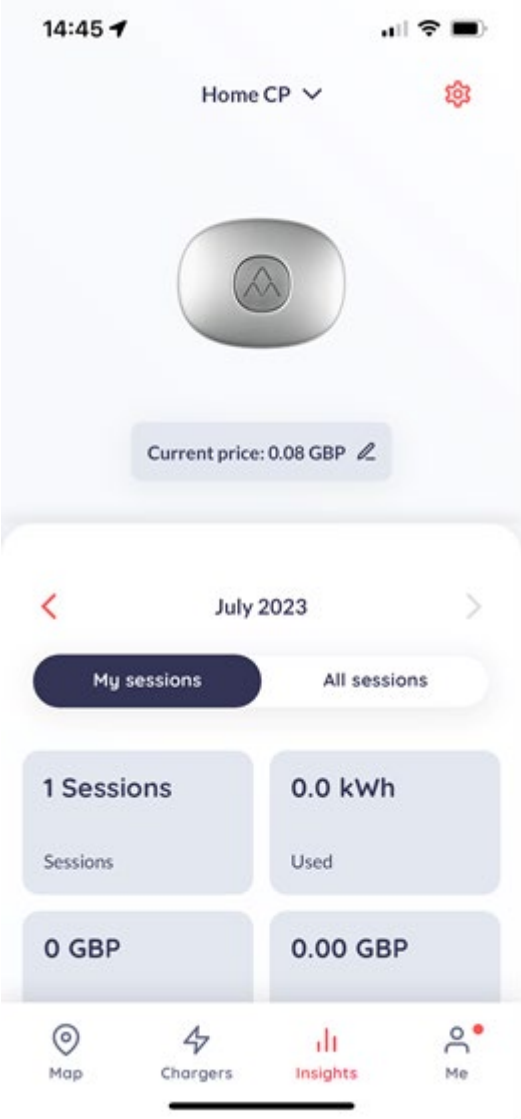
Requirement	Technical solution adopted to meet the requirement
<p>Charge point is configured such that it will not allow a relevant person to carry out a specified operation where to do so would or may result in a risk to the health or safety of persons.</p> <p>“Relevant persons” means the owner, or an end-user of the relevant charge point who is not the owner.</p>	<p>Charge Amps Halo is designed and manufactured to ensure physical safety of all users.</p> <p>It is CE marked to certify it complies with the relevant standards for EV charging equipment.</p> <p>In addition, we recommend that Charge Amps Chargers should only be installed by persons who are qualified to install such equipment, and have completed the Charge Amps Academy training.</p>

<p>“Specified operation” means:</p> <ul style="list-style-type: none"> <li>• Overriding the default mode of charging during the default charging hours</li> <li>• Overriding the provision of demand side response services</li> <li>• Overriding the random delay</li> </ul>	<p>There are no buttons or switches on the Charge Amps Halo for physical interaction. Once the charger is connected to the vehicle, management of the charging session is via the Monta user interface or App.</p> <p>The user interface enables users to initiate and stop charging, to schedule charging and to access information on charging sessions, there are no options to make changes that would result in a risk to the health and safety of any person.</p>
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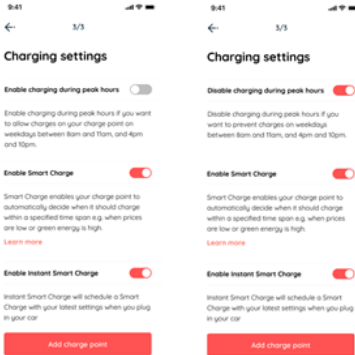
## Measuring system

Requirement	Technical solution adopted to meet the requirement
<p>On each occasion it is used, the charge point measures or calculates:</p> <ul style="list-style-type: none"> <li>• The electricity it has imported or exported (in watt-hours or kilowatt-hours)</li> <li>• The amount of time for which it is importing or exporting electricity</li> </ul>	<p>Charge Amps Halo measures the voltage and current internally by a separate measuring circuit and current clamps in both directions (import/export).</p> <p>The internal processor (ATM90E32AS; a processor that is typically used in electricity meters) measures the time to calculate kilowatt-hours. Charge Amps Halo charger makes the information available to the Charger Management Platform (Monta).</p> <p>The accuracy has been tested and certified by an external test house – See attached test report.</p>
<p>The charge point is configured such that the owner can view the information in reference to:</p> <ul style="list-style-type: none"> <li>• Any occasion on which it was used to import or export electricity within the past 12 Months.</li> <li>• Any month within the past 12 months</li> <li>• The entirety of the last 12-month period</li> </ul>	<p>Compliant</p> <p>The owner of the Charge Amps Halo Charger can view and download data on used electricity within the past 12 months on any occasion:</p> <p>Daily, Weekly, Monthly for the past 12 Months or for a specified period.</p> <p>This information is readily available via the Monta User interface.</p> <p>Image of the user App showing electricity used in the last charging session:</p>

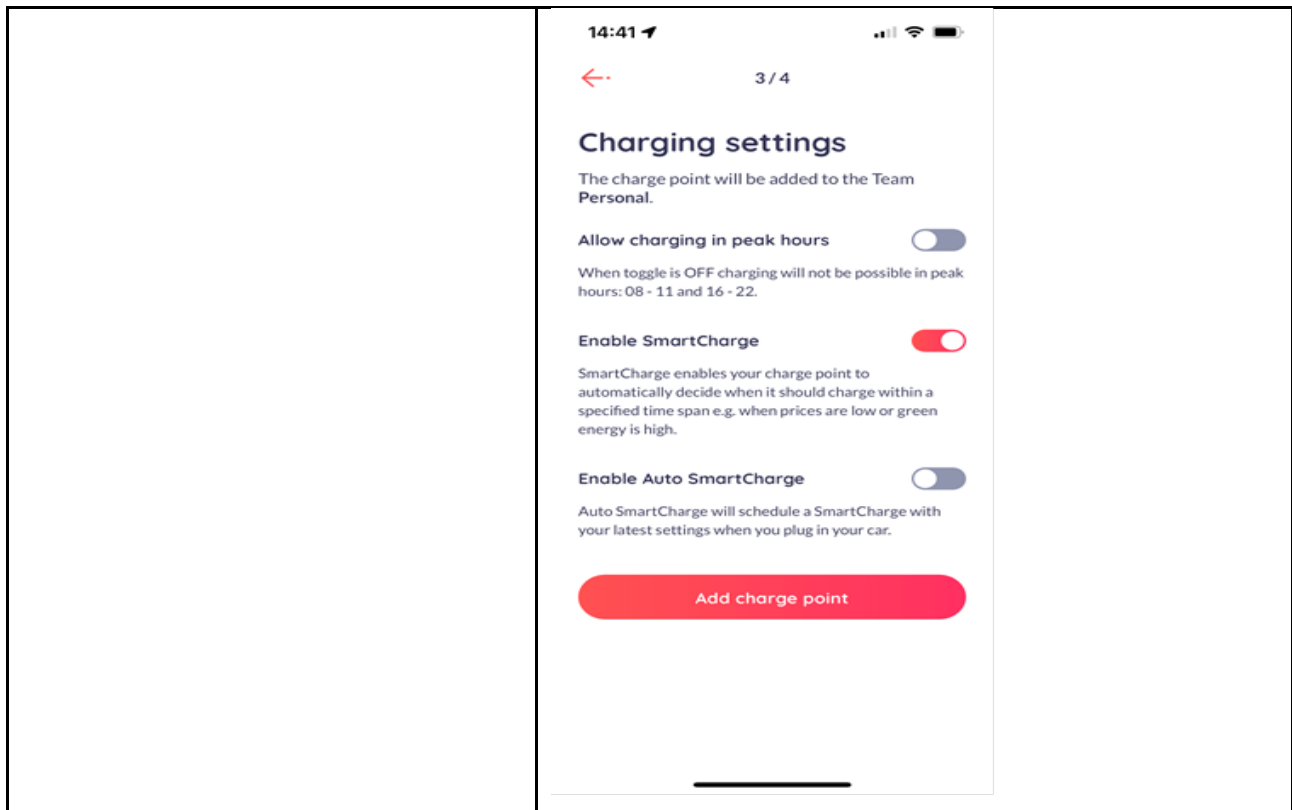


	 <p>The screenshot shows the Charge Amps Halo app interface. At the top, the status bar displays the time 14:45, signal strength, Wi-Fi, and battery levels. The app header shows 'Home CP' with a dropdown arrow and a settings gear icon. Below this is a large image of a silver smart charge point. Underneath the image, it says 'Current price: 0.08 GBP' with a small edit icon. A calendar view for 'July 2023' is shown, with 'My sessions' selected. Below the calendar, there are four summary cards: '1 Sessions' (with 'Sessions' below it), '0.0 kWh' (with 'Used' below it), '0 GBP', and '0.00 GBP'. At the bottom is a navigation bar with icons for 'Map', 'Chargers', 'Insights' (highlighted in red), and 'Me'.</p>
<p>The charge point is configured such that it can:</p> <ul style="list-style-type: none"> <li>• On each occasion it is used, measure or calculate every one second the electrical power it has imported or exported (in watts or kilowatts)</li> <li>• Provide this information via a communications network</li> </ul>	<p>Compliant:</p> <p>Charge Amps Halo Chargers calculate energy usage per second, in accordance with the OCPP standard measurement parameters</p>
<p>The charge point is configured such that:</p> <ul style="list-style-type: none"> <li>• The figures measured or calculated are accurate to within 10% of the actual figure</li> <li>• Any inaccuracies are not systematic</li> </ul>	<p>Compliant:</p> <p>Accuracy of 1% verified by external test houses – certificates included in the supporting documents.</p>

## Off-peak charging

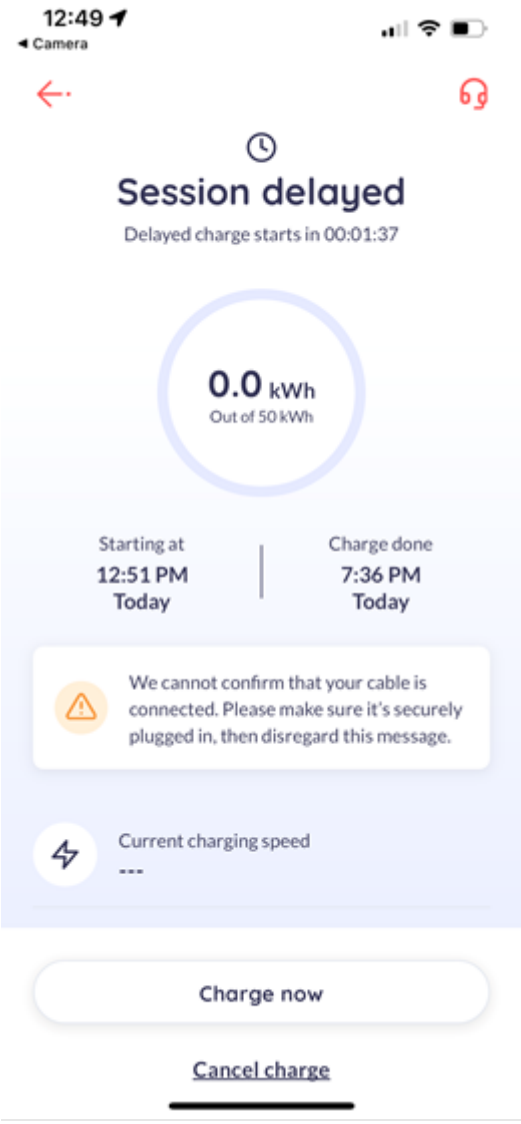
Requirement	Technical solution adopted to meet the requirement
<p>The charge point:</p> <ul style="list-style-type: none"> <li>Has pre-set default charging hours which are outside of peak hours</li> <li>Offers the owner the opportunity to accept, remove, or change the default charging hours on first use</li> <li>Offers the owner the ability to change, remove, or set default charging hours any time after first use</li> </ul> <p>unless the charge point is sold with a DSR agreement, configured to comply with the requirements of this agreement, and details of the agreement are included in the statement of compliance</p>	<p>Default schedules are pre-set in the User interface, with sessions avoiding Peak electricity demand.</p> <p>No Charging between 8am- 11am, and 4pm-10pm during weekdays.</p> <p>On first use, domestic users are prompted to accept, the pre-set schedules, reject the pre-set schedules or set their own schedules.</p> <p>In Workplace chargers only the administrator can accept, remove or override these default schedules.</p> <p>Screen shots of the User APP:</p> <p>Enabling and disabling charging during Peak hours</p> <p>Our Portal &amp; Mobile app allows Charge Point owners to set charging restrictions to prevent overloading the electrical grid during peak hours on weekdays or make changes to their settings at any time. Toggling off "charging during peak hours" will prevent members of a team to charge during peak hours, be it through the App or a Charge key.</p> 
<p>The charge point is configured:</p> <ul style="list-style-type: none"> <li>To charge a vehicle during the default charging hours (if any), unless the owner overrides the default mode of charging during this time</li> <li>Such that the owner can override the provision of demand side response services</li> </ul>	<p>Compliant:</p> <p>It is possible to override the default mode of charging during the default charging hours in the Monta User interface.</p> <p>Provision of Demand Side Responses can also be overridden in the User interface if required.</p> <p>Screenshot of the user APP</p>

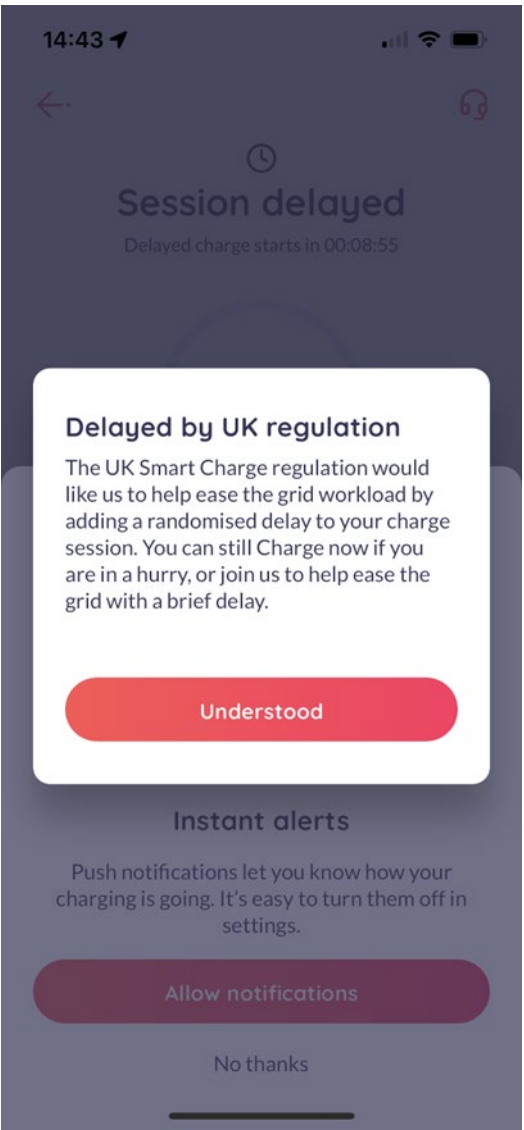




## Randomised delay

Requirement	Technical solution adopted to meet the requirement
The charge point is configured such that it must operate, at each relevant time, with a delay of random duration up to 600 seconds, determined to the nearest second each time	<p>Compliant:</p> <p>The Charge Amps Halo management platform offers by default a delay of random duration up to 600 seconds.</p> <p>If required, users can override the randomised delay feature and instantly charge.</p> <p>Screenshot of the User App</p>

