

INSTALLATION MANUAL FOR

# AGEVOLT AC EDGE PILLAR



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## List of used abbreviations


AC - Alternating Current  
CB – current bracker  
CIB - Common Installation Bus  
EVSE - Electric Vehicle Supply Equipment  
EV - Electric Vehicle  
EMS- Electric managment system  
RFID - Radio Frequency IDentification  
RCB - Residual current circuit breaker  
RCBO - Residual current circuit breaker with Overcurrent Protection


# 1. About this Manual

This manual shows how to install and configure your the charging station AC EDGE PILLAR (further also mentioned as „PILLAR,, or „charging station,,). The manual contains step by step instruction for installation (placing and wiring) and first start. Particular steps of installation need to be properly followed and provided by authorised and qualified electrician.

## 1.1 Safety Information

This document contains important instructions and warnings that must be followed when installing and maintaining the charging station.

- Please read all the instructions before installing this product
- Only an authorised and qualified electrician may install, repair or maintain the charging station. Unauthorised repair and modification of device equipment will make the manufacturer warranty null and void.
- Unauthorised modifications or conversions are not permitted.
- Don't install or use the charging station near flammable, explosive, harsh, or combustible materials, chemicals, or vapors.
- Don't operate the charging station in temperatures outside its operating range of -25°C to +45°C.
- The charging station must be grounded through a permanent wiring system or an equipment grounding conductor (depend on charging system project)
- Protect charging station from any impact which it may be exposed.
- The charging station does not have its own power switch. Always follow local electricity rules and regulations, as relevant.
- Don't use private power generators as a power source for charging station.
- Not proper installation of the charging station could potentially damage the either charging station itself and or either the electric vehicle.
- At various points in this manual, you will see notes and precautionary warnings regarding possible hazards. The symbols used have the following meaning:
  -  **DANGER** - indicates an imminently hazardous situation, which will result in death or serious bodily injury if the corresponding precautions are not taken.

-  **CAUTION** - means that damage to property can occur if the corresponding safety measures are not taken.

## 2. Description of charging station

### 2.1 Body of charging station

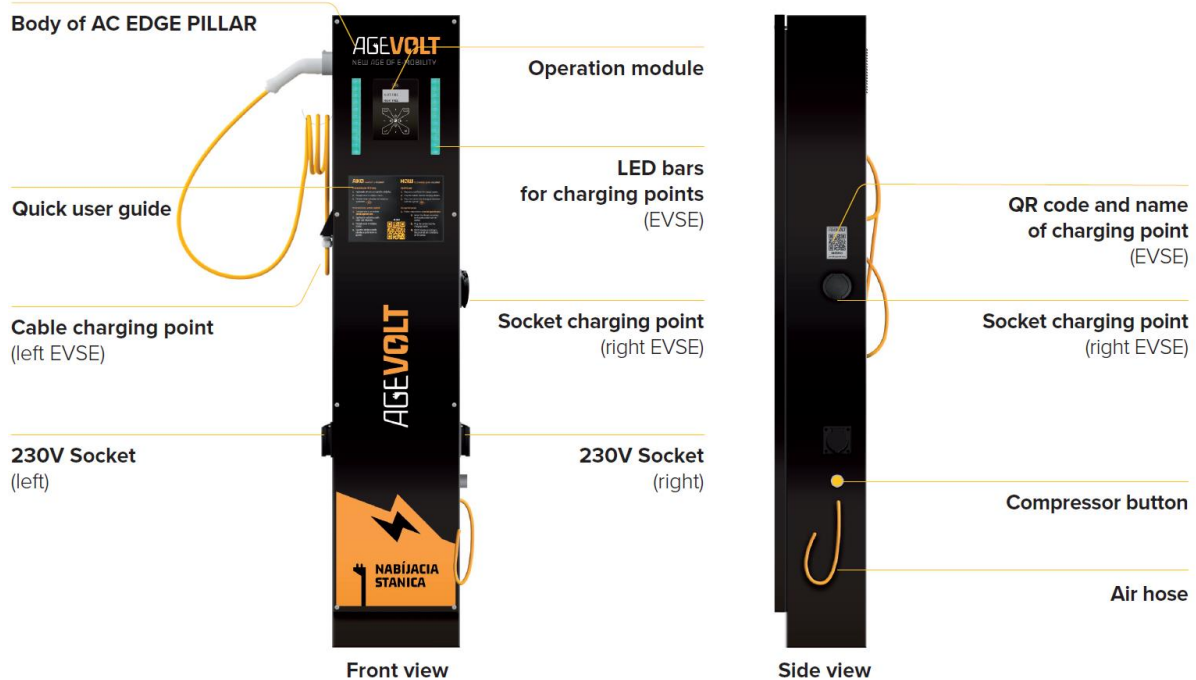



Figure 1 - Pillar front and side view

### 2.2 Operation modul and LED indicators

LED indicators and display shows current status of charging process. Via display is also manage charging process and also get more info about charging. RFID reader is placed on operation modul and marked by symbol 

### 2.3 Charging points (EVSE) for electric vehicle (EV)

Number, type and location of charging points (EVSE) on a charging station depends on the design. EVSE could have socket or cable version. Reach of cable depends on configuration of charging station. Please take into account when locating the charging station to have easy and comfortable access during charging of EV.

### 2.4 230V sockets

Depend on configuration of charging station, it could contain up to two 230V sockets. Location of sockets depends on the design. 230V sockets are primarily intended for charging of e-bikes but is also possible to use as regular socket if needed. Please take into account when locating the charging station to have reserve space for bikes.

## 2.5 Bollards

Placing bollards around charging station is advised. Bollards can protect charging station against car hitting. Please make sure that bollards will not block access to servis door of charging station and if yes bollards should be removable.

