Waypole 2

User Manual

ENGLISH

enel way

Index

1. Purpose

The purpose of this document is to describe how to use the apparatus called Enel X Way Waypole™ 2.

2. Field of application

It is used to document the activities of this apparatus within the Charging System for Electric Vehicles.

3. Definitions/Abbreviations

JP	Enel X Way Waypole™ 2
EV	Electric Vehicle
R	Right
L	Left
CM	Communication Model
CP	Control Process

4. The pole

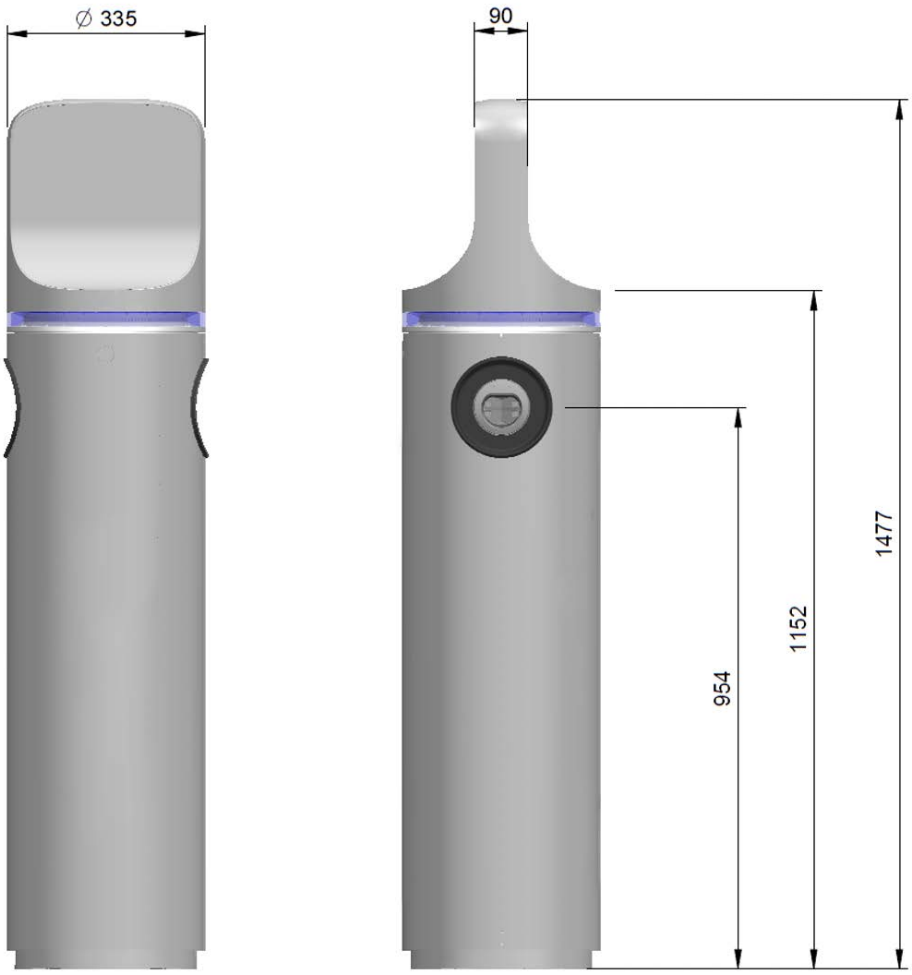
4.1 Size

There are different versions of Waypole 2:

1. Three phase / Three phase with 2 T2 sockets;
2. Single phase / Three phase with 1 T3a socket and 1 T2 socket;
3. Single phase / Single phase with 2 T3a sockets.

These variants involve the User mainly for the type of power cable supplied to the Electric Vehicle.

3/4 view



Size and dimensions in mm

4.2 Features

POWER SUPPLY

Voltage: 400 Vac Three phase

Frequency: 50 Hz

CHARGING DATA

SINGLE PHASE CHARGING

Socket Type 3A with 4 contacts: L, N, PE + CP

Maximum power: 3,7 kW

Maximum power: 16 A

Magnetothermic protection:

I_n = 16 A

I_{cn} = 10 kA

Type "D"

Differential Protection:

Power = 0.03 A

Type B protection

THREE PHASE CHARGING

Socket Type 2 - 7 contacts: L1, L2, L3, N, PE + CP + PP

Maximum power: 22 kW

Maximum power: 32 A

Magnetothermic protection:

I_n = 40 A

I_{cn} = 10 kA

Type "D"

Differential Protection:

Power = 0.03 A

Type B protection

GENERAL

Environment temperature: -30°÷+50°C

Humidity: 5%÷95%

Atmospheric pressure: 860hPa÷1060hPa

Level of protection: IP55

REGULATIONS

EN61851-1

EN61851-22

EN62196-1

4.3 Functionality

Waypole 2 was designed to recharge "Class I" Electrical Vehicles.