	
<p>The charge point is configured such that the maximum duration of this delay can be remotely increased to up to 1800 seconds if required</p>	<p>Compliant:</p> <p>The maximum duration of the delay can be increased to up to 1800 seconds through a remote software update.</p>
<p>The charge point is configured such that the random delay will not operate where:</p> <ul style="list-style-type: none"> <li>• The owner or another relevant end-user has manually overridden it</li> <li>• An equivalent random delay has already been applied to the operation of the relevant charge point</li> <li>• The charge point is responding to a response DSR service</li> </ul>	<p>Compliant:</p> <p>Users can override the randomization settings in the Management Platform or App by setting the charger to "Always on".</p> <p>Provision of Demand Side Responses can also be overridden in the User interface if required.</p> <p>When a car is connected to the charger outside the scheduled charging hours, the app will show the status "Waiting for schedule". In this view there is a "Start" button that will start charging the car immediately, cancelling both the delay and overriding the schedule.</p>

	<p>Image of the Charge Amps Halo user APP:</p>  <p>In addition, Charge Amps Halo can respond to a response DSR service communicated via OCPP</p>
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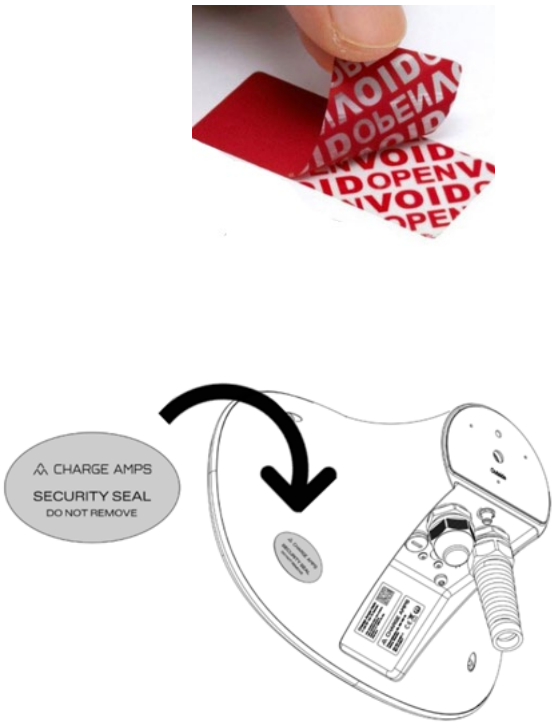
## Security

Requirement	Technical solution adopted to meet the requirement
<p><b>General principles</b></p> <p>The charge point is designed, manufactured, and configured to provide appropriate protection:</p> <ul style="list-style-type: none"> <li>• Against the risk of harm to, or disruption of the electricity system</li> <li>• Against the risk of harm to, or disruption of, the charge point</li> </ul>	<p>Charge Amps Halo is designed, manufactured, and configured to provide appropriate protection, they are manufactured from recycled aluminium and are IK 10 rated.</p> <p>There are no screens or buttons on the charger so all interaction is via the user interface in the cloud management platform or App.</p> <p>Internal access to Charge amps Halo is achieved by removing 4 x Allen screws on the rear panel of the charger.</p>

<ul style="list-style-type: none"> <li>For the personal data of the owner and any other end-user of the relevant charge point</li> </ul>	
<p><b>Passwords</b></p> <p>The charge point is configured such that where passwords are used on it:</p> <ul style="list-style-type: none"> <li>The password is unique to the charge point and not derived from, or based on, publicly available information, or is set by the owner</li> <li>The password cannot be reset to a default password applying to both the charge point and other charge points</li> </ul>	<p>Compliant:</p> <p>The credentials required for local access to the Charge Amps Halo is programmed into the charger as part of the manufacturing process of the charger.</p> <p>They are unique for each charger and cannot be reset to a default password as there are no shared or default passwords available.</p>
<p><b>Software</b></p> <p>The charge point incorporates software which is able to be securely updated using adequate cryptographic measures to protect against cyber attack</p>	<p>Compliant:</p> <p>Charge Amps Halo user interface (Monta) supports updating the firmware on the charge point via OCPP both in our Portal for administrators and in the app for end users.</p> <p>The firmware update file is encrypted with secret key and signed with manufacturer certificate. The encryption and signature is verified before upgrading.</p>
<p><b>Software</b></p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> <li>It checks for security updates available when first set up by the owner and periodically after</li> <li>It verified the authenticity and integrity of each prospective software update by reference to both the data's origin and its contents and only applies the update if the authenticity and integrity of the software have been validated</li> <li>By default, it provides notifications to the owner about prospective software updates</li> <li>The owner can implement software updates without undue difficulty</li> </ul>	<p>Compliant:</p> <p>Charge point will always be prompted with a notification for new firmware update once it's released (see point 3 below). Both, if it's a newly set up charger or not.</p> <p>Firmware updates can be signed and have a certificate attached to ensure the security and integrity of the firmware file.</p> <p>Charge Amps User interface sends out in-app banner type notifications to the user that a new firmware update is available.</p> <p>One button click "Update Firmware" to initiate the firmware update, both in the APP and portal.</p> <p>Firmware updates are transferred from Charge Amps via OCPP, ensuring the very latest updates are always available.</p>
<p><b>Software</b></p> <p>The charge point is configured such that:</p>	<p>Compliant:</p> <p>Charge Amps Halo software is protected against unauthorized modification by physical means. The</p>

<ul style="list-style-type: none"> <li>• It verifies via secure boot mechanisms that its software has not been altered other than in accordance with a validated software update</li> <li>• If unauthorised change to software is detected, it notifies the owner and does not connect to a communications network other than for purposes of this notification</li> </ul>	<p>software is stored within the processor in the same component and the bus used for accessing the software is not available externally as in other solutions that would require secure boot.</p> <p>Charge Amps Halo does not use a separate Operating System – the management system is programmed directly on to the processor. The memory is also located on the microprocessor which ensures that no one can access or change the memory without destroying the microprocessor.</p> <p>Unauthorised changes cannot be made due to the architecture of the microprocessor.</p> <p>Changes to the software can only be made by Charge Amps using the encrypted file and secret key process mentioned above.</p>
<p><b>Sensitive security parameters</b></p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> <li>• Security credentials stored on the charge point are protected using robust security measures</li> <li>• Software does not use hard-coded security credentials</li> </ul>	<p>Compliant:</p> <p>Security credentials stored on the charge point are protected using robust security measures</p> <p>The charge point has a secure and encrypted connection to the User interface.</p> <p>In addition to that, credentials e.g. PIN for local access and Authorization Key for remote access cannot be read by any external system.</p> <p>Charge Amps Halo does not contain hard-coded security credentials</p>
<p><b>Secure communication</b></p> <p>The charge point is configured such that communications it sends are encrypted</p>	<p>Compliant</p> <p>Communication between the Charge Amps Halo and the User Interface is based on OCPP via WebSocket Secure (wss://) connections, which is an encrypted communication.</p>
<p><b>Data inputs</b></p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> <li>• Data inputs are verified so that the type and format of the data is consistent with that expected for the function</li> <li>• If such data cannot be verified, it is discarded or ignored by the charge point in a relevant manner</li> </ul>	<p>Compliant:</p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> <li>• Communication between the Charge Amps Halo and the User Interface is based on OCPP via WebSocket Secure (wss://) connections, which is an encrypted communication.</li> <li>• The Open Charge Point Protocol (OCPP) is a communication standard for EV charging stations and network software platforms. Simply put, any EV charging station that is OCPP-compliant can be configured to run any similarly OCPP-compliant software as the type and format of data is standardised.</li> <li>• Any data inputs that are not OCPP compliant cannot be interpreted by the charger and so will be ignored.</li> </ul>

	<ul style="list-style-type: none"> <li>User data inputs are via the App, most commonly by clicking on an icon or an image</li> </ul>
<b>Ease of use</b> <p>The charge point is configured to minimise the inputs required from the owner in connection with its set-up and operation</p>	<p>Compliant:</p> <p>We recommend that Charge Amps Chargers should only be installed by persons who are qualified to install such equipment, and have completed the Charge Amps Academy training. During the installation process the installer will ensure that the off peak charging schedules and randomised delay are set on the charger.</p> <p>Users just need to ensure the vehicle is connected to the charger.</p> <p>There are no buttons or switches on the Charge Amps Halo for physical interaction. Once the charger is connected to the vehicle, any additional management of the charging session is via the user interface or App.</p>
<b>Ease of use</b> <p>The charge point is configured such that any personal data can be deleted from it by the owner without undue difficulty</p>	<p>Compliant:</p> <p>All personal data stored on the user interface can be deleted by contacting Charge Amps Technical Support support.</p> <p>This includes WiFi codes , charge session history, RFID saved on the chargers</p> <p>Alternatively users can log-in to the local user management interface and delete all personal data by clicking on the reset button – this resets the charger and deletes all personal information.</p>
<b>Protection against attack</b> <p>The charge point is designed and manufactured to provide an adequate level of protection against physical damage to the charge point</p>	<p>Compliant:</p> <p>Charge Amps Halo is designed, manufactured, and configured to provide appropriate protection, they are manufactured from recycled aluminium and are IK 10 rated.</p> <p>There are no screens or buttons on the charger so all interaction is via the user interface in the cloud management platform or App.</p> <p>Internal access to Charge amps Halo is achieved by removing 4 x Allen screws on the rear panel of the charger.</p>
<b>Protection against attack</b> <p>The charge point incorporates a tamper-protection boundary to protect the internal components of the charge point</p>	<p>Compliant:</p> <p>Charge Amps Halo has an IK rated Aluminium casing comprising a rear enclosure and front cover. The front cover can only be removed by 4 x fixing screws located on the rea of the, close to the Charging sockets..</p> <p>Tamper Evident labels, similar to the below image will be applied to the fixing screws on the rear panel of the Charge Amps Halo, on completion of installation, they</p>

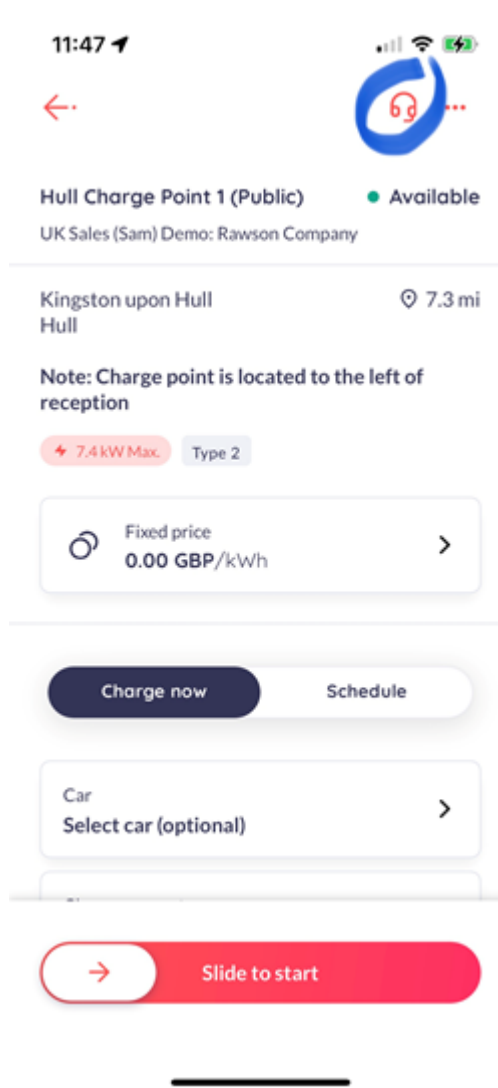
	<p>can also be applied to the joint between the front cover and rear enclosure if necessary.</p> <p>Any attempt to open the charger via the lock will be evident to the user as the label will be damaged or removed. When the label is removed, a 'VOID' pattern appears on both the charger and the label, preventing reuse.</p> <p>Any attempt to prise open the charger will be evident to users as it will cause damage to the front panel and/or rear enclosure.</p> <p>Image of the Tamper evident label applied to Charge Amps Halo</p> 
<p><b>Protection against attack</b></p> <p>The charge point is designed and manufactured to provide an adequate level of protection to its user interfaces and against use or attempted use of the charge point other than through the user interface</p>	<p>Compliant</p> <p>There are no screens or buttons on Charge Amps Halo Chargers as all user interaction is via the cloud based Management platform, or via a pre-authorised RFID card if the charger is offline.</p>
<p><b>Protection against attack</b></p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> <li>• If there is an attempt to breach the tamper-protection boundary, the owner is notified</li> </ul>	<p>Compliant:</p> <p>The Tamper evident labels are visible to the owner – on the rear of the charger.</p> <p>The user instructions state that in the event of a tamper incident the charger should be powered-off, and cannot be used until it has been checked by a qualified installer</p>

- Its software runs with only the minimum level of access privileges required to deliver functionality
- Any logical or network interfaces that are not required for the normal operation of the charge point or otherwise comply with the Regulations are disabled
- Software services are not available to the owner unless necessary for the relevant charge point to operate
- Any hardware interfaces that are used for the purposes of testing or development, but not otherwise during the operation of the charge point are not exposed

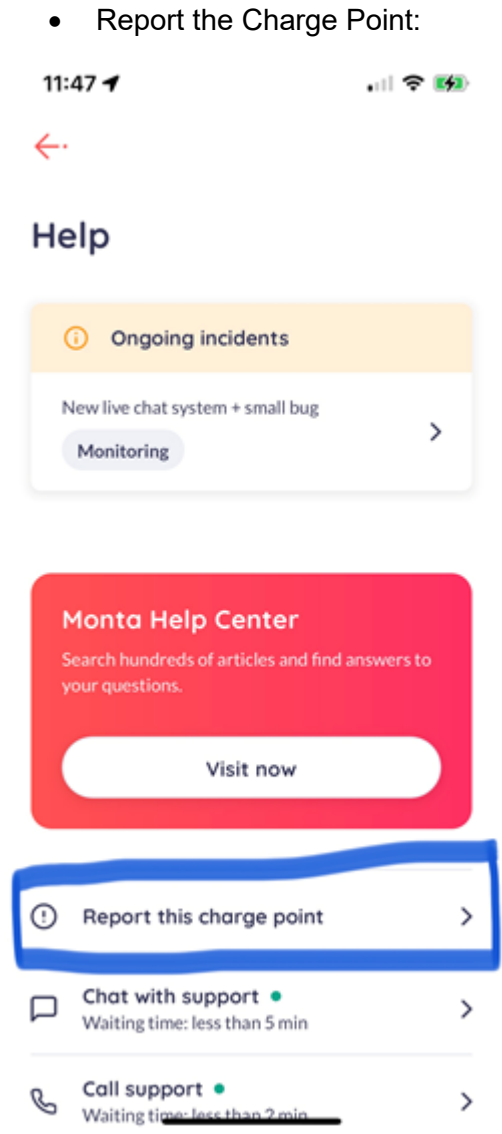
or maintenance provider to ensure there is no danger of harm to the user.