## 2.6 Body of charging station dimensions

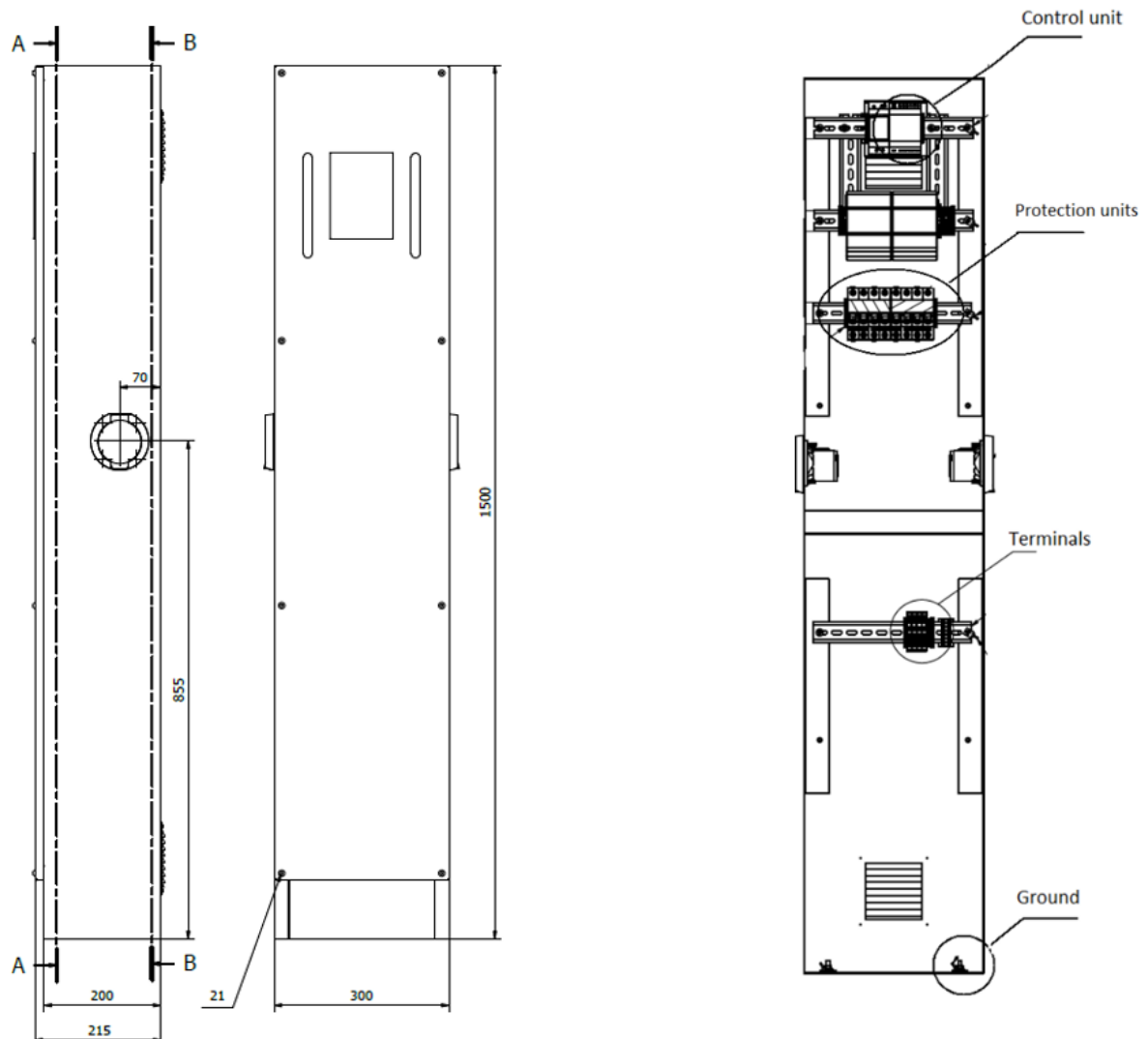


Figure 2 - Pillar dimensions and description

## 2.7 Electrical diagram

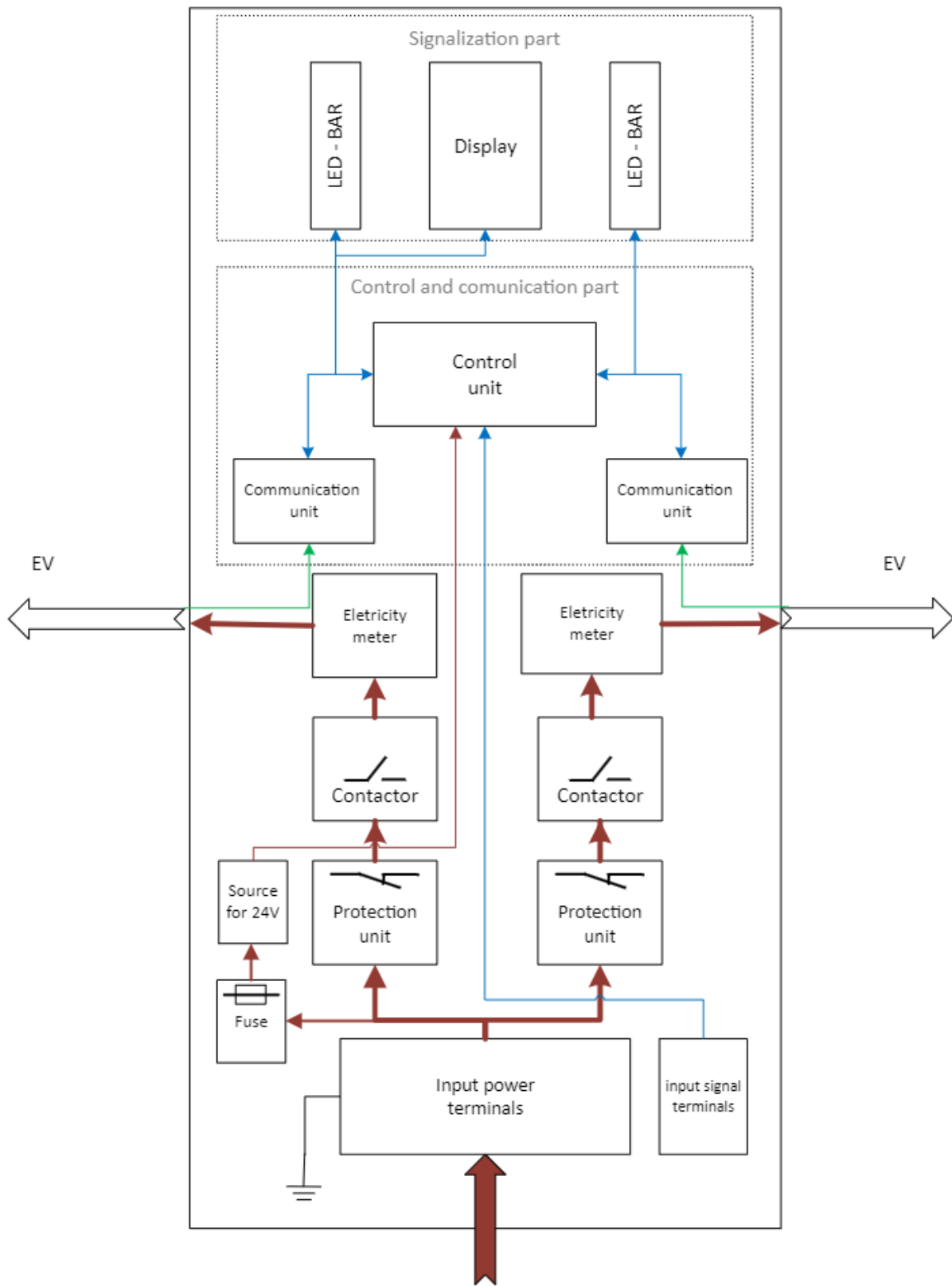


Figure 3 - Electrical diagram

# 3. Specifications of charging station

## 3.1 Datasheet

### Standard

Type	AC EDGE Pillar
No. of EVSE	1-2
Vehicle connection	Socket TYPE2 Mennekes(IEC62196-2)
Overall dimensions	380x1400x220mm
Maximum EVSE performance	22kW
Rated voltage	3x400/230V AC
Rated current	32 A
Rated frequency	50 Hz
Protection level	IP54
Mechanical protection	IK08
Weight	28 kg
Operating temperature	-25°C to +45°C
Operating humidity	5% to 95%
Storage temperature	-25°C to +60°C
Network connection	10/100 BaseTX(TCP-IP,RJ45))
Protocol	OCPP 1.6
Surface material	Steel
Access to device	Service(front)door panel
Mounting access to device	Service(front)door panel
Status indication	RGB dynamic LEDstrips
Information display	Multilingual LCD
RFID reader	MIFARE13,56MHz (ISO14443A,ISO15693)
Surge protection	Circuit breaker
Security protection	Residual-current device RCD type A(30mA) + RDC-DD(6mA)
Energy meter	MID Class 1

### Optional extras (may not be part of the charging station you have purchased)

Surge protection	Type 1 + Type 2 + Type 3, (B+C+D), 12,5kA TN-S
Safety protection	RCD typeB (30mA)
Wireless connection	LTE/3G, Wi-Fi
Car connection	TYPE2 Mennekes cable 4m
Performance control	Dynamic control according to available capacity
Energy management	Dynamic load protection (50 to 2400 A)
Wireless system connection	868 Mhz Phase
Optimizer	Optimize performance for single-phase charging
E-bike	Socket for charging electric bicycles
Servicing socket	230V additional socket IP54
Design	Customised design & branding of chargers available

## 3.2 Technical label

Main information about charging station is part of technical label placed on enclosure of charging station.

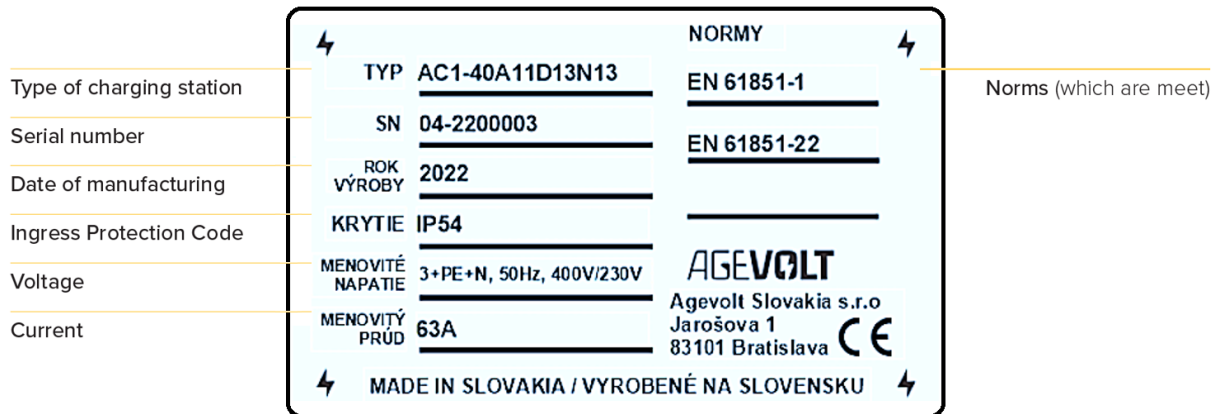


Figure 4 - Technical label

# 4. Planning Your Installation

## 4.1 Power cable requirements

Installation of the AC EDGE PILLAR charging station requires following:

- Calculating the existing electrical load to determine the maximum operating current
- Calculating the distance to ensure minimal voltage drop
- Obtaining necessary permits from the local authorities, for example building permit
- Ensuring that the installation is afterwards inspected by a certified electrician