It supplies a Single phase 230 Vac supply voltage with a maximum power of 3,7 KW and/or Three phase at 400 Vac with a maximum power of 22 kW.

Operates in "Mode 3"; connection to the vehicle described in EN61851-1 (Ed. 3.0) as **"Case A"** or "**Case B".**

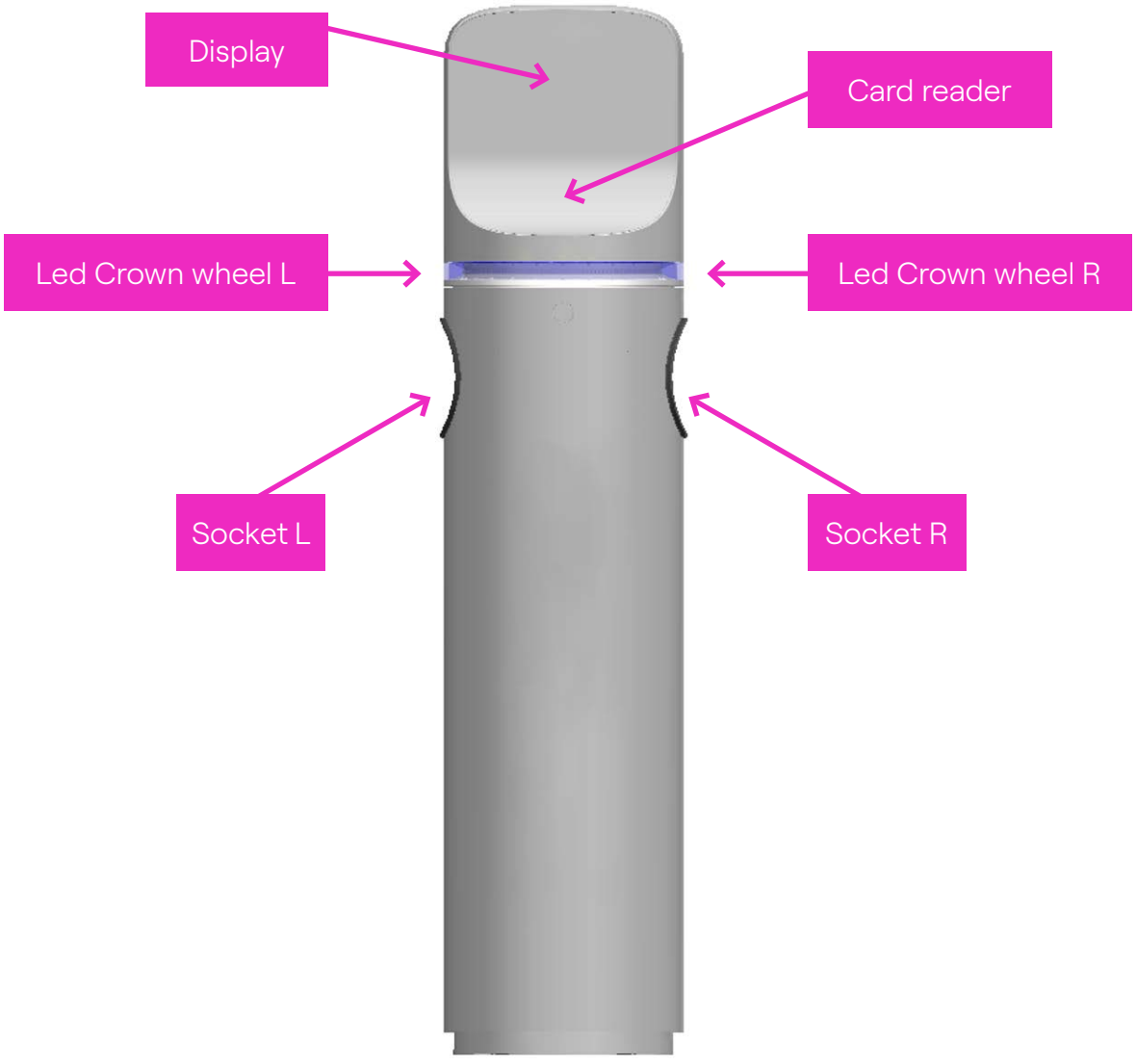
Class I	Electric Vehicle in which the protection against contact voltages, when connected to the power grid, is entrusted to an additional safety measure based on the connection of all the masses at the vehicle's ground clamp.
Mode 3	Direct connection of the Electric Vehicle to the power grid. Any chargers are directly installed on board the Vehicle.
Case A	The connection of the Vehicle to the power equipment occurs by using a cable with a normalized plug permanently attached, which is part of the Vehicle itself.
Case B	The connection of the Vehicle to the power equipment is made by using a terminating cable with standard plugs as part of the equipment of the Vehicle itself.