If there is evidence of an attempt to breach the tamper-protection boundary, the owner must:

- Power-off the Charge Amps Halo charger.
- Log the breach of the Tamper Protection Boundary in the Charge Amps Halo User Interface:
- On the home page of the charge point in question, the user can click the headset icon at the top right:





	<ul style="list-style-type: none"><li>Report the Charge Point:</li></ul>  <ul style="list-style-type: none"><li>Select the reason, describe the issue and record the time and date the event occurred. The user can also take pictures for the report:</li></ul>
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11:47

←

Report charge point

Select reason

▼

Describe the issue

Add screenshots or photos so we can help you better. (optional)

+

+

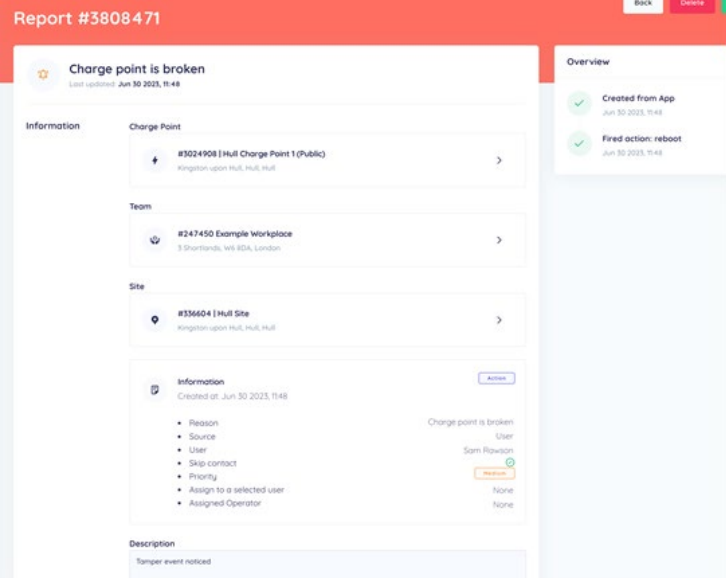
+

☐ I want to be contacted about this issue by the support team.

Submit report

- Once this report is submitted, it would then be viewable within the users Portal access. This will be in their 'reports' section and can be 'resolved' when the tamper event has been sorted.
- This will remain as a resolved ticket within the users reports environment:

- The report can be clicked in to for more detail and photos are all attached.

	<div data-bbox="699 192 1428 768">  <p><b>Report #3808471</b></p> <p><b>Charge point is broken</b> Last updated: Jun 30 2023, 11:48</p> <p><b>Information</b></p> <p><b>Charge Point</b> #3024908   Hull Charge Point 1 (Public) Kington-upon-Hull, Hull, Hull</p> <p><b>Team</b> #247450 Example Workplace 8 Shortlands, W8 8DA, London</p> <p><b>Site</b> #356604   Hull Site Kington-upon-Hull, Hull, Hull</p> <p><b>Information</b> Created at: Jun 30 2023, 11:48</p> <ul style="list-style-type: none"> <li>Reason: Charge point is broken</li> <li>Source: User</li> <li>User: Sam Reason</li> <li>Skip contact: <input checked="" type="checkbox"/></li> <li>Priority: <span>Medium</span></li> <li>Assign to a selected user: None</li> <li>Assigned Operator: None</li> </ul> <p><b>Description</b> Tamper event noticed</p> <p><b>Overview</b></p> <ul style="list-style-type: none"> <li>Created from App: Jun 30 2023, 11:48</li> <li>Fired action: reboot: Jun 30 2023, 11:48</li> </ul> </div> <ul style="list-style-type: none"> <li>• The user should then notify the installer or maintenance provider to check the charger and rework /replace if necessary.</li> <li>• Upon completion of the checks and any remedial work, the installer or maintenance provider will re-apply a tamper evident label.</li> </ul>
<p><b>Security log</b></p> <p>The charge point incorporates a security log – an electronic record which includes attempts (whether or not successful) to:</p> <ul style="list-style-type: none"> <li>• Breach the tamper-protection boundary</li> <li>• Tamper with the relevant charge point</li> <li>• Gain unauthorised access to the charge point</li> </ul> <p>These entries must record the time and date the event occurred (by reference to Coordinated Universal Time).</p>	<p>Compliant:</p> <p>The owner is responsible for adding attempts to breach the Tamper Protection Boundary to the log on the Charge Amps Halo User Interface.</p> <p>During the installation process users will be informed of and trained in the operation of the log function in the Charge Amps Halo User Interface. Where users will record the time and date the event occurred.</p>

## Test reports

The Regulations do not set a requirement to test charge points, however if tests have been performed which are deemed relevant to evidencing compliance with the Regulations, these should be included in this document.

This page documents the outcome of any tests. Resulting test reports, certifications, or other evidence should be attached to this file.

Name of test	Date of test	Outcome	Certificate attached to file?	Notes (e.g., did test occur via third party?)

Supporting documents to be attached:

1. IK10 Statement
2. MID test report (Accuracy of reporting)



Prøvningsrapport  
AURA r01.pdf



Statement IK AURA  
2022-12-27.pdf

## Test report of the metrology system of the Charge Amps chargers /Informe de comprobación del sistema de metrología de los cargadores Charge Amps

The means of results of the metrology analyzes carried out on the electric vehicle recharging equipment Charge Amps Aura and Charge Amps Halo are presented below.

	Mean discrepancy ( $\pm 0.081\%$ )	Max. discrepancy ( $\pm 0.081\%$ )
Charge Amps Aura	0.2481%	0.41309%
Charge Amps Halo	0.2408%	0.4745%

These values are equivalent to the ones presented in a C class active electric energy meter in concordance to the measuring Instruments Directive (MID) 2014/32/EU.

This report does not replace those verifications and/or calibrations that proceed by an Authorized Metrological Verification Body or Metrological Control Bodies, in accordance with the provisions of Order ICT/155/2020, of February 7, including Spain and Portugal.

*A continuación, se presentan la media de resultados de los análisis de metrología realizados a los equipos de recarga de vehículo eléctrico Charge Amps Aura y Charge Amps Halo.*

	Discrepancia media ( $\pm 0.081\%$ )	Discrepancia máxima ( $\pm 0.081\%$ )
Charge Amps Aura	0.2481%	0.41309%
Charge Amps Halo	0.2408%	0.4745%

*Estos valores son correspondientes a los de un contador de energía eléctrica activa clase C según la Directiva 2014/32/UE Del Parlamento Europeo Y Del Consejo, incluyendo España y Portugal.*

El presente informe no sustituye a aquellas verificaciones y/o calibraciones que procedan por un Organismo Autorizado de Verificación Metrológica u Organismos de Control Metrológico, de acuerdo con lo establecido en la Orden ICT/155/2020, de 7 de febrero, por la que se regula el control metrológico del Estado de determinados instrumentos de medida y resto de legislación en vigor

**Evaluator / Evaluador** ..... : Álvaro José Moreno Cruz  
**Address / Dirección** ..... : C/ Trespaderne, 29 – Edificio Barajas I  
28042 Madrid (Spain)

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- 2.- REFERENCE DOCUMENTATION / *DOCUMENTACIÓN DE REFERENCIA*
- 3.- RESULTS OF THE EVALUATION / *RESULTADOS DE LA EVALUACIÓN*

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## 1.- OBJECT AND SCOPE / OBJETO Y ALCANCE

### Object / Objeto:

The purpose of this report is to present the results of the tests performed on the Charge Amps recharging equipment, specifically in the Aura and Halo equipment. The purpose of these tests is to compare the energy measurements provided by the equipment and to compare them with our portable three-phase verification standard for testing electricity meters and transformers - PWS 2.3 PLUS.

*El objeto de este informe es presentar los resultados de los ensayos realizados a los equipos de recarga de la marca Charge Amps, en concreto de sus equipos Aura y Halo. El objeto de estos ensayos es comparar las medidas de energías proporcionadas por los equipos y compararlas con nuestro patrón trifásico portátil de verificación para la prueba de medidores de electricidad y de transformadores de medida - PWS 2.3 PLUS.*

### Scope / Alcance:

The test carried out on the Aura consists of:

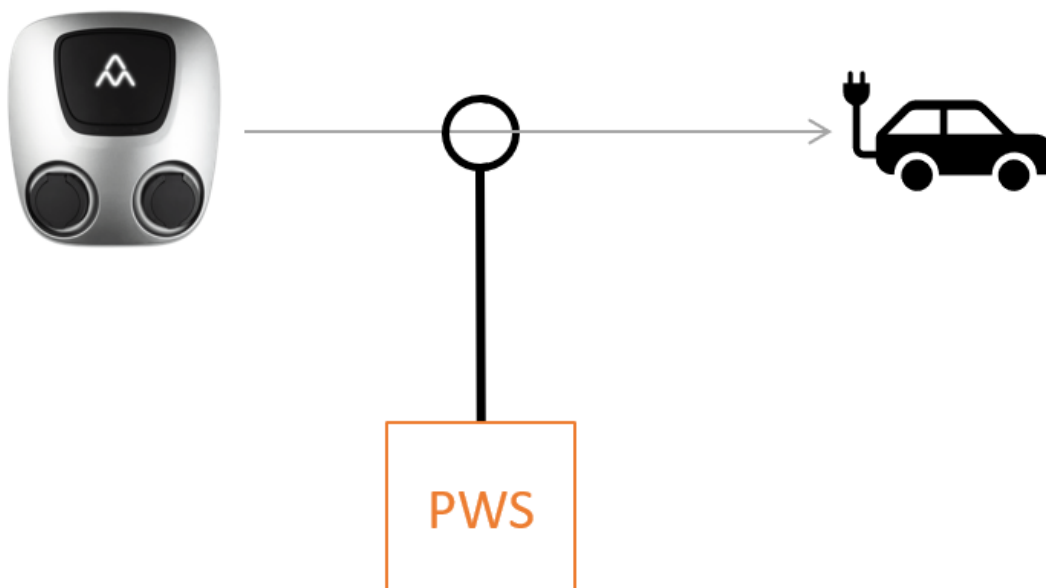
- 22 kW recharge and energy measurement
- 11 kW recharge and energy measurement
- 5 kW and 7,4 kW EV recharge and energy measurement

The test carried out on the Halo consists of:

- 11 kW recharge and energy measurement
- 5 kW recharge and energy measurement
- 3 kW recharge and energy measurement
- 5 kW EV recharge and energy measurement

All the tests will be conducted at room temperature and without imposing any type of power restriction on the power input of the equipment beyond its limit power. Charge Amps equipment will be connected to Internet to be able to collect data on the measured energy by them.

The scheme to be used is the following:



*El ensayo realizado al equipo Aura consta de:*

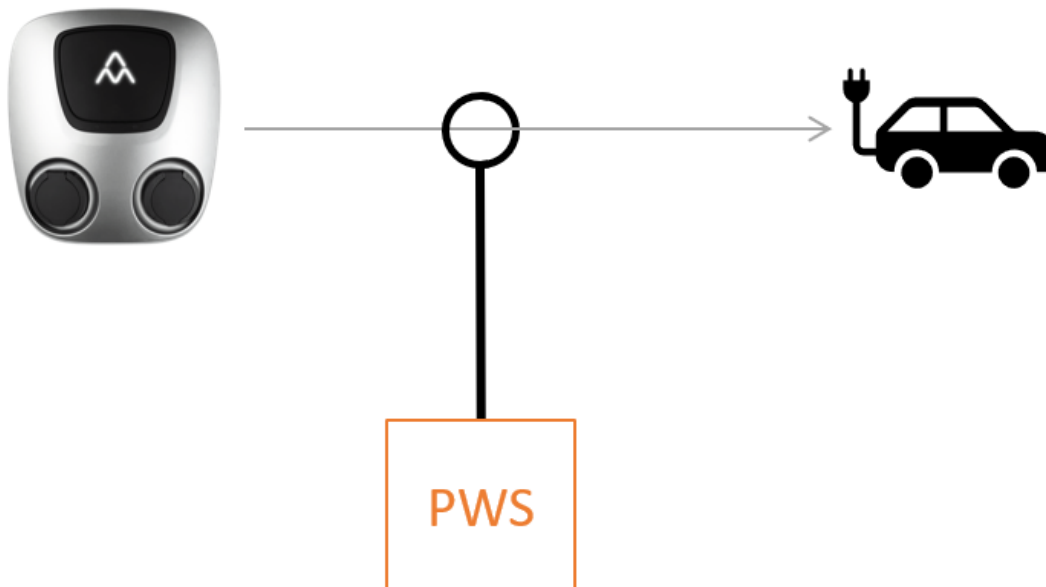
- *Carga a 22 kWh y lectura de la energía entregada*
- *Carga a 11 kWh y lectura de la energía entregada*
- *Carga con vehículo eléctrico de 5 kW/7,4kW y lectura de la energía entregada*

*El ensayo realizado al equipo Halo consta de:*

- *Carga a 11 kWh y lectura de la energía entregada*
- *Carga a 5 kWh y lectura de la energía entregada*
- *Carga a 3 kWh y lectura de la energía entregada*
- *Carga con vehículo eléctrico de 5 kW y lectura de la energía entregada*

*Todos los ensayos se realizarán a temperatura ambiente y sin imponer ningún tipo de restricción de potencia a la entrada de alimentación del equipo más allá de su potencia límite. Los equipos de Charge Amps se conectarán a Internet para poder realizar la toma de datos de la energía medida por los mismos.*

*El esquema que se utilizará es el siguiente:*





## 2.- REFERENCE DOCUMENTATION / DOCUMENTACIÓN DE REFERENCIA

The reference documentation based on which this evaluation has been carried out is the following:

*La documentación de referencia en base a la cual se ha realizado esta evaluación es la siguiente:*

- Real Decreto 244/2016, por el que se desarrolla la Ley 32/2014, de 22 de diciembre, de Metrología y sus anexos I, II y X.
- Los procedimientos de operación aprobados por la resolución de 11 de diciembre de 2019, para su adaptación al Real Decreto 244/2019.
- Orden ICT/155/2020 y anexos, por el que se regula el control metrológico del Estado en determinados instrumentos de medida.
- Real Decreto 1110/2007, de 24 de agosto, por el que se aprueba el Reglamento unificado de puntos de medida del sistema eléctrico e instrucciones técnicas complementarias.
- Orden TEC/1281/2019, de 19 de diciembre, por la que se aprueban las instrucciones técnicas complementarias al Reglamento unificado de puntos de medida del sistema eléctrico.
- Real decreto 842/2002, de 2 de agosto, por el que se aprueba el Reglamento electrotécnico para baja tensión, y actualizaciones.
- Real Decreto 1053/2014, de 12 de diciembre, por el que se aprueba una nueva Instrucción Técnica Complementaria (ITC) BT 52 «Instalaciones con fines especiales. Infraestructura para la recarga de vehículos eléctricos»
- Real Decreto 542/2020, de 26 de mayo, por el que se introduce la ITCBT 52 – Infraestructura para la recarga de vehículos.
- A Diretiva 2014/32/UE, do Parlamento Europeu e do Conselho, de 26 de fevereiro de 2014, relativa à harmonização da legislação dos Estados-Membros respeitante à disponibilização no mercado de instrumentos de medição, revogou a Diretiva 2004/22/CE, de 31 de março de 2004, e estabelece os requisitos essenciais a que os seguintes instrumentos e sistemas devem obedecer, tendo em vista a sua comercialização e/ou colocação no mercado.
- Decreto Lei n.º 90/2014, que altera o Decreto Lei n.º 39/2010.
- Decreto-Lei n.º 39/2010, de 26 de abril, artigo nº29 – Pontos de carregamento em edifícios existentes
- Decreto Lei n.º 90/2014, de 11 de junho, estabelece o regime jurídico da mobilidade elétrica, aplicável à organização, acesso e exercício das atividades relativas à mobilidade elétrica, bem como as regras destinadas à criação de uma rede piloto.