- We strongly recommend using only copper conductors, not aluminium ones
- Conductors must be sized in accordance with local wiring regulations
- The insulation of the used wiring must be in accordance with local standards
- Use protective devices such as overcurrent protection if it isn't already part of Pillar (depend on configuration of Pillar)

All electrical devices including residual current device, overcurrent protection device, wiring, etc., must be consulted with a certified electrician.

To obtain the fastest possible charging use a three-phase circuit breaker rated for 63A. In some cases, this power level is not available and therefore the maximum available charging current must be set to the correct level by our technicians.

### Power cable requirements:

#### **Minimum: (reduced charging power 2x11kW)**

input power cable CYKY-J 5x6 providing **400V, 32A** on installation site of Pillar upstream **current breaker 32A** before charging station\*

#### **Optimal: (full charging power 2x22kW):**

input power cable CYKY-J 5x16 providing **400V, 63A** on installation site of Pillar upstream **current breaker 63A** before charging station

\* Lower input parameters than minimal can be installed after individual communication with the AgeVolt technician with regard to the reduction of the output charging power.

Different vehicles have different onboard chargers which means different charging power. This means that although the charging point is rated for 22kW (three-phase 32A), your vehicle might be charged slower.

**!!!Pay attention to keep order for input phases L1 black, L2 brown, L3 gray to run charging station properly!!!**

## 4.2 Signal cables requirements

**Communication cable J-Y(ST)Y** is necessary to install if EMS (electrical management system) is also installed. Cable J-Y (ST) Y will provide communication between control unit placed in charging station and EMS placed in electrical distribution box. Cable J-Y (ST) Y is also necessary to install when more than one charging station are installed to provide communication between them. We recommend installation of communication cable J-Y (ST) Y even you install only one for easy future upgrade of charging stations system.

**Optimal requirements: J-Y(ST)Y 2x2x0,8**

**Cable CAT** for local area network (internet) is necessary to install to control unit. Control unit then can provide online access for users of charging station.