Note: We wish to remind the User that if the plug is not fully inserted into the socket, Waypole 2 does not generate power, following the "pilot wire" check present in the power supply circuit.

4.4 The interface with the User

Waypole 2 is so equipped.

DESCRIPTION	USE
Display	Provides information for the User
Card Reader	Reads User's Card
Led Crown wheel R	See Led Crown wheel Appendix
Led Crown wheel L	See Led Crown wheel Appendix
Socket R	Dispensing point R side
Socket L	Dispensing point L side



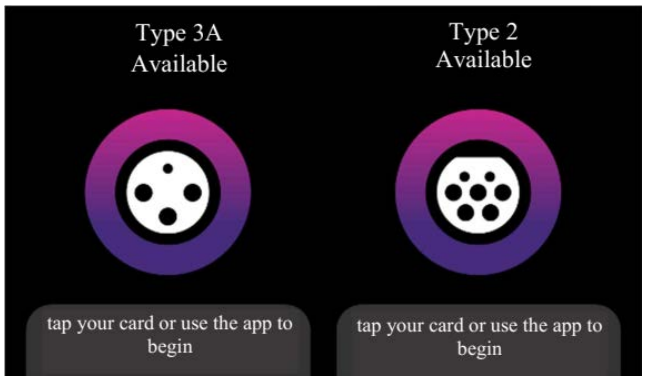
4.5 Operational Activities

4.5.1 Introduction

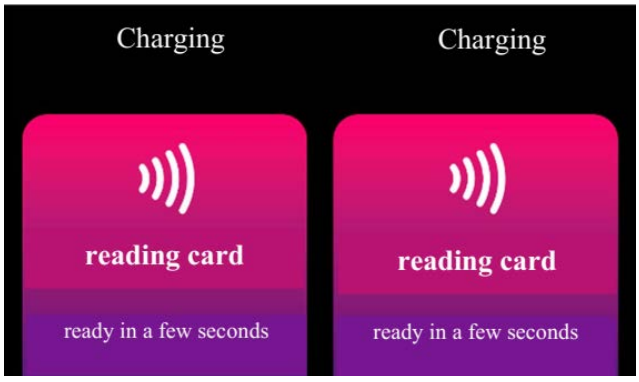
The two L and R sockets are managed by the Waypole Control System simultaneously; namely it is possible to charge two electric vehicles at the same time.

4.5.2 Charging process

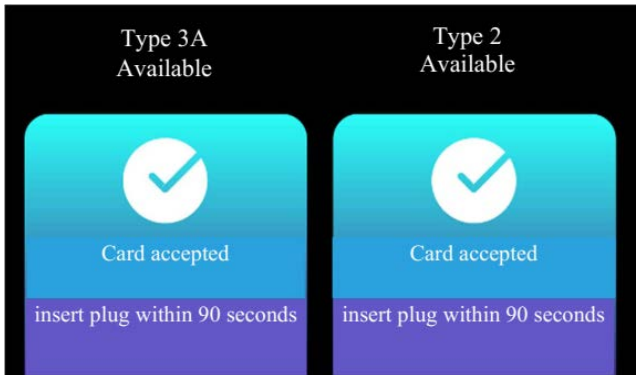
The Display initially looks like this (assuming there are no other charging processes in progress):