### 3.- RESULTS OF THE EVALUATION / RESULTADOS DE LA EVALUACIÓN

All the test has been carried out at temperaturas between 16-25°C.

The test has been conducted on the chargers with SN 1113851807 and SN 2108011499A

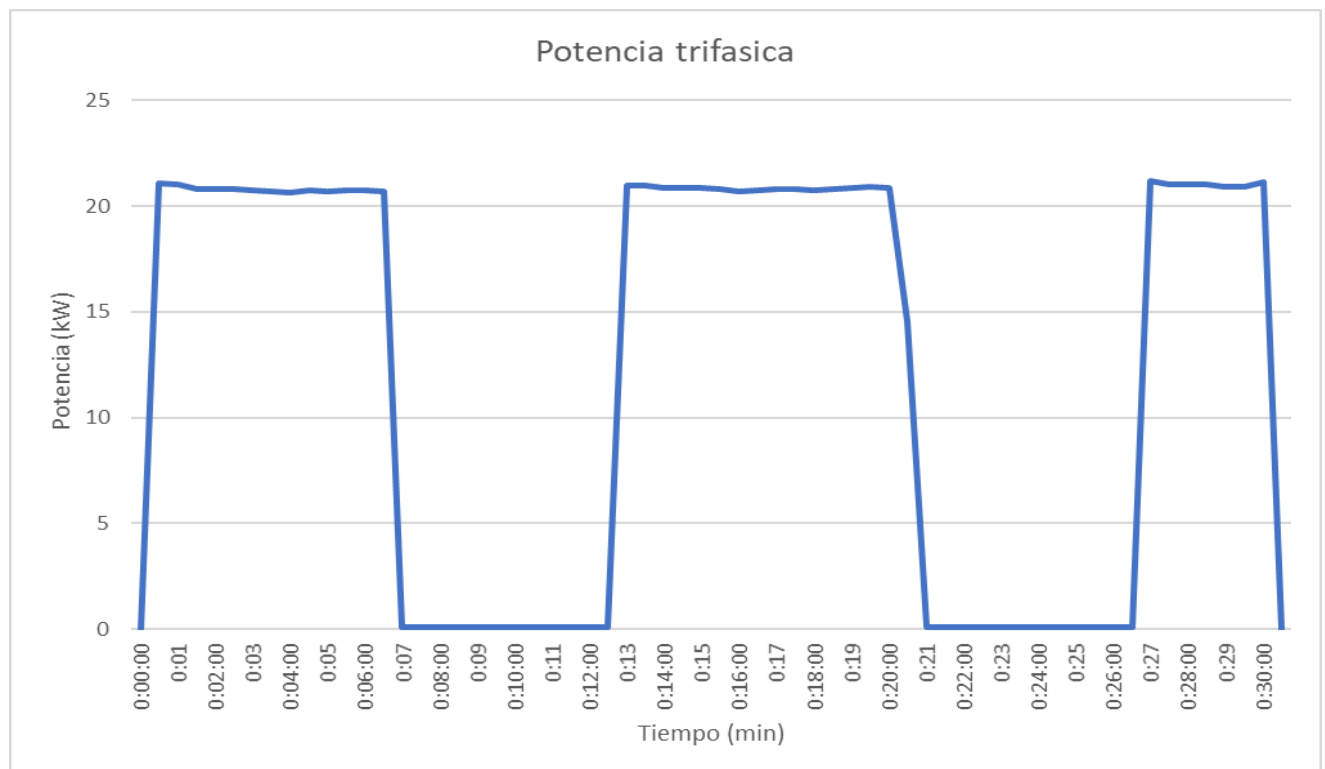
*Todos los test se han realizado a temperaturas comprendidas entre 16-25°C.*

*Las pruebas se han realizado sobre los equipos con SN 1113851807 and SN 2108011499A*

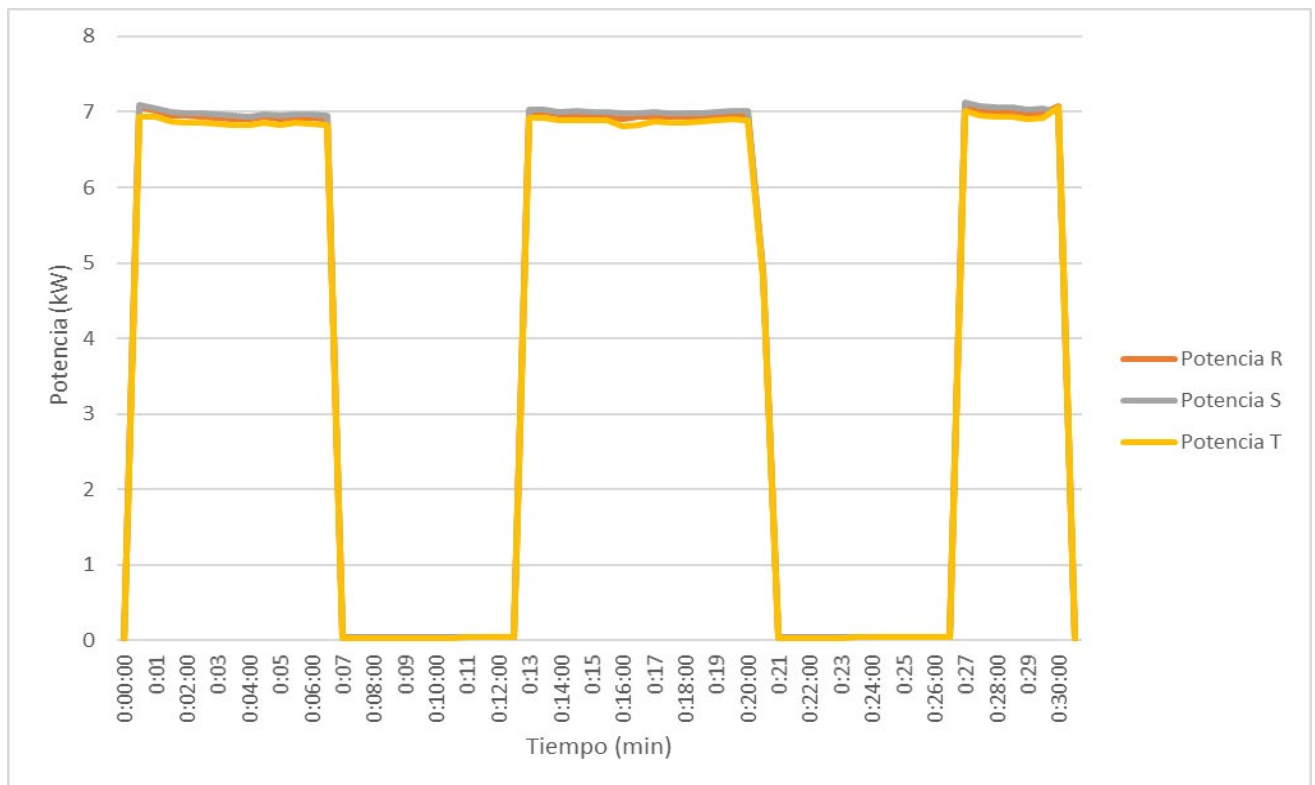
#### 3.1.1-Aura test 22 kW /Prueba Aura 22 kW

A load test is carried out using a 22 kW resistance at room temperature. Readings are taken during the charging process of the power and energy delivered to the resistance, obtaining the following results:

Three phases power:



Per phase power:



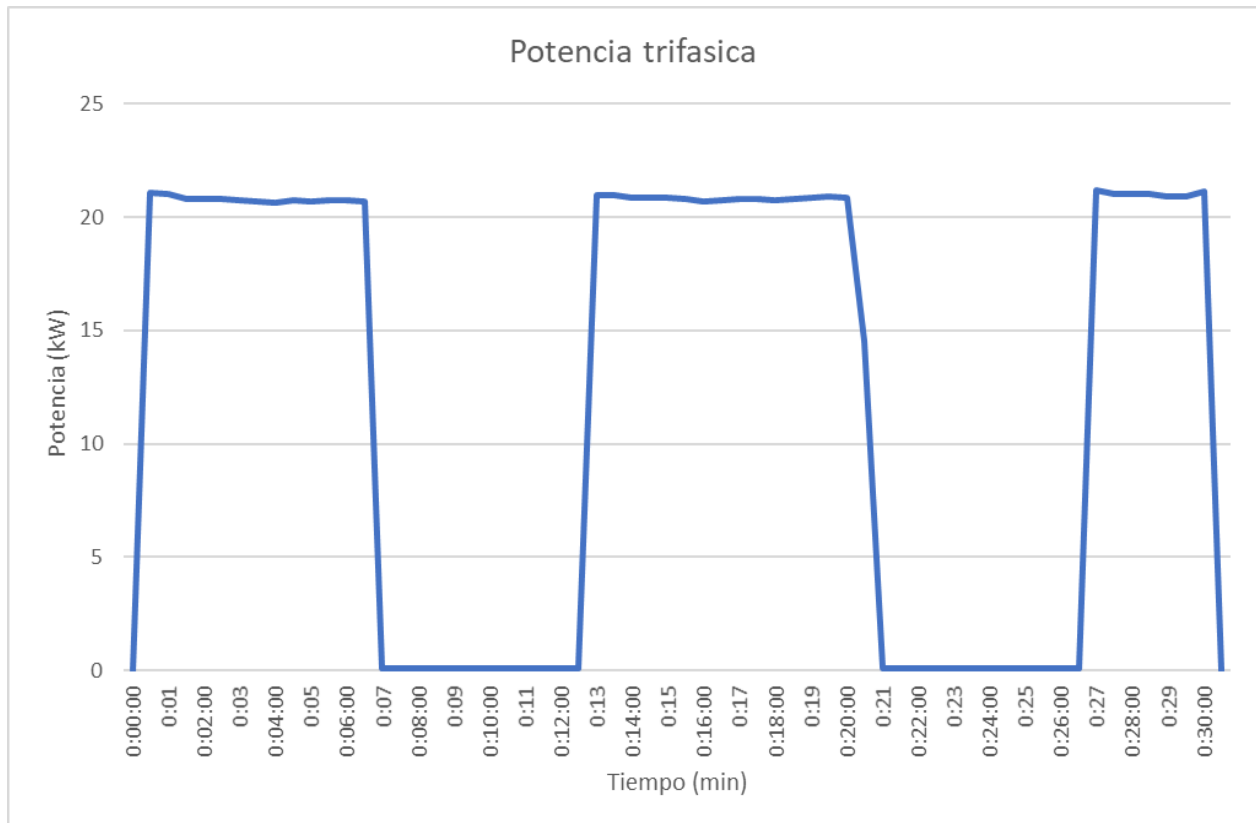
Energy meter:

PWS energy measurements	6.3128 kWh
PWS energy measurements plus losses	6.32139163 kWh
Aura energy	6.315 kWh
Discrepancy	0.1011112%±0.081%

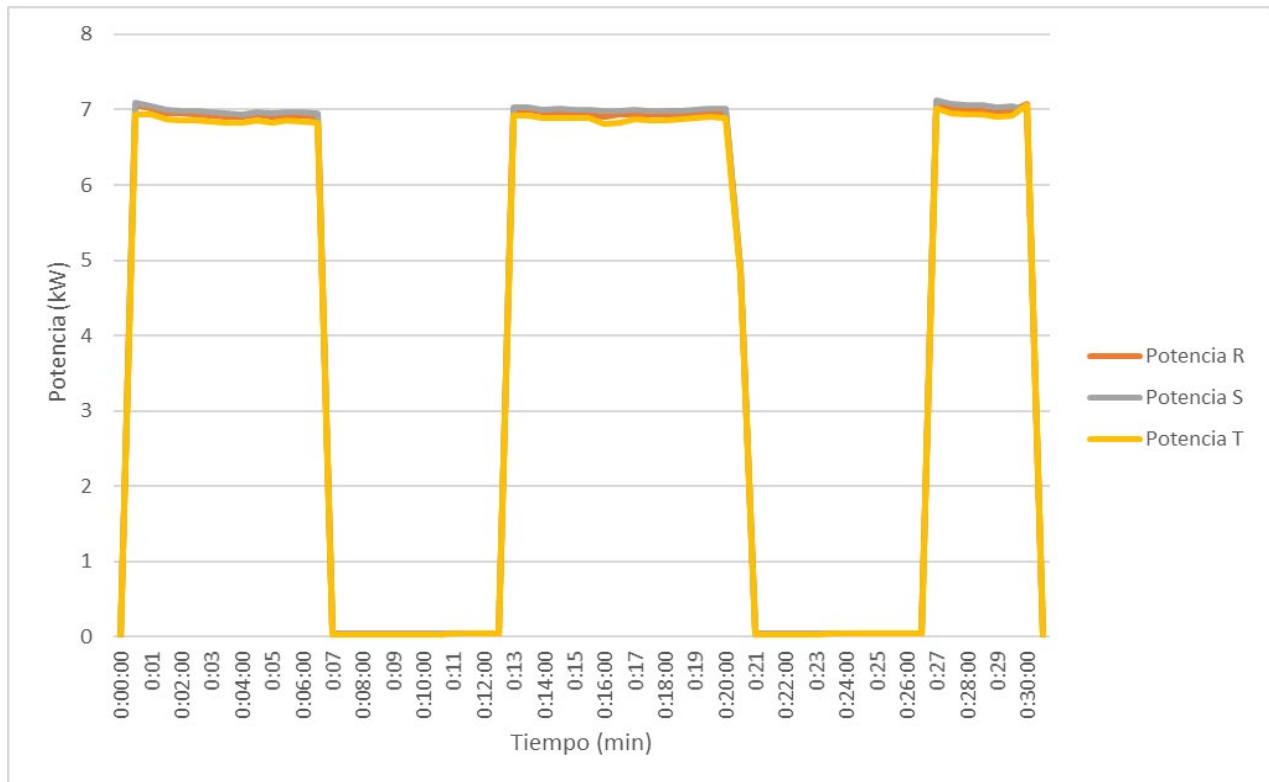
The discrepancy of results between that measured by the measurement equipment and the energy measured by the aura is 0.101112%.