**Optimal requirements: CAT5(or higher) + RJ45**

## 4.3 Space requirements

The PILLAR charging station is recommended to be placed between two parking lots, taking into account the length of charging cables and also comfort access to the charging station during the entire charging process. Avoid placing of back side of Pillar less than 0,2m from wall to keep air flow for ventilation holes of enclosure.

The PILLAR is approved for outdoor installation and needs no additional protection from the environment. Bollards are recommended equipment. Avoid installation in an enclosed box, or adjacent to hot appliances.

Local regulations for electrical installations, fire prevention measures and accident prevention must be taken into account, and escape routes at the installation site must be provided. It is forbidden to install the device in a location where falling objects may damage the charger.

### **Recommendation:**

#### **Zone A 1,0x0,8m**

- Adjust Zone A with focus on comfortable and especially safe access to the charging station, even when two EVs are charging in same time. Make a sufficiently large space between the EVs and the charging station.

#### **Zone B r = 3m**

- The length of the charging cables depends on the configuration of the charging station. Park EV into parking lot to keep EV's charging input in Zone B (to be in reach of charging cable).

#### **Zone C 1,0x0,2m**

- Adjust Zone C with focus on keeping air flow behind back side of charging station where vents are placed.

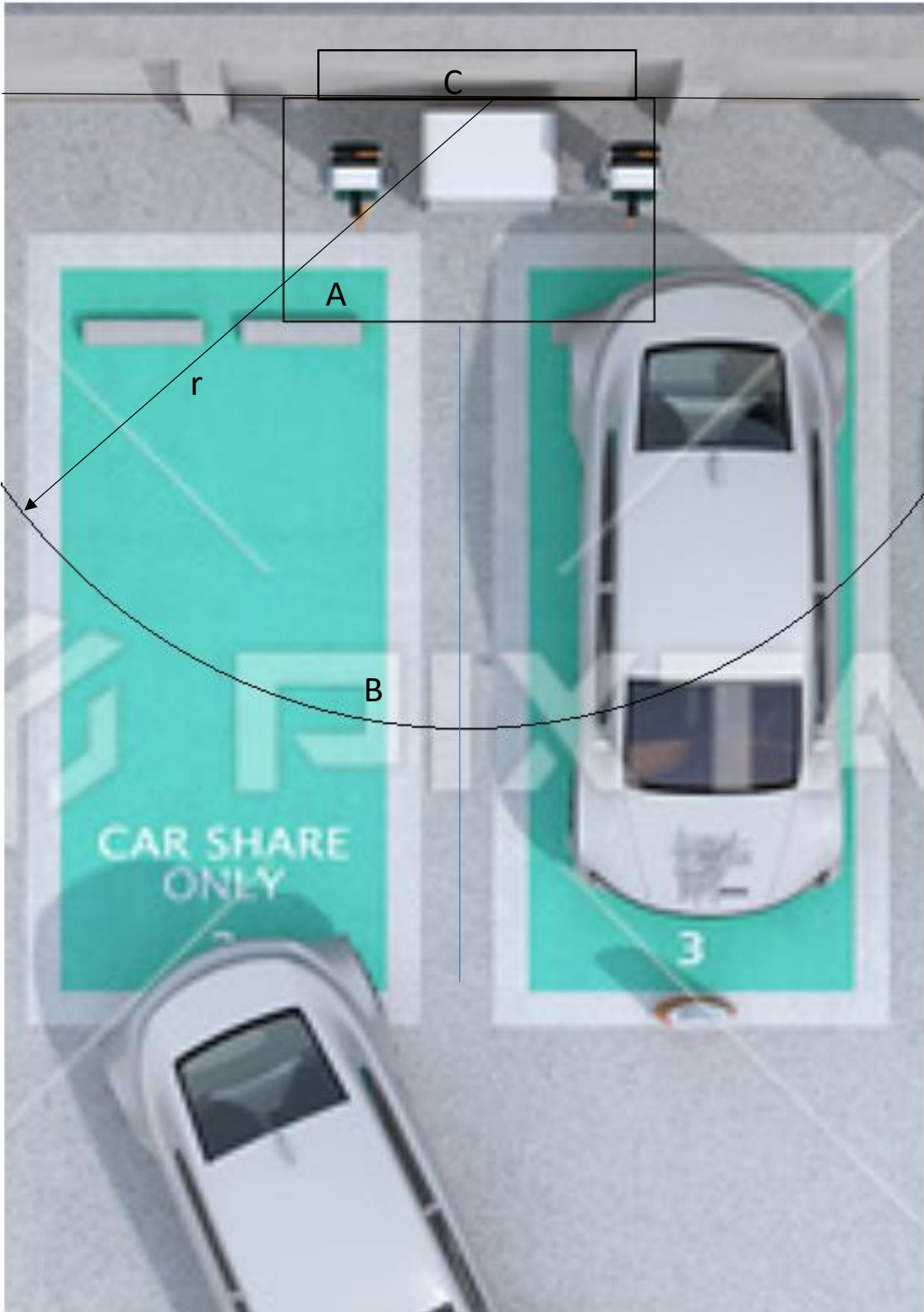


Figure 5 - Charging space requirements

# 5. Step-by-Step Installation

## 5.1 Tools and Materials Required

Before installing the EDGE PILLAR charger, gather the following tools and materials:

- Torx key size TT30/T30H– to open the charger door
- Level,
- Hammer drill, drill bit 8 mm (only if anchoring system is not used)
- 4 x steel anchor bolt M8 x 100mm (only if anchoring system is not used)
- 8 x M8 washers, 4 x M8 nuts, M8
- Torque wrench size 17.
- Wire stripper,
- Phillips screwdriver,
- Ferrules (5pcs for power wires, 2pcs for CIB communication wires, dimensions of ferrules depend on the diameter of the wirings),
- Ferrule crimping pliers,
- Flat screwdriver with dimension max. 5mm wide (for CIB terminals),
- FTP Ethernet connector CAT5e,
- Ethernet crimping pliers,
- Ethernet cable tester,
- Voltmeter or digital multimeter to measure AC voltage at the installation site.

## 5.1 Concrete base

Prepare concrete base including anchoring system which provides easier installation of Pillar. Anchoring system is optional accessories. If concrete base do not contain anchoring system use 4x anchor bolt instead and keep placing of them according Figure 6. Distance between holes 220mm and 175mm. Route the power cables and signal cables thru anchoring as shown in the Figure 7, Figure 8. Type and use of power cables and signal cables depending on project of charging system. Keep at least 1,5m of CYKY-J and J-Y(ST)Y and 2,5m for CAT (ethernet cable) length over concrete base.