First, the User must identify themselves via RFID card or suitable APP. Bring your RFID card close to the Reader and wait for it to be accepted;
as soon as it is, the following will appear briefly on the Display:

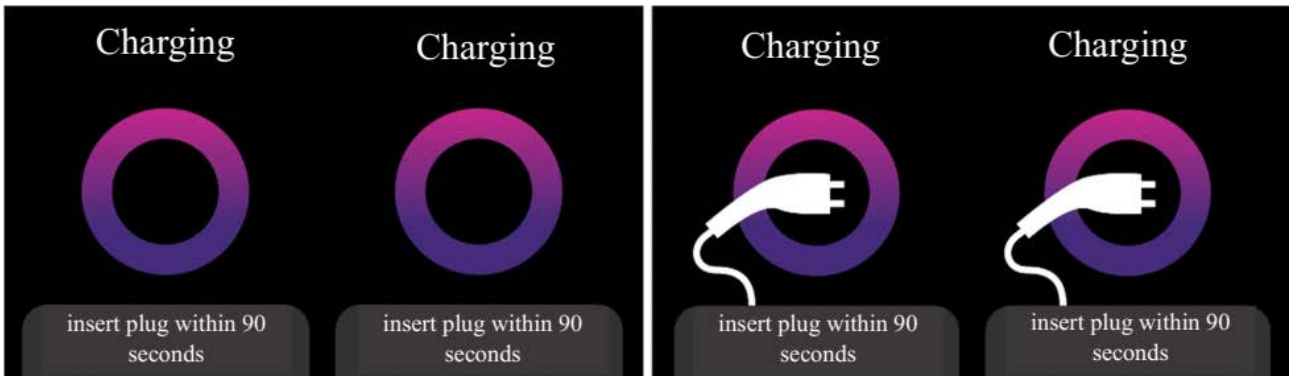


If the RFID card is accepted by the System you'll see:

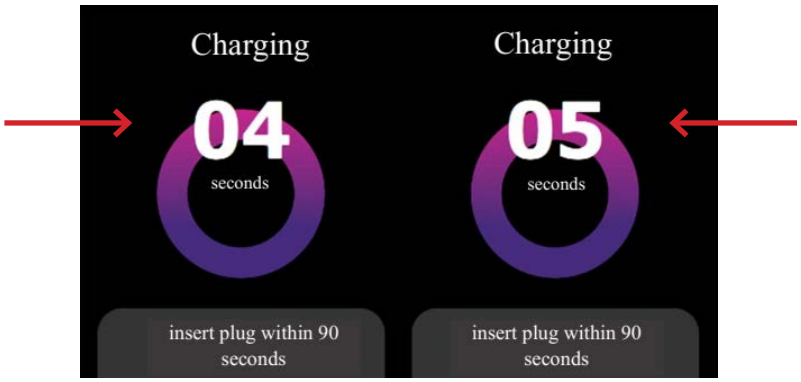


At this point you have to insert the Plug of the charging cable into the chosen Socket, **within 90 seconds (timeout**).

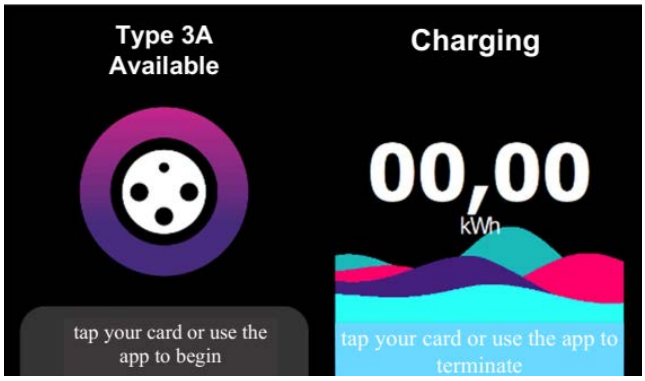
The following windows that cyclically "alternate".



When you've only got 30 seconds are left, there will appear on the screen a numerical Countdown (See Red Arrow).