*Se realiza una prueba de carga mediante una resistencia de 22 kW de potencia a temperatura ambiente. Se toman lecturas durante el proceso de carga de la potencia y energía entregada a la resistencia obteniendo los siguientes resultados:*

*Potencia trifásica*



*Potencia por fases*



### Lecturas de energía

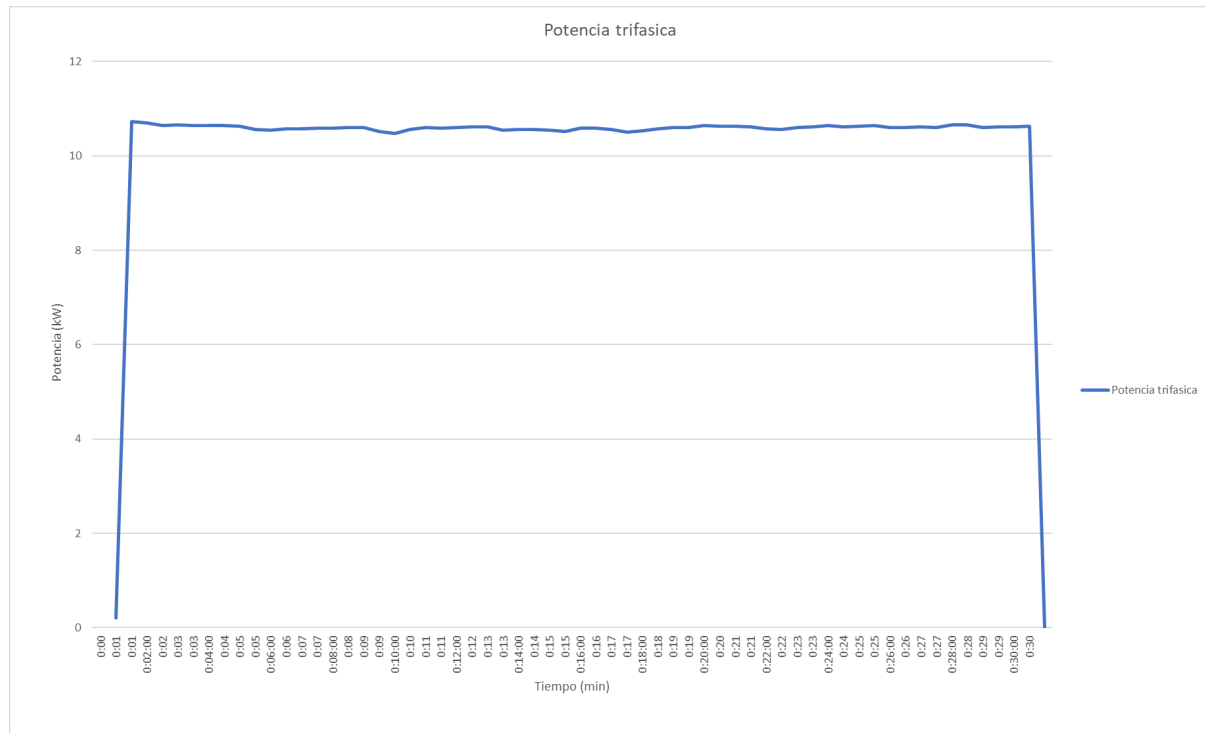
Energía medida PWS	6.3128 kWh
Energía medida PWS más pérdidas	6.32139163 kWh
Energía Aura	6.315 kWh
Discrepancia	0.1011112%±0.081%

La discrepancia de resultados entre el medido por el equipo de medida y la energía medida por el aura es de 0.1011112%.

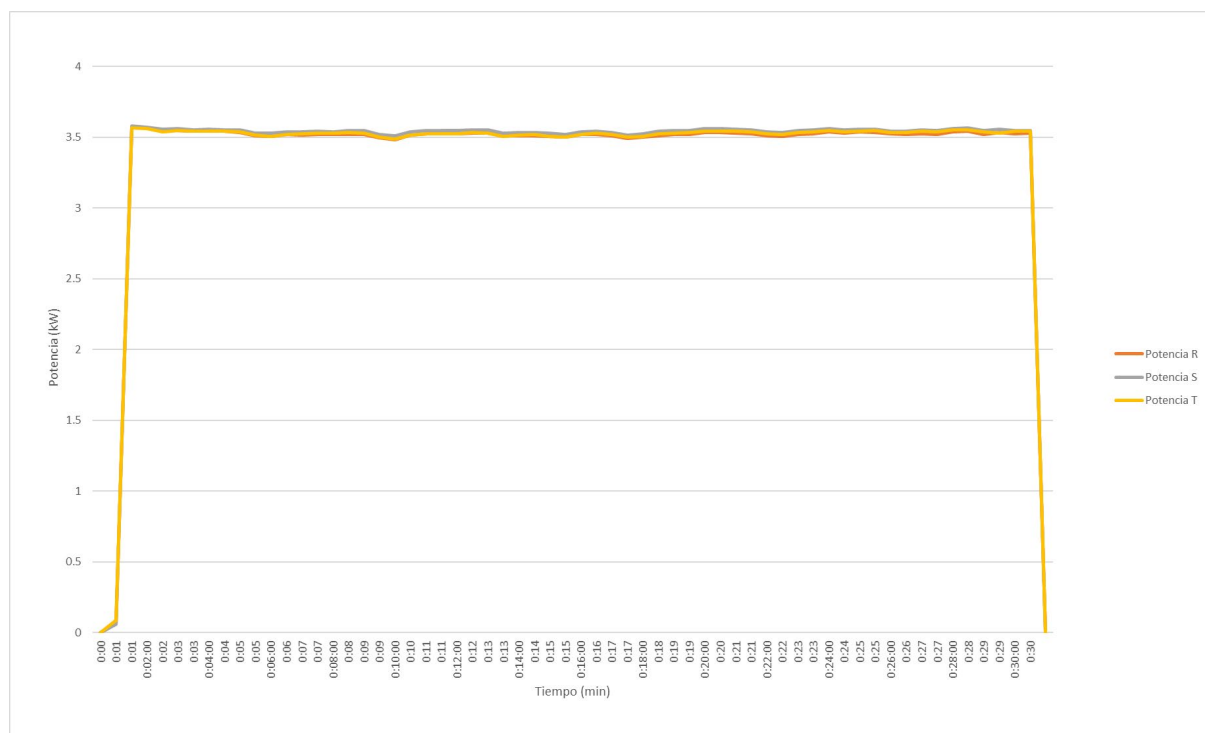
### 3.1.2-Aura test 11 kW /Prueba Aura 11 kW

A load test is carried out using a 11 kW resistance at room temperature. Readings are taken during the charging process of the power and energy delivered to the resistance, obtaining the following results:

Three phases power:



Per phase power:



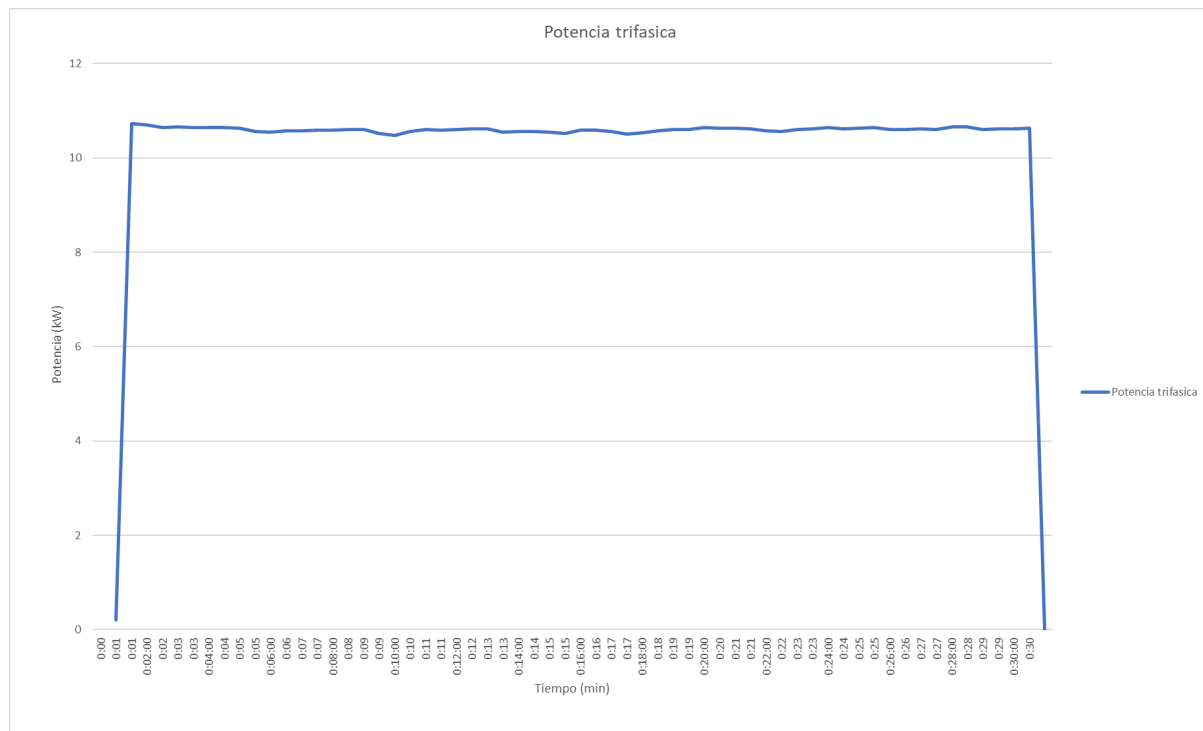
Energy meter:

PWS energy measurements	5.3063 kWh
PWS energy measurements plus losses	5.309933 kWh
Aura energy	5.331 kWh
Discrepancy	-0.39674692%±0.081%

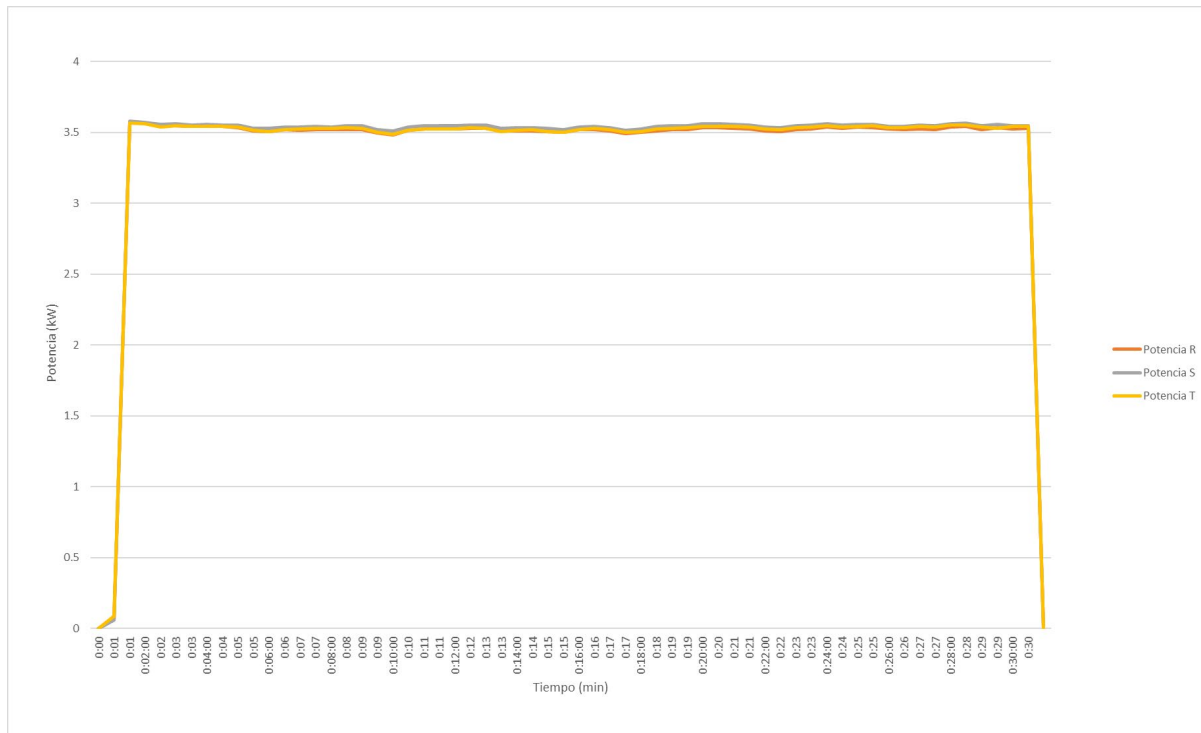
The discrepancy of results between that measured by the measurement equipment and the energy measured by the aura is -0.39674692%.

*Se realiza una prueba de carga mediante una resistencia de 11 kW de potencia a temperatura ambiente. Se toman lecturas durante el proceso de carga de la potencia y energía entregada a la resistencia obteniendo los siguientes resultados:*

*Potencia trifásica:*



Potencia por fases:



Lecturas de energía

Energía medida PWS	5.3063 kWh
Energía medida PWS más pérdidas	5.309933 kWh
Energía Aura	5.331 kWh
Discrepancia	-0.39674692%±0.081%

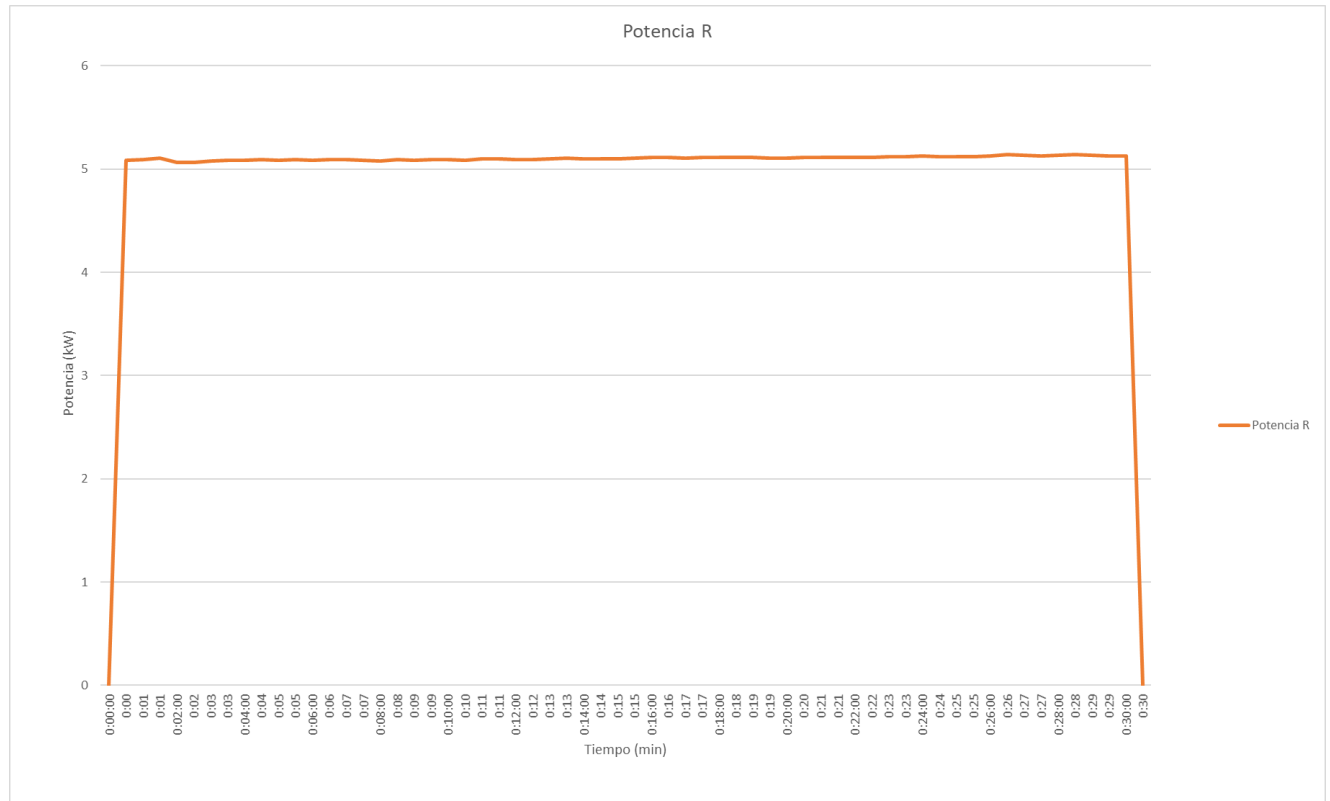
La discrepancia de resultados entre el medido por el equipo de medida y la energía medida por el aura es de -0.39674692%.