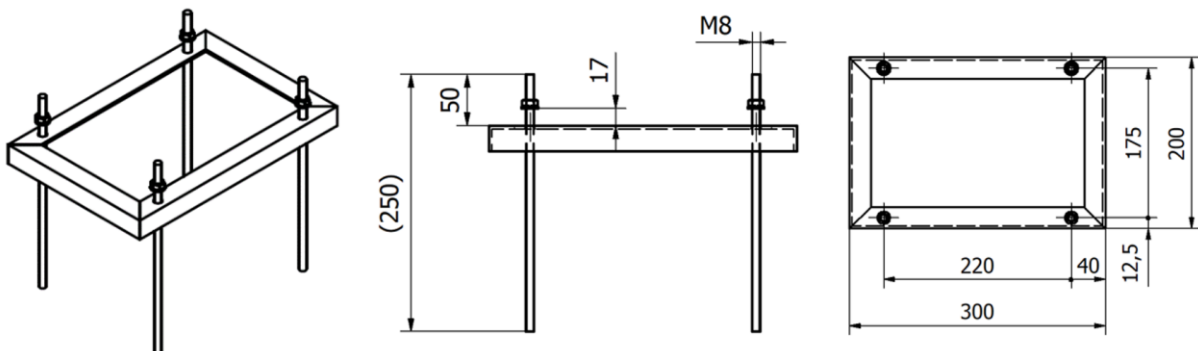


Figure 6 - Anchoring system

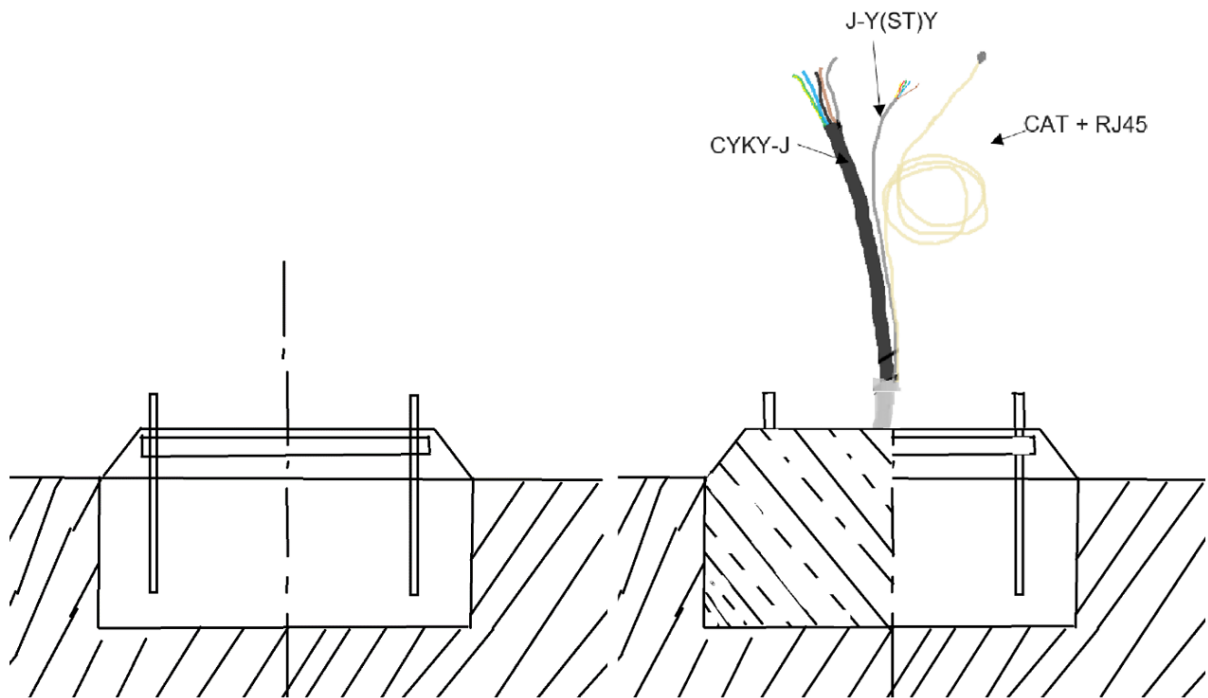


Figure 7 - Anchoring system in concrete base (side view)

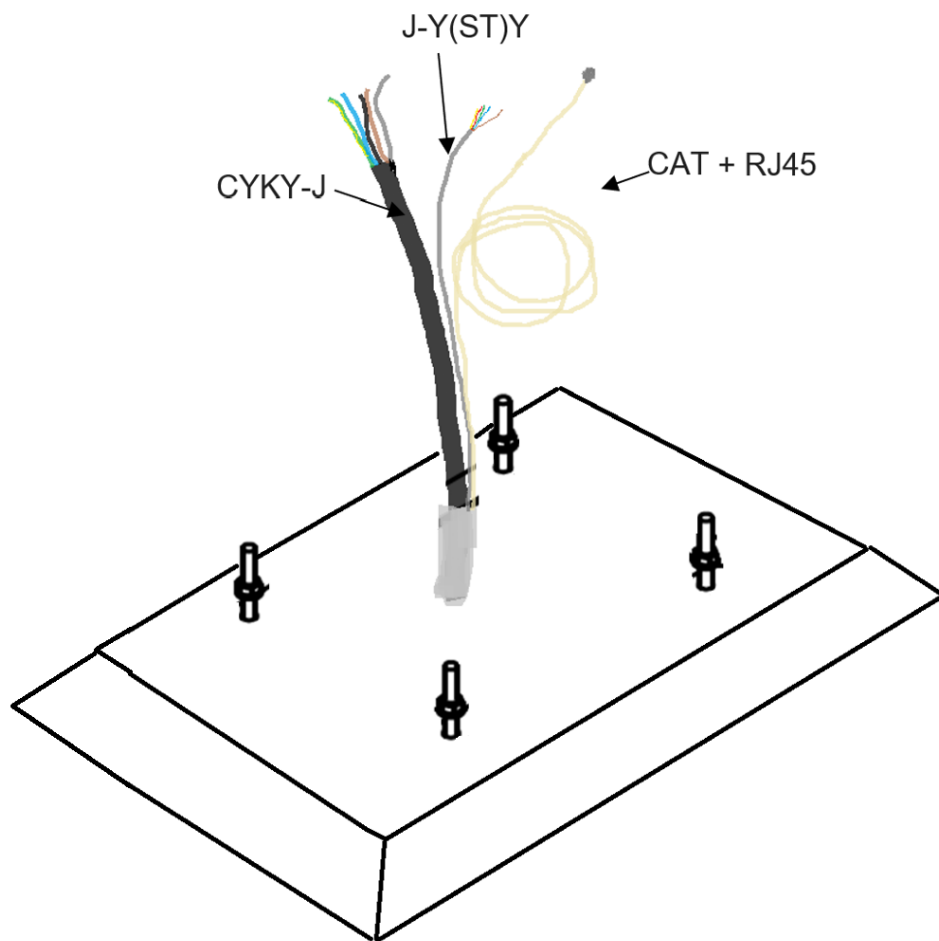


Figure 8 - Concrete base prepared for mounting Pillar

## 5.2 Mounting the Pillar on anchoring system



Warning: Before the installation TURN OFF THE UPSTREAM CIRCUIT BREAKER AND VERIFY THERE IS NO VOLTAGE IN THE WIRING.