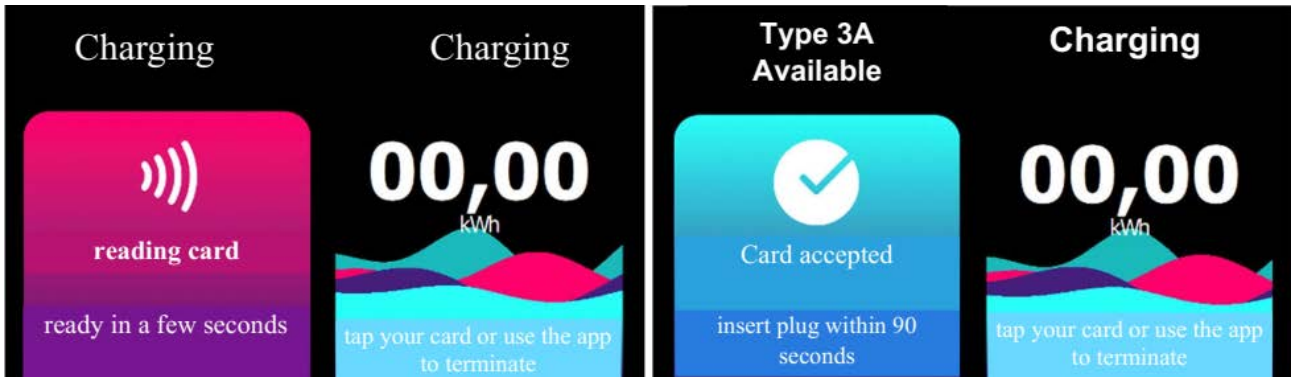


Let's say we insert a Plug in the R side; on the Display we'll see:

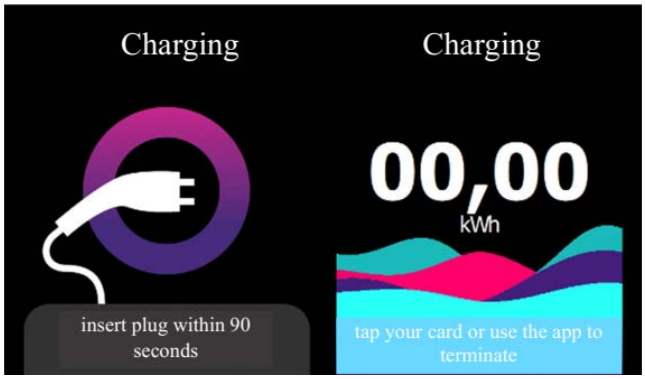


As soon as the charging session begins (on the side where the plug is inserted – e.g. R) the dispensed kWh will appear on the screen.

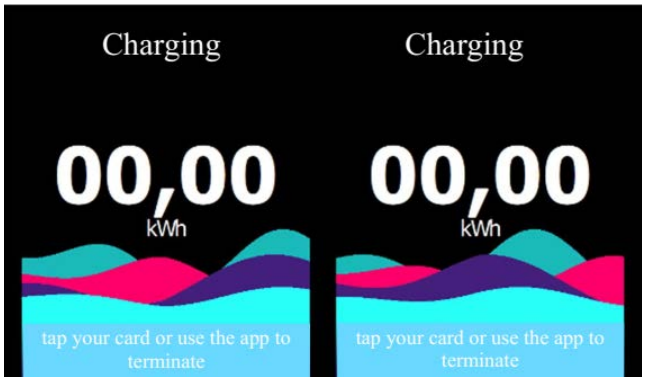
If during the start of the charging session a second (valid) RFID card is presented to the reader (or by using the appropriate APP) in sequence there will appear:



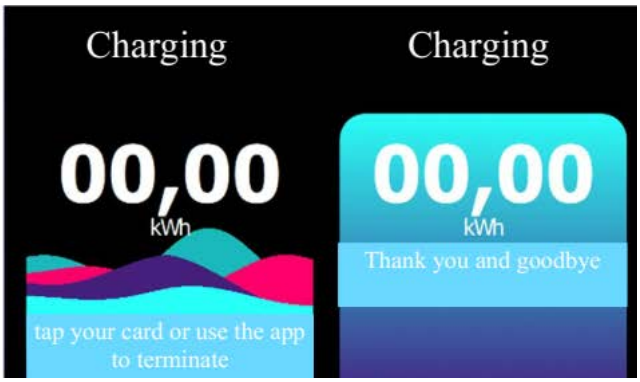
At this point you have to insert the Plug of the charging cable into the L side socket (last available) **within 90 seconds (timeout)**, only for the L side one will see the screen with the Plug appearing/disappearing.