### 3.1.3-Aura test EV 5 kW /Prueba Aura VE 5 kW

A load test is carried out using a EV at room temperature. Readings are taken during the charging process of the power and energy delivered to the resistance, obtaining the following results:

Power:



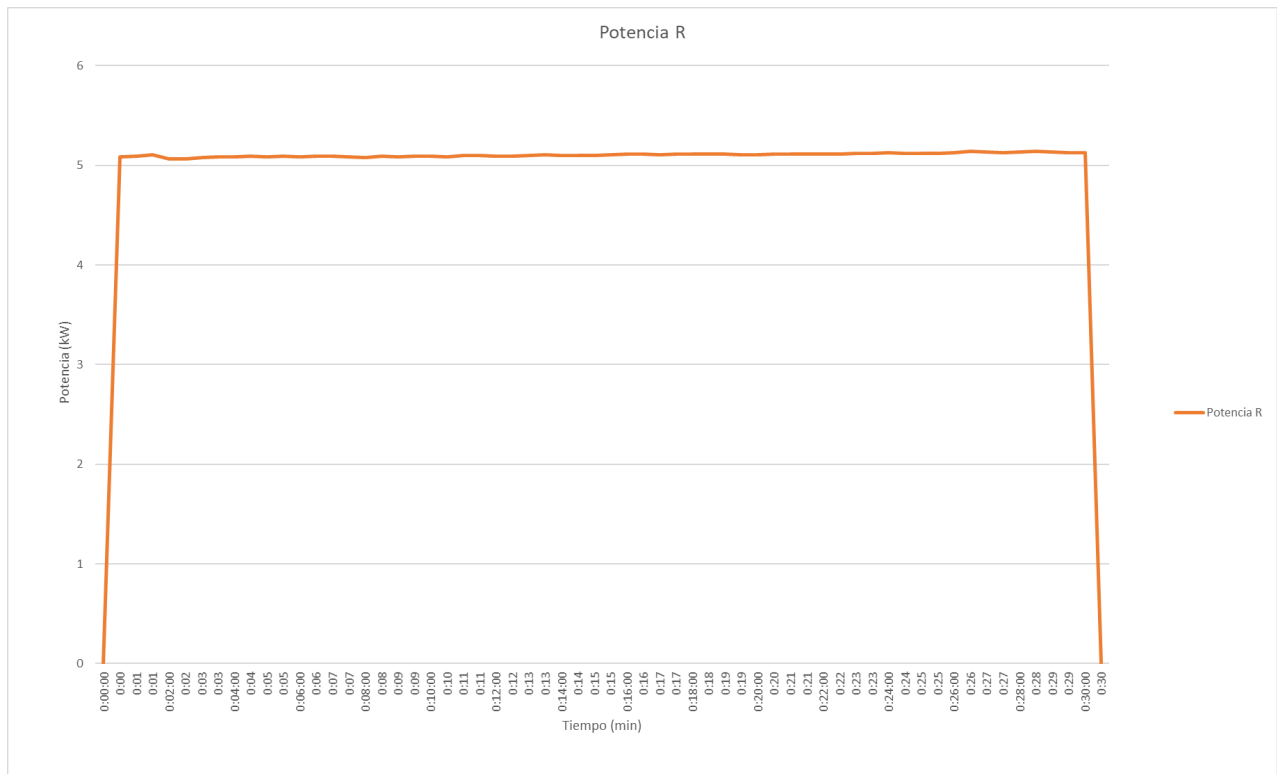
Energy meter:

PWS energy measurements	2.5419 kWh
PWS energy measurements plus losses	2.54451114 kWh
Aura energy	2.534 kWh
Discrepancy	0.41309065%±0.081%

The discrepancy of results between that measured by the measurement equipment and the energy measured by the aura is 0.41309065%.

*Se realiza una prueba de carga mediante la conexión de un vehículo eléctrico a temperatura ambiente. El vehículo solo permite la carga monofásica por lo que solo se tendrá en cuenta dicha fase. Se toman lecturas durante el proceso de carga de la potencia y energía entregada al vehículo obteniendo los siguientes resultados:*

Potencia:



Lecturas de energía

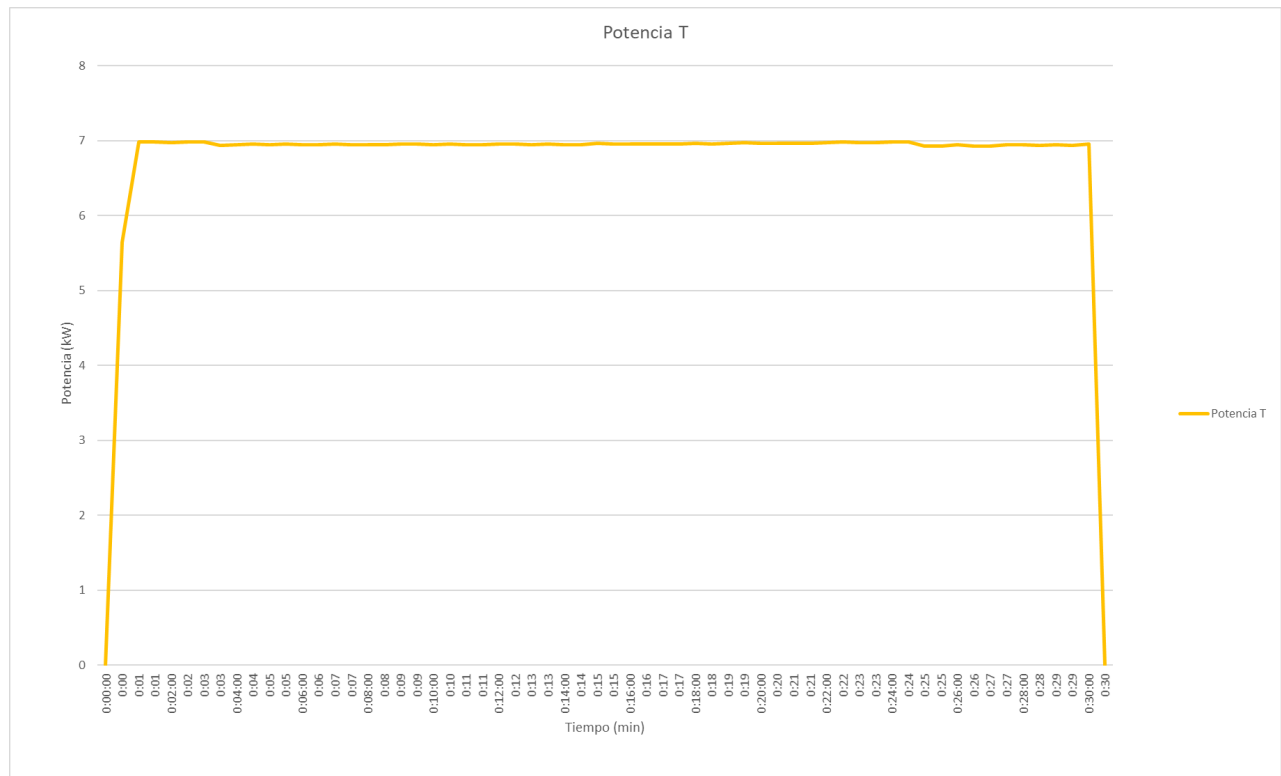
Energía medida PWS	2.5419 kWh
Energía medida PWS más pérdidas	2.54451114 kWh
Energía Aura	2.534 kWh
Discrepancia	0.41309065%±0.081%

La discrepancia de resultados entre el medido por el equipo de medida y la energía medida por el aura es de 0.41309065%.

**3.1.4-Aura test EV 7.4 kW / Prueba Aura VE 7,4 kW**

A load test is carried out using a EV at room temperature. Readings are taken during the charging process of the power and energy delivered to the resistance, obtaining the following results:

Power:



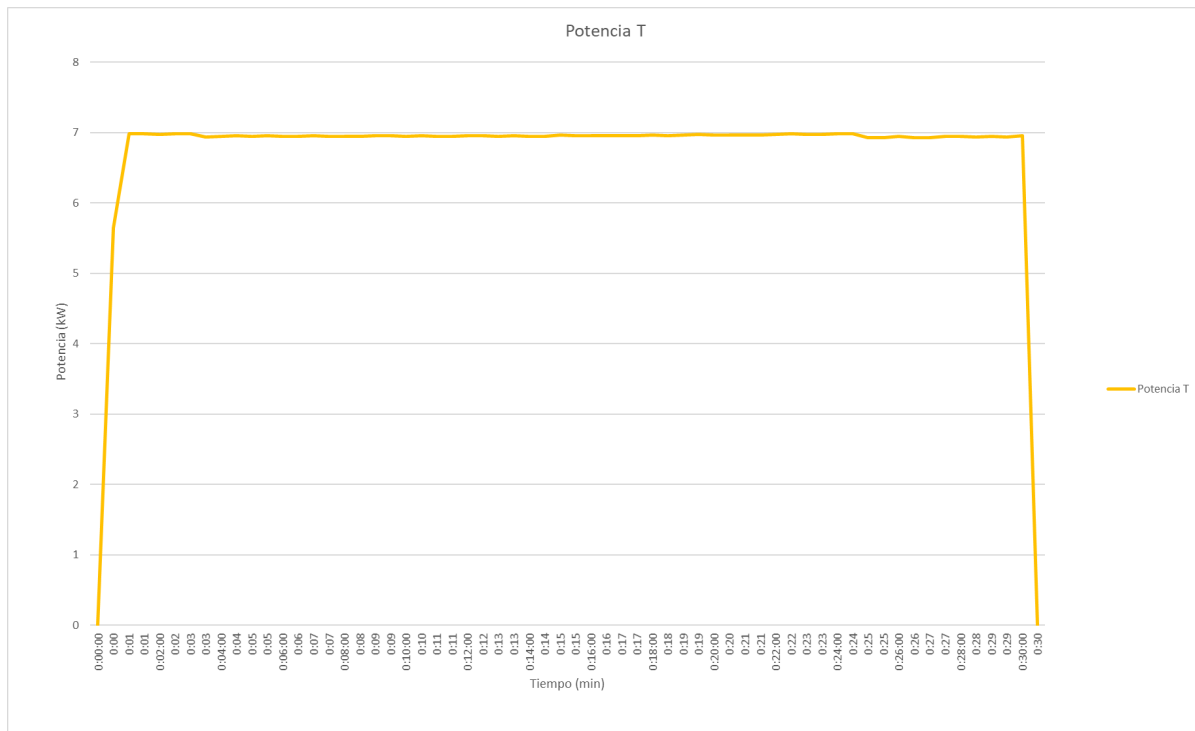
Energy meter:

PWS energy measurements	3.4519 kWh
PWS energy measurements plus loses	3.45681538 kWh
Aura energy	3.454 kWh
Discrepancy	0.08144422%±0.081%

The discrepancy of results between that measured by the measurement equipment and the energy measured by the Aura is 0.08144422 %.

*Se realiza una prueba de carga mediante la conexión de un vehículo eléctrico a temperatura ambiente. El vehículo solo permite la carga monofásica por lo que solo se tendrá en cuenta dicha fase. Se toman lecturas durante el proceso de carga de la potencia y energía entregada al vehículo obteniendo los siguientes resultados:*

Potencia:



Lecturas de energía

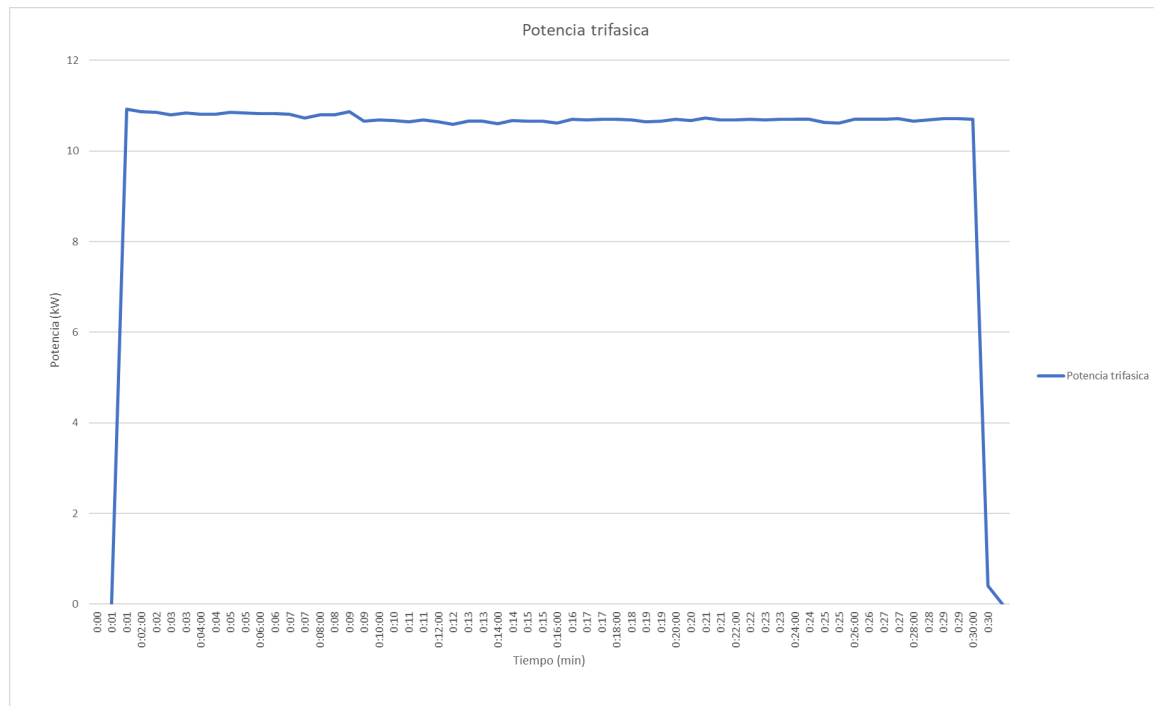
Energía medida PWS	3.4519 kWh
Energía medida PWS más pérdidas	3.45681538 kWh
Energía Aura	3.454 kWh
Discrepancia	0.08144422%±0.081%

La discrepancia de resultados entre el medido por el equipo de medida y la energía medida por el Aura es de 0.08144422 %.