Handle Pillar gently during mounting to do not damage inside components. Unscrew front lid of Pillar. First route power and signal cables thru bottom of pillar and then fit holes in bottom of encloser on thread rods in anchoring system in concrete base. If it is necessary to adjust the vertical position of the Pillar, use level and additional M8 nuts and washers on the rods. Ensure that Pillar is standing straight and steady. In case of gap between the foundation surface and the bottom of encouser fill gap with appropied material.

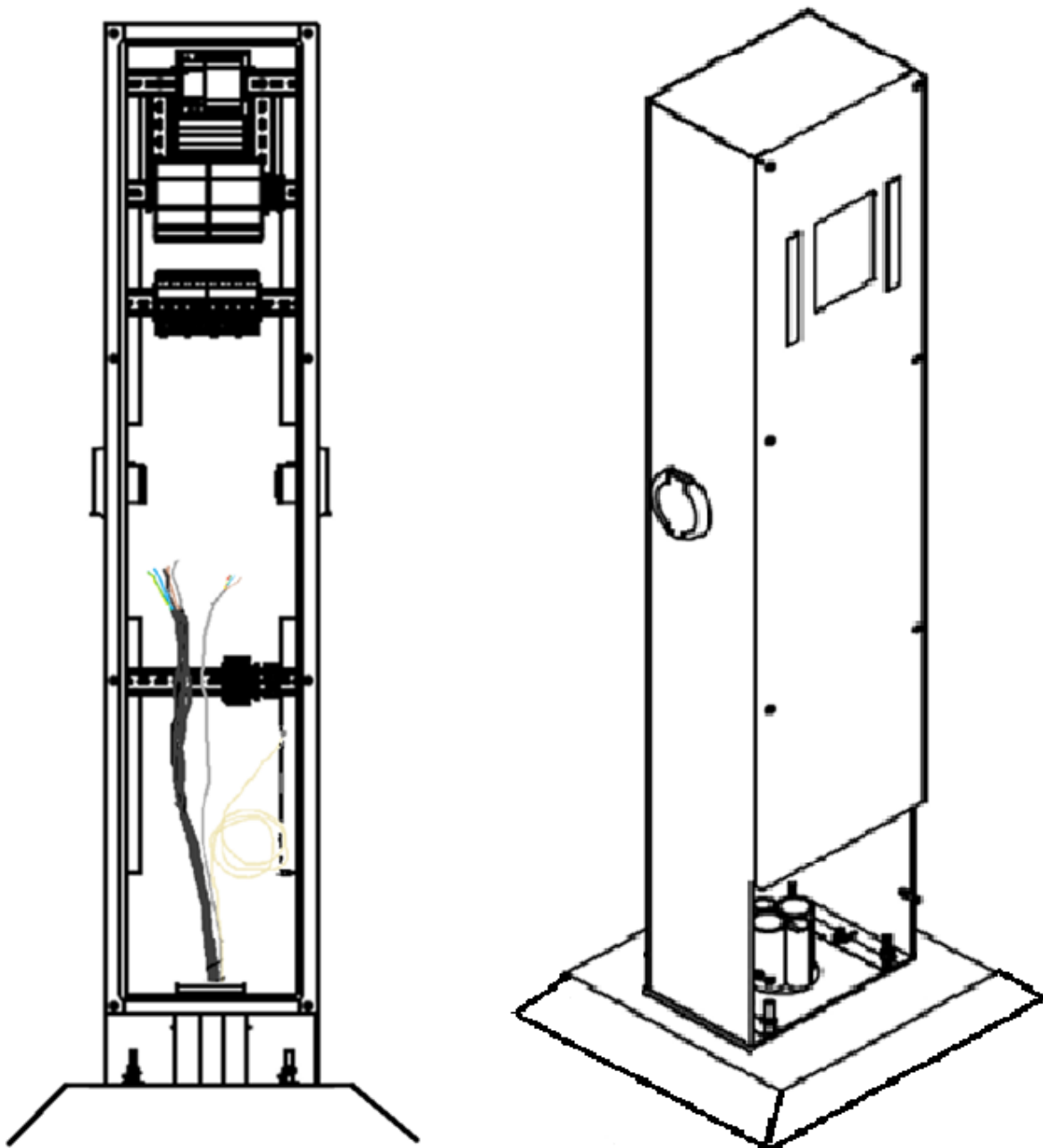


Figure 9 - Pillar fixed on anchoring system

## 5.3 Connect the Wiring



Before the installation TURN OFF THE UPSTREAM CIRCUIT BREAKER AND VERIFY THERE IS NO VOLTAGE IN THE WIRING.

### 5.3.1 Power conductors connection

First the PE conductor must be connected to the PE terminal block XD:5. Then the N conductor must be connected to the N terminal XD:4. Then connect the phase conductors to the phase terminals L1 (XD:1), L2 (XD:2) and L3 (XD:3) with consideration to the local standards.



The connection must be provided by certified electrician. Afterwards the whole installation must be checked by certified electrician.

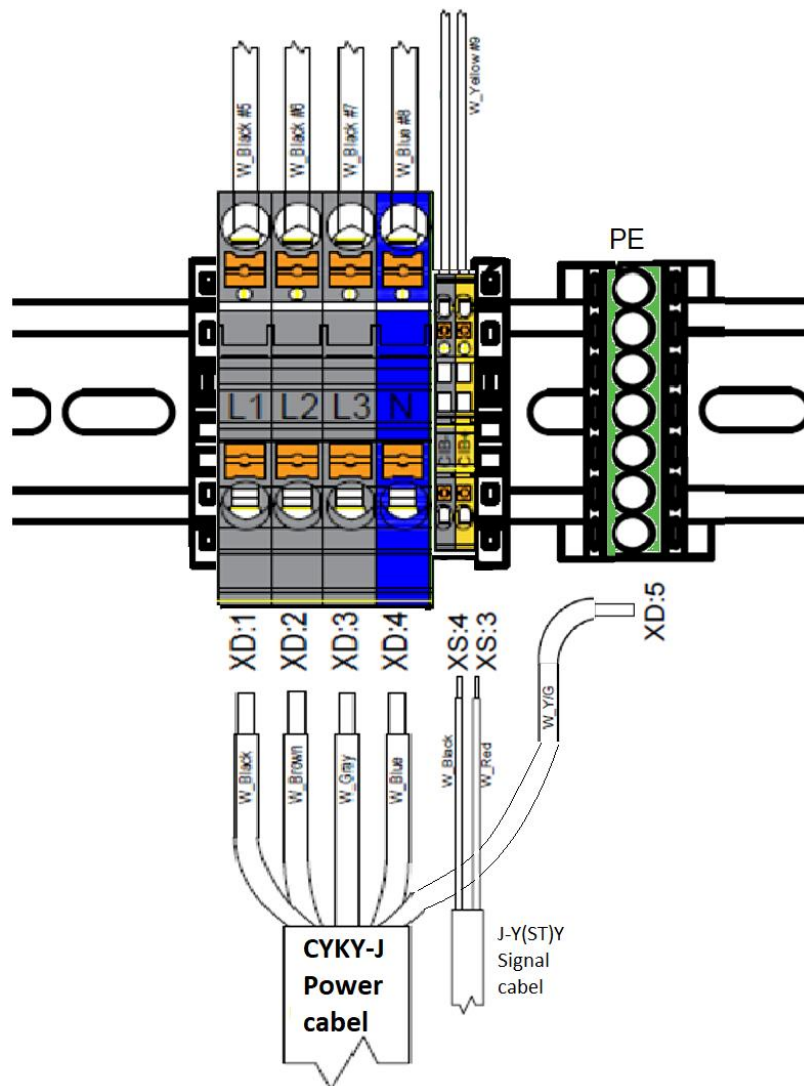


Figure 10 - Connections of PE conductor, N conductor, phases conductors and CIB conductors

If input power cable is over specification CYKY-J 5x25 extra terminals for thicker cable is necessary to use.

### 5.3.2 CIB conductors connection

In case that EMS will be managing charging proces of EDGE Pillar place internal bus (CIB) cable into terminals according Figure 10. Prior to the connection verify that in the upstream cabinet the red conductor is connected to CIB+ terminal and black conductor is connected to CIB- terminal of the power meter.

Using appropriate tools, connect red conductor from electrical cabinet to terminal CIB+ located on the bottom DIN rail next to the power terminals. Then connect the black conductor to CIB- terminal.

### 5.3.3 Ethernet connection

If charging system is projected that Pillar contain control unit place ethernet cable into. The Ethernet cable previously prepared on the installation site must be fitted with a CAT + RJ45 connector. According to standard T568B the connection must be as in Figure 11. It is always necessary to ensure that the handmade connectors on both ends of the Ethernet cable are functional with an Ethernet cable tester. Use the cable tester according to the manufacturer instructions.

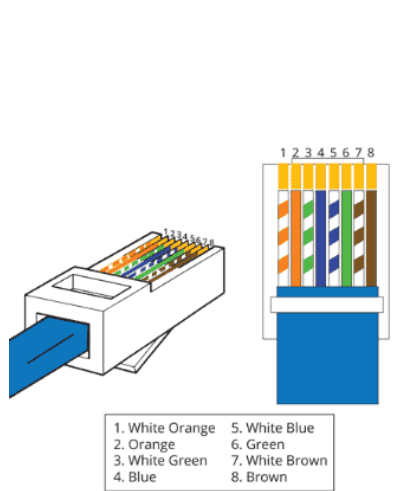


Figure 11 - Wiring of CAT cable into RJ45

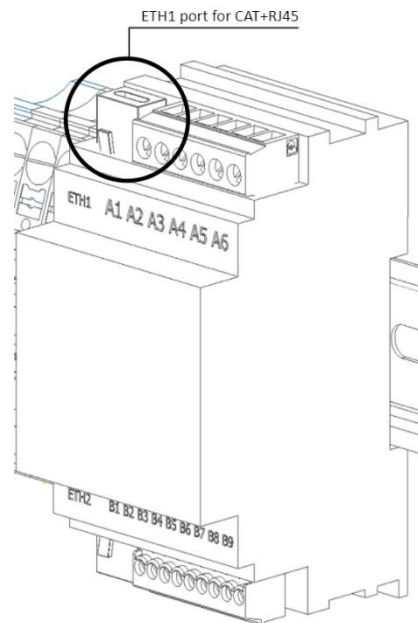


Figure 12 -Placing of CAT +RJ45 cable into Control unit

After successful test with the cable tester, plug the connector into the control unit port ETH1 Figure 12. Do not plug ethernet to port of bottom side of control unit.

## 6. Commissioning the charging station



Check for miswiring using a multimeter and verify that there are no shorts before turning the upstream circuit breaker ON.

### 6.1 First start

Turn on upstream CB and also both Protection units (RBCOs) in charging station (if contain). Charging station will turn on and will be in default setting(Free charging mode, charging power for each EVSE 22kW). Both LED bars are green in whole length and display shows status of EVSEs (Free). Further info regarding how LED bars and display work find in User manual for AC EDGE PILLAR. If Display and LED do not act accordingly check power and signal cables and Troubleshooting (See section 7.1)

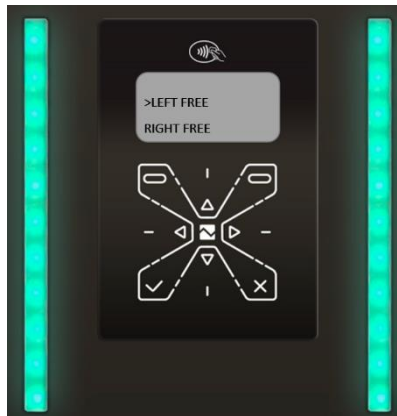


Figure 13 - Display and LED after first start

### 6.2 Charging station settings via control unit

All settings regarding charging capacity, availability, limitation, pricing, type of authorization, users of charging station, language, customization of charging station atc. Find in Smart System manual.

**!!!!Charging capacity and charging power is necessary to set before first charging proces in control unit (if contain) or via communication units!!!**

### 6.3 First charging of EV

To start with first charging please follow steps of charging proces in User manual for AC EDGE PILLAR. There is step by step description how to start, checking and finishing charging proces in each authorization mode and also what LED and display shows in each charging proces step.

# 7. Troubleshooting

## 7.1 Errors overview

Error	Possible causes	Remedy
<b>First start - running</b>		
Charging station do not start properly	Order of phases is not hold	Check order of phases if order fits with installation requirments
Charging station do not charge 22kW for each EVSE	Not enough input power	Check if input power cabel provide 400V/63A
<b>Display</b>		
Shows "HALT"	Software update is running	Wait till update is done
	Display won't communicate with the control unit	1. Restart__(on/off) charging station 2. Contact Tech support
Shows un-recognizable signs	Display not work properly	Restart(on/off) charging station
<b>LED</b>		
Does not illuminate	LED turned off in settings	Check settings for LED via web interface -> System -> Edit
	LED module broken	LED module need replacement
Illuminates red	Charging station_error	1. Restart(on/off) charging station 2. Contact Tech support

## 7.2 Restarting the charging station



Turn on/off charging station from source of energy. If control unit is part of electrical distribution box of the building, then turn it off/on instead of circuit braker.

## 7.3 Restart of charging points (EVSE)



In the event of charging point (EVSE) not working, please check the protection switches.

1. Unscrew a front cover
2. Check/Lift arm of protection switch to up position

Type of protection switch will depend on the configuration of your charging station.

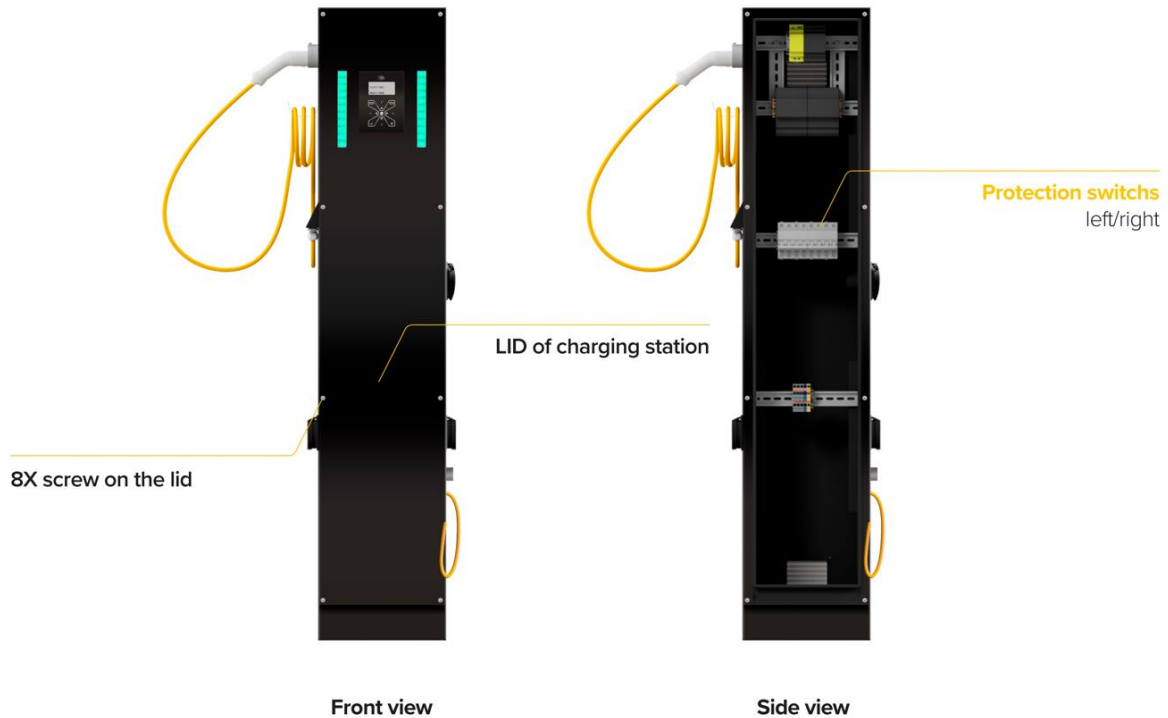


Figure 14 - Pillar placing of protection units

## 7.4 Test of protection unit of EVSE

AgeVolt recommends test of protection unit once a month. (See picture in section 7.3)



1. Unscrew a front cover
2. Press test button on protection unit (switch of protection unit falls to down position)
3. Lift switch of protection unit to up position

## 8. Warranty conditions

AgeVolt provides warranty for product according market, regional laws and regulation. Please check your warranty list. Warranty can be provided only if conditions below are fulfilled:

- Installation of charging station must be provided by qualified electrician
- Installation must follow installation manual steps and local requirements
- Only general maintenance work on charging station is allowed. Any other tampering to the charging station is not allowed
- In case of needed repair only original spare parts approved by AgeVolt can be used.
- Do not remove manufacturer's seals.
- Do not use charging station if any failure or damage appears on charging station

## 9. Servis and care

### 9.1 Maintenance



The charging station is essentially maintenance free. AgeVolt recommends regular electrical check of the charging station according to local requirements by authorised and qualified specialist (qualified electrician) especially when in use for public. Owners should carry out regular visual inspection and keep charging station in a good working condition to avoid any failure, damage or accident. AgeVolt recommends test of protection unit once a month. (See section 7.4)

### 9.2 Repair



Any unauthorised repairs of the charging station are not permitted. Repairs can only be carried out by qualified electrician using original spare parts approved by AgeVolt.

### 9.3 Cleaning



Only a dry cloth use to clean the charging station if necessary. To avoid any risk of fatal electric shock during cleaning, switch off charging station from source of energy. Do not clean the charging station with a high-pressure cleaner and do not use any aggressive cleaning agents.

### 9.4 Additional documentation

More information and documentation regarding charging station are available on our website: <https://www.agevolt.com/en/charging-stations/>

## 10. Lifetime of charging station

- Lifetime of charging station is projected for 10 years (except EVSE cables, plug and sockets which are mechanically worn)
- Connection cycles of socket/plug EVSE : 10000 cycles
- Lifetime of electricity meter: 999999,99kWh
- Mechanical durability of RCBO 20000 cycles
- Electrical durability of RCBO 15000 cycles
- Rated on and off capability: 1500A
- Rated short-circuit current
- Rated insulation voltage: 500V AC
- Rated impulse withstand voltage: 6kV
- Surge current resistance: 250A
- Mechanical durability of switched elements: min 5 000 000 cycles
- Electrical durability of switched elements: 100 000 cycles