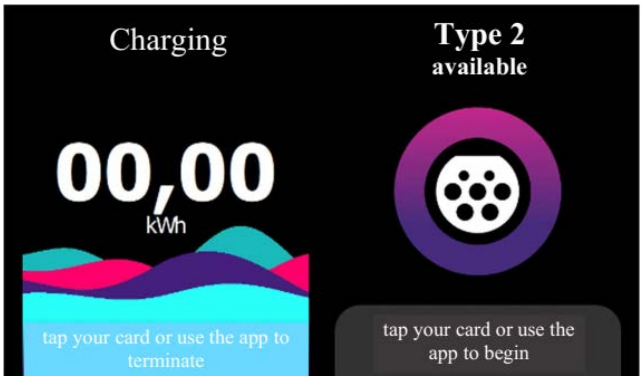
As soon as the charging session starts on the Display (on the L side, where the Plug is inserted) the supplied kWh will appear.



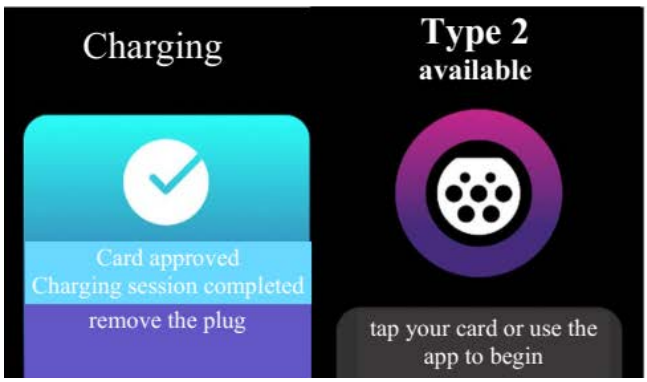
Let's suppose that the supply from the R side ends when nearing your card to the RFID Reader (or by using a suitable APP); there will appear in sequence:
The System stops supplying power from the side corresponding to the RFID Card used and summarizes the Wh supplied during the charging process. One must now pull out the R side Plug.



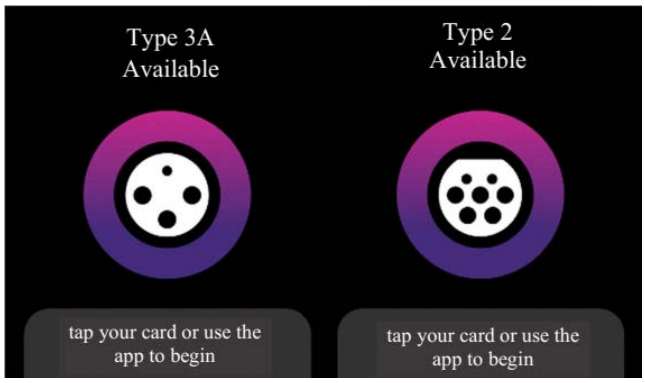
The R side Socket is available again for the following charging session.



Finally, let's suppose that the supply on the L side is also completed when nearing the card to the RFID Reader; there will appear in sequence:



The System stops supplying power from the side corresponding to the utilized Card and summarizes the Watt supplied during the charging session. One must now extract the L side Plug.

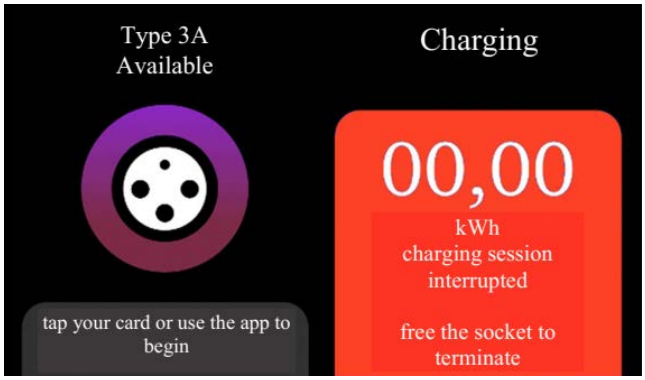


Both Sockets are now available for future charging sessions.

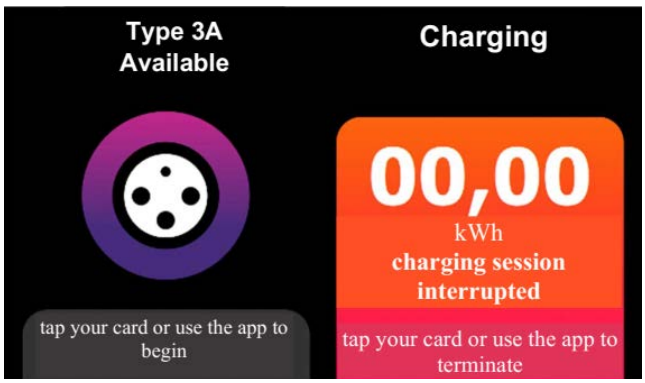
4.5.3 Exceptions

During the activities mentioned in the Paragraph above, the System may respond in an unexpected way to the User, who must take specific action to proceed and resolve the setback, if possible.

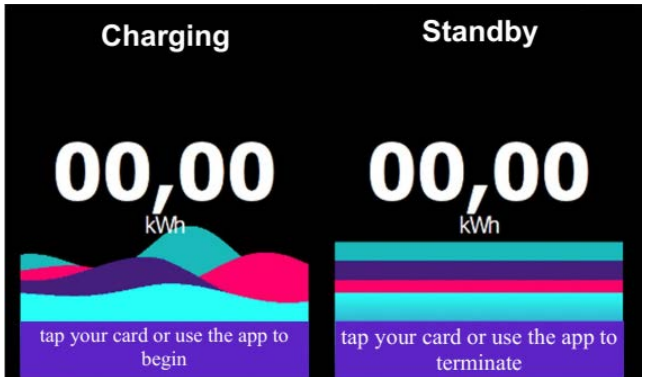
Obviously, the exceptions relating to the "validation" of the Card used by the User on behalf of the Control Center do not concern the APP that communicated directly with the latter.



o Dispensing terminated with issues ➔ Remove the Plug.



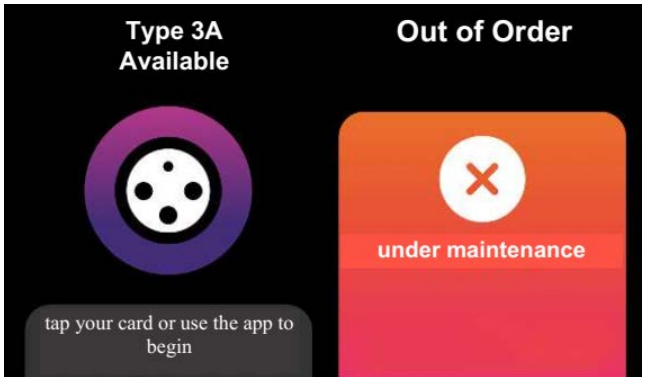
o Dispensing terminated with issues ➔ Use your card or App to terminate.



o Standby: charging session suspended by the Control Center ➔ wait for dispensing to resume.

o Standby: charging session suspended by EV (overheated batteries) ➔ Wait for dispensing to resume.

o Standby: charging session suspended by EV (batteries charged) ➔ Remove the plug.



o Plug inserted without Card validation ➔ Remove Plug

- Communication problems with the Control Center ➔ If the communication problems are permanent the recharging session will terminate at the end of the deadline (for example 15 minutes).

- (105:) Problems with the Control Center ➔ Impossible to proceed.

The message encoding is as follows:

100: The Card is not Valid
o ➔ Impossible to proceed.
101: Validation unsuccessful
o ➔ Impossible to proceed.
103: Validation Failed
o Problems with the Control Center ➔ Impossible to proceed.
105: Center disconnected
o Communication problems with the Control Center ➔ Impossible to proceed.
106: Session limit reached
o ➔ Impossible to proceed.

107: Unmanaged error

- ➔ Impossible to proceed.

108: Unregistered CU

- Problems with the Control Center ➔ Impossible to proceed.

109: Commissioning Error

- ➔ Impossible to proceed.

200: Unauthorized card

- Card issues ➔ Impossible to proceed.

201: Card expired

- Card issues ➔ Impossible to proceed.

202: Unmanaged card

- Card issues ➔ Impossible to proceed.

203: Unregistered card

- Card issues ➔ Impossible to proceed.

204: Card not accepted

- Card issues ➔ Impossible to proceed.

205: Card accepted

- Card issues ➔ Impossible to proceed.

206: No credit

- Card not valid ➔ Impossible to proceed.

207: Card already in use

- ➔ Impossible to proceed.

208: Contract not valid

- Card not valid ➔ Impossible to proceed.

209: Stakeholder association missing

- Card not valid ➔ Impossible to proceed.

210: Incorrect CU type

- Card not valid ➔ Impossible to proceed.

211: Incorrect POD

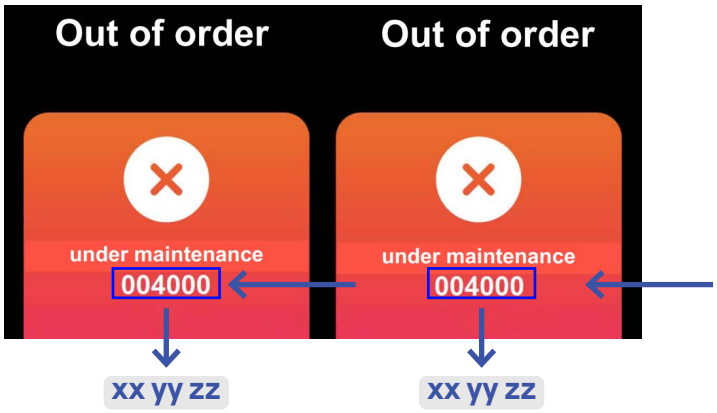
- Card not valid ➔ Impossible to proceed.

212: Outside the province
o Card not valid ➔ Impossible to proceed.
214: Socket reserved
o ➔ Impossible to proceed.

APPENDIX A

The encoding of Errors

In case of problems during regular operational activities, Waypole 2 will show "Error Code" messages on the Display (See Blue Arrow).



In the next Table you'll find listed all possible Error codes with their meaning and possible solutions.

X	X	Y	Y	Z	Z	EVENTS	RESOLUTION
0	#	#	#	#	#	Pole Station Identifier	
4	#	#	#	#	#	The system is switching off	Restore power
#	**2**	#	#	#	#	CM non-operational	Turn the PS off and on
#	**4**	#	#	#	#	Full internal Flash Memory	Request cancellation through the Control Center
#	**6**	#	#	#	#	CM non-operational + Full internal Flash Memory	Turn the PS off and on + Request cancellation through the Control Center
#	**8**	#	#	#	#	Lack of main power supply	Restore power
#	**A**	#	#	#	#	CM non-operational + Lack of main power supply	Turn the PS off and on
#	**E**	#	#	#	#	CM non-operational + Full internal Flash Memory+ Lack of main power supply	Turn the PS off and on + Request cancellation through the Control Center
#	#	**1**	#	#	#	Card reader communication problem	Turn the PS off and on
#	#	**2**	#	#	#	Meter communication problem	Turn the PS off and on
#	#	**4**	#	#	#	Detected open apparatus (Antitamper)	Request Reset through Control Center
#	#	**5**	#	#	#	Card reader communication problem + Detected open apparatus (Antitamper)	Turn the PS off and on + Request cancellation through the Control Center
#	#	#	#	1	#		
#	#	#	#	**2**	#	Differentialormagnetothermic internal protection power outage	Cross-check protections
#	#	#	#	#	**1**	Missing Aux adapter communication	Turn the PS off and on
#	#	#	#	#	**2**	CP non-operational	Turn the PS off and on
#	#	#	#	#	**3**	CP non-operational Missing + Aux adapter communication	Turn the PS off and on

Note: "# " means "any amount".

APPENDIX B

The Led Crown wheel

STATUS	COLOR	RGB%	EFFECT	NOTES
Available	white	R100%, G100%, B100%	SOLID	RGB values must be equalized to match brightness of the colors
Reserved	orange	R100%, G50%, B0%	SOLID	
RFID Card detected (when online)	white	R100%, G100%, B100%	FLASH	
RFID Card detected (when reserved)	orange	R100%, G50%, B0%	FLASH	
Start/Stop command accepted (from App or RFID)	green	R0%, G100%, B0%	FLASH	
Awaiting for cable connection	green	R0%, G100%, B0%	FLASH	Statusduration:90seconds
Charging	green	R0%, G100%, B0%	GLOW	
Standby	yellow	to be confirmed	GLOW	Switch to SOLID GREEN (charge completed) after 30 minutes in standby
Charge completed	green	R0%, G100%, B0%	SOLID	
Error	red	R100%, G0%, B0%	GLOW	