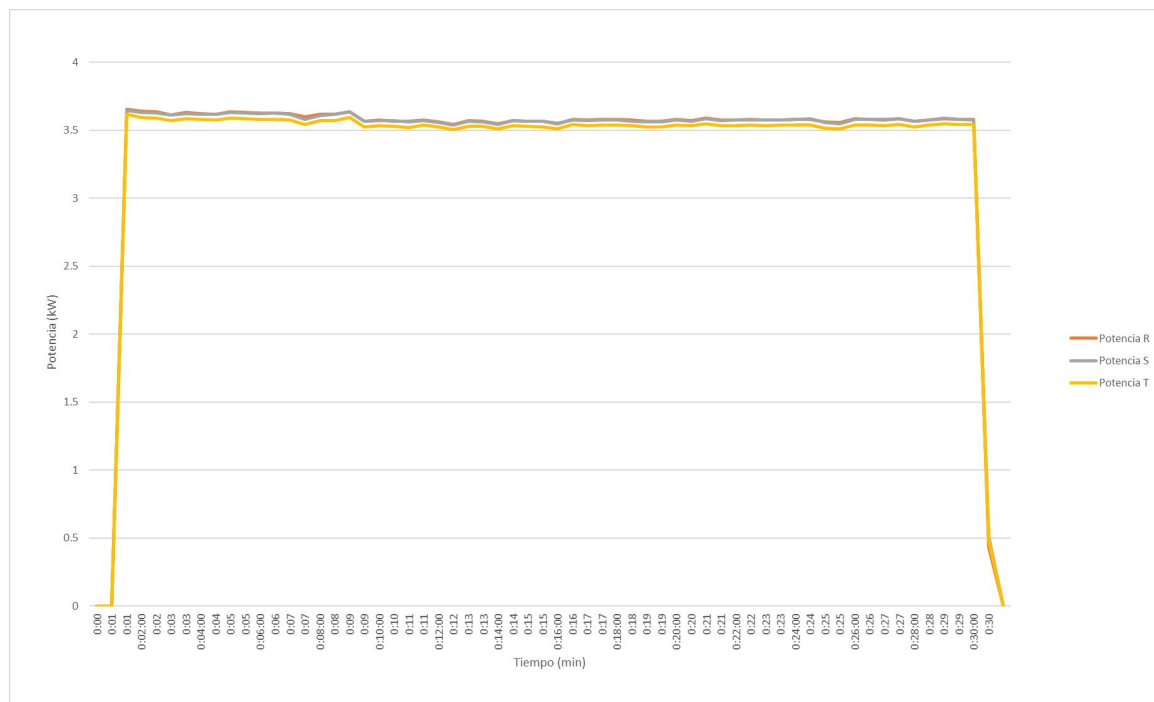
### 3.2.1 -Halo test 11 kW / Prueba Halo 11 kW

A load test is carried out using a 11 kW resistance at room temperature. Readings are taken during the charging process of the power and energy delivered to the resistance, obtaining the following results:

Three phases power:



Per phase power:



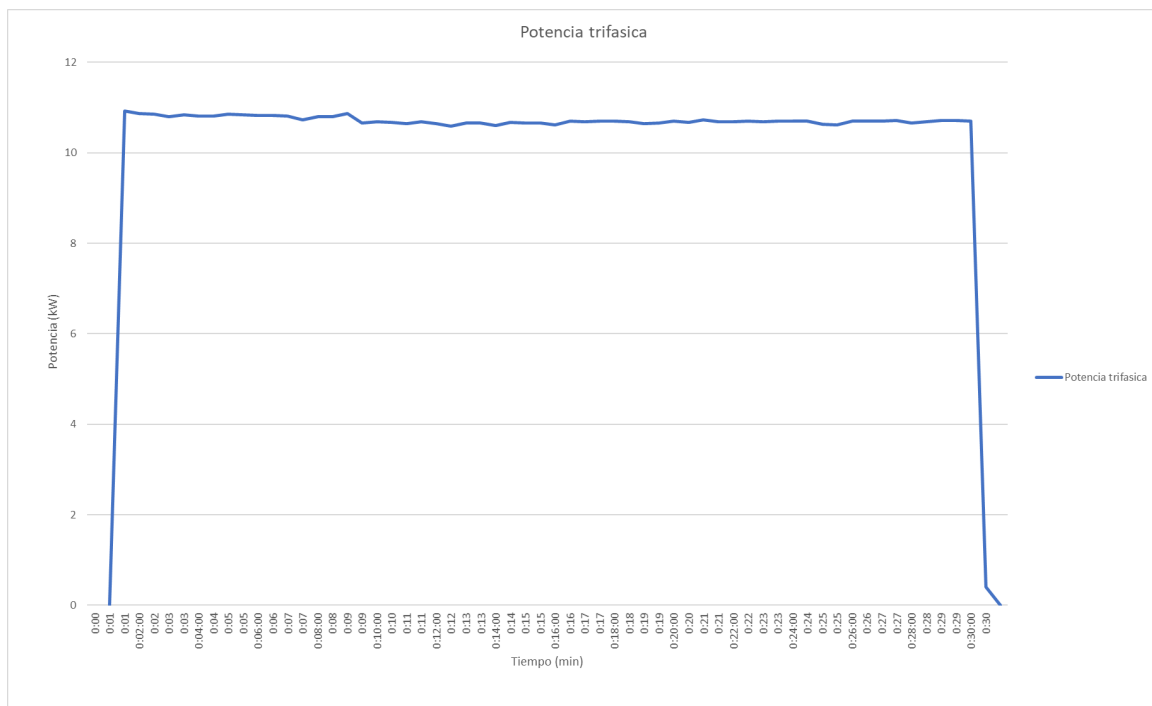
Energy meter:

PWS energy measurements	5.3451 kWh
PWS energy measurements plus loses	5.3487374 kWh
Aura energy	5.36 kWh
Discrepancy	-0.21056556%±0.081%

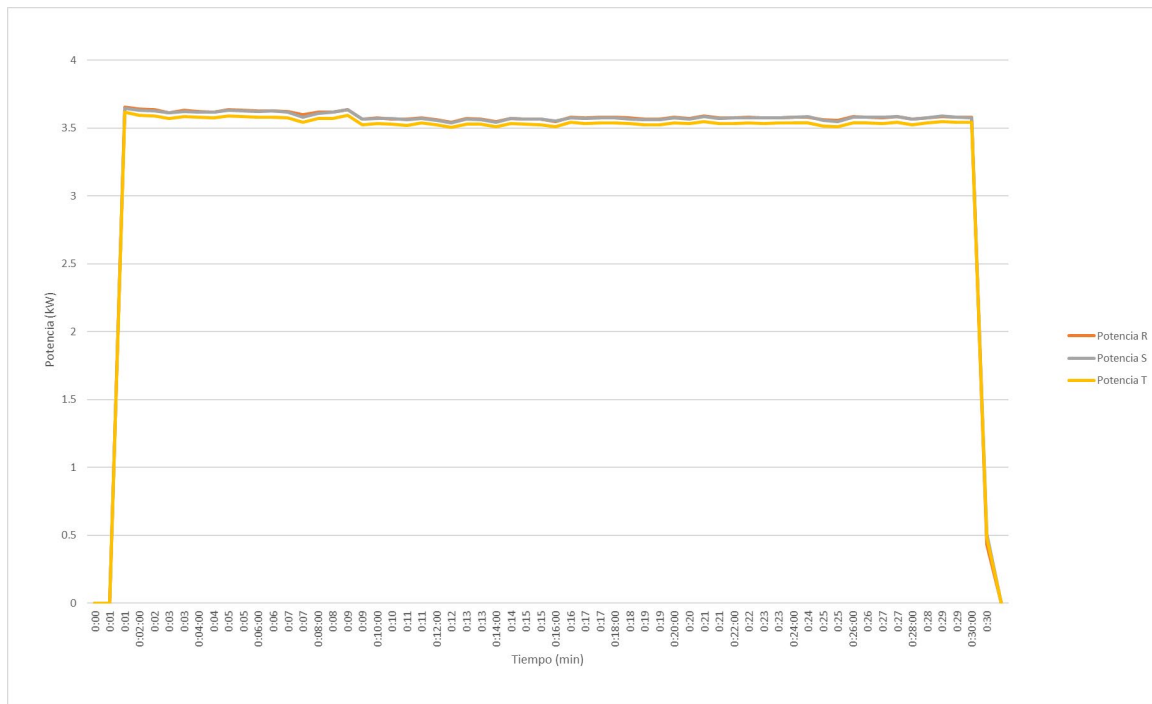
The discrepancy of results between that measured by the measurement equipment and the energy measured by the Halo is -0.21056556%.

*Se realiza una prueba de carga mediante una resistencia de 11 kW de potencia a temperatura ambiente. Se toman lecturas durante el proceso de carga de la potencia y energía entregada a la resistencia obteniendo los siguientes resultados:*

*Potencia trifásica*



### Potencia por fases



### Lecturas de energía

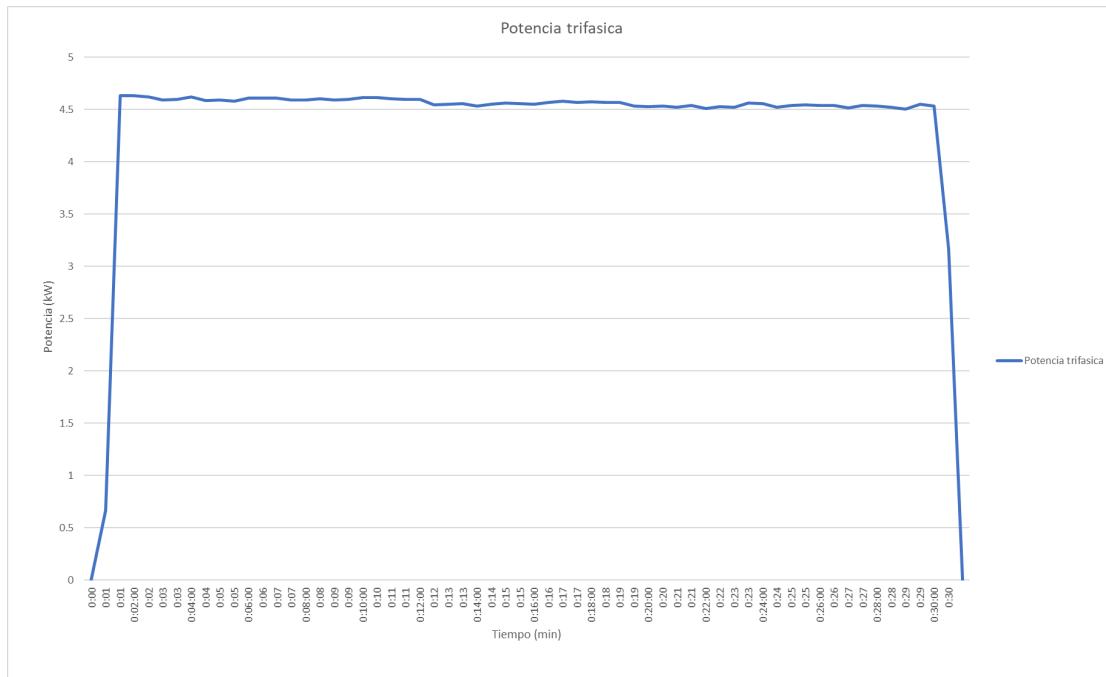
Energía medida PWS	5.3451 kWh
Energía medida PWS más pérdidas	5.3487374 kWh
Energía Aura	5.36 kWh
Discrepancia	-0.21056556%±0.081%

La discrepancia de resultados entre el medido por el equipo de medida y la energía medida por el Halo es de -0.21056556%.

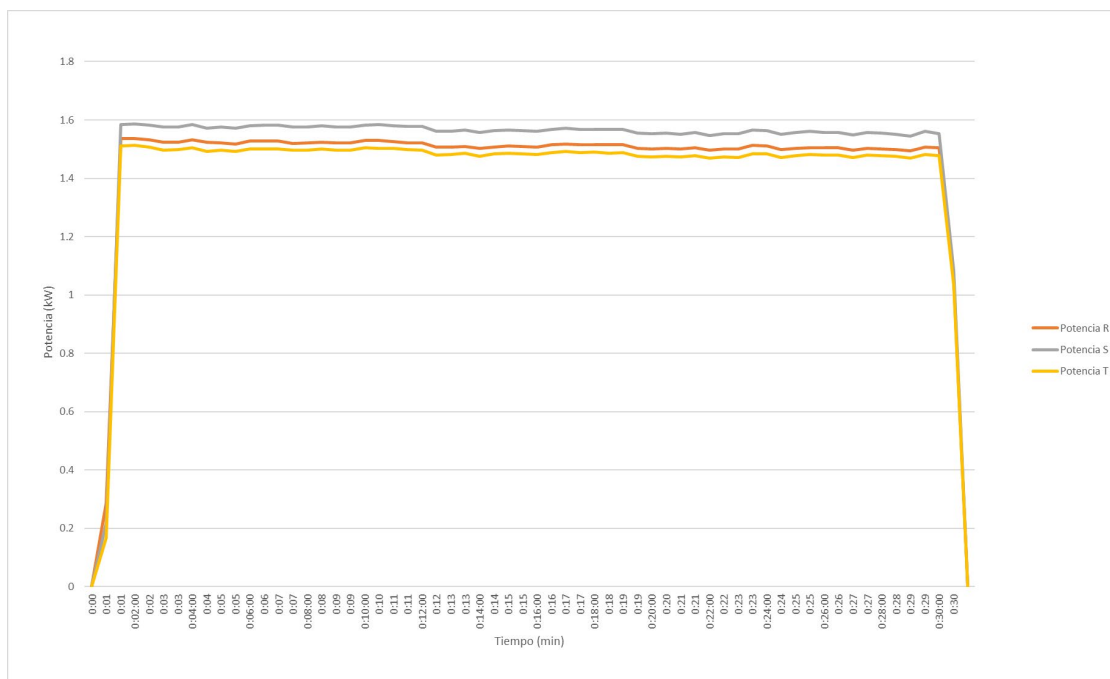
### 3.2.2-Halo test 5 kW /Prueba Halo 5 kW

A load test is carried out using a 5 kW resistance at room temperature. Readings are taken during the charging process of the power and energy delivered to the resistance, obtaining the following results:

Three phases power:



Per phase power:





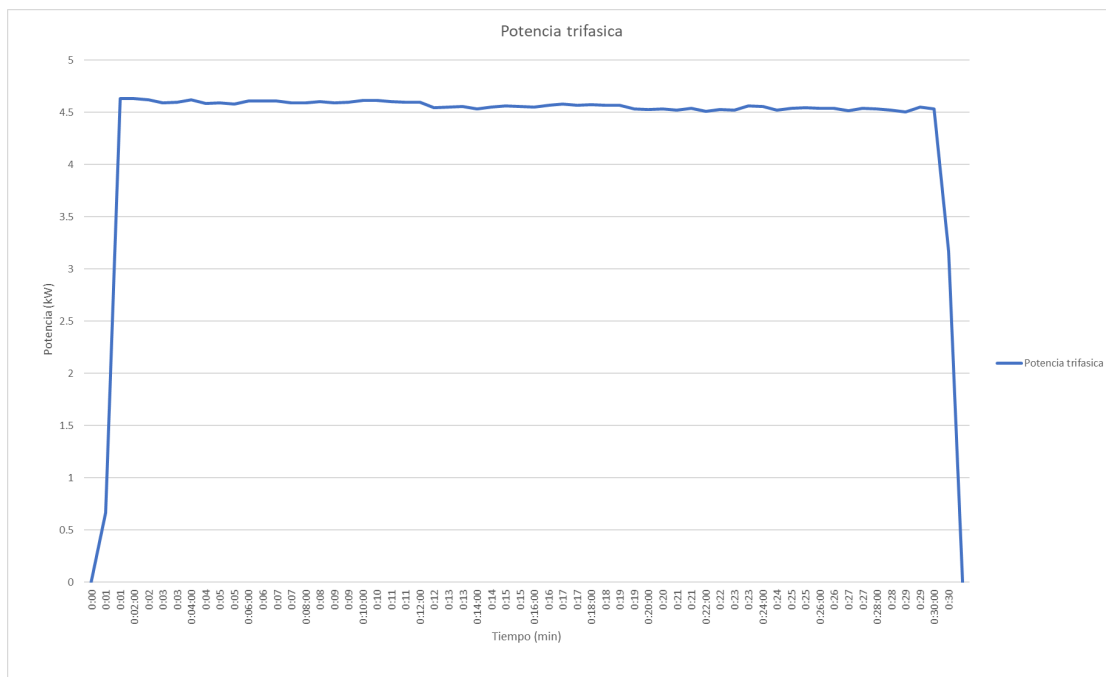
Energy meter:

PWS energy measurements	2.284 kWh
PWS energy measurements plus losses	2.28466626 kWh
Aura energy	2.285 kWh
Discrepancy	-0.01460801%±0.081%

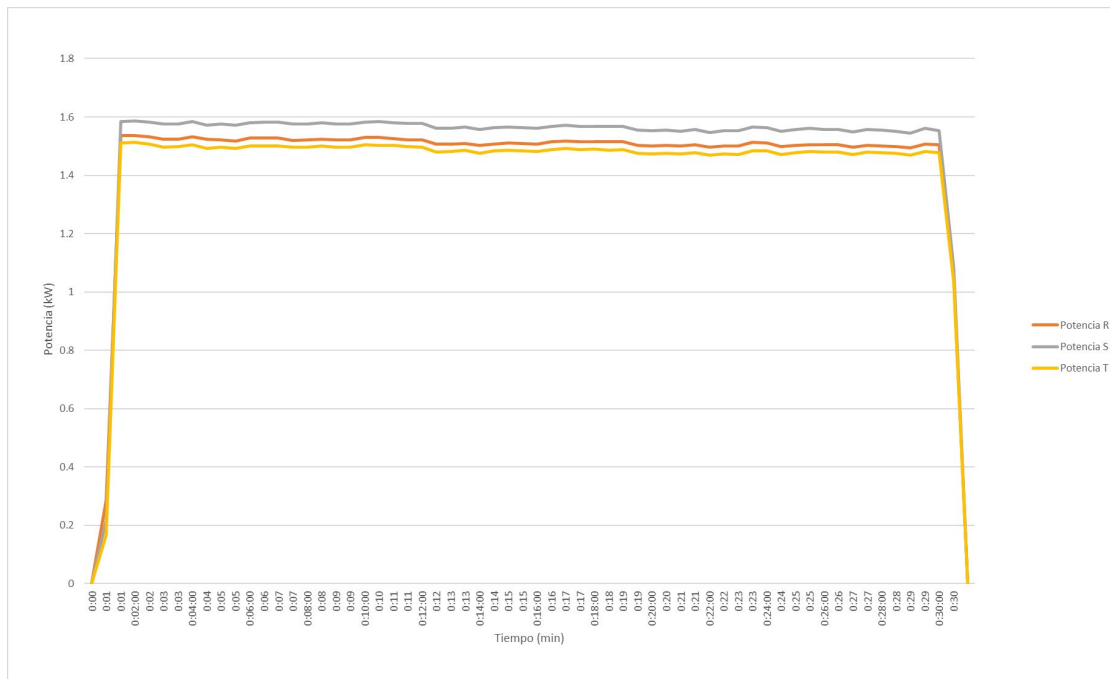
The discrepancy of results between that measured by the measurement equipment and the energy measured by the Halo is -0.01460801%.

*Se realiza una prueba de carga mediante una resistencia de 5 kW de potencia a temperatura ambiente. Se toman lecturas durante el proceso de carga de la potencia y energía entregada a la resistencia obteniendo los siguientes resultados:*

*Potencia trifásica:*



Potencia por fases:



Lecturas de energía

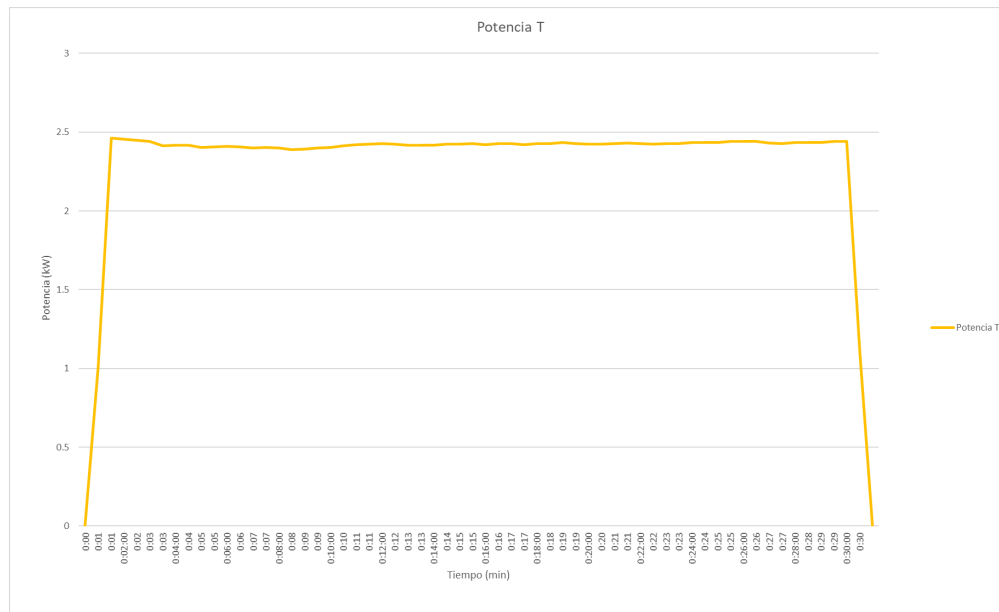
Energía medida PWS	2.284 kWh
Energía medida PWS más pérdidas	2.28466626 kWh
Energía Aura	2.285 kWh
Discrepancia	-0.01460801%±0.081%

La discrepancia de resultados entre el medido por el equipo de medida y la energía medida por el Halo es de -0.01460801%.

### 3.2.3-Halo test 3 kW /Prueba Halo 3 kW

A load test is carried out using a 3 kW resistance at room temperature. Readings are taken during the charging process of the power and energy delivered to the resistance, obtaining the following results:

Power:

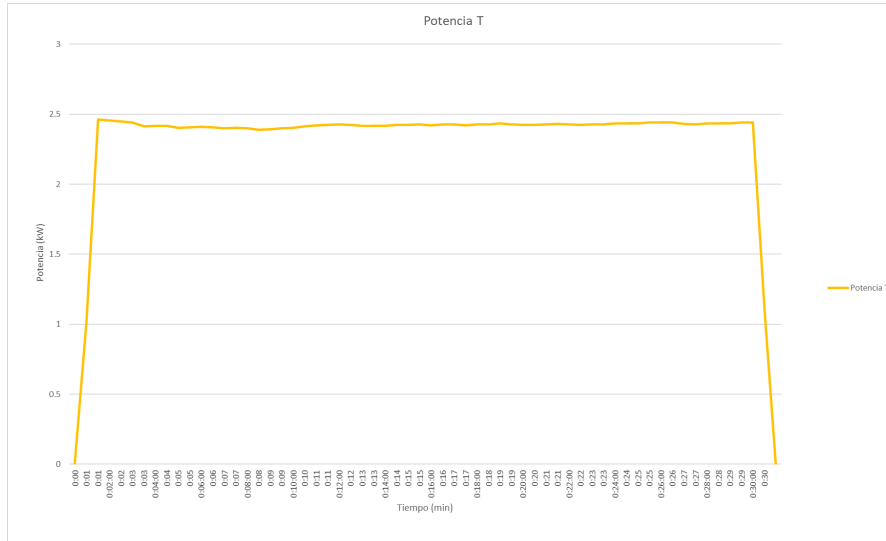


Energy meter:

PWS energy measurements	1.189308kWh
PWS energy measurements plus losses	1.18986277 kWh
Aura energy	1.193 kWh
Discrepancy	-0.26366291%±0.081%

The discrepancy of results between that measured by the measurement equipment and the energy measured by the Halo is -0.26366291%.

*Se realiza una prueba de carga mediante una resistencia de 3 kW de potencia a temperatura ambiente. Se toman lecturas durante el proceso de carga de la potencia y energía entregada a la resistencia obteniendo los siguientes resultados:*

**Potencia:**

**Lecturas de energía**

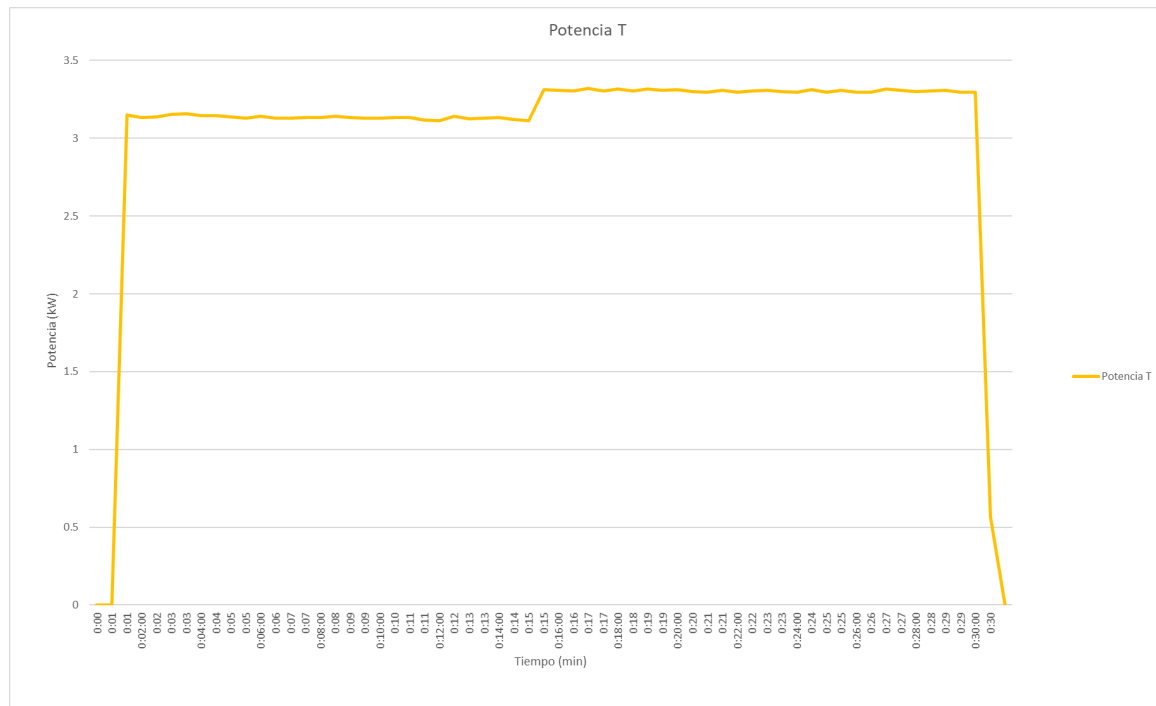
Energía medida PWS	1.189308kWh
Energía medida PWS más pérdidas	1.18986277 kWh
Energía Aura	1.193 kWh
Discrepancia	-0.26366291%±0.081%

La discrepancia de resultados entre el medido por el equipo de medida y la energía medida por el Halo es de -0.26366291%.

### 3.2.4-Halo test EV 5 kW /Prueba Halo VE 5 kW

A load test is carried out using a EV at room temperature. Readings are taken during the charging process of the power and energy delivered to the resistance, obtaining the following results:

Power:



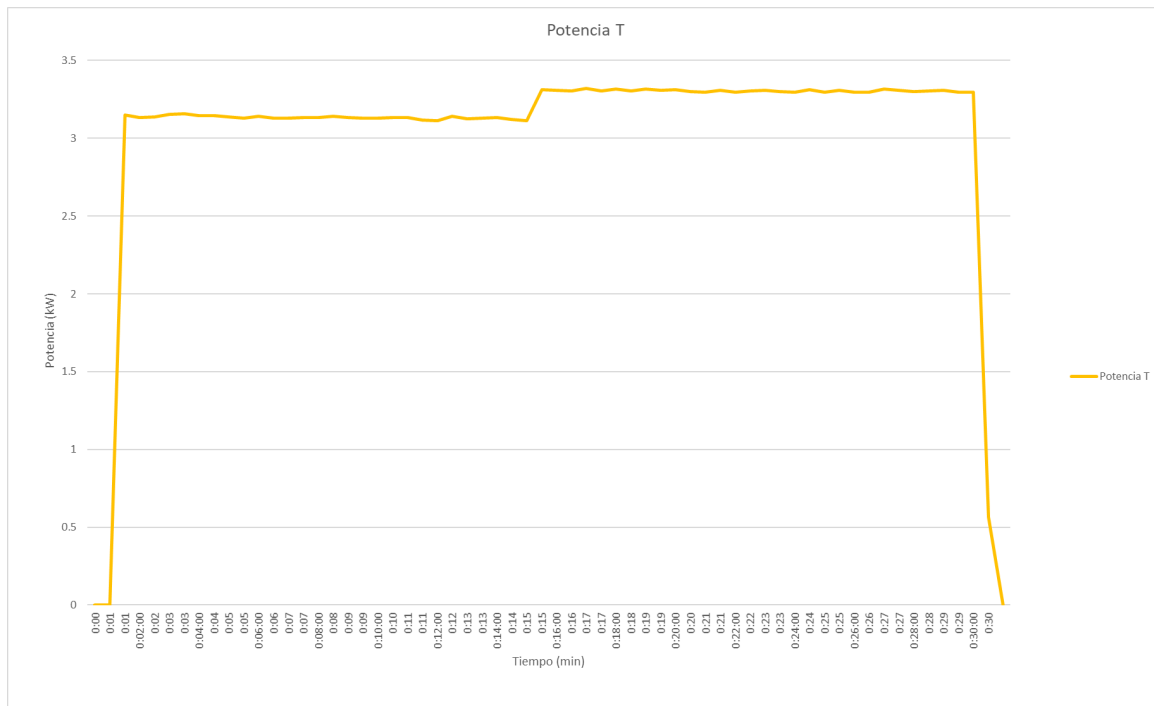
Energy meter:

PWS energy measurements	1.5815 kWh
PWS energy measurements plus loses	1.58250908 kWh
Aura energy	1.575 kWh
Discrepancy	0.4745047%±0.081%

The discrepancy of results between that measured by the measurement equipment and the energy measured by the Halo is 0.4745047%.

*Se realiza una prueba de carga mediante la conexión de un vehículo eléctrico a temperatura ambiente. El vehículo solo permite la carga monofásica por lo que solo se tendrá en cuenta dicha fase Se toman lecturas durante el proceso de carga de la potencia y energía entregada al vehículo obteniendo los siguientes resultados:*

Potencia:



Lecturas de energía

Energía medida PWS	1.5815 kWh
Energía medida PWS más pérdidas	1.58250908 kWh
Energía Aura	1.575 kWh
Discrepancia	0.4745047%±0.081%

La discrepancia de resultados entre el medido por el equipo de medida y la energía medida por el Halo es de 0.4745047